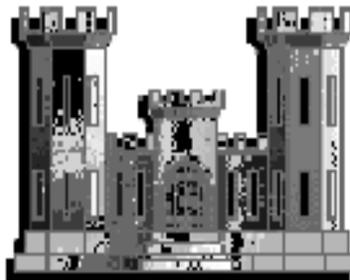


FORT HOOD

INTEGRATED CULTURAL RESOURCE MANAGEMENT PLAN (ICRMP)



**Prepared By: Dr. Cheryl L. Huckerby
Cultural Resource Program Manager**

Department of Archaeology
Environmental Division
DIRECTOR OF PUBLIC WORKS
ATTN ENVIRONMENTAL DIVISION
III CORPS AND Fort Hood, TX
4213 77TH STREET, ROOM 6
FORT HOOD, TX 76544-5028

An Integrated Cultural Resource Management Plan (ICRMP) for Fort Hood, Texas

ICRMP for Fiscal Years 2002 - 2007
By Fiscal Year 2001

Copyright © 2001 FTHCRM. All rights reserved.

The ICRMP is for informational and Management purposes only. Use of this information should be requested through Fort Hood's Cultural Resource Management Program office.

Cultural Resource Management
Environmental Division
Director of Public Works
Attn Environmental Division
III CORPS And Fort Hood, TX
4612 Engineer Drive, Room 76
Fort Hood, TX 76544-5028

Table Of Contents

Table Of Contents	1
List Of Figures	1
List of Tables	3
Chapter 1: Introduction	6
Intent and Purpose of ICRMP	6
Plan Organization:	6
Audience	6
Installation	6
CORPS Commander	6
Garrison Commander	6
Assigned Divisions	7
Support Organizations	7
Non-Installation Integration	7
DoD	7
Non-DoD Integration	7
Statutes and Regulations	8
Statutes:	8
Executive Orders:	8
Presidential Memorandum:	8
Federal Regulations and Guidance:	9
National Register Bulletins and Other Guidance Documents	9
Secretary of the Interior Standards	9
Department of Defense (DoD) Regulations and Guidance:	10
Army Regulations and Guidance:	10
Fort Hood Regulations:	10
Fort Hood Forms:	10
Texas State Law	10
Texas State Guidance	10
Organization Description	11
Mission Statements	11
Department of the Army:	11
Forces Command:	11
Fort Hood:	11
CRM	11
Organization Integration:	11
Fort Hood Overview:	14
III Corps History	14
Fort Hood History	14
Military Complement:	15
Chapter 2: Cultural Resource Management Program	20
Introduction	20

Table Of Contents

Section 1: Goals, Expectations and Responsibilities	20
ICRMP Management Goals	20
Cultural Resource Staff Responsibilities	21
Expectations	21
FTHCRM Duties	21
Section 2: Program Status	24
Current Program Status	24
Status as of August 2001	24
Installation Information	24
Archaeological Site Assessment:	24
Planning Level Surveys:	24
Training Areas & Cantonment: 157,452.5 Acres	24
Livefire & Impact Area: 61,374.9 Acres	24
National Register of Historic Place (NRHP) Eligibility Assessments	24
Historic Structure Assessments	25
Historic Buildings: 4	25
Cold War Historic Building (Potential):	25
Effective Re-Use of Historic Structures	25
Historic Cemeteries:	26
Traditional Cultural Properties (TCP):	26
Historic Landscape Assessment:	26
Agreements:	26
Cooperative Agreements:	26
NAGPRA	27
Curation	27
Data Management	27
Staffing Requirements	28
ID/IQ Contracts	28
ARPA	28
Field Monitoring	28
Public Outreach and Education	29
Current Installation Integration Status	30
Military Readiness – Civil works mission support	31
Project Review Board attendance	31
Dig Permit program	31
Support firebreak – Roads	31
Coordination with ITAM – Engineering	31
Data sharing	31
NRHP Testing program	31
Section 3: Current and Past Funding	32
Averages over the last five (5) years.	32
Proportion to project types.	32
Percent of total programmed required.	32

Section 4: Reporting Procedures and Associated Funding Mechanisms	32
Management Systems (Effectiveness Review)	32
Command and Installation Standards	32
Environmental Compliance Assessment System (ECAS)	33
Deficiencies as of April 2001 Assessment:	34
FINDING ID: CR-NR-01	34
FINDING ID: CR-NR-02	34
FINDING ID: CR-NR-03	34
FINDING ID: CR-NR-04	34
FINDING ID: CR-NR-05	34
Corrective measures	34
FINDING ID: CR-NR-01	34
FINDING ID: CR-NR-02	35
FINDING ID: CR-NR-03	35
FINDING ID: CR-NR-04	36
FINDING ID: CR-NR-05	36
Annual Reporting Requirements	36
Environmental Program Requirements (EPR) Report (RCS-1997; replaces 1383) ...	36
Installation Status Report (ISR) Part II (Environmental)	37
Environmental Quality Report (EQR; formerly ACTS) (RCS-1997; replaces 1485)	37
Secretary of Interior's Report to Congress on Federal Archaeological Activities	38
Chapter 3: Mission Activities and CRM	40
Introduction	40
Mission Activities	40
Cantonment Areas	40
Training Areas	41
Army Airfields	42
Tenant Activities/Support	42
Impacts to Cultural Resources	42
Archaeological Resources	42
Prehistoric	42
Actions Taken To Combat Impacts	43
Historic	43
Impacts to Historic Archaeological Resources	43
Historic Buildings Future Management Requirements	43
Impacts to Structures	44
Traditional Cultural Properties and Cemeteries	44
Intact Cemeteries	45
Defunct Cemeteries	46
Ceremonial sites	46
Landscapes	46
Monuments and Memorials	46
Archival Documents	46

Table Of Contents

Summary	46
Chapter 4. FTHCRM Management Strategy	48
Introduction	48
FTHCRM Objectives	48
Vision:	49
Mission:	49
Goals	49
Objectives	49
Provide accurate landscape access data	49
Monitor resources for impacts	49
Implement protective measures	49
Implement conservation measures	50
Increase public outreach	50
Publish Articles	50
Develop Cooperative Programs	50
Management Strategy	50
Protection	51
Structures	51
Archaeological Resources	52
The Strategy	52
Monitoring	54
Public Education	55
NHPA Section 106 Project Review	55
Resource Types and Planned Projects	55
Archaeological Resources	56
Fort Hood Archaeological Resources	56
Historic Archaeological Resources	57
Prehistoric Archaeological Resources	57
Current Status of Archaeological Research and Evaluations	58
Archaeological Research and Preservation: The Next 5 to 10 years	59
Military Training	60
Military Training: Next 5 to 10 years	60
Structural Resources	60
Military Support Facilities	60
Military Support Facilities: Next 5 to 10 years	61
Housing Facilities	61
Housing Facilities: Next 5 to 10 years	61
Pre-Fort Hood Structures	62
Pre-Fort Hood Structures: Next 5 to 10 years	62
Additional Sub-programs	62
Traditional Cultural Properties	62
European	62
European TCP: Next 5 to 10 years	63

Native American	63
Comanche National Indian Cemetery	63
Comanche National Indian Cemetery: Next 5 to 10 years	63
Leon River Medicine Wheel	63
Leon River Medicine Wheel: Next 5 to 10 years	64
Burials in Archaeological Resources	64
Burials in Archaeological Resources: Next 5 to 10 years	64
Native American Coordination	64
Native American Coordination: Next 5 to 10 years	64
Curation	65
Curation: Next 5 to 10 years	65
Data Management	65
Data Management: Next 5 to 10 Years	65
Installation Objectives	65
Training	65
Projected Projects	66
Short-Term (5-10years)	66
Long-Term (Beyond 10 years)	67
ISR Program Performance Criteria	68
Monitoring Criteria for Section 106 Compliance	68
Archaeological Survey	68
Compliance with 36 C.F.R. 79	69
ARPA Compliance: Permits	69
ARPA Compliance: Vandalism	69
Building Condition Assessments	69
Traditional Cultural Properties	70
(NAGPRA) Implementation	70
Native American Access	70
Performance Indicators/Measures = METLs	70
Chapter 5: Introduction - SOPs	74
Introduction	74
Section I: Statutory Compliance Procedures	75
SOP - Leon River Medicine Wheel Access Procedures	76
Procedure:	76
1. Native American Traditional Ceremony Performance	76
2. Scientific Studies	76
Dispute resolution:	77
SOP - Comanche National Indian Cemetery	78
Procedure:	78
1. Visits to pay respects	78
1. Repatriation Ceremonies	78
Dispute resolution:	79
SOP - ARPA Permitting	80

Table Of Contents

Procedure:	80
SOP - ARPA Apprehension and Prosecutions	81
Procedure:	81
SOP - 106 Internal Coordination/Consultation Procedures:	82
Fort Hood Proponents	82
Procedure:	83
Exclusions for Coordination and Consultation:	84
SOP - 106 External Coordination/Consultation Procedures:	85
Texas State Historic Preservation Officer and Consulting Parties	85
Procedures	86
Exclusions for Coordination and Consultation:	88
SOP - Inadvertant Discoveries	90
When FTHCRM has a plan for discoveries:	90
When FTHCRM has no plan for new discoveries:	90
SOP - Emergency Undertakings	92
In an emergency, an agency may choose one of two courses of action:	92
Section II: Management Procedures	93
SOP - Collecting Guidelines	94
Objectives	94
Artifact Collecting	95
SOP - Coordination For Excavation, FTH420X10	96
Purpose	96
Background:	96
Authorities:	96
Application	96
Acquisition Procedure:	97
Field Procedures	98
Military Training	98
Application of Penalties:	98
ARPA violation	99
Penalties	99
SOP - Research Procedures	102
Background Research.	102
Research Plan	102
Fieldwork to Locate Cultural Resources	103
Subsurface Testing	104
Excavation	104
Disposal of Excess or Redundant Materials.	105
SOP - Curation	108
Procedures	108
Creating The Collection	109
Preparing collections for transport.	111
Processing Artifacts and Samples	112

Assessment	113
Conservation Treatment	114
Cleaning	114
Cataloging	117
Labeling Artifacts	118
Packaging Artifacts for Storage	121
Artifact Container Guidelines	121
Record Keeping	123
Curation History	124
Processing Associated Documentation	125
Accessioning/Registering the Documentation	126
Assessment and Conservation Treatment	126
Refolding, Reboxing, and Numbering Arrangement	128
Recommendations by Document Type	130
Paper Documents	130
Cartographic/Oversize Documents	130
Photographic Materials	130
Audiovisual Materials	131
Electronic Media	131
Packaging	132
Document Containers	133
Storage Containers	134
Record Keeping	135
Finding Aids	135
Curation History	136
Preventive Conservation: Artifacts and Records	136
Conservation Criteria: Archaeological Materials	137
Bone	138
Antler	139
Ivory	139
Human Remains	139
Botanicals (see also Textiles, Wood)	139
Ceramics	140
Composite Materials	141
Glass	141
Leather and Other Animal Skin Products	142
Masonry	143
Metals	143
Plaster	144
Plastics	145
Shell	146
Soil Samples	146
Stone	147

Table Of Contents

Textiles	148
Basketry and Cordage	149
Wood	150
Audiovisual Materials	151
Cartographic Materials/Oversize	151
Electronic Media	152
Microform	153
Paper	153
Photographic Materials	155
SOP - Monitoring	157
Unsurveyed Areas	157
Monitoring (Undertakings)	157
Construction over 100 meters from known resource:	157
Construction where deeply buried or otherwise obscured resources may occur:	157
Monitoring (ARPA Violations)	157
Monitoring (Property Condition)	158
Artifact Collecting	158
SOP - Public OutReach and Education	159
Procedures:	159
SOP - Recycling and Waste Disposal	160
Introduction	160
Policy	160
Procedure	160
.....	163
Bibliography	164
Appendix A: Acronyms	166
Appendix A: Geography and History	176
Geographic Context	176
Vegetation and Wildlife	176
Climate and Air Quality	176
Topography	176
Geology	176
Soils, Petroleum, and Minerals	176
Historical Context	176
Native American History	176
Early European History	176
Agriculture, and Settlement	176
Camp Hood	176
World War II to the Present	176
Appendix C: Army Standards	178
Appendix D: Fort Hood Standards	182
Appendix E: FTHCRM EPR Projects	188
Appendix F: ICRIF	197

..... 202

Table Of Contents

List Of Figures

III CORPS and Fort Hood	12
DPW Flowchart	13
Fort Hood CRM Staff organization	13
Foundation Sub-Programs	51
linear framework	56
Coordination for Land Excavation Form	100
Coordination for Land Excavation Form	101

List Of Figures

List of Tables

Tracked Vehicles	15
Aircraftl	16
Live Firing Ranges (SOURCE: G-4, G-3 as of 30 Sep 00)l	16
Military Units (Source: G-3 as of 30 Sep 00)l	16
Assigned Units (Source: G-3 as of 30 Sep 00)l	16
: Total Archaeological Sites: 2219	25
Attainable methodologies for minimizing adverse effects	52
Archaeological Site Protection Matrix	53
Historic Resources on Fort Hood, TX	57
Prehistoric resources on Fort Hood, TX	58
Archaeological Resources on Fort Hood, TX	59
Proposed Projects	67
: Examples of projects and training activities classified as undertakings and requiring NHPA review. This list is not exhaustive	83
Project and training activity examples classified as undertakings and requiring NHPA review.	86
Types of non-structural undertakings expected and if coordination is required.	88
Types of non-structural undertakings expected and if coordination is required	89
Guidelines for Collecting Redundant Archaeological Materials While in the Field.	105
: Materials for Packing Collections	110
: Basic Steps in Processing Archaeological Materials	112
Guidelines for Cleaning Archaeological Materials	116
Sample Catalog Data	117
Steps for Direct Labeling of Artifacts	118
Basic Rules for Labels Attached with String or Thread	119
Curation History of a Collection	124
Basic Steps in Archival Processing	127
General Rules For Processing Photographic Materials	130
Label for Photographic Materials	131
Label for Audiovisual Materials	132
Sample Label for Electronic Materials	132
Document Container Label	134
Components of An Archival Finding Aid	135
Classes of Paper Based on Acid Content (Balough 1993:14)	155
Compliance Standards	178
Protective Manangement Standards	179
Fort Hood Standards	182

List of Tables

Chapter 1:

Intent and Purpose of ICRMP

Chapter 1: Introduction

Intent and Purpose of ICRMP

The Integrated Cultural Resource Management Plan (ICRMP) provides management information and standard operating procedures to efficiently and effectively continue stewardship responsibilities of cultural resources located within the boundaries of Fort Hood and those cultural resources outside of Fort Hood that may be affected by meeting mission requirements including those coordinated through Fort Hood by the Resident and Tenant organizations. A list of Acronyms is provided in Appendix A for reference.

Plan Organization:

The Fort Hood ICRMP presents the overall management strategy of the Fort Hood Cultural Resource Management (FTHCRM) program. To support the management Strategy, an overview of the current status of cultural resources within the boundaries of Fort Hood is presented. Additional information is provided on the structure in which the FTHCRM program operates on Fort Hood and provides the Standard Operating Procedures (SOPs) derived from the various compliance laws and regulations that integrates FTHCRM into the installation structure. The chapters are laid out as follows: Chapter 1: Intent and Purpose of ICRMP; Chapter 2: Cultural Resource Management Program; Chapter 3: Mission Activities and CRM; Chapter 4: Management Strategy; and Chapter 5: Implementation - Standard Operating Procedures.

Audience

This document is intended for a multi-faceted audience. Internally this ICRMP provides an overview of the Fort Hood program, integration requirements and implementation SOP's to insure Fort Hood's Cultural Resource Management (FTHCRM) program is part of project early planning teams and provides a proactive approach to management of Fort Hood's Cultural Resources. Externally, it provides reviewers an overview of FTHCRM. The following is a list of the Fort Hood components, tenants and external parties FTHCRM interacts with to ensure legal compliance and good stewardship practices.

Installation

CORPS Commander

Overall Land Manager

- III CORPS Operations

Garrison Commander

Direct Land Manager as assigned by CORPS Commander

Garrison users of the ICRMP at the installation level are:

- Directorate of Public Works
 - Environmental Division
 - Housing Division
 - Fire and Emergency Services
 - Business Office

- Services Division
- Projects and Planning (i.e. Master Planning, Real Property, and Project Contracting)
- Maintenance Division
- Directorate of Plans, Training, Mobilization, and Security
 - Range Control Office
 - Integrated Training Area Management (ITAM) Program
- Directorate of Contracting
- Directorate of Personnel and Community Activities
- Public Affairs
- Staff Judge Advocate

Assigned Divisions

- 4th Infantry Division
- 1st Cavalry Division

Support Organizations

- 13th COSCOM
- 62 Enginners

Non-Installation Integration

DoD

The following heirarchial organizations are also coordinated with in regards to large multi installation projects or guidance evaluation.

- Department of Army
- Forces Command (FORSCOM)

Non-DoD Integration

This section identifies non DoD participants in the NHPA Section 106 and 110 consultation with Ft. Hood CRM to insure compliance under the various statuates and regulations. This also includes 106, AIRFA, and NAGPRA

- Texas Historic Commission (State Historic Preservation Officer)
 - Advisory Council on Historic Preservation
 - Interested public / parties
 - Native American Tribes
- Federally Recognized*
- Caddo Indian Tribe
 - Comanche Indian Tribe
 - Kiowa Indian Tribe
-

- Mescalero Apache
- Tonkawa
- Wichita and Affiliated Tribes (Keechi, Waco & Tawakonie)

Non-Federally Recognized

- Coahuiltecan Nation (San Antonio Mission Indians)

Statutes and Regulations

This section lists the various legal requirements under which the program operates and available guidance from Federal, State, DOD, and DA sources.

NOTE: For Web version, Ctrl, Alt+Click Hyperlinks to the prescribed Regulatory URL

Statutes:

[Abandoned Shipwreck Act of 1987 43 USC 2101-2106](#)

[Antiquities Act of 1906 16 USC 431-433; 34 Stat. 225](#)

[Archeological and Historic Data Preservation Act of 1974 16 USC 469-469c](#)

[Archeological Resources Protection Act of 1979--ARPA -- 16 USC 470aa-470ll](#)

[Historic Sites Act of 1935 16 USC 461-467](#)

[National Environmental Policy Act--NEPA -- 42 USC 4321-4370c](#)

[National Historic Preservation Act of 1966, as amended -- NHPA -- 16 USC 470-470w](#)

[Native American Graves Protection and Repatriation Act of 1990--NAGPRA -- 25 USC 3001-3013](#)

[Public Buildings Cooperative Use Act 40 USC 601-619](#)

[Sikes Act--16 USC 670a-670o, 74 Stat. 1052](#)

[Sikes Act Improvement Amendment-1998](#)

Executive Orders:

[EO 11593 - Protection and Enhancement of the Cultural Environmen](#)

[EO 12512 - Federal Real Property Management](#)

[EO 13007 - Indian sacred sites](#)

[EO 13084 - Consultation and Coordination With Indian Tribal Governments](#)

Presidential Memorandum:

[Government-to-Government Relations with Native American Tribal Governments](#)

Federal Regulations and Guidance:

Advisory Council on Historic Preservation (ACHP), [Protection of Historic Properties, 36 CFR 800](#)

Council on Environmental Quality, [Regulations Implementing the National Environmental Policy Act, 40 CFR 1500-1508](#)

Department of the Interior, [Curation of Federally-owned and Administered Archeological Collections, 36 CFR 79](#)

Department of the Interior, [Determinations of Eligibility for Inclusion in the National Register of Historic Places, 36 CFR 63](#)

Department of the Interior, [National Historic Landmark Program, 36 CFR 65](#)

Department of the Interior, [National Register of Historic Places, 36 CFR 60](#)

Department of the Interior, [Preservation of American Antiquities, 43 CFR 3](#)

Department of the Interior, [Supplemental Regulations \[per ARPA\], 43 CFR 7](#)

Department of the Interior, [Waiver of Federal Agency Responsibility under Section 110 of the National Historic Preservation Act, 36 CFR 78](#)

Department of the Interior, [The Secretary of the Interior's Standard for the Treatment of Historic Properties, 36 CFR 68](#)

[Regulations Implementing the National Environmental Policy Act, 40 CFR 1500-1508](#)

National Register Bulletins and Other Guidance Documents

[Guidelines for Documenting and Evaluating Historic Military Landscapes](#)

[How to Apply the National Register Criteria for Evaluation - National Register Bulletin 15 \(NRB 15\)](#)

[How to Complete the National Register Registration Form \(NRB 16A\) How to Evaluate and Nominate Designed Historic Landscapes \(NRB 18\)](#)

[Guidelines for Evaluating and Documenting Rural Historic Landscapes \(NRB 30\)](#)

[Guidelines for Evaluating and Registering Historical Archeological Sites and Districts \(NRB 36\) \(zip format\)](#)

[Guidelines for Evaluating and Documenting Traditional Cultural Properties \(NRB 38\)](#)

Secretary of the Interior Standards

[Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring and Reconstructing Historic Buildings](#)

[Standards for the Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes](#)

[Standards and Guidelines for Archeology and Historic Preservation](#)

Department of Defense (DoD) Regulations and Guidance:

[Department of Defense \(DoD\) Instruction 4715.3, Environmental Conservation Program, Protection of Archeological Resources, 32 CFR 229](#)
[American Indian and Alaskan Native Policy](#)

Army Regulations and Guidance:

[Army Regulation 200-1, National Environmental Preservation Act \(NEPA\).](#)
[Army Regulation 200-3, Natural Resource Management.](#)
[Army Regulation 200-4, Cultural Resources Management. AR 200-4](#)
[Department of the Army Pamphlet 200-4, Cultural Resources Management. AR Pam 200-4](#)

Fort Hood Regulations:

[FH 420-2, Environment and Natural Resources FH REGULATION 420-2](#)
[FH 420-27, Care, Maintenance, and Alterations of Facilities FH REGULATION 420-27](#)
[FH 350-40, Fort Hood Range Division Operating Procedures FH REGULATION 350-40](#)
[FH 210-190, Internment on the Fort Hood Military Reservation FH REGULATION 210-190](#)

Fort Hood Forms:

[FH FORM 420-X10](#)

Texas State Law

[Antiquities Code of Texas](#)

Texas State Guidance

[Rules of Practice and Procedure](#)
[Restricted Cultural Resource Information](#)
[Council of Texas Archeologists: Guidelines for Cultural Resource Management Reports](#)
[Archeological Survey Standards for Texas](#)

Organization Description

This section describes Fort Hood and its role within the Army.

Mission Statements

Department of the Army:

Preserve the peace and security, and provide for the defense of the United States, the Territories, Commonwealths, and Possessions, and any areas occupied by the United States. Support national policies Implement national objectives. Overcome any nations responsible for aggressive acts that imperil the peace and security of the United States.

Forces Command:

United States Army Forces Command ... is the Army Component of the United States Atlantic Command and a Major Army Command. We train, mobilize, and deploy ready ground forces of America's Total Army to meet operational requirements of our Nation. We are stewards of Army resources, caring for soldiers, civilians, retirees and families, and for the high quality installations from which we project and support the force.

Fort Hood:

Provide an efficient and effective power projection platform -- training, mobilization, deployment, and sustainment support to produce the world's best trained and most lethal warfighters in a caring, safe, and secure environment.

CRM

Balance Cultural Resource Stewardship with Army Mission Training Requirements.

Organization Integration:

Fort Hood is a large installation with a CORPS command as well as the normal Garrison Command structure. Training and projects can be initiated at both levels. As such, integration at both levels insures impacts to cultural resources will be considered during the planning stages. The following organization charts (Figures 1-1, 1-2, and 1-3) demonstrate the heirarchy which currently exists and through which projects and training must be coordinated to include FTHCRM.

Figure 1-1. III CORPS and Fort Hood

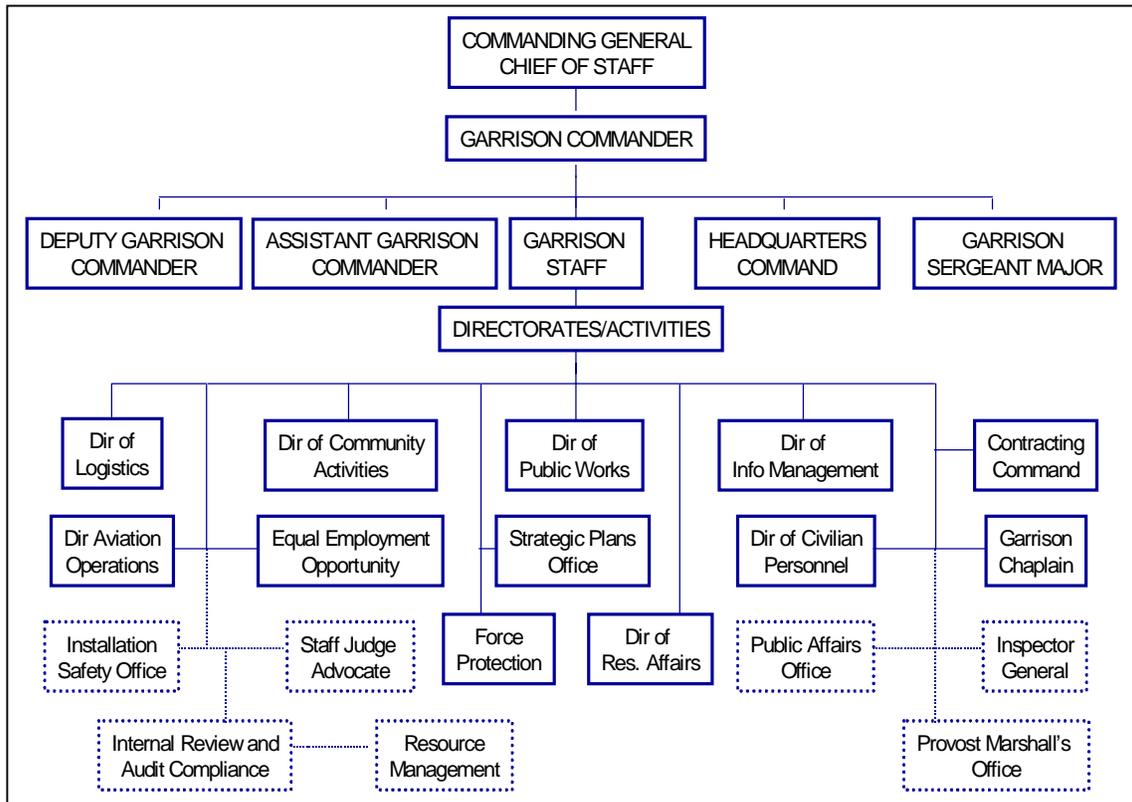


Figure 1-2. DPW Flowchart

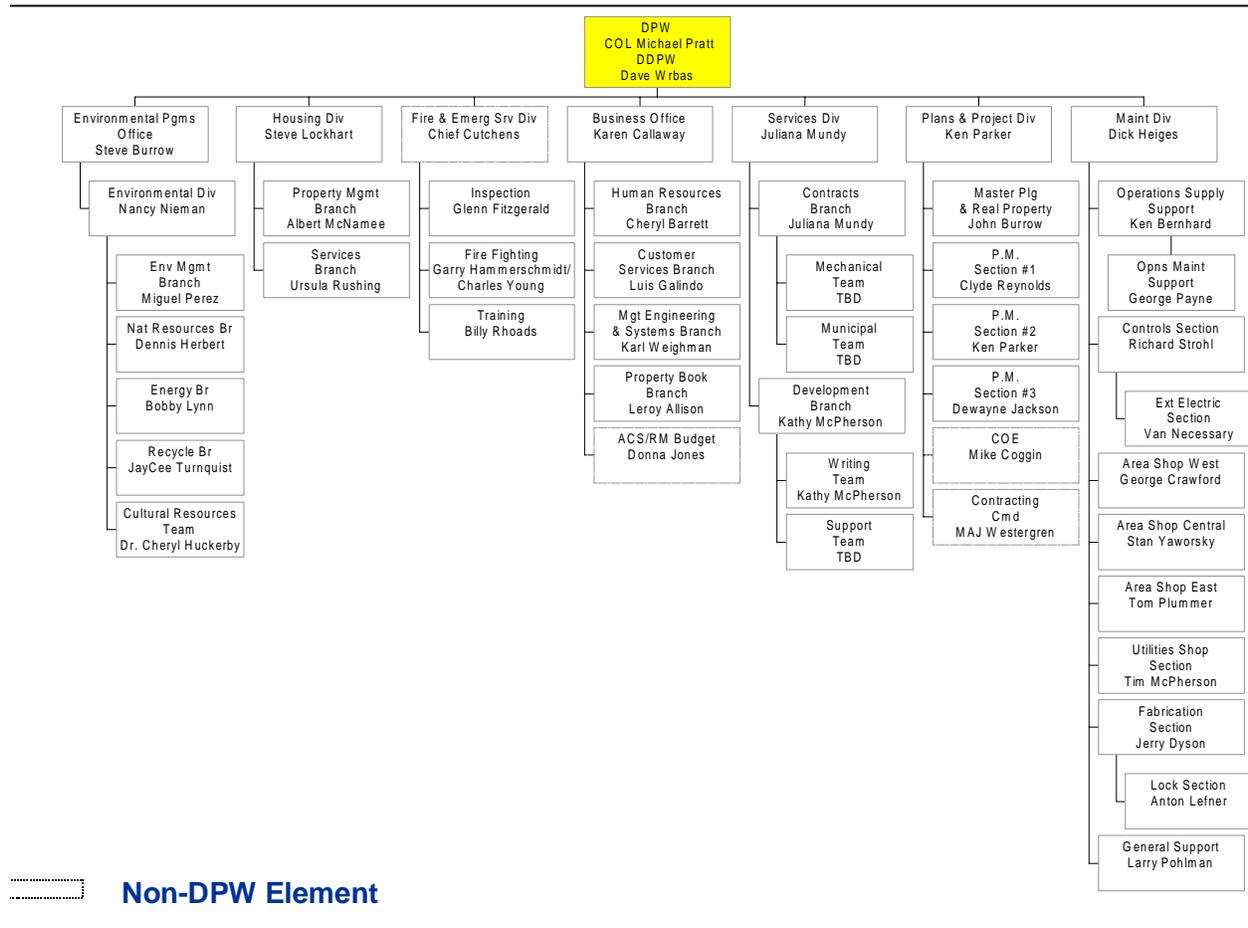
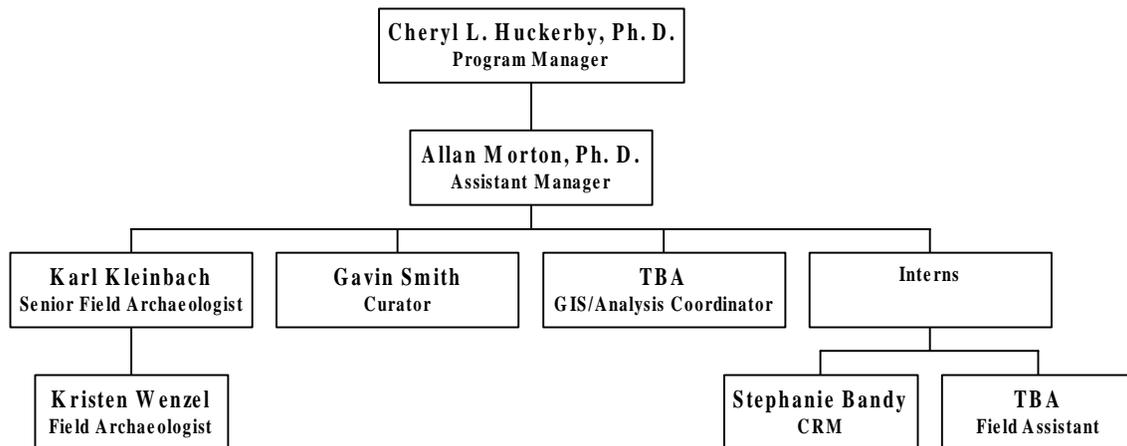


Figure 1-3. Fort Hood CRM Staff organization



Fort Hood Overview:

Source: Historian, Directorate of Community Relations.

III Corps History

III Corps' colorful history dates from 1918 when the Corps served in World War I, winning battle streamers for the Aisne-Marne, Lorraine, and the Meuse-Argonne campaigns.

Inactivated in 1919, the Corps was reactivated in 1940 to train combat divisions. During World War II the Corps was deployed to The European Theater of Operations and earned the name "Phantom Corps" by hitting the enemy when and least expected. It won campaign streamers in Northern and Central Europe, and established the Remagen Bridgehead, enabling the Allies to secure a foothold in Germany.

Inactivated in 1946, III Corps was reactivated in 1951 and served on active duty until 1959. Inactivated that year, it quickly returned to duty at Fort Hood during the Berlin Crisis in 1961. In 1962 III Corps was designated as part of the U.S. Army Strategic Army Corps.

During the Vietnam conflict, III Corps trained and deployed two Field Force Headquarters and many combat and combat service support units totaling more than 100,000 personnel.

In recent years, III Corps forces have fought in and supported operations worldwide, to include Grenada, Panama, Honduras, Saudi Arabia, Kuwait, and Iraq, and provided humanitarian support for Operation Restore Hope in Somalia. III Corps elements provided support for Operation Joint Endeavor in Bosnia and Herzegovina.

For many years, the primary focus of III Corps was the reinforcement of NATO. As the world and the U.S. Army have changed the Corps has also changed, and broadened it's focus to be ready to deploy anywhere, anytime and win.

III Corps major units comprise the 1st Cavalry Division and 4th Infantry Division; as well as the 3rd Armored Cavalry Regiment, the III Corps Artillery; and the 13th Corps Support Command.

Fort Hood History

Fort Hood was named for the famous Confederate General John Bell Hood, an outstanding leader who gained recognition during the Civil War as the commander of Hood's Texas Brigade. The original site was selected in 1941, and construction of South Camp Hood began in 1942. North Camp Hood, located 17 miles to the north, was established shortly after the first land acquisition and the founding of the cantonment area.

South Camp Hood was designated as Fort Hood, a permanent installation, in 1951. Acquisition of Camp Hood (as Fort Hood was formerly known) began in 1941 in preparation for World War II. Camp Hood was established by acquiring 104,000 acres in 1942. In 1943, 46,000 additional acres were acquired. Camp Hood formally opened for troop training in September 1942 and, at peak population, provided training grounds for over 130,000 troops. In 1950, the Department of the Army designated Camp Hood a permanent post and renamed the installation "Fort Hood". The second major land acquisition of 49,578 acres occurred between 1953 and 1955 and was concurrent with the acquisition of land for Belton Lake Reservoir. Over the years Fort Hood expanded in size through a series of land acquisitions to accommodate new equipment and training needs.

North Camp Hood became North Fort Hood and what is now West Fort Hood was formerly a U.S. Air Force Base. The U.S. Air Force ran both the airfield and the base from 1947 to 1952. From 1952

to 1969, the U.S. Army under the Defense Atomic Support Agency ran the facilities. It became part of Fort Hood in 1969.

Today, the Army owns approximately 213,093.5 acres and has a lease of 5,733.9 acres adjacent to Lake Belton from the U.S. Army Corps of Engineers (ACOE). FTHCRM has oversight responsibility for all 218,827.4 acres.

Fort Hood is a tank training facility with two assigned divisions, 1st Cavalry and 4th Infantry. 1st Cavalry is a heavy mechanized division deploying up to the Abrams tanks. 4th Infantry is a light to medium mechanized division fielding up to Bradley personnel carriers. These divisions train on 218,000 acres of rangeland including the live fire ranges and impact area. Fort Hood began as Camp Hood with the acquisition of property during 1942-43 as a response to World War II needs to develop tanks and train personnel on their use in the battlefield. At the close of World War II, it was decided that heavy mechanized fighting machines were the future of the Army and thus that a development and training facility was needed to support long-term Defense goals. Hence Camp Hood was retained, additional property was acquired, particularly on the east side of the installation in conjunction with the development of Belton Lake Reservoir. In 1956, Camp Hood became a permanent Department of Army training installation and was designated Fort Hood.

Fort Hood is located in Central Texas approximately one hour north of Austin and one hour south of Waco. The landscape is varied with rolling hills on the west side and 200 meter escarpments in the east abutting Belton Lake. Constant water is supplied via two major river systems, in the north by the Leon River, and through the middle of the installation by Cowhouse Creek. Numerous tributaries have running water throughout most if not all the year. Oak stands border many tributaries and White Juniper also called cedar locally, was native to the escarpments but has encroached to the lowlands as fire has been brought under control. A detailed overview of the geology, natural resources, and general location information is located in Appendix B.

Fort Hood is home to two endangered species, the Black-Capped Vireo and the Golden Cheeked Warbler. Through an active cowbird reduction program, predation on both species has decreased with a significant effect on the Vireo due to the closer coincidence of its nesting season with the Cowbird's.

Military Complement:

Source: Directorate of Community Relations

Tactical equipment

Table 1-1. Tracked Vehicles

Tracked Vehicles	Number
Tanks	535
Bradleys	438
Other Tracked Vehicles	1,537
Wheeled Vehicles	10,718

Table 1-2. Aircraft

Aircraft	Number
Fixed Wing	12
Rotary Wing	161

Table 1-3. Live Firing Ranges (SOURCE: G-4, G-3 as of 30 Sep 00)

Tracked Vehicles	Number
Multiuse	535
Machine Gun	14
Pistol	7
Mortar/Artillery (Indirect Fire)	3
Rifle	31
Dismounted Assault Course	12
Other Small Arms	4
(Law, Grenade Launcher, Etc.)	11
Total Live Fire Ranges	82

Table 1-4. Military Units (Source: G-3 as of 30 Sep 00)

Military Units	Number
Divisions	2
Corps Support Command	1
Brigades	13
Groups	4
Battalions	53
Companies	301
Detachments	28

Table 1-5. Assigned Units (Source: G-3 as of 30 Sep 00)

Units Assigned	Number
1st Cavalry Division	16,980
4th Infantry Division	11,693

13th Corps Support Command	5,197
21st Cavalry Brigade (AC)	309
504th Military Intelligence Brigade	482
89th Military Police Brigade	909
3rd Signal Brigade	1,491
13th Finance Group	303
3rd Personnel Group	727
Hedquarters Command	1,184
Other Units/Activities	662
<i>Total Army Assigned</i>	<i>39,937</i>
3rd Air Support SQ (USAF)	325
Total Military Assigned	40,262

Chapter 2:

Cultural Resource Management

at Fort Hood, Texas

Chapter 2:. Cultural Resource Management Program

Introduction

To effectively and efficiently meet the FTHCRM mission of balancing resource stewardship with training requirements, a knowledge of the program as it is currently implemented is needed. This chapter is split into four sections. The first provides an overview of the broad Goals of the management plan, Army Expectations, and Staff Responsibilities. Section two presents an overview of the program. Section 3 presents the various mechanisms for fundin. Section 4 describes the review and evaluation mechanisms used to determine the program's effectiveness.

Section 1: Goals, Expectations and Responsibilities

This section is derived from Section 3.2 in the Fort Lewis, Washington ICRMP developed by the Corps of Engineers's Construction Engineer Research Laboratory, Champaign, Illinois. The goals, expectations and responsibilities are derived form the various legislative and regulatory documents plus the Department of Army's guidance referenced in Chapter 1 and therefore is considered to apply to all installations. Modifications were made in the production of the Fort Hood ICRMP to reflect the differences in applying the training mission of Fort Hood versus Fort Lewis.

ICRMP Management Goals

The management goals of this plan are to:

1. Comply with Army standards derived from federal legislation
2. Maintain a cultural resources management program that meets its mission;
3. Assess the success of the program; and
4. Identify improvements that can be made in the management processes.

The FTHCRM plans to meet existing standards, implement program improvements, and respond to new initiatives and emergencies as they arise. Monitoring the success of the plan is accomplished as status reports are created and as processes are followed to accomplish management goals. In developing this plan, FTHCRM can identify additional work that may be needed to more effectively meet existing standards. Responses to some emergencies can be standardized, such as dealing with the inadvertent discovery of an archaeological site or human remains. Processes have already been established to ensure compliance with federal legislation. However, the CRM cannot always foresee new Army initiatives, such as a mandated transformation in brigade structure that may ultimately impact cultural resources management and cannot yet be reflected in the plan. The implications of the change in brigade structure for cultural resources management may not be fully understood until several years of testing have passed. The only recourse for FTHCRM is to assess the success of the plan annually and to redirect efforts, if necessary, in the annual work plan. When the major five-year review of the ICRMP is due, the overall plan can be re-evaluated.

Cultural Resource Staff Responsibilities

One critical aspect of maintaining the cultural resources program is to have a full-time, federally appointed cultural resources management officer. This position has been in existence at Fort Hood since 1978.

The Cultural Resources Program at Fort Hood provides oversight and management in two major areas: (1) archaeology and (2) Native American affairs. Program responsibilities focus primarily within the boundaries of Fort Hood inclusive of leased Corps of Engineers property at the edge of the Belton reservoir but extends to coordinating resident and tenant activities outside of Fort Hood's physical boundaries. The program focuses on archaeological, historical, and traditional resources but functionally has three missions:

- Reduce and preferably eliminate impacts to military missions.
- Meet compliance requirements.
- Identify, enhance, and implement program efficiencies.

Expectations

The Army's expectations for the FTHCRM program range from the simple to the complex. Each individual program manager will develop the specific ways that work for him/her to meet the expectations at individual installations. For cultural resources, the Army expects that FTHCRM will know:

- What is important?
- Where is it?
- What is its condition?
- Why is it important?
- What threatens its integrity?

FTHCRM will:

- Establish standards for performance;
- Develop specific management actions and design them either to maintain or improve resource conditions;
- Define and implement a program to monitor established standards;
- Monitor to determine whether or not management actions work;

If they do not work, apply an analysis that defines the root cause of the problem and modify management based on this analysis; and endeavor to make a difference.

The necessary and sufficient definition of "to make a difference" is that FTHCRM's activities as applied to the cultural resources program mission supports other missions as part of an integrated team on the installation.

FTHCRM Duties

Duties fall within 12 major categories, which relate to accomplishment of the program's missions. In alphabetical order these duties are:

-
1. Develop, implement, and monitor cultural resources projects, which include:
 - Administrative tasks to document decisions.
 - Application of system checks to determine quality of program performance.
 - Permitting activities.
 - Administrative tasks to document known resources.
 - Internal coordination to facilitate application of program.
 - Contracting Officer's Representative and contract management tasks.
 - Document review.
 - Protection of important resources.
 2. Develop, update, and implement the integrated cultural resources management plan:
 - Create the plan.
 - Apply the plan.
 - Provide training in use of plan.
 - Maintain databases that are part of plan.
 - Improve the plan.
 3. Facilitate Government-to-Government relations with Indian Tribes:
 - Implement policy (DoD, DA, and Fort Hood)
 - Facilitate good relations
 - Provide internal coordination for meetings
 - Ensure meaningful and timely contacts
 - Implement "trust responsibility" in liaison work
 - Provide training on intercultural contacts.
 4. Manage the program:
 - Plan annual application of cultural resources program.
 - Prepare budget for program.
 - Ensure budget submittal occurs.
 - Apply the annual work plan.
 - Improve the cultural resources program.
 - Apply appropriate management techniques.
 - Prepare program management reports.
 - Respond to data calls.
 5. Negotiate with external agencies and provide legal compliance:
 - Comply with applicable laws and regulations.
 - Establish installation policy on coordinating with external agencies.
 - Provide cultural resources support in negotiation of mitigation comments and decisions under the NEPA.
 - Meet with outside interested parties and negotiate solutions with them.
-

6. Perform technical research to aid in implementation of projects and programs:
 - Prepare technical documentation in support of NEPA and NHPA compliance.
 - Determine technical solutions to special problems.
 - Understand and use current technology.
 7. Provide archaeological resources management
 - Plan for archaeological investigations.
 - Support dig permit programs.
 - Provide training on the need to protect resources and how to protect resources.
 8. Provide collections management
 - Document collections.
 - Protect collections and collection records per archival standards.
 - Enable research and public access per regulations.
 9. Provide historic building and landscape management as applicable:
 - Plan for building/landscape investigations.
 - Define important aspects of historic buildings/landscapes.
 - Prioritize efforts to protect important building and landscape features.
 - Facilitate appropriate preventative maintenance activities.
 - Provide training on standing operating procedures for maintenance.
 - Facilitate capital improvement programs for building and landscape systems.
 10. Provide technical support, which includes:
 - Public education and outreach projects.
 - External subject matter expert duties.
 11. Provide traditional cultural places and traditional cultural resources management
 - Plan for traditional cultural property investigations.
 - Support access requests from Indian people and other ethnic or historic community members.
 - Provide training on need to protect resources and how to protect resources.
 12. Review, interpret, and apply laws and regulations
 - Monitor changes in statutes and regulations.
 - Interpret laws and regulations.
 - Provide training in legal requirements.
 - Ensure compliance.
-

Section 2: Program Status

Current Program Status

Status as of August 2001

Installation Information

FTHCRM has legal compliance oversight responsibility for all of the property within the boundaries of Fort Hood in addition to oversight responsibility for installation sanctioned activities outside of the installation boundaries. These off-site activities can include training at other locations, need to temporarily lease property for communications exercises, and property acquisition. The list below is a breakout of Fort Hood acreage used for training and considered inside the broad Fort Hood boundary.

- Real Property: 213,093.5 Acres
- COE Property: 5,733.9 Acres
- CRM Oversight: 218,827.4 Acres
- Inclusion of COE reservoir property is based on lease agreements.

Archaeological Site Assessment:

Planning Level Surveys:

The lists below show the breakout by acreage of the planning level surveys at Fort Hood. Funding since the late 1980s has enabled extensive survey of the total acreage to locate archaeological cultural resources. The result is that 98.6 % of Training and Cantonment Areas have been surveyed for archaeological resources whereas 71.1 % of the Livefire Area has been surveyed. 43.7 % of the unsurveyed area in the Livefire Area is in the permanently duded zone.

Training Areas & Cantonment: 157,452.5 Acres

- Unsurveyed: 2,252.3 Acres
- Surveyed: 155,200.2 Acres

Livefire & Impact Area: 61,374.9 Acres

- Unsurveyed: 17,710.7 Acres
- Surveyed: 43,664.2 Acres

National Register of Historic Place (NRHP) Eligibility Assessments

National Register of Historic Places eligibility assessment has been undertaken differently for the historic and prehistoric archaeological resources. Assessment of historic resources has focused on a historic document review. This review was divided into two segments based on the two periods of property acquisition. The first segment focuses on the properties acquired in 1942-43 when Camp Hood was established by acquiring 104,000 acres in 1942. In 1943, 46,000 additional acres was acquired to meet Army training needs of the time. The second major land acquisition of 49,578 acres occurred between 1953 and 1955 after the re-designation of Camp Hood to permanent facility status and renamed Fort Hood. This is the second segment of the document review project. Belton Reservoir on the east side of Fort Hood was created during this same period. The products from this review include chain of title information for all properties associated with historic archaeological resources,

and archaeological integrity assessment of all historic archaeological sites, and a historic context for the 1942-43 acquisition project segment. The two chains of title reports have been published. The integrity report and historic context were published in May 2001 as well as a historical book for the general public. Project information was distilled and edited as a historical narrative of life on the pre-Fort Hood landscape. The historical book contains excerpts from oral interviews and historical photos.

Prehistoric archaeological resources assessment has followed a more traditional approach of shovel testing proceeding to National Register testing. This program prioritized testing of resources based on mission needs, particularly throughout the training areas.

Table 1-6. : Total Archaeological Sites: 2219

	Total	Eligible	Potentially Eligible	Not Eligible
Prehistoric:	1100	174	274	652
Historic:	1119	13	717	389

Historic Structure Assessments

Assessments completed at this time is the World War II wooden buildings covered under the National Programmatic agreement between the National Council of State Historic Preservation officers, The Department of Army and the Advisory Council on Historic Preservation. A preliminary assessment of pre-Fort Hood structures was undertaken in 1977 and again by the Texas SHPO in 1990-1991. The resulting potentially eligible structures are listed below. The potentially eligible Cold war structure, Killeen Base Nuclear Warhead Storage Facility, has not been assessed nor has the approximately 5000 military constructed structures.

Historic Buildings: 4

- Okay Community Buildings circa 1900 - 2
- Reynold's House circa 1915 - 1
- North Fort Hood Swimming Pool - 1

Cold War Historic Building (Potential):

- Killeen Base – Nuclear Warhead Storage Facility

Effective Re-Use of Historic Structures

Several significant historic structures are being preserved through adaptive reuse. The 1915 Hiram B. Reynolds House is a fine example of an early 20th century structure with all the amenities of the time -- indoor bathroom fixtures and carbide lighting. The structure retains many of its original features, and now provides office space for the Red Cross. In past years it served as home to several of the installation's commanding Generals. The circa 1935 Claude Whitehead House and Okay Store represent another style of early 20th century regional architecture. The simple stone buildings currently provide office and storage space to military readiness units. Routine maintenance of these structures is accomplished so as not to compromise their historic character.

Historic Cemeteries:

FTHCRM is the point of contact (POC) with the surrounding community and previous residents of Fort Hood Property for information and request to visit the historic cemeteries remaining on the installation. In 1943 and 1953, many large cemeteries were dis-interred and remains moved to established cemeteries in local communities. However, smaller cemeteries with less than fifty (50) interments were allowed to remain. There are twenty-two (22) known cemeteries. Fort Hood regulation 210-190 identifies the Army's role in their upkeep and the conditions for future interments.

Traditional Cultural Properties (TCP):

No formal assessment for Traditional Cultural Properties has been implemented on Fort Hood. The two properties listed below were identified as the result of other activities. The Leon River Medicine Wheel was identified during scheduled archaeological survey in 1990. It has since been recognized as a medicine wheel by various tribal representatives and is currently being used for ceremonial activities. These activities include equinox observance and a yearly renewal ceremony. Access to the location is restricted to Native Americans for traditional observances. FTHCRM personnel visit the resource for condition monitoring purposes and serve as point of contact for Native American access.

The Comanche National Indian Cemetery is a repatriation cemetery established in 1991 as a location for reburial of repatriated remains that had been located on Fort Hood. The establishment of the cemetery pre-dates NAGPRA legislation but met a recognized need. Fort Hood's role in the cemetery is restricted to land ownership and access oversight. Maintenance is the responsibility of Native American groups. Interments are scheduled at the request of Native Americans who bear organizational and financial responsibility.

- Leon River Medicine Wheel
- Comanche National Indian Cemetery

Historic Landscape Assessment:

A historic landscape assessment has not been completed, but is scheduled as part of other inventories.

Agreements:

Programmatic Agreement (PA) among the United States Army at Fort Hood, the Advisory Council on Historic Preservation, and the Texas State Historic Preservation Officer regarding implementation of the Fort Hood cultural resource management plan for fiscal years 1995-1999

Memorandum Of Agreement (MOA) between Fort Hood, Texas, City of Killeen, Texas and the Texas State Historic Preservation Officer regarding the inclusion of historic archaeological sites within the proposed Robert Gray Army Airfield Joint Use Facility in the historic archaeological site assessment plan for Fort Hood, Texas.

Memorandum Of Understanding (MOU) among the Comanche Tribal Council, the American Indian Resource and Education Coalition, Inc., and the United States Army at Fort Hood, Texas on the use of federal land for reburial of repatriated human remains and the use of the Leon River Medicine Wheel.

Cooperative Agreements:

The following Cooperative Agreements (CA) have been implemented to provide technical expertise for which it is not efficient or economical to have as a full-time position. These CAs function such that as individual projects are identified as requirements, expertise can be funded via a project task

order with a scope of work (SOW). The difference between them is that the UB CA is a research oriented vehicle for broader, interpretive work where FTHCRM works with them in a reciprocating manner and NPS-MWR is a more functional vehicle. Both result in information that furthers FTHCRM's program to better manage cultural resources and thus improve the balance with mission requirements.

- University of Birmingham (UB).
- National Parks Service - Mid-West Region (NPS-MWR).

NAGPRA

Only the current MOU regarding use and access to the Leon River Medecine Wheel and the Repartriation Cemetery address some of the concerns under NAGPRA. A Draft SOP for inadvertent discovery of human remains and associated funerary objects is included in this ICRMP. Coordination with the Native American tribes with a traditional interest in Central Texas where Fort Hood is located is being sought at this time.

Curation

This is an ongoing activity which FTHCRM will have in perpetuity. Artefacts from archaeological and historical investigations since 1990 have been archived in accordance with 36 CFR Part 79 however the catalogues have not been complete nor are they electronic. Currently an electronic catalogue is under development as well as verifying recent accessions. In addition, pre-1990 artefacts and materials are being repackaged to meet 36 CFR Part 79 standards and their information added to the catalogue. The current curation facility is a converted refrigerated locker with air conditioning and a humidifier to control temperature and humidity plus it is equipped with a CO₂ fire suppression system which is activated by heat and smoke detectors. Temperature and humidity are monitored 24 hours a day, 7 days a week via a computer program. Both variables are within acceptable ranges for the materials in storage. The locker is located within the current FTHCRM building on Fort Hood. The information listed below is an overview of the current curation status.

- 600 square feet of Space:, 90 % full.
- Project full date is Jan 2002.
- 315 boxes appropriately packaged.
- 100 boxes to be packaged.
- Developing an electronic database in Microsoft Access and FileMAKER Pro.

Data Management

Geographic Information System (GIS) Technology has been a key factor in the Cultural Resource Management Program's ability to keep pace with the expanding military and civilian operations on Fort Hood. Geographic and spatial data layers, including installation boundaries, aerial photos, archaeological site boundaries, and region geomorphology, have been integrated to create a variety of different maps. An up-to-date map of the potentially eligible and eligible prehistoric and historic archaeological sites within the installation is used to issue dig permits. The map is revised as needed based on information collected from field monitoring, surveys, and other projects, which ensures accurate and efficient processing of dig permits, as well as ensuring the appropriate protection of significant archaeological and cultural resources. The geographic data layers are also used to create high quality site maps for use in reports and presentations, as well as for generating field maps to relocate sites during monitoring.

The Cultural Resource Management staff continues to expand their capabilities in GIS applications through training and coordination with other departments. A full time GIS position will be filled,

allowing the program to explore an even wider range of possibilities with the technology. This includes expanding analytical capabilities for archaeological research to assess extensive raw data in written and electronic format to identify patterns and evaluate data at a regional level instead of at the individual resource level.

Staffing Requirements

As shown in FTHCRM's organization chart, most required positions are filled. These positions are determined required based on the workload of project assessment and program operational needs to perform in-house work. Listed below are the two remaining positions to be filled as of June 2001.

- GIS Analyst
- Field Personnel

ID/IQ Contracts

FTHCRM manages an indefinite delivery / indefinite quantity contract. The amount of delivery orders let during a single year is based on needs and primarily the amount of available funding. The contract is advertised and bid for in five year increments with a base year and four year options that are renewed on a yearly basis. The current contract with Prewitt and Associates, Inc. of Austin, Texas was awarded in April 1999. As of March 2001, the second (2) option year was implemented.

ARPA

FTHCRM is targeting the problem of vandalism and looting of archaeological sites at Fort Hood with the latest advances in technology. An experimental program has been initiated that utilizes remote audio and visual surveillance equipment to monitor archaeological sites. Any documentation that is generated will be used to prosecute ARPA violators. Looted sites are documented and plotted within ArcView to identify high traffic areas and perhaps establish a pattern to the illegal digging and collecting activities.

Random field checks of vandalized sites as part of the Field Monitoring program also tracks active vandalism and looting. All vandalism and looting activity is recorded using ARPA investigation kits. The staff continues to train in ARPA regulations, investigations and prosecution.

The conviction of two looters caught red-handed on a Fort Hood archaeological site in October 1999 taught us a great deal about the legal process. This lesson learned, combined with an upcoming program of archaeological resource protection measures should greatly reduce the amount of site damage. This increased efficiency will translate directly into cost effectiveness in terms of applying ourselves to military readiness.

Field Monitoring

Beginning in 2000, Fort Hood instituted a Field Monitoring Program to systematically examine all the potentially eligible and eligible historic and prehistoric sites on the Installation. Field Archaeologists visit the sites and record observations on each of the site's cultural assemblage, environment, and condition using a standardized Installation Cultural Resource Inventory (ICRIF) form. This new program serves several purposes for FTHCRM including: (1) archaeological sites in areas of issued dig permits will randomly be monitored to ensure the protection of the resource and compliance with the dig permit guidelines, (2) heavily vandalized and looted sites will be monitored to track activity and evaluate site integrity (see ARPA above for further discussion), and (3) based on the site observations and integrity, recommendations on the National Register eligibility and treatment are made. The overall goal of the program is to systematically track the significant sites on the Installation,

to update archaeological site conditions, to identify and gauge site impacts of natural and human origin, and to revise recommendations for National Register eligibility and treatment as necessary.

The monitoring program uses modern equipment to ensure accurate data collection, quality assurance, and efficient use of time in the field. Site and feature boundaries and collected or significant artifacts are mapped and location data recorded using hand-held Trimble Geoexplorer GPS units. The GPS data collected in the field is downloaded into Pathfinder Office software to correct, view and edit into a format suitable for the GIS system. With these time-saving applications, the Field Archaeologists are also able to collect supplemental data, maintaining Fort Hood's commitment to archaeological research in Central Texas.

Public Outreach and Education

Recognizing that public outreach and education is an integral part of successful cultural resource management, FTHCRM has spent much time developing and implementing these types of programs, ranging from static exhibits to seminars, site tours, and educational courses. The staff strives to inform and educate the greater Fort Hood community, including military and civilian personnel as well as local residents, about the cultural resources on the installation. With this raised awareness, the community gains an appreciation of and reverence for the history and heritage surrounding them, helping them to become conscientious stewards of cultural resources.

FTHCRM serves as a point of contact for former residents of the Fort Hood lands, and their descendants. These people gave up their land in the 1940s and 1950s, when the Army acquired the property to build what would become Fort Hood. In recent years FTHCRM has focused a great deal on the installation's historical resources. The publications generated from this research are available to the public and have proven to be quite popular. Hundreds of copies have gone out to local historians, community members, genealogy buffs, and former residents. Several more publications are in the works and they are expected to be just as popular with the public.

Little remains of the hundreds of farms and ranches that once dotted the Fort Hood landscape, however, former residents still retain strong ties to the area. Each year dozens of groups hold reunions on the installation and in the surrounding community. FTHCRM staff regularly attends these meetings, providing historical information and answering questions. Typically, however, staff members gain as much knowledge as they impart, by hearing the interesting and informative stories and remembrances.

In concert with G3 Range Control, tours are organized allowing former residents and their descendants to visit home, school, church, and community sites throughout the installation. Firing ranges are temporarily shut down, and escorts in the form of Range Inspectors, Explosive Ordnance Disposal personnel, and FTHCRM staff accompany the groups. Each Memorial Day all training is suspended and community members and former residents are invited to visit the installation's historic cemeteries. Again, FTHCRM staff and Range Inspectors are on hand to answer questions and act as escorts respectively.

FTHCRM participates in several annual events, namely Earth Day and Texas Archaeology Awareness Month (TAAM). Earth Day activities include articles in the Fort Hood Sentinel focusing on historic preservation and archaeology, and a minimum daylong interactive exhibit. The exhibit typically highlights the different aspects of the CRM program and displays prehistoric and historic artifacts recovered from sites on the installation, with staff on hand to talk to visitors and answer questions. TAAM, as the name implies, is a month long statewide event promoting all aspects of Texas archaeology. FTHCRM hosts a variety of activities throughout the month, including seminars, exhibits, and public site visits. For example, events for TAAM 2000 consist of displays at the installation's post exchanges, weekly brown bag lunches and seminars, an Archaeology Lab open-house and lunch, and public and school tours of a prehistoric archaeological site under investigation.

Partnering with the Fort Hood Natural Resources program and a local chapter of The Nature Conservancy, an interpretive nature trail has recently been developed. The trail area contains an historic archaeology site with associated structural features. The trail is designed to meander through the site, with appropriate signage describing different components and providing a brief history of the site and the region. Furthering this theme, FTHCRM and the NR program are currently working on plans for an interpretive museum. The museum will focus on Natural and Cultural Resource protection, and will offer exhibit topics ranging from beaver habitats and endangered species, to prehistoric and historic period peoples who once lived on the Fort Hood lands, and a mock archaeological excavation unit. While this project is early in its development, it promises to be a showcase for the both the CRM and NR programs.

Other public outreach efforts supported by FTHCRM include informal presentations to local community groups, volunteer opportunities, and artifact loans. High school and college students with an interest in archaeology regularly volunteer in the archaeology lab, processing artifacts. Several of these students have given presentations to their classes and scout groups, and have borrowed artifacts from the collection to use in displays in their schools. Fort Hood artifacts are also on loan to the Bell County Museum, a local historical museum. The loan of these artifacts helps to further awareness of Fort Hood's cultural resources throughout the community.

Working with a middle school on the installation, two school curricula are being developed. One lesson focuses on 19th and early 20th century settlement of the region, and the changes that occurred after 1942, when the Army chose the region as the home of Fort Hood. This lesson is supplemented with a field trip to a 1915 historic structure located on the installation, and touches on historic architecture along with history. The second lesson focuses on the prehistoric peoples of central Texas and what archaeology can tell us about these peoples. This lesson is supplemented with a field trip to a prehistoric site if possible, depending on excavation schedules.

Finally, intense efforts are made to educate Fort Hood's military personnel about cultural resources. A portion of the Environmental Management Course (required for all unit Environmental Coordinators) focuses on CRM issues, and includes a field visit. The 45-minute lecture addresses federal laws and military regulations that apply to cultural resources, and the resource types soldiers are likely to encounter during training exercises or recreational activities on the installation. The lecture is followed by a visit to one or two archaeology sites, where participants are encouraged to look for and identify components of the site. This field trip provides a rare opportunity for participants to spend time in the training area when they do not have to concentrate on a training exercise, allowing them to truly absorb their surroundings and take note of cultural resources.

Similar presentations are given, on request, to various units, companies, and battalions, with the audience being all personnel rather than just Environmental Coordinators. Occasionally, if cultural resources are in close proximity to a training exercise FTHCRM staff will accompany key unit personnel on a pre-training site visit. This serves to educate military personnel about cultural resources and protect the site during training. While the CRM class is the newest addition to FTHCRM's outreach and education program, it is perhaps the most important. Eventually all installation Environmental Coordinators will be exposed to culture resource management and protection, insuring significant properties are preserved while optimum training is accomplished.

Current Installation Integration Status

FTHCRM coordinates with a variety of different departments and agencies to facilitate projects and share information. For example, cultural resources, natural resources, ITAMS, and the NRCS coordinate periodically on erosion control projects that include construction of check dams, firebreaks, reservoirs, and roads and on numerous vegetation clearing projects. Some of the resources that are involved and beneficial to the other departments may also be utilized for cultural resources, i.e. seeding heavily eroded areas which may actually fall within an archeological site. Other examples would be

staking significant site boundaries at the same time as endangered species habitat is being conducted or gating a cave entrance that contains examples of each.

The strong technical orientation of the Cultural Resource Management Program has allowed successful integration of cultural resource issues into all levels of installation operations, planning, and training. The program's emphasis on well-articulated research frameworks and operational procedures, qualified staff, and use of varied scientific technologies ensures Fort Hood's compliance with the cultural resource regulations, as well as facilitating the Installation's overall Military Mission. At the same time, Fort Hood's Cultural Resource Management Program contributes significantly to the overall knowledge of Central Texas Prehistory and History, producing a substantial volume of work on the region and maintaining the program's position at the cutting edge of archaeological research.

Military Readiness – Civil works mission support

Project Review Board attendance

The Project review board of the engineering department at the Directorate of Public Works holds weekly meetings to consider all aspects of upcoming projects. Representatives of FTHCRM have been present at virtually all meetings to comment upon developments and to coordinate with the State Historic Preservation Officer. FTHCRM involvement ensured streamlined project approval with attending military readiness.

Dig Permit program

To facilitate training activities and construction projects, FTHCRM has developed a streamlined map to immediately assess site suitability for military excavation. The dig permit map enables units to quickly ascertain appropriate areas for training activities – leading to enhanced military readiness and support for civil works.

Support firebreak – Roads

FTHCRM coordinates in the construction of firebreaks. Military readiness includes the ability to train with minimal hindrances. FTHCRM swift input into the placement of new firebreaks ensures lower down-time and increased training availability.

Coordination with ITAM – Engineering

Coordination with the Integrated Training Area Management team ensures streamlined operations for all facets of their mission. From stream crossings to cedar clearing, FTHCRM has made certain all projects are accurately and quickly considered in order to enhance training and military readiness.

Data sharing

Data collection – both in the course of daily FTHCRM operations and special projects have routinely been disseminated to relevant departments. The digitization of aerial photographs of Fort Hood from 1938 will aid the Department of Fish and Wildlife, the Nature Conservancy, Fire Department and the Department of Agriculture. Efficiency in all these departments unquestionably benefits support of both civil works and military readiness.

NRHP Testing program

Fort Hood's CRM department is nearing completion of an aggressive testing program where all known archaeological sites on the installation have been assessed for National Register eligibility. This data greatly quickens our ability to process project requests – contributing to military readiness.

Section 3: Current and Past Funding

Averages over the last five (5) years.

Proportion to project types.

Percent of total programmed required.

Section 4: Reporting Procedures and Associated Funding Mechanisms

This section is derived from Section 3.3 in the Fort Lewis, Washington ICRMP developed by the Corps of Engineers's Construction Engineer Research Laboratory, Champaign, Illinois. The procedures and funding mechanisms apply to all installations. Modifications were made in the production of the Fort Hood ICRMP to reflect the differences in applying the training mission of Fort Hood versus Fort Lewis.

Management Systems (Effectiveness Review)

Monitoring of the FTHCRM occurs at two levels: (1) monitoring the success of the program with respect to program performance standards; and (2) assessing current conditions and documenting any changes since the last condition assessment was conducted for the resources themselves. Monitoring the success of the cultural resources management program entails evaluation of whether or not the management actions at Fort Hood work to meet or exceed management goals. These goals are set by the Army in the form of the Installation Status Report (ISR) and by FTHCRM to carry out the program. The Army Command Compliance and Protective Management located in Appendix C: Army Command Standards are taken directly from the revised Installation Rating System (IRS). The Standard Operating Procedures (SOPs) located in Chapter 5: Implementation, are based on applicable federal, state, and local environmental laws and regulations; Army regulations; and formal agreements. Fort Hood is working towards implementing the Environmental Management System (EMS) by 2010.

Fort Hood's SOPs apply to a range of cultural resources: archaeological sites; buildings, structures, and landscapes; and traditional cultural properties. Archaeological sites, buildings, structures, and landscapes are historic properties considered to have significant value to warrant protection, whereas traditional cultural properties are those sites of demonstrable continuing importance to Native American or other cultural groups. Significance of historic or traditional cultural properties is determined by applying the test for eligibility to list on the NRHP. Only those historic properties that meet this test are significant and need to be protected

Command and Installation Standards

The ISR is a three-part information system with purpose of providing decision makers at all levels with an objective assessment of the status of Army installations with respect to infrastructure (ISR Part I), environment (ISR Part II), and services (ISR Part III). Part II of the ISR evaluates 24 different environmental programs. The evaluation for each is in four parts: (1) Program Performance, (2) Environmental Condition, (3) Mission Impact, and (4) Compliance with legal requirements. Each environmental program receives a GREEN, AMBER, or RED rating for the four areas. Detailed tables of the Army Command Standards are located in Appendix C: Army Command Standards.

FTHCRM also sets standards to rate local success of the cultural resources management program at Fort Hood. If a rating is amber or red, FTHCRM should revise management actions to address unacceptable resource conditions. The Fort Hood concept of internal standards with green, amber, and red ratings and corresponding management action descriptions are derived from the ISR. The management strategy associated with the green, amber, and red conditions as follows:

Green Rating: Standard/maintenance-level resources management. All legal requirements are being met and all rating elements are acceptable.

Amber Rating: Heightened resources management. All legal requirements are being met, and some rating elements are unacceptable. Management actions will be implemented to specifically address resource conditions that are unacceptable. Resource conditions will be monitored and data reviewed for adaptive management.

Red Rating: Priority resources management. Legal requirements are not being met, and/or several rating elements are unacceptable. Management actions will be implemented to meet all legal requirements and to specifically address all resource conditions that are unacceptable. The actions will be proactive to aggressively encourage improvement of resource conditions. Resource conditions will be monitored and data reviewed for evaluation of adaptive or alternative management strategies or actions.

The environmental objectives and targets to meet ISR requirements for Cultural Resources are translated into action by FTHCRM who must prepare an annual work plan to develop and execute the cultural resources portion of environmental programs. The annual work plan is funded through the Environmental Program Requirements (EPR) process, and defines specific actions for fulfilling the objectives and targets. Currently, the Fort Hood standards focus on the training maneuver areas since these resources are more likely to be effected by mission actions. Nevertheless, the entire range of cultural resources is included in the annual work plan and is addressed in the Fort Hood standards. Detailed tables of the Fort Hood Standards are located in Appendix D: Fort Hood Standards. The monitoring criteria to address ISR sections is provided in Chapter 4.

Environmental Compliance Assessment System (ECAS)

Monitoring the execution of FTHCRM regulatory compliance is coordinated with the Army-wide Environmental Compliance Assessment System (ECAS) Program [(aec-www.apgea.army.mil:8080/prod/usaec/eq/programs/ecas03.htm)] every three years. An ECAS review results in an Environmental Compliance Assessment Report (ECAR) that includes the findings, recommended corrective actions, and a draft Installation Corrective Action Plan (ICAP) that will be further reviewed and developed by installation personnel. ECAS is designed to assist commanders in identifying environmental compliance and operating deficiencies, and recommending short- and long-term corrective actions. The three-year assessment is conducted by a technical team of environmental experts who are not employed by the installation. An internal assessment is conducted annually by the installation to track deadlines set in the ECAR, and to evaluate the status of compliance as new installation operations are introduced. The CRM provides data to the internal assessment and the assessment by the outside technical team on the status of the environmental program. The data needed for ECAS overlaps with that used to address the Army Command Standards that are a replication of ISR, Part II; the Fort Hood Standards; and the EMS program review. The Army advises that an installation develop an interface between ECAS and EPR to ensure that deficiencies requiring funding are programmed, and cross check the ECAS and the ISR, Part II, Environment so that each reporting system submission describes the same environmental compliance/performance status (see the ECAS Web page cited above).

Deficiencies as of April 2001 Assessment:

FINDING ID: CR-NR-01

Manual Question Number: C-005-002-US

Finding Category: Class III

Finding Type: Negative

FINDING ID: CR-NR-02

Manual Question Number: C-020-004

Finding Category: Class I

Finding Type: Negative

Status of Correction: In Progress

FINDING ID: CR-NR-03

Manual Question Number: C-001-006-AA

Finding Category: Class III

Finding Type: Negative

Status of Correction: In Progress

FINDING ID: CR-NR-04

Manual Question Number: C-005-001-US

Finding Category: Class I

Finding Type: Negative

Status of Correction: Awaiting Funding

FINDING ID: CR-NR-05

Manual Question Number: C-002-003-AA

Finding Category: Positive

Finding Type: Positive

Status of Correction: None Needed

Corrective measures

FINDING ID: CR-NR-01

Manual Question Number: C-005-002-US

Finding Category: Class III

Finding Type: Negative

Status of Correction: In Progress

Corrective Action: Developing SOPs to integrate better into installation land use activities as part of ICRMP development. Supporting that is focus on specific processes such as the dig permit process where we are working on a new SOP and Reg.

Corrective Action Type:

Cost:

1383 Project Number:

Corrective Action Comments:

FINDING ID: CR-NR-02

Manual Question Number: C-020-004

Finding Category: Class I

Finding Type: Negative

Status of Correction: In Progress

Corrective Action: Lack of progress between 1998 ECAS and Jan 2000 with previous curator indicated a change was needed to expedite bringing the materials up to 36 CFR Part 79 standards. A new curator was employed Sept 2000 and has progressed through one-third of the material between Sept 2000 and ECAS 2001 Assessment in April. Project is now on track.

Corrective Action Type:

Cost: No additional

1383 Project Number:

Corrective Action Comments:

FINDING ID: CR-NR-03

Manual Question Number: C-001-006-AA

Finding Category: Class III

Finding Type: Negative

Status of Correction: In Progress

Corrective Action: Work on the ICRMP is in Progress. Attempting to implement PA with TxSHPO on Section 106 consultation. This section is part of the ICRMP. Expected draft completion date is May 2001.

Corrective Action Type:

Cost:

1383 Project Number:

Corrective Action Comments:

FINDING ID: CR-NR-04

Manual Question Number: C-005-001-US

Finding Category: Class I

Finding Type: Negative

Status of Correction: Awaiting Funding

Corrective Action: Line items are already submitted to Environmental Program Requirements (EPR) system to inventory Fort Hood buildings. There is one for the Military facilities (FH000F0022) and one for the Cold War Nuclear Warhead Storage Facility (FH000F0019).

Corrective Action Type:

Cost: FH000F0022 -\$500,000.00; FH000F0019 - \$300,000.00

1383 Project Number:

Corrective Action Comments:

FINDING ID: CR-NR-05

Manual Question Number: C-002-003-AA

Finding Category: Positive

Finding Type: Positive

Status of Correction: None Needed

Corrective Action: Will continue to improve Public outreach through programs and information access via the web.

Corrective Action Type:

Cost:

1383 Project Number:

Corrective Action Comments:

Annual Reporting Requirements

Environmental Program Requirements (EPR) Report (RCS-1997; replaces 1383)

The EPR Report serves as a source document to program, budget, and allocate resources needed to execute the Army Environmental Program. It is used to show past accomplishments and expenditures;

to indicate the status of current projects; to refine and validate requirements for the budget year; and to support planning, programming, and budgeting for the out-years, to build the Program Objective Memorandum (POM). In addition, EPR data is used for Congressionally mandated lists of funded projects that are part of the DoD Environmental Quality Report to Congress.

<http://aec-www.apgea.army.mil:8080/prod/usaec/eq/programs/epr.htm>

Oct, Nov, Dec, Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep.

- EPR Report 02-Dec 15-May
- ISR 15-May
- EQR (ACTS) 15-Nov 15-Feb 15-May 15-Aug
- Archaeological Activities 15-Nov
- Reports to Chief, DPW 01-Apr
- Review Cantonment Projects 01-Mar
- Curation Check 01-Mar
- Historic Landscape Eval 01-Sep
- Cultural Resources Program Team Meeting 01-Mar
- HQ Reports Fort Hood Requirements and Reports.

Current Projects Listed in EPR are in Appendix E. Projects are also described relative to the respective sub-programs discussed in Chapter 4, Management Strategy.

Installation Status Report (ISR) Part II (Environmental)

The Chief of Staff, Army (CSA) directed the implementation of ISR Part II (Environment) on 2 October 1995. As part of the readiness review for the CSA, the Assistant Chief of Staff for Installation Management (ACSIM) reports ISR Part II results. The goal of Part II is to capture macro-level status of an installation's environmental program and improve the justification/prioritization of limited resources. Project objectives are to assess installation environmental compliance, summarize environmental conditions, measure mission impacts, and assess the effectiveness of environmental program performance. Analysis of ISR data should assist commanders at all levels to improve installation conditions and ultimately the readiness of forces that our installations support.

<http://aec.army.mil/prod/usaec/eq/programs/isr.htm>

Environmental Quality Report (EQR; formerly ACTS) (RCS-1997; replaces 1485)

The EQR is a World Wide Web-based data system that serves as a primary source of information for conveying the Army's environmental status to the Senior Army Leadership, DoD, and Congress. Its primary focus is to track Army compliance with environmental laws for multi-media reporting and management areas through Inspections, Enforcement Actions (ENFs), and Fines and Penalties, and other program parameters on a quarterly basis. Primary reports for this data are the Quarterly Army Performance Review (to the Secretary of the Army), and the semi-annual DoD Environmental Quality IPR (to DUSD(ES)), the fall IPR being the Army's input to the DoD Environmental Quality Report to Congress (RCS-1997). In addition to the quarterly reports, the EQR data calls in the Fall and the Spring also include requirements for additional data required by the semi-annual DoD IPRs and other reports that HQDA submits.

<http://aec.army.mil/prod/usaec/eq/programs/eqr.htm>

Secretary of Interior's Report to Congress on Federal Archaeological Activities

The Secretary of Interior's Report to Congress on Federal Archaeological Activities is mandated through statute 16 USC Section 47011 and Archeological Resources Protection Act (ARPA) of 1979. Annually, through a standardized questionnaire, each Federal agency with land management responsibilities provides information on archaeological activities occurring that year. The report is compiled and submitted to the Secretary of the Interior. The data for this report is currently collected in surveys defined in the Fall EQR data call.

Chapter 3:

CRM and Fort Hood Operations

Chapter 3: Mission Activities and CRM

This section is derived from Section 2.2 in the Fort Lewis, Washington ICRMP developed by the Corps of Engineers's Construction Engineer Research Laboratory, Champaign, Illinois. Generalities occur as a result of the basic installation structure hence broad categories and support information apply to all installations. Modifications were made in the production of the Fort Hood ICRMP to reflect the differences in applying the training mission of Fort Hood versus Fort Lewis.

Introduction

This chapter describes the various activities performed on Fort Hood to meet mission requirements: maintain readiness and deployability of soldiers and their equipment. Activities take the form of direct training and support functions. These activities take place in different areas of the installation. The following sections describes the different areas on Fort Hood and the activities that can take place in them. Descriptions of how these activities impact cultural resources within the areas is also presented.

Briuer, F. L. and C. M. Niquette (1983) Military Impacts to Archaeological Sites. American Society for Conservation Archaeology,

Proceedings 1983. Boca Raton ICG Solid

Mission Activities

Fort Hood's primary function is as a major military training facility for both weapons qualification and field training. The primary organizations at Fort Hood include III Corps; 1st Cavalry Division, 4th Infantry Division; 13th COSCOM, and components of various other groups previously listed in Chapter 1 under Audience. The mission activities conducted in accordance with the stated missions of these units occur under three main land-use categories: Cantonment Areas, Training Areas, and Airfields. Each of these in turn can be divided into sub-categories based on multiple use and function and each has different implications for potential impacts to cultural resources.

Cantonment Areas

Cantonment Areas, for example, can be sub-divided into at least five sub-areas, as follows: (1) residential areas used for family and troop housing; (2) administrative areas used for training support and planning; (3) commercial zones used for businesses, medical, retail, and public services; (4) industrial zones used for maintenance, logistics, and transportation activities; and (5) open spaces used for training, recreation, and future development. These built-up areas usually constitute the primary location of mission impacts to potential historic buildings, although subsurface archaeological resources can also be impacted through digging activity related to new construction or to modifications to existing buildings or infrastructure. The following is a list of potential mission activities within the Cantonment Area that may affect cultural resources:

- Maintenance of buildings, structures or landscapes
- Changes in the use of buildings, structures, or landscapes
- Closure of facilities
- Disabled accessibility programs
- Energy conservation programs
- Hazardous materials removal
- Environmental programs
- Master planning and other planning activities
- Training Activities.

Training Areas

Training Areas are sub-divided into the following four sub-areas: (1) maneuver areas; (2) impact areas; (3) range areas; and (4) special use areas (e.g., storage areas, etc). Fort Hood has 157,453 acres of maneuver area and 61,675 acres incorporated into the live fire area that includes the impact area and ranges. The perimeter of the live fire area hosts 82 ranges. In addition, there is one main storage area (ammunition supply point or ASP). These areas represent a wide variety of microenvironments and biotic zones, including scrub forest, prairie, brush, and escarpment environments.

The Fort Hood Range Regulation 350-40 provides details on the types of military activities that take place in these areas. In general, the training areas involve artillery firing, demolition training, and tactical maneuver training. The training facilities in the maneuver areas generally include non-firing zones such as amphibious sites, drop zones, and landing strips. The ranges include pistol, rifle, machine gun, tank and anti-tank, grenade, and demolition areas. Fort Hood provides a variety of fixed facilities for the following training activities: industrial skills training and small arms qualifications; Tank tables; live fire maneuver through the platoon level; armor crew training and sub-caliber firing; field artillery firing through the battalion-level external evaluation and field training exercises; and maneuver land to develop team and unit skills through division external evaluation and field training exercises.

Training at Fort Hood is dynamic in the sense that the type of training and personnel trained varies over time in accordance with the military mission and military needs. The types of munitions or ordnance used include small arms (pistols, rifles), machine guns, hand grenades, artillery, mortars, and sub-munitions, such as antipersonnel, antitank, flame weapons, and mines. In addition, there are approximately 13,401 pieces of tactical and tracked equipment at Fort Hood. The equipment includes approximately 13,228 tracked and wheeled vehicles plus 12 fixed wing and 161 helicopters. The amount of equipment used varies at any time, depending on the number and types of military personnel assigned to Fort Hood.

Potentially adverse impacts to cultural resources on training lands at Fort Hood are comparable to those found at many military installations having substantial training missions. These include: (1) maneuver damage from tracked vehicles; (2) maneuver damage from wheeled vehicles; (3) vandalism and looting of historic buildings and archaeological sites (either by military personnel or by the public); (4) explosive ordnance; (5) excavation and earth-moving activity; (6) natural erosion processes that may be exacerbated by the above. The first two of these effects can be commonly recognized on training lands, with their severity dependent upon the number of repeated passes over the same area and the existing climatic conditions (wet or dry, etc). For example, repeated passes of a tracked vehicle over the same landscape under rainy, muddy conditions can produce severe rutting in excess of 12 inches. Such rutting can often be severely exacerbated through continued precipitation, surface water flow, and gullying. Tracked vehicle evidence is usually much more prevalent in training lands than is evidenced for wheeled vehicle traffic. The potential for deep rutting and erosion is of concern as a direct impact on surface and subsurface archaeological resources. (Briuer and Niquette 1983)

As Briuer and Niquette (1983) observe, vandalism in the form of illegal excavation and collecting is apparent by the irregular, and often very recent holes distributed over an archaeological resource. In many cases these holes are exceedingly large and deep, representing continuous artifact mining operations. In some cases, there is evidence of earth-moving with heavy equipment.

Other, more common forms of excavation within training areas are mission-related and are implemented for purposes of tactical concealment and survivability as described in the Department of the Army, Survivability, Field Manual 5-103 (10 JUN 85). These include large volume excavations carried out by Combat Engineers with heavy earth-moving equipment for purposes of partially or entirely concealing artillery (gun emplacements), tanks (hull defilade positions), and support vehicles,

or for defensive purposes (e.g., tank ditches). Deep excavations usually accompany the construction of bunkers, shelters, and protective walls. Individual fighting emplacements (e.g., fox holes) are usually less common and less invasive. Sometimes they incorporate sand bags, rock walls, and brush for protection and concealment. Because of the large volume of displaced earth that results from these operations, they can have very severe impacts to the surface and subsurface archaeological record, especially if they happen to coincide with areas of high archaeological sensitivity and site density.

Shell craters resulting from explosive ordnance are almost exclusively limited to artillery impact areas and can seldom be mistaken for anything else. Frequently the ground and vegetation surrounding the craters still shows evidence of burning and shell fragmentation (Briuer and Niquette 1983). Thus, while they are ubiquitous within designated impact areas, their occurrence in other zones of the training area is sporadic. While they can have dramatic impacts on the surface and subsurface archaeological record, the impact areas where they commonly occur are usually off-limits for purposes of archaeological inventory survey (due to safety considerations). Thus the extent of actual impacts is usually never determined in these cases.

Army Airfields

There are two Army Airfields on Fort Hood: Hood Army Airfield and Robert Gray Army Airfield. Hood Army Airfield serves the rotary wing units. It was the main Fort Hood air field from 1943 to 1963 and served the smaller aircraft and rotary winged aircraft as they developed. Robert Gray Army Airfield was originally an Army Air Command and later Air Force facility supporting the Nuclear Warhead Storage program. In 1963, the air field and surrounding acreage including the storage facility was transferred to Fort Hood. Robert Gray Army Airfield has a 10,000 foot runway supporting fixed wing aircraft. It is currently undergoing an upgrade and is also the focus of the joint-use program with the City of Killeen.

Tenant Activities/Support

The various tenant and support units assigned to Fort Hood also participate in training exercises that include similar activities to those already described.

Impacts to Cultural Resources

Artificial and natural processes can impoverish the integrity of historic and prehistoric cultural properties to varying degrees. The degree that these processes impact cultural properties is dependant on variables such as resource type, location, and composition. All of these variables are taken into consideration in developing the appropriate action strategy to preserve integrity of the significant cultural properties on the installation.

Archaeological Resources

Prehistoric

The prehistoric resources on Fort Hood can be generalized into categories of open campsites, rockshelters, and lithic scatters/lithic resource procurement sites.

The greatest threats to the open sites are large earthmoving projects and continuous tank maneuvering. Many open sites also contain burned rock middens, which are targeted by looters. To a lesser extent, these sites may be subjected to impacts from vegetation clearing, overgrazing, reseeding, natural erosion (fluvial cutbank erosion and sheetwash), and floral/faunal bioturbation.

In contrast to the impacts threatening open campsites, the primary impact at rockshelters is looting. Natural erosion, weathering, and bioturbation would be secondary disturbances.

Actions Taken To Combat Impacts

The primary procedure for deterring potential impacts to Fort Hood cultural properties is the required NHPA Section 106 coordination and SOP - Coordination for Excavation (FTH420X10) as implemented by Form 420-X10. FTHCRM along with various other land managers, must approve any and all excavation projects on the installation.

In instances where other activities, such as vehicular traffic, may be a potential impact to eligible or potentially eligible resources, other measures may be taken to deter the impact agents. Site type and location will dictate what actions may be taken to divert or lessen impacts to cultural properties. For example, no actions would be taken for an eligible or potentially eligible open campsite that is deeply buried below the surface and has a very limited, if any, possibility of being impacted by any of the above mentioned agents. A program to deter impacts and protect eligible and potentially eligible sites has been implemented when such sites are shallowly buried and may be impacted. In the case of a shallowly buried significant site, such as those located in the Paluxy sand deposit on the installation, large boulders will be placed around the perimeter to deter tank and other vehicular traffic. In a stable clay sediment, the use of Siber stakes along the perimeter is being considered as an option to deter maneuver activity. In cases of open site looting, remote surveillance equipment is employed to monitor activities at the resources. Visual equipment is being tested and may likely be utilized soon. Other options to protect resources are being evaluated. All protection options are discussed in Chapter 4, Management Strategy.

Historic

Fort Hood's historic archaeological resources include a variety of site types, ranging from 19th and early 20th Century homesteads, farms, and ranches, to World War II era military related sites. The majority of the historic sites consist of late 19th - early 20th Century farmsteads and ranches, once occupied by historic residents of the Fort Hood lands.

Fort Hood contains 1121-recorded historic archaeological sites. A small percentage of the installation lands remain unsurveyed, so it is likely this number will increase slightly. Of the 1121 historic sites, 460 are considered eligible or potentially eligible for the National Register of Historic Places under criteria A, B, D or a combination of the three criteria. The 13 eligible resources are protected from military training, construction, and development. If the site cannot be protected, formal appropriate mitigation measures are implemented. The potentially eligible sites are protected until their eligibility status can be determined. On going assessment of the potentially eligible historic sites is underway.

Impacts to Historic Archaeological Resources

An array of impacts can affect Fort Hood's historic archaeological resources. The same types of impacts that affect prehistoric archaeological resources would affect historic archaeological resources. The main difference between the results would be the destruction of any remaining structures at the historic archaeological resources. Protection actions would be applied as described in Chapter 4, Management Strategy.

Historic Buildings Future Management Requirements

An inventory of Fort Hood's housing units will be completed by August 2002 through a National Park consultant. Upon the completion of this inventory, future evaluations should be conducted every five years to document those properties that have turned 50 years old since 1 January 2003.

1. Develop a plan for the assessment and management of historic buildings and structures. This plan should incorporate a schedule for appropriate HABS/HAER documentation on the existing buildings and structures. This will include an installation-wide maintenance management program to

ensure that the condition of each building is maintained. An assessment/monitoring schedule, formats and reports and schedule for regular maintenance will be established.

2. Reevaluate buildings or structures, which in previous evaluations have been determined ineligible for listing, only if the SHPO, ACHP, or an interested member of the general public specifically requests they be evaluated. Such evaluations shall be done during a regularly scheduled evaluation period.

3. Conduct out-of-cycle evaluations on an as-needed basis for buildings and structures that become 50 years old between scheduled evaluations. Such evaluations shall be scheduled when:

- a. An undertaking is planned,
- b. Consultation with the SHPO identifies buildings and structures that are eligible for the National Register within the area of potential effect, or
- c. The undertaking will adversely affect the identified buildings and structures.

4. Evaluate buildings and structures at Fort Hood that are less than 50 years old and are not scheduled for demolition only if the Army, the SHPO, or an interested member of the general public provides information that substantially supports the conclusion that the property is of exceptional importance. The definition of "exceptional importance" shall be that used in the National Register Bulletin "Guidelines for Evaluating and Nominating Properties that Have Achieved Significance Within the Last Fifty Years." Fort Hood will consult with the SHPO prior to demolishing any structure that is between 45 and 50 years old, provided it is not covered by a pre-existing agreement document.

Fort Hood's historic buildings and structures encompass a variety of property types, some of which are easily recognizable and some of which are not. In addition to the buildings of the Okay Community and the Reynold's House, Fort Hood's historic structures include a swimming pool and nuclear warhead storage facility.

A complete inventory of historic buildings and structures has not been completed for the installation. In addition, the appropriate Historic American Buildings (HABS) and Historic American Engineering Record (HAER) documentation must be completed on the existing historic buildings and structures.

Impacts to Structures

Historic buildings and structures of Fort Hood can be impacted by a variety of different agents. The most obvious impact is time itself, as the cumulative effect of continuous exposure to elements such as sun, wind, and rain. Maintenance and rehabilitation activities, such as hazardous waste removal, energy modernizations, and disabled accessibility modifications can also impact the integrity of historic buildings. The current occupants of the Reynold's House may also impact elements of the building's integrity. Despite the location of the historic buildings in the cantonment, military training activities also threaten integrity of these structures when used as command posts or operations centers. Vandalism and looting also constitute a threat to the more remote buildings and structures.

Traditional Cultural Properties and Cemeteries

According to National Register Bulletin 38, a traditional cultural property is a place that is: "eligible for inclusion in the NRHP because of its association with cultural practices or beliefs of a living community that (a) are rooted in the community's history, and (b) are important in maintaining the continuing cultural identity of the community." A traditional cultural property may have significance for any identifiable living community with a shared history. However, federal legislation, including the American Indian Religious Freedom Act (AIRFA), Sections 106 and 110 of the NHPA, Executive Order 12898, and Executive Order 13007, requires federal officials to ensure that Native American traditional cultural properties receive consideration in the management of federal lands.

Fort Hood lands include at least 22 cemeteries from the historic period Bethel cemetery, Brown's Creek cemetery, Friendship cemetery, Graham Ranch cemetery, Independent cemetery, Maple cemetery, New Graham cemetery, Old Graham cemetery, Pleasant Grove cemetery, Potter cemetery, Rainer cemetery, Ruth cemetery, Salem cemetery, Spring Hill cemetery, Walker cemetery. These cemeteries have a total of 3729 known internments. There are other old cemeteries on Fort Hood where the internments were moved to other areas. These defunct cemeteries have been determined as maintaining their status as traditional cultural property. The reason for this is twofold. First, the accuracy of exhumation and reburial by undertakers in the 1940's is notoriously lacking. Past experience with these situations have consistently resulted in the disturbance of historic graves missed by the reburial process. Second, despite reburial, the location itself retains its association with the cultural practices and beliefs of a living community that are rooted in the community's history, and are important in maintaining the continuing cultural identity of the community

Many DoD installations contain things and places that may be called traditional cultural resources; but few have Indian people who make active use of these properties. Fort Hood contains properties where actively concerned Indian people make contemporary use of traditional cultural resources. These resources include the Leon River Medicine Wheel and the Comanche National Indian Cemetery.

Traditional Cultural Properties on Fort Hood can be listed in three separate categories: Intact Cemeteries, Defunct Cemeteries, and Ceremonial sites. Training at Fort Hood is dynamic in the sense that the type of training and personnel trained varies over time in accordance with the military mission and military needs. The types of munitions or ordnance used include small arms (pistols, rifles), machine guns, hand grenades, artillery, mortars, and sub-munitions, such as antipersonnel, antitank, flame weapons, and mines.

Potentially adverse impacts to cultural resources on training lands at Fort Hood are comparable to those found at many military installations having substantial training missions.

These include:

- (1) Maneuver damage from tracked vehicles;
- (2) Maneuver damage from wheeled vehicles;
- (3) Vandalism and looting (either by military personnel or by the public);
- (4) Explosive ordnance;
- (5) Excavation and earth-moving activity;
- (6) Natural erosion processes that may be exacerbated by the above.

Intact Cemeteries

Because these cemeteries (Bethel cemetery, Brown's Creek cemetery, Friendship cemetery, Graham Ranch cemetery, Independent cemetery, Maple cemetery, New Graham cemetery, Old Graham cemetery, Pleasant Grove cemetery, Potter cemetery, Rainer cemetery, Ruth cemetery, Salem cemetery, Spring Hill cemetery, Walker cemetery and the Comanche National Repatriation cemetery) are protected by fence and are regularly tended to by interested parties, they are subject to a smaller amount of impacts. Cemeteries located within the live fire area are subject to direct impact by military artillery. All cemeteries are subject to vandalism, wildfires, and other natural occurrences such as erosion, acid rain, lightning, earthquakes, insect damage, smoke damage from military training, insect and micro organism damage.

Defunct Cemeteries

Because these Traditional Cultural Properties are not visible to training, potential impacts are many and severe and include items 1 to 6, above.

Ceremonial sites

The Leon Medicine Wheel is kept securely locked - opened only for inspection by FTHCRM and to allow access by Native Indians during ceremonies. Nevertheless, impacts affecting the site may include vandalism, wildfires, and other natural occurrences such as erosion, acid rain, lightning, earthquakes, insect damage, smoke damage from military training, insect and microorganism damage. Additionally, since the site is not labeled for the sake of respect and anonymity, there is the potential for wheeled vehicle damage if unauthorized access is gained through a fence breach.

Landscapes

Ft. Hood landscapes have not been evaluated for Historic and Prehistoric significance.

Monuments and Memorials

Ft. Hood has many Monuments and Memorials, their oversight is the responsibility of the III Corps Historian under the Directorate of Community Relations.

Archival Documents

FTHCRM maintains a variety of Archival documents ranging from Plat Maps to resource files. These documents are curated under 36 CFR Part 79. Potential impacts to them relate from any future lack of a facility that meets 36 CFR Part 79 criteria that would expedite their deterioration.

Summary

FTHCRM is responsible for a variety of cultural resources which can be affected in different ways by Fort Hood operations. Since some impacts are common, programmatic ways to address them are presented as part of the management strategy discussed in Chapter 4. Nevertheless, the variety of potential impacts requires constant integration of FTHCRM in planning meetings and a proactive approach by FTHCRM to implement a management strategy that strives to minimize impacts before they can occur.

Chapter 4:

Management Strategy

Chapter 4. FTHCRM Management Strategy

Introduction

This chapter presents the FTHCRM management strategy that integrates the various sub-programs and projects that proactively advances Fort Hood's mission, increases resource knowledge and improves management techniques. Sub-programs include Monitoring, Protection, Public Education, and NHPA Section 106 Reviews. The Monitoring, Protection and Public Education sub-programs encompass all of the resources and responsibilities assigned to Cultural Resource Management in AR 200-4. Implementation of these sub-programs is presented. NHPA Section 106 review addresses the installation's objectives that include mission support projects and training activities. The sections below state FTHCRM's objectives for the management strategy and outline the installation's objectives that FTHCRM responds to under NHPA Section 106 review procedures. Known construction and general internal work order projects for the next 5 to 10 years are summarized and FTHCRM's procedural response embodied in the SOPs for internal and external 106 Coordination is outlined. Known projects and activities projected out past 10 years are presented and FTHCRM's response presented. Individual resource types and responsibilities are addressed in accordance with the impacts of the sub-programs and defined operating procedures.

FTHCRM Objectives

Consistent and accurate readiness training of America's soldiers in the use of heavy artillery and mechanized vehicles is the prime function of Fort Hood. This activity requires constant use of a bounded landscape. This landscape consists of many components: vegetation, wildlife, ground conditions, water access, etc. These components are interactive and shape the landscape through natural processes. Overlaying this natural landscape is the effects from people's activities that span over 9,000 years. People have used the various natural resources to sustain themselves either directly, i.e., the Native American Indians, or indirectly, i.e., European Settlers growing cotton and other agricultural products. These effects have left their mark on the landscape in the form of archaeological locations, agricultural fields, and fence-lines. More recently, Army training has left another mark on the landscape by defining roads and trails, controlling natural processes such as fires, and reducing community development impacts. All these components and effects create a dynamic landscape that changes as a whole in response to changes in parameters of individual components and effects. Therefore a joint effort of many Fort Hood Directorates and their divisions is needed to sustain a landscape on which, realistic training is required.

FTHCRM is moving in new directions to improve and increase efficiency and effectiveness in meeting its responsibility to manage the preservation and conservation of impacts by people on the landscape considered cultural resources. These new directions evolve from a centralized and individualistic focus on archaeological resource survey and testing to active preservation and conservation of potentially eligible and eligible archaeological resources as a landscape. In addition, focus has widened to include Historic Structures and Native American Coordination in addition to meeting basic NHPA Section 106 project and training impact reviews, resulting in a diversified resource management approach. The NHPA requires management of, as well as, consideration of, these resources when projects are developed. Chapter 2, Section 2, describes the many types of cultural resources on Fort Hood and Chapter 3 describes the impacts from mission and other activities on the resources.

Since 1978, the FTHCRM program prioritized and actively pursued inventorying and assessment for NHPA eligibility of archaeological resources in the training areas recognizing the damage that training activities with heavy tracked vehicles can cause. Concurrently, effects on structures and other cultural resources have been assessed on a case-by-case basis. This has produced an immense database of raw information on individual resources. The sections below present the new management directions in the form of goals and objectives that support FTHCRM's vision and mission. The Mission

Essential Task List (METL) used to assess program overall effectiveness within the Department of Public Works is linked to the goals and objectives with respect to the monitoring criteria presented in the last section of this chapter.

Vision:

Support sustainable army training through development of a proactive research and management program that preserves and conserves cultural resources on Fort Hood while increasing soldier, civilian and community's appreciation of local and international heritage.

Mission:

Balance Cultural Resource Stewardship with Army Mission Training Requirements.

Goals

- Support Sustainable Training
- Reduction / Elimination of Landscape Access Restrictions
- Protect Resources from Damage
- Conserve Resources and their Information for Future Generations
- Increase Cultural Resource Appreciation
- Contribute to Local, National and International knowledge base

Objectives**Provide accurate landscape access data**

- Resource avoidance locations
- Terrain information

Monitor resources for impacts

- Vehicle Maneuver
- Bivouac/Stationing
- Looting
- Natural processes such as erosion, disaster damage
- Demolition
- Animal Damage, i.e. cattle, rabbits, termites

Implement protective measures

- BFRs
- Fencing
- Overfill/Capping
- Mitigation
- Rehabilitation

Implement conservation measures

- Maintain artifacts, documentation, photos, maps, etc. in accordance with 36 CFR Part 79
- Stabilize resources from further degradation

Increase public outreach

- Increase school visits, both to and from
- Incorporate CR awareness in more Soldier Training Programs
- Increase civilian and community awareness participatory activities

Publish Articles

- Locally
- Nationally
- Internationally

Develop Cooperative Programs

- Research
- Interns
- Volunteer

Management Strategy

To achieve the goals and objectives listed above, several sub programs shall be implemented or continued if already underway. The primary sub-programs Monitoring, Protection, Public Education, and NHPA Section 106 review form the foundation of the management strategy. Cultural resource management is an ongoing, dynamic program where the condition of resources requires constant surveillance. When the resource has been adversely impacted by any means then the level of adversity must be assessed and the rehabilitation/mitigative measures determined. Once these measures are implemented, then the appropriateness of current protective actions and future protection needs are assessed and implemented. Since cultural resources are a non-renewable resource and as a function of the various legal requirements cited in Chapter 1, section 2?, cultural resources will require some level of management in perpetuity. Hence the following strategy addresses short- and long-term management needs of Fort Hood's Cultural Resources.

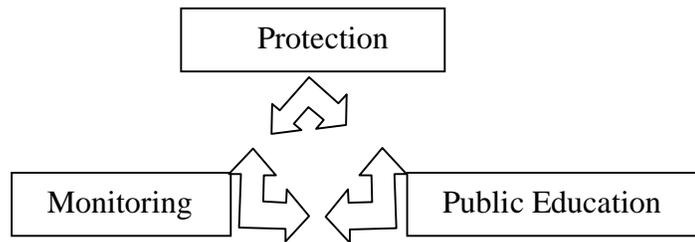
The management strategy recognizes the dynamic nature of Army training requirements while still addressing information needs for making decisions implemented under normal Base Operations conditions. Legislation and regulation provides for emergency situations. The key base operations factors that affect CR management decisions is the availability of funding and projected training requirements. FTHCRM has no control over either of these two factors but makes firm and reasonable recommendations with an aim to promoting the FTHCRM mission.

The dynamic nature of Army training requirements also results in the need for FTHCRM to implement these four sub-programs simultaneously to meet legal mandates. Three of the sub-programs, Protection, Monitoring and Public Education, integrate into a feedback loop that is central to long-term management of cultural resources. This feedback loop is supplemented by NHPA Section 106 reviews by enabling assessment of impacts from a project and activity perspective.

The Feedback loop works because integration of the components improves information available to make management decisions. Specifically, resources must be constantly and consistently monitored to assess their current conditions, identify new impacts and assess the level of damage to the resource

the impact has caused. This information feeds into identification and assessment of effective protective measures for the resources against identified potential impacts. Information from both of these programs help to refine the Public Education program needed to reduce ignorance of protective measures that need to be heeded, and the penalties for not heeding them. Figure 4-4 displays this relationship graphically. The following sub-sections describe the overall strategy and identify the appropriate SOP for implementing the strategy.

Figure 4-1. Foundation Sub-Programs



Protection

Protection of cultural resources is the primary mandate of the NHPA and its amendments. NHPA Section 110 provides the legal authority for Agencies to develop cultural resource programs to implement protection and conservation for the resources they identify and assess as eligible or potentially eligible for the NRHP. The following sub-programs all support the details of this overarching sub-program. The following sub-sections address details in the protection and conservation of resource types and any resulting materials that result from identification, and assessment of a resource's NRHP eligibility. Hence the first section applies to structures while the second applies to archaeological resources.

Structures

This category not only include buildings but infrastructure such as towers, observation and water, sheds and the like that provide the backdrop to people's activities on the landscape. Protection and conservation of structures begins with an inventory and assessment. Structures on Fort Hood have only started turning 50 years, the key triggering point for NHPA eligibility assessment, within the last 10 years. Many of these early buildings are World War II temporary wooden buildings covered by the programmatic agreement between the Department of Defense, the National Council of State Historic Preservation Officers, and the Advisory Council on Historic Preservation. Other structures that have been assessed include three pre-Fort Hood structures and structures assessed on a case-by-case basis. Details regarding specific projects to assess the remaining structures and address known potentially eligible structures are given below under the section "Military Facilities".

The strategy for the protection and conservation of structural resources combines review of proposed construction and rehabilitation projects with the monitoring strategy described below. FTHCRM representatives attend meeting hosted by project proponents to obtain information on the proposed project. Projects are then review in accordance with the SOP - 106 Internal Coordination. When the internal assessment is complete and, if the determination requires, the SOP- 106 External Coordination is implemented to provide the THC/SHPO and opportunity to comment. When the coordination process is complete, the project proponent is then notified of the final determination and any conditions on the project. When a dig permit is submitted for the commencement of construction, the project is then monitored to insure all conditions are adhered to. Monitoring will occur in accordance with the Monitoring Strategy described below and SOP - Monitoring.

As for direct conservation of structures potentially eligible or eligible for the NRHP, re-use shall be considered in accordance with the Secretary of Interior's standards and guidelines. Any rehabilitation to meet re-use needs will be addressed as described above. When practicable based on funding and codes, original fabrics and fittings shall be employed in the rehabilitation. New construction of additions shall meet Secretary of Interior Standards and Guidelines to insure the integrity of the structure is not diminished.

Archaeological Resources

This category includes TCPs and other landscape-based resources on Fort Hood. These resources are at risk from a variety of factors ranging from military training activities to looting by persons not affiliated with Fort Hood. The variety of potential impacts possible were listed in Chapter 3.

The strategy for protecting archaeological resources is more extensive than other resources as a result of the nature of these resources and their non-renewable nature. This is particularly true for Prehistoric, Native American archaeological resources. Historic archaeological resources on Fort Hood can be supplemented with archive research and oral history research to identify what different structural remains were used for, the distribution of communities and their interrelationships. These resources are assessed and recorded in light of this additional information that is available. Prehistoric archaeological resources do not have this supplemental information available therefore they are more fragile and the need to safe guard the information in them is crucial. Nevertheless, both archaeological resources types are given the same weight when it comes to determining the appropriate protective and conservation measures.

To protect and conserve archaeological resources on Fort Hood, the risk of damage by the various potential impacts must be identified in order to assign the appropriate protective action listed in Table 4 - 7. In addition to the type of impacts possible, the amount of individual impacts or repetitiveness that can occur, the resource's location, the geomorphology, and in what form that information is best kept in perpetuity, must be reviewed and assessed. For example, an open campsite in the middle of a major maneuver-training lane located in shallow caliche soils and gullied by erosion compounded by cattle grazing will require a different protective action to preserve its information versus a rockshelter on the side of an escarpment with a steep slope and thick shrubs that may have a future potential to be looted.

The Strategy

The effects of military training and vandalism require different approaches to minimize impacts. Table 4 - 7 lists attainable methodologies for the two types of damage. Natural processes adversely affecting archaeological sites are largely beyond the control of Fort Hood. While efforts are made to minimize erosion during rehabilitative actions, naturally occurring effects are considered tolerable.

The methodologies listed in Table 4 - 7 are approaches to be undertaken by Fort Hood. It is understood that no single methodology is sufficient to minimize site damage. Instead, these methodologies represent a suite of approaches that together will drastically change the rate of archaeological resource destruction.

Table 4-1. Attainable methodologies for minimizing adverse effects

Damage Type	Methodology
Military Training	Signage: NATO standard signs delimiting a no-go area posted on the perimeter of each archaeological resource. Fastened to 1.5 meter metal stakes, the signs will be brightly colored for increased visibility. The intent is to draw the attention of the military vehicle operator.
	SIBER stakes: Plain plastic cylinders that mark areas "off limits" to vehicles and other traffic on Army installations, help prevent damage to sensitive lands without adversely impacting field training operations. The Army intends to use the stakes—which are at least 16 inches long and wrapped with reflective tape – it is intended to be an awareness tool and has proven to be effective at other installations.

	Burying: Archaeological resource covered in landscaping fabric and then covered with sand up to 1 meter deep. The intent is to create a physical barrier so that subsurface site components will remain undisturbed.
	Electronic Maps(E-maps): GPS/GIS data incorporated into mechanized equipment's digital mapping system as no-go areas. The intent is to provide a vehicle-borne electronic system for boundary delineation and a perimeter alarm system for vehicles nearing sites.
	Fencing: Chain-link fence delineating the perimeter of archaeological sites. The intent is to limit access for both military vehicles and personnel.
	Barriers: Large concrete barricades strategically placed to limit vehicle access to archaeological sites.
	Training: Central to all methodologies, training will be crucial to ensure military compliance. Additionally, this approach will include a 'train the trainers' component.
Vandalism	Grating: Heavy-gauge industrial iron grating placed on the surface of archaeological sites forming a barrier. The intent is to make it extremely difficult to access subsurface cultural resources.
	Burying: Archaeological sites will be covered in landscaping fabric and then covered with sand up to I meter deep. The intent is to create a physical barrier so that subsurface site components will be difficult to access.
	Gating: Appropriate archaeological sites fitted with a heavy-gauge metal gate limiting access to cultural remains.
	Surveillance: Video surveillance measures at actively vandalized archaeological sites implemented to apprehend ARPA violators.

Not all approaches are appropriate for all types of archaeological sites. Table 4 - 8 outlines the six site types at Fort Hood as a matrix with the protection methodologies. It indicates which measure is appropriate for the various site types. Rows show protection methodologies. Columns list archaeological resource types.

Table 4-2. Archaeological Site Protection Matrix

	Caves	Mounds	Middens	Open Campsites	Rockshelters	Paluxy
Training	X	X	X	X	X	X
Signage		X	X	X		X
SIBER		X	X	X		X
Surveillance		X	X	X	X	X
Burying		X	X	X		X

Fencing		X	X	X		X
Grating		X	X	X	X	X
Barriers		X	X	X	X	X
Gating	X				X	
E-maps		X	X	X		X

The training aspects as shown in Table 1 is applicable to all six archaeological site types. Education is absolutely fundamental to ensure compliance with other protection measures. Table 4 - 8 shows the appropriateness of each measure for the different site types. SIBER stakes, for example are not applicable to karst features while grating can protect mounds, middens, open campsites, rockshelters, and Puluxy sites, but may not be effective for caves.

Monitoring

Fort Hood shall ensure that known NRHP potentially eligible and eligible historic properties are protected in a reasonable manner against damage as a result of military and civilian activities as described in Chapter 3 and to include natural causes such as erosion and non-natural causes such as looting within the parameters of available resources to include personnel and funding. This sub-program includes but is not limited to Archaeological and Structural Resources, and Traditional Cultural Properties (TCPs).

Monitoring strategy varies between the training/range areas and the cantonment purely as a function of the types of resources located in each region. Archaeological resources and TCPs are the primary resource in the training/range areas whereas structures predominate in the cantonment. The Monitoring SOP shall be used as guidance for recording and assessing resource condition and damage to determine the cause of possible impacts.

Nearly all of the resources in the training areas have been assessed for NRHP eligibility. Many Structures including cantonment buildings have only been assessed on a case-by-case basis. Monitoring is conducted to assess and track any adverse effects to eligible or potentially eligible resources and to supply information for evaluation to determine the effectiveness of the Protection sub-program. An update of the conditions on these resources, along with any newly discovered information, will be recorded on the installation cultural resource inventory form (Appendix F). This data will ultimately be entered into an electronic database.

Regular Visitations

FTHCRM will periodically monitor 60 eligible and potentially eligible resources per fiscal year. Resources that are actively being vandalized will take precedence over the suite of other resources (see below). Any damage to the resource will be described, affects of damage on integrity will be discussed, and recommendations for further action will be made. Recommendations may range from no further action required to immediate data recovery. Visual and written documentation will be collected.

Looting Activities and Vandalized Resources

As stated above, resources that are actively being looted will be tracked at a more frequent, but random, interval than other resources. Remote surveillance equipment may be installed at some of these resources. If equipment is placed on a given resource, generated images will be downloaded, equipment will be maintained, and any additional illegal digging will be treated as an Archeological Resource Protection Act violation (see SOP - ARPA).

Project Monitoring (Military and Infrastructure)

As mentioned under the SOP - 106 Coordination, military and infrastructure projects will be randomly monitored as quality assurance at a rate of 25% of projects per fiscal year. Violations will be addressed under the SOP - ARPA. In addition to random checks, all of the proposed projects that require monitoring, resultant from consultation with the SHPO, will be monitored during the length of the project.

Public Education

Public Education is essential to reduce ignorance of cultural resource values and insure protective measures work. Public Education also provide feedback as to how well people are incorporating cultural resource training into their activities, the value they place on the resources, and how protective actions are impacting training or other activities/functions. FTHCRM has implemented a public education program that features participation in two major functions a year: Earth Day sponsored by the Army and Texas Archaeological Awareness Month sponsored by the Texas State Archaeologist and the Texas Historic Commission. For both of these functions FTHCRM participates with various activities for the military and civilian communities participation and education. Activities include visual and interactive displays, seminars, and an open house. Additional functions the FTHCRM participates in are Military training session such as Sergeant's time and the Environmental Coordinator's Awareness course and associated refresher.

FTHCRM also has implemented a program to go to schools or host schools to visit Fort Hood to learn first hand about cultural resources in general and local resources specifically. Visits range from two hours to a day of activities. There is a combination of discussion and hands-on activities that supplements the discussion. There are also classroom-teaching guides available that are handed out to the teachers to supplement the visit and improve the teaching unit on cultural resources and archaeology specifically.

NHPA Section 106 Project Review

This sub-program is a reactive program that involves attending project review meeting to obtain information on the proposed project. Conditions resulting from determinations of impacts are provided to proponents for incorporation into the respective project scope of work. FTHCRM's review procedures are embodied in the SOP-106 Internal Coordination. Projects reviewed are tracked on an internal database for future reference and reporting needs. Dig permits, formally called Coordination for Excavation (FTH420X10), are a component of NHPA Section 106 reviews. Dig permits identify the commencement of a project or a phase of a project, are tracked in another database. Military training activities are reviewed under the Dig permit process as a function of the lead-time normally incorporated into training planning. Both types of dig permit are reviewed under the SOP - Coordination for Excavation (FTH420X10). These procedures are discussed as they apply to specific project types in the sections below on " Resource Types and Planned Projects".

Resource Types and Planned Projects

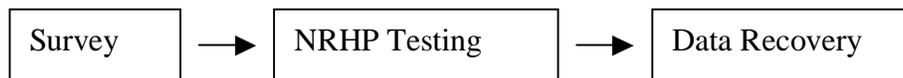
There are three primary cultural resource types scattered across the bounded Fort Hood landscape: Archaeological (historic and prehistoric), Structural, and Traditional Cultural Properties. Each type has unique characteristics that must be addressed with respect to the management goals above.

Archaeological resources are the predominate resource type as they are distributed throughout the training areas and are at the highest risk of damage from training activities. Structures have been addressed on a case-by-case basis but many are now reaching the NHPA 50 year old trigger date for evaluation, hence there is an increased focus on these resources. Thirdly, Traditional Cultural Properties include both Native American and European settlement. This resources type involves continued coordination and review of issues such as access to cemeteries. The following subsections present the respective known characteristics of each resource type and how FTHCRM plans to implement the above goals and objectives.

Archaeological Resources

A linear framework developed from the 1970's interpretation of NHPA and associated regulations has guided the investigations and eligibility assessments of archaeological resources on Fort Hood. This framework begins with the identification of resources via a survey of a designated area then the identified resources are tested against National Register of Historic Places (NRHP) eligibility criteria. Finally, if the resources cannot be protected in situ, then data recovery involving detailed excavation to recover as much of the resource information as possible, is implemented (Figure 4 - 5). This framework evolved into the major Cultural Resource Management procedure over the years and is still heavily used in utility and roadwork projects.

Figure 4-2. linear framework



The Fort Hood Archaeological Research Management Series (FHARMS) as of the date of this ICRMP consists of over 45 volumes each containing vast amounts of raw data on archaeological resources resulting from this management framework. This data has provided FTHCRM with baseline information about resources characteristics that make the resource eligible for preservation or at a minimum, further research yet it does not provide information or the basis to assess inter-relationships between resources or look at the broader, regional use of the landscape. This wider perspective is just as if not more important then the individual characteristics of resources because of the dynamic nature of the landscape itself over time. For example, available natural resources change due to climatic conditions affect growing conditions for crops or for grasses that bring animals into the area for hunting may not be good over a period of time. The result is that people using the landscape change the natural resources they use, if not completely leave the area until climate changes occur again and improves conditions. Identification of these changes are the focus of archaeological research and shape the resource's characteristics and the resource's eligibility for preservation. These changes also provide a piece of the story of how people lived and use the landscape in historical times. Therefore, FTHCRM is broadening its research of the archaeological resources from a individual resources perspective to a landscape orientation.

Fort Hood Archaeological Resources

There are two types of archaeological resources on Fort Hood: Historic - European descendant and Prehistoric - Native American. Previous program management decisions resulted in different research approaches for these two types. Prehistoric archaeological sites were assessed based on their location and the potential risk of damage from training activities. Historic resources were assessed from a more regional viewpoint, grouping the historic resources based on land acquisition periods and review the large amount of documents about European settlement of central Texas. Both types of resources are similar in that most of their material is on the ground or below and represents how people used the location and the resources located nearby. Nevertheless, the composition of those materials and their spatial layout is different. This difference is what FTHCRM uses to identify different landscape impacts and resource use patterns.

Historic Archaeological Resources

Categories of historic archaeological resources on Fort Hood are listed in Table 4 - 9. These resources, though scattered about the installation are grouped at different levels. Some buildings comprise a single homestead with a house, barn and other associated out buildings. The spatial relationship between these buildings is smaller than the relationships between those groupings that comprise the historic hamlets. Supporting these homesteads are a variety of out structures such as water tanks, sheep dips, etc.

Table 4-3. Historic Resources on Fort Hood, TX

Resource Type	Definition
Artifact Scatter	Surface and sub-surface scatter of historic materials, no structural remains present
Bridge	Bridge structure
Cemetery	Known location of burials, may or may not still have interred remains
Community	Group of habitation structures
Culvert	Water diversion structure
Demolished Building	Condition of specific single structure
Dump	Defined group of garbage
Farm/Ranch	Homestead and/or grouping of related structures
Livestock Feature	Structure used for attending and support of livestock
Quarry	Specific location of material removal
Railroad	Features related to present of railroad, i.e. right-of-way
Rock Wall	Fences, supporting structures, etc made of local rock.
School	Remains of school building
Water Features	Employed in irrigation, water containment, etc.
Unknown	Remains not identifiable

If these structures, groupings and ancillary structures cannot be identified directly, then they may be identified from indirect means. This would include the identification of exotic vegetation and general vegetation patterns on the ground and by historic plat maps and land surveys.

Prehistoric Archaeological Resources

Prehistoric archaeological resources are more integrated with the landscape and its features. Table 4 - 10 lists the types of prehistoric resource types identified on Fort Hood. The location of these different resource types on a general scale is related to landscape features, i.e., rockshelters/caves/sinks, and/or available natural resources used to create internal features on the landscape such as burned rock mounds within an open camp resource. Hence the search for these resources includes defining the geomorphology on a micro-scale, identifying geologic features such as paluxy sands versus limestone caliche, and the distribution of specific chert types and burned rock.

Table 4-4. Prehistoric resources on Fort Hood, TX

Resource Type	Definition
Cave/Sink hole	Cavity in limestone where entrance is smaller than depth.
Lithic Scatter	Surface concentration of stone artifacts with limited matrix depth.
Midden	Thick amorphous deposit of primarily burned rock without relief or standard shape.
Mound	Domes shape deposit of burned rock.
Open Camp	Scatter of stone artifacts in conjunction with hearths and other cooking activities.
Open Camp with Midden	Same as above but include concentrations of burned rock with other debris among the rock.
Paluxy	Hearths and burned rock concentrations buried in sandy deposits derived from Cretaceous-age Paluxy Formation.
Rockshelter	Overhang in limestone walls caused by undercutting of limestone where the opening is greater than depth.

Current Status of Archaeological Research and Evaluations

Since the implementation of the NHPA, surveys have identified a total of 2219 archaeological resources resulting in 100 percent of training areas and cantonment plus 85 percent of the Live Fire Area systematically inventoried for archaeological cultural resources (Chapter 2?). This number consists of 1,100 prehistoric archeological resources inclusive of one Native American sacred resource and 1,119 historic archeological resources. The archeological cultural resource inventory was completed in 1991. Since then, Fort Hood has implemented NRHP eligibility testing for prehistoric archeological resources that is currently near completion. Chronology of the prehistoric material recovered span from approximately 10,000 BP to 700 BP and represent the remains of hunter/gatherer camps, kill sites, quarries, and resource processing centers. Other features include rock art, burned rock middens and mounds, rockshelters and a Native American recognized Medicine Wheel.

Currently Fort Hood protects 1178 historic and prehistoric archaeological resource covering approximately 13,500 actual acres (Table 4 - 11). With 100 meter buffers, the total acreage requested for avoidance is 33,500 acres. In addition military and civilian digging is controlled in unsurveyed areas (20,262 acres) and alluvial terraces (13,706 acres). This constitutes less than 5 % of the total installation acreage.

Table 4-5. Archaeological Resources on Fort Hood, TX

Resources	NRHP Assessment	Number	Acreage	Buffered Acreage
Historic	Eligible or Potentially eligible	730	2400.9	13977.4
Prehistoric	Eligible	174	4089.9	8679.0
Prehistoric	Potentially eligible	274	6984.9	10803.4
Total		1178	13475.7	33459.8

Fort Hood contains the entire or partial territories of 23 dispersed rural communities represented by the historic archeological resources, three historic buildings and 21 pioneer cemeteries. Historic resources include cattle ranches, farms, community structures and trash dumps ranging from the 1850s through to the military acquisition periods of 1942 and 1953. Pioneer cemeteries and adjacent community resources remain the focus for ethnic identity among former members of these dispersed communities. Many of these resources have been dropped from protected status as resource integrity does not exist as a result of natural and non-natural degradation. The remaining historic resources are under assesment using archive research supplemented with site visits to determine current integrity level.

FTHCRM continues to track the 1041 archaeological resources considered not eligible for the National Register of Historic Places for several reasons. Firstly, there still may be artifacts at that location and even though they do not qualify the resource for protection, these cultural materials can still be relocated and could provide information on inter-site usage. Second, archaeological resources are tested for NRHP eligibility by selectively placing excavations within and along resource boundaries. Sometimes the location of these excavations can miss the highest concentration of the best cultural material and hence, years later, erosion or construction excavations could recover unknown material. Tracking this location as the original resource provides background to the location and expedites any needed re-evaluation and if necessary, mitigation. Long-term tracking of the resource properties and location reduce rediscovery situations. Thirdly, information from and on non-NRHP eligible resources is a component of the larger archaeological landscape and can fill in interpretation gaps. Interpretation of the archaeological resources provides a better understanding of the resources' inter-relationships and the relationship of the people who created the resource location to the landscape. Therefore, long-term cultural resource management must track all known archaeological resources over time to be realistically effective and efficient in managing the resource landscape.

Archaeological Research and Preservation: The Next 5 to 10 years

Continue to implement Monitoring, Protection and Public Education sub-programs and refine management in accordance with results of the proposed projects to meet FTHCRM's mission.

A holistic approach focusing on a landscape theoretical framework shall be implemented. As discussed above, archaeological resources are integrated with the landscape in which they are located. To continue to protect and determine long-term management goals for individual resources is not productive especially since the military mission operates within a landscape framework. Existing information is under review and analysis to provide an overview and identify potential patterns in the distribution of defined site types listed above. In addition, patterns for the distribution of features within resources and across the landscape will be assessed. This information will lead to a regional compilation of data and overview of cultural and natural resource usage.

Concurrently, these same assessments will be performed from the perspective of military training to prioritize resources at risk from training impacts presented in Chapter 3. These assessments will be performed under the protection risk assessment discussed above. The results will identify the best protective action to take. As funding allows, these actions will be implemented and monitored to

insure the best method is applied. Supporting the implementation of the protective action will be an education program to train military personnel of protective actions and of penalties for ignoring them.

Data recovery excavations are considered a last resort protective action. This action will be considered when the risk of total destruction of an archaeological resource is predicted within two fiscal years or less and other protective actions have been tried and have failed to effectively eliminate damage to the resource. Funding will be programmed to implement data recovery at two resources per fiscal year if funding is provided. Data recovery will be implemented under the following criteria:

1. A research proposal is developed that
 - assesses known information on the resource and surrounding resources,
 - identifies a hypothesis to be assessed by the excavation results,
 - identifies additional questions/hypothesizes the results may be applicable to,
 - describes the excavation and analysis methodology,
 - defines the amount of excavation required to provide the information to address the hypothesis, and
 - outlines the proposed reporting venues.
2. The proposed methodology shall follow the SOP - Excavation.

Military Training

This includes all the training and range areas. Training activities are reviewed via the Coordination for Excavation (FTH420X10) permit review process (Dig Permit Program) on a case-by-case basis in accordance with the associated SOP. Larger exercises that require NEPA documentation such as Force-on-Force exercises are assessed in the planning stages.

Military Training: Next 5 to 10 years

Known and scheduled proposed projects are discussed under the Installation Objectives section below.

Structural Resources

Military Support Facilities

This includes all facilities supporting training, from barracks to motor pools. Such facilities on Fort Hood have been assessed on a case-by-case basis relative to proposed projects and in many cases these buildings have been less than 50 years old and have been considered not to meet the exceptional circumstances clause for buildings less than 50 years. Therefore projects have proceeded. The World War II temporary wooden buildings that are covered under the Programmatic Agreement between the Department of Defense, the National Council of State Historic Preservations Offices and the Advisory Council on Historic Preservation are the only group of buildings assessed.

Construction of Military Support facilities such as range upgrades or re-designs to meet new equipment requirements, are supervised by G3/Range Control and their engineers. These projects are coordinated in the planning stages and assessed in accordance with SOP - Section 106 Internal and as needed SOP - Section 106 External coordination.

Military Support Facilities: Next 5 to 10 years

Needs: Assessment of Military permanent structures pre-1945 (32 buildings) and during the Cold War period (~2000 buildings).

The 2001 ECAS identified this survey as a negative finding that needs to be addressed. Partial funding has been provided to commence a phased approach. A phased scope of work is under development to implement the assessment. A major aspect of the assessment will be the identification of Cold War relevance of Fort Hood. Since Fort Hood was established during World War II, the activities and missions the assigned divisions and tenants have participated in may have significance to the larger Cold War issues. Other areas of consideration are the Korean and Vietnam wars, Peacekeeping missions, and research facilities. These areas will all be addressed over time based on the availability of funding for each phase.

Known and scheduled proposed projects are discussed under the Installation Objectives section below.

Housing Facilities

There are 14 housing communities on Fort Hood: 13 are operated by Fort Hood and 1 is operated under the 801 program by a private developer. This constitutes management of over 5000 housing properties. As a measure to improve housing facilities in a cost effective and efficient manner, Congress approved an initiative to privatize housing management. The result is the Residential Community Initiative (RCI) where the buildings are leased to a private developer in a partnership. Fort Hood retains ownership of the land and responsibility for legal compliance. Fort Hood Family Housing (FHFH) is the private partner. The lease is for 50 years with a 25-year option.

FTHCRM's responsibility is to assess the impacts of proposed new construction and rehabilitation of the housing facilities under the proposed 5-year development plan submitted for consideration under NEPA requirements. In the assessment, FTHCRM identified areas for survey in the Comanche IV expansion and Montague III Expansion. In addition it was determined that one of the housing communities would turn 50 years old in 2001 triggering NHPA assessment of the housing structures and the community landscape. Assessment of the housing areas had not been a consideration during negotiations in previous years because the communities were not 50 years old yet. With the McNair Village community turning 50 years old, several others have been identified that will turn fifty within the first 5-10 years of the lease. Hence FTHCRM contracted with the National Park Service Mid-West Region to evaluate these six communities totaling 1006 buildings. Proposed building rehabilitation work is phased and thus shall provide ample opportunity to complete the inventory and determine eligibility status of any properties before work begins.

Fieldwork is completed for the Comanche IV extension and the report is under preparation for coordination with the THC/SHPO. No historic properties were located during the field survey. The proposed construction area is west of the existing Comanche communities. The area is an open, upland surface incised by a creek. Soils are shallow. Transects were walked at 30 meter intervals with a closer distance on the creek alluvium though it was shallow also. All cutbacks in the project area were examined. No cultural materials were located. Fieldwork is in the planning stages for the Montague III extension and will be based on the construction designs for the community.

Housing Facilities: Next 5 to 10 years

Evaluation of impacts to the housing units will be completed when the inventory and NHPA eligibility assessment is completed. Future projects whether the construction of new housing units or rehabilitation of existing will continue to be coordinated through Fort Hood and the FTHCRM office for potential impacts unless future plans are produced that enable a programmatic approach to be implemented. Known and scheduled proposed projects are discussed under the Installation Objectives section below.

Pre-Fort Hood Structures

In the 1995 to 1999 Cultural resource Management Plan, three structures were recognized as potentially eligible to the NRHP based on a 1990-1991 review by the THC/SHPO. These structures are the Reynolds House, the Okay Store building and the Whitehead House both at Robert Gray Army Air Field.

The Reynolds house was built in 1915 and was the retirement home of Mr. Reynolds. Mr. Reynolds was a businessman who participated in the agricultural and rural development of Central Texas in his early years. By the time the house was built for him and his family, he was retired from community services and dies in 1921. Not long after the family moved out of the house. When the property was acquired for Camp Hood by the government, the house was used as general field officer's quarters as it had electric lighting and running water. The house is located off of the Warrior Way Commissary parking lot next to Walker Village housing Community. In 1979, Bell, Klien, and Hoffman assessed the pre-Fort Hood structures for architectural integrity and determined that it was a representative building for the time period and means of the family. THC/SHPO's reassessment in 1990-1991 determined it may be potentially eligible with respect to the local community.

The two other structures are the Okay Store and Whitehead House located next Robert Gray Army Air Field in West Fort Hood. They are stone structures currently with metal roofs. In 1979, Bell, Klien, and Hoffman assessed the structures for architectural integrity and determined none continued to exist short of the stone masonry as a result of a variety of modifications including the removal of the chimney to the house and the replacement of the roof with metal roofing. The THC/SHPO reassessment in 1990-1991 stated the buildings were potentially eligible as they may be representative of local community structures for the early 20th century for Central Texas. Re-use of the facilities by military units have not changed the building configurations nor remaining stone fabric.

Pre-Fort Hood Structures: Next 5 to 10 years

Projects are planned to re-assess these structures for NRHP eligibility. If they are determined as eligible, then re-use and maintenance plans shall be developed to maintain their remaining integrity and eligible characteristics.

Additional Sub-programs

These sub-programs deal with issues that require additional responsibilities outside but complementary to, the four main-sub-programs discussed above. These additional responsibilities are presented for each sub-program as well as directions presented for the next 5 to 10 years.

Traditional Cultural Properties**European**

European Traditional Cultural Properties on Fort Hood consist of historic cemeteries. These 22 cemeteries were established by communities that existed in Central Texas prior to Camp Hood being established in 1942. Each cemetery consisted of less than 50 burials. There are letter agreements that cover the acquisition of title of the property by the government but enable spouses to be interred in the future. The intent of these agreements are embodied in Fort Hood Regulation 210-190. FTHCRM and Real Property are POCs for inquires regarding internment in the cemeteries.

Remains in several large cemeteries (>50 burials) were relocated when the government acquired the property. FTHCRM holds a list of the relocated remains for review by interested parties. The locations of these large cemeteries are still considered off limits for digging purposes because of the lack of paperwork to confirm all remains were relocated. This issue is discussed in Chapter 3.

European TCP: Next 5 to 10 years

Identify paperwork for original exhumations to determine if all remains were removed. Implement a random Geophysical examination of disturbed ground to confirm removals.

Native American

There are two types of Native American TCPs on Fort Hood: Comanche National Indian Cemetery and Leon River Medicine Wheel. These three types of TCPs each have different but additional responsibilities in addition to the four main sub-programs described above. Each type will be addressed separately.

Comanche National Indian Cemetery

The 5 acres were established in 1991 for the repatriation of Native American remains that had been recovered since Fort Hood had been established and held in the FTHCRM office at that time. The Comanche and Tonkawa tribes took responsibility for interring remains and performing the ceremonies. A non-profit group called the American Indian Resource and Education Coalition, Inc. (AIREC) provided a funding avenue for the tribes to support the cemetery. A Memorandum of Understanding (MOU) was signed between Fort Hood, the Comanche Tribal Council as represented by the Comanche (Otipoby) Cemetery Committee, and AIREC. The MOU outlines the use and access for the cemetery. It also identifies Fort Hood's continued ownership of the land and that visits for scientific and archaeological purposes shall be authorized by Fort Hood. Currently access to the cemetery is overseen by FTHCRM and is governed by tribal wishes that only Native Americans visit the cemetery except when others have been given permission by the tribes or FTHCRM personnel are performing normal monitoring activities to insure protection measures are adequate. The SOP - Access and Use Request for Repatriation Cemetery is followed for Native American requests.

Comanche National Indian Cemetery: Next 5 to 10 years

Develop new access and use procedures in consultation with interested Native American tribes, in particular the Comanche and Tonkawa. These procedures will include criteria for Fort Hood's role in screening users, assisting with the storing of remains until repatriation, identify types of remains for repatriation, and the tribes' roles for funding and performing the ceremony.

Leon River Medicine Wheel

The Leon River Medicine Wheel is a stone structure located in North Fort Hood. It consists of stones laid out in 8 sections that create a circle with pathways to the center. When it was discovered during an inventory survey in 1989-1990, it was only 60 % complete. Archaeological excavations were coordinated with the Comanche and Tonkawa tribes with an aim to determine the age of the wheel. The results of this research are published in FHARMS Vol 10 (?). Concurrently, interviews were conducted with tribal members to identify any tribal stories of a medicine wheel in the Central Texas area. This result was inconclusive but the tribes agreed that the stone structure was a medicine wheel and presented their desire to reinstate the wheel as a traditional ceremonial place. Fort Hood accepted this desire and incorporated it into the MOU signed between Fort Hood, the Comanche Tribal Council as represented by the Comanche (Otipoby) Cemetery Committee, and AIREC. The MOU also outlines the use and access conditions for the Medicine Wheel. Currently access to the Medicine Wheel is overseen by FTHCRM and is governed by tribal wishes that only Native Americans visit the Medicine Wheel except when others have been given permission by the tribes or FTHCRM personnel are performing normal monitoring activities to insure protection measures are adequate. Access to the Leon River Medicine Wheel is covered by the SOP - Access and Use Request for the Leon River Medicine Wheel and is followed for Native American requests.

Leon River Medicine Wheel: Next 5 to 10 years

Develop new access and use procedures in consultation with interested Native American tribes, in particular the Comanche and Tonkawa. These procedures will include criteria for Fort Hood's role in screening users of the Medicine Wheel to perform traditional ceremonies.

Burials in Archaeological Resources

Some prehistoric Native American resources on Fort Hood are known to have interred remains or fit the profile for resources with remains and thus are considered to have the potential to yield remains. These archaeological resources are monitored and are under review to determine the appropriate protective actions to implement. Discussions with Native American tribes per the Native American Graves and Repatriation Act (NAGPRA) have indicated remains should stay *in situ* instead of being exhumed and reburied in the Comanche National Repatriation Cemetery. FTHCRM adheres to these discussions by coordinating proposed NHPA eligibility testing for high probability resources and has incorporated into Archaeological eligibility testing contracts, instructions to leave inadvertently discovered remains *in situ* if located during testing.

Burials in Archaeological Resources: Next 5 to 10 years

Maintain list of resources with burials and consistently monitor adequacy of protective actions. List disclosures are restricted under NHPA, NAGPRA and ARPA.

Native American Coordination

Various federal statutes (NHPA, NAGPRA, etc.) require consultation with federally recognized Native American Tribes who have known previous ranges in Central Texas. In accordance with these laws, FTHCRM has an active coordination program with the following tribes:

- Comanche Indian Tribe,
- Tonkawa Indian tribe.

FTHCRM continues to pursue discussions with the following tribes:

- Mescalero Apache
- Wichita and Affiliated Tribes (Keechi, Waco & Tawakonie)
- Caddo Indian Tribe
- Kiowa Indian Tribe

Non-federally recognized tribes can express their interest as public parties. The major area of interest that has been expressed is the discovery of remains and the application of NAGPRA. Other area of interest is the operation of the Comanche National Indian Cemetery and the Leon River Medicine Wheel.

Native American Coordination: Next 5 to 10 years

Continue to expand FTHCRM's relationship with the Native American Tribes both federally recognized and non-recognized.

Curation

36 CFR Part 79 outlines the criteria for federal agencies in the curation of artifacts, documents, field notes, and a variety of other items related or the result of cultural resource activities. This includes items randomly picked up and turned over to FTHCRM through to major excavation materials and supporting documentation. All of these items are to be curated to maintain their integrity and information in perpetuity. Regulations governing the de-accessioning items have not been developed. Hence collection and research policies incorporate the requirement to maintain all materials as well as research plans developed for excavations.

Currently 75 % of FTHCRM's collections meet 36 CFR Part 79 criteria for long-term storage. The remaining 25 % are pre-1990 collections that are being reviewed and repackaged to meet the regulation. Artifacts and materials without clear provenience are maintained but used for display and teaching/demonstration collections. Resource files are kept in fireproof filing cabinets and the remaining material is maintained in a converted refrigerated locker where temperature and humidity are controlled and monitored. A CO₂ fire suppression system is linked into the locker and the building itself has an extensive water sprinkler system in the office spaces and in the attic to account for the building being a World War II wooden temporary structure.

Curation: Next 5 to 10 years

Complete repackaging and inventorying pre-1990 collections. Obtain more curation space to accommodate new materials resulting from management projects. Obtain permanent display space to complement Public Education sub-program.

Data Management

FTHCRM has a large amount of data in written hard copy consisting of field notes to published volumes. FTHCRM also maintains digital information in MicroSoft Access and in Environmental Systems and Research, Inc. (ESRI's) ArcView geographic information system (GIS) program. Digital data is used extensively and is supplemented with hard copy data to make management decisions. Global Position Systems are employed to improve location data and is downloaded into the GIS files.

Data Management: Next 5 to 10 Years

Digitize as much of the hard copy data as is practicable to improve access efficiency and enable archiving. Also implement assessment and analysis of data to support the landscape management approach of the management strategy presented above.

Installation Objectives

Training

As stated in the Fort Hood Mission, soldier readiness is the primary function of Fort Hood. To achieve the balance in FTHCRM's mission, all training exercises require the attainment of a Coordination of Excavation permit (FTH420X10) also called a dig permit. FTHCRM is one of several permit reviewers. If other signatories do not concur with the specified location on the permit, the revised permit is re-submitted to FTHCRM to review the revised locations and actions. SOP - Coordination of Excavation permit (FTH420X10) provides the steps taken to obtain a permit for military training in the Training Areas including the Ranges inside the Live Fire Area.

Projected Projects

Projects on Fort Hood usually include some level of construction that require ground disturbance. These projects can be implemented in the training Areas, Live Fire Areas, or the Cantonment. FTHCRM participates in project review board meetings to examine projects for impacts under NHPA section 106 guidelines. Potential impacts if any, are identified and internal coordination begins to avoid impacts. Depending on the type and severity of the impacts, FTHCRM determines whether the project meets agreed upon criteria for exclusion to individual coordination or coordination on the individual project must occur with the THC/SHPO per SOP - 106 Coordination - Internal. If Coordination with the THC/SHPO is required, then SOP - 106 Coordination - External is implemented. The project is tracked to monitor any agreed upon terms and for implementation of required dig permits.

DPW Plans and Program division supplied the Major Construction Approval (MCA) and Work Order lists. Table 4 - 12 is a distillation by broad project type as categories by FTHCRM for review purposes. The types of projects are identified in this plan to provide information for future management decisions. Projected date of funding needed for each project is stated but actual funding is congressionally mandated and is affected by other need-based decisions before funding is made available.

Short-Term (5-10years)

For the purpose of the ICRMP, projects are split into operational support and major construction. Table 4 - 12 below provides a break-out of the scheduled projects. These projects contain both training support and civil support construction. Operational support projects are defined by FTHCRM as those projects funded by the base ops budget and are not funded directly as defined projects by Congress and include the projects on the work order list. MCA projects are defined projects with funding and other requirements the result of direct Congressional approval. Funding for these projects is dedicated to the project and cannot be used for other projects. If money released from project, it is returned to the treasury.

Table 4-6. Proposed Projects

Project Category	Number of Projects	Project Descriptions
Operational Support	2080	Numbers of Work Orders Submitted but some work orders cover several buildings or areas. Hence the breakout numbers do not add up.
Training Areas		Projects for improvements in the Training/Range areas.
Cantonment Structures	2170	Projects modifying existing utilities, , etc.
Support		These are projects that affect structures with identifying numbers.
Support		Projects that support functions such as putting up signs.
MCA	36	These are projects where congressional funding is sought.
Training Areas	15	Improve Ranges or training facilities includes MCA Range Upgrades..
Cantonment	5	New Barracks and living facilities.
Support	16	Support structures including Training/Military motorpools, fire stations, family life, etc.

Long-Term (Beyond 10 years)

Projects that are currently scheduled to commence in the next 5 to 10 years and are scheduled to continue past include the following. This list is based on current common knowledge, installation management and strategic plans that our common knowledge. Conditions of the listed projects and new projects can be announced at any time. Changes in conditions and new projects will be evaluated per the SOPs 106 Internal Coordination and 106 External Coordination.

General:

- RCI Housing Lease with FHFH (50 years with 25 year option).
- RGAAF And City for Killeen Joint-Use Lease (75 year lease).

Mission (Training):

- Digital Range development (all ranges converted to support digital technology in the next 10 years or depending on funding).
- Fielding new equipment.
- Transformation

Support Activities

- Infrastructure development.

ISR Program Performance Criteria

The criteria listed below is based on the Army's ISR rating system described in Chapter 2.4. These criteria support Fort Hood's Department of Public Work's METLs for FTHCRM presented below. The implementation period is based on the normal government fiscal year that runs from October 1 to September 30.

Monitoring Criteria for Section 106 Compliance

The Section 106 compliance monitoring protocols are based on program maintenance activities described in the SOPs.

1. Once each year by Nov 1, FTHCRM, with assistance from program staff, shall meet to evaluate compliance with each Dictating Policy/Rule or other applicable agreement.
2. Between Oct 1 of each year and Sept 30 of each following year, on at least five (5) random occasions, cultural resources program personnel shall complete an after-action analysis of individual training events to assess and report on troop unit compliance with environmental training standards and potential adverse effects to protected archaeological resources.
3. Between Oct 1 of each year and Sept 30 of each following year, on at least five (5) random occasions, cultural resources program personnel shall spot check Work Management Center projects to see if any effects to cultural resources were not reported.
4. Once each year by Jan 1, FTHCRM shall prepare and submit a report to the Director of Public Works, Fort Hood. The report shall assess compliance with applicable agreements. The CRM shall rate that compliance as Green, Amber, or Red according to the standards established in the ICRMP, and make recommendations for any necessary corrective action.
5. FTHCRM shall initiate agreed upon corrective actions and monitor by the process protocol in paragraphs 1 through 3 above.

Archaeological Survey

The archeological survey monitoring protocols are based on program maintenance activities described in

the SOPs.

1. As an after-action review, on or before Nov 1 of each year, FTHCRM will review projects conducted during the previous 12 months in the Fort Hood cantonment area. One goal of this review is to categorize projects into sets that would and would not require project specific intensive archeological survey. Another goal is to determine which of the projects that require a project-specific intensive archeological survey actually received such survey.
2. Once each year by Jan 1, FTHCRM shall prepare and submit a report to the Director of Public Works, Fort Hood. The report shall assess trends and patterns in the status of archeological resources inventory. The report shall also rate conditions for the Fort Hood standard "Inventory survey for historic properties is complete and up-to-date at Fort Hood" as red, amber, or green, and make recommendations for any necessary corrective action.
3. FTHCRM shall initiate agreed upon corrective actions and monitor by the process protocol in paragraphs 1 and 2 above.

Compliance with 36 C.F.R. 79

The monitoring protocols for curation of archeological collections are based on program maintenance activities described in the SOPs.

1. On or before Nov 1 of each year, FTHCRM will inspect the artifact and record repository of the curatorial services contractor to verify compliance with 36 CFR 79.

2. Once each year by Jan 1, FTHCRM shall prepare and submit a report to the Director of Public Works, Fort Hood. The report shall assess trends and patterns in the status of archaeological curation facilities. The report shall also rate conditions for the Fort Hood standard "Compliance with Cultural Resources Agreements/Laws/Army Regulations - Curation" as red, amber, or green, and make recommendations for any necessary corrective action.

3. FTHCRM shall initiate agreed upon corrective actions and monitor by the process protocol in paragraphs 1 and 2 above.

ARPA Compliance: Permits

The monitoring protocols for ARPA compliance on permits are based on program maintenance activities described in the SOPs.

All professional archaeological research not for the government is accomplished under a valid permit.

ARPA Compliance: Vandalism

The monitoring protocols for ARPA compliance on vandalism are based on program maintenance activities described in the SOPs.

1. Within each year, between the dates of Oct 1 and Sept 30 of the following year, cultural resources program staff shall visit and individually report on the present conditions of at least 60 archaeological sites and changes to these sites since the last record. The sites visited each year shall include all archaeological sites in protected areas and a sample of other archaeological sites distributed throughout the installation.

2. Once each year by Nov 1, FTHCRM, with assistance of program staff, shall meet to analyze the 60 or more individual site monitoring reports for patterns and trends in changing site condition.

3. Once each year by Jan 1, FTHCRM shall prepare and submit a report to the Director of Public Works, Fort Hood. The report shall assess trends and patterns in changing archaeological site conditions; rate the compliance as green, amber, or red according to the standards established in the ICRMP, and make recommendations for any necessary corrective action.

4. The cultural resources program manager shall initiate agreed upon corrective actions and monitor these actions by the process protocol in paragraphs 1 through 3 above.

Building Condition Assessments

The monitoring protocols for assessing building condition are based on program maintenance activities described in the SOPs.

1. Within each year, between the dates of Oct 1 and Sept 30 of the following year, cultural resources program staff shall visit and individually report on the present conditions of at least 60 historic buildings and changes to these buildings since the last record.

2. Once each year by Nov 1, the FTHCRM, with assistance of program staff, shall meet to analyze the 60 or more individual building monitoring reports for patterns and trends in changing building condition.

3. Once each year by Jan 1, the FTHCRM shall prepare and submit a report to the Chief, Directorate of Public Works, Fort Hood. The report shall assess trends and patterns in changing building conditions; rate the compliance as green, amber, or red according to the standards established in the ICRMP, and make recommendations for any necessary corrective action.

4. The cultural resources program manager shall initiate agreed upon corrective actions and monitor these actions by the process protocol in paragraphs 1 through 3 above.

Traditional Cultural Properties

The monitoring protocols for traditional cultural properties are based on program maintenance activities described in the SOPs.

1. Monitor that installation activities do not impact traditional cultural properties without first conducting a Section 106 review.

2. Once each year by April 1, FTHCRM shall prepare and submit a report to the Chief, Directorate of Public Works, Fort Hood. The report shall assess trends and patterns in the status of traditional cultural properties inventory.

(NAGPRA) Implementation

1. Review complaints of Army non-compliance with NAGPRA.

2. Once each year by Jan 1, FTHCRM shall prepare and submit a report to the Director of Public Works Fort Hood. The report shall assess complaints of Army non-compliance with NAGPRA. This report shall also rate conditions for the Fort Hood standard "Protection of unmarked Native American cemeteries" as red, amber, or green, and make recommendations for any necessary corrective action.

Native American Access

The monitoring protocols for Native American access are based on program maintenance activities described in the SOPs.

The Installation Commander will evaluate complaints of access denial. If the Commander believes the complaints are unfounded, he/she will consult with the Chairperson of the relevant Tribe to resolve the issue. If the Commander concludes the complaint is founded, he/she will consider corrective action and inform the Chairperson of the relevant Tribe of any decision to resolve the complaint. Continued warranted complaints will adversely affect the rating for the Fort Hood standard on Traditional Use Opportunities.

Performance Indicators/Measures = METLs

- Locate and Identify Cultural Resources.
- Evaluate and Assess Cultural Resources against National Register Eligibility Criteria.
- Protect those Cultural Resources that Meet Eligibility Criteria
- Research and Identify best Protection and Management Techniques.

- Outreach and Education.

Chapter 5:

Implementation:

Standard Operating Procedures (SOPs)

Chapter 5: Introduction - SOPs

Introduction

The implementation of cultural resource management requires clear procedures by which their effectiveness can be measured and needed corrections identified. This section presents the procedures to cover the various activities FTHCRM performs to monitor the preservation and conservation of cultural resources as well as integrating with other installation, Army, DOD and Non-DoD entities to meet FTHCRM's mission of balancing cultural resource stewardship with training mission requirements. This chapter is split into two sections. Section I contains procedures directly related to statutes such as NHPA and ARPA. Section II contains procedures directly related to regulation guidance and program management needs. This includes resource monitoring programs, public education, and curation.

Section I: Statutory Compliance Procedures

SOP - Leon River Medicine Wheel Access Procedures

Purpose:

Clarify who can obtain access to the Leon River Medicine Wheel (LRMW), when and provide instruction on how to request access.

Authorities:

Memorandum of Understanding (MOU) between The Army at Fort Hood, the Comanche Tribal Council, and the American Indian Recreation and Education Coalition, Inc (AIREC); American Indian Religious Freedom Act (AIRFA); National Historic Preservation Act (NHPA); Department of the Army Force Protection Regulations; AR 200-4

Application:

All parties interested in accessing the Leon River Medicine Wheel for religious or scientific purposes.

Procedure:

Note: Fort Hood Cultural Resource Management (FTHCRM) is the designated Point of Contact (POC) for undertakings and activities which include the location of the Leon River Medicine Wheel per the above authorities.

Note: As the responsible land owner for the property where the LRMW is located, Fort Hood screens visitors for security reasons and to meet the intent of the MOU to allow Native Americans to visit the LRWMW however as a federal agency, Fort Hood can not restrict which Native Americans who wish to visit except based on proposed purpose.

1. Native American Traditional Ceremony Performance

- Interested Native American (proponent) submits written request to visit LRMW to FTHCRM. Request must include
 - Name of visitor(s),
 - Purpose,
 - Date(s) of ceremony.
- Copy of request will be sent to Comanche Tribal Council per MOU.
- Purpose and number of visitors will be reviewed for compliance with intended MOU access intent and Fort Hood security regulations respectively.
 - If purpose does not meet the MOU access intent and/or security issues are identified, the proponent will be notified and provided an opportunity to respond. If FTHCRM still has ground for denying access, then FTHCRM will be consult with the MOU signatories before responding. If the MOU signatories agree with FTHCRM but the proponent still wishes to pursue access, Dispute Resolution procedures defined below shall be followed.
 - If purpose does meet the MOU access intent and there are no security issues, access will be granted. FTHCRM will proceed making arrangements for proponent to visit making sure the gate is unlocked at the requested time.

2. Scientific Studies

- Visitor requesting access for scientific purposes (proponent) submits request to FTHCRM.

Request should include the follow information:

- Proponent's name
 - Qualifications
 - Affiliation
 - Purpose of visit,
 - Description of the proposed scientific project,
 - Place in larger context,
 - Provide workplan and timeline,
 - Provide SOW that must follow FTHCRM's research, publication and associated SOPs and guidelines in this ICRMP relevant to the scientific project,
 - Outline expected contributions to knowledge about the LRMW, and Native American use of the area.
- FTHCRM will review the project for technical soundness and assess proposed contributions.
 - Interested Native American Tribes, in particular the Comanche will be provided an opportunity to comments as a courtesy. Their comments will be taken into account in FTHCRM's final decision.
 - Proponent will be notified of the results of their submission.
 - If submission successful, commencement dates will be determined and access arranged.
 - If submission denied, then the proponent can modify their proposal in accordance with the reasons for denial and re-submit.
 - If successful, commencement dates will be determined and access arranged.
 - If denied again, proponent has an opportunity to revise and submit at a later date.

Dispute resolution:

Due to the emotional nature of the LRMW and the various laws, there is a potential for access being denied. As outlined above, a proponent requesting access will be provided the reasons why their request was denied and an opportunity to re-submit their request. Nevertheless, there is the potential for the request to continue to be denied. The following procedures will be followed if this occurs:

- The request will be turned over to Fort Hood's Staff Judge Advocates (SJA) office for review.
- A meeting will be held with representatives from all MOU signatories and mediated by SJA.
- The request will be presented at the meeting as will the reasons for previous denials.
- Meeting attendees shall make a formal determination if the request meets the intent of the MOU and document that decision.
- The request proponent shall be provided a copy of the decision.
 - If the decision is positive, the access will be arranged by FTHCRM.
 - If the decision is negative, any attempts by the proponent to gain access to LRMW shall be considered in the least, trespassing on Federal Property and they shall be charged accordingly.

SOP - Comanche National Indian Cemetery

Purpose:

Clarify who can access the Comanche National Indian Cemetery (CNIC), when and provide instruction on how to request access.

Authorities:

Memorandum of Understanding (MOU) between The Army at Fort Hood, the Comanche Tribal Council, and the American Indian Recreation and Education Coalition, Inc (AIREC); American Indian Religious Freedom Act (AIRFA); National Historic Preservation Act (NHPA); Department of the Army Force Protection Regulations; AR 200-4

Application:

All parties interested in visiting to pay respects or to repatriate disinterred remains.

Procedure:

Note: Fort Hood Cultural Resource Management (FTHCRM) is the designated Point of Contact (POC) for undertakings and activities which include the location of the Comanche National Indian Cemetery per the above authorities.

Note: As the responsible land owner for the property where the CNIC is located, Fort Hood screens visitors for security reasons and to meet the intent of the MOU to allow Native Americans to visit and use the CNIC however as a federal agency, Fort Hood can not restrict which Native Americans who wish to visit except based on proposed purpose.

1. Visits to pay respects

- Interested Native American (proponent) submits written request to visit CNIC to FTHCRM. Request must include
 - Name of visitor(s),
 - Purpose,
 - Date(s) of proposed visit.
- Copy of request will be sent to Comanche Tribal Council per MOU.
- Purpose and number of visitors will be reviewed for compliance with intended MOU access intent and Fort Hood security regulations respectively.
 - If purpose does not meet the MOU access intent and/or security issues are identified, the proponent will be notified and provided an opportunity to respond. If FTHCRM still has ground for denying access, then FTHCRM will be consult with the MOU signatories before responding. If the MOU signatories agree with FTHCRM but the proponent still wishes to pursue access, Dispute Resolution procedures defined below shall be followed.
 - If purpose does meet the MOU access intent and there are no security issues, access will be granted. FTHCRM will proceed making arrangements for proponent to visit making sure the gate is unlocked at the requested time.

1. Repatriation Ceremonies

Note: The repatriation proponent takes all responsibility for the the cost of the ceremony, preparing the burial site, and maintenance of the the site per the MOU. Per the authorities stated above, federal funds cannot be spent on such an activity.

- Native American proponent submits a written request to repatriate remains at CNIC. The proposal should include
 - Name of Proponent,
 - Tribal affiliation,
 - Description of remain,
 - Proposed ceremony dates, and
 - Expected number of attendees.
- Copy of request will be sent to Comanche Tribal Council per MOU.
- Purpose and number of visitors will be reviewed for compliance with intended MOU access intent and Fort Hood security regulations respectively.
 - If purpose does not meet the MOU access intent and/or security issues are identified, the proponent will be notified and provided an opportunity to respond. If FTHCRM still has ground for denying access, then FTHCRM will be consult with the MOU signatories before responding. If the MOU signatories agree with FTHCRM but the proponent still wishes to pursue access, Dispute Resolution procedures defined below shall be followed.
 - If purpose does meet the MOU access intent and there are no security issues, access will be granted. FTHCRM will proceed making arrangements for proponent to visit making sure the gate is unlocked at the requested time.

Dispute resolution:

Due to the emotional nature of the CNIC and the various laws, there is a potential for access being denied. As outlined above, a proponent requesting access will be provided the reasons why their request was denied and an opportunity to re-submit their request. Nevertheless, there is the potential for the request to continue to be denied. The following procedures will be followed if this occurs:

- The request will be turned over to Fort Hood's Staff Judge Advocates (SJA) office for review.
- A meeting will be held with representatives from all MOU signatories and mediated by SJA.
- The request will be presented at the meeting as will the reasons for previous denials.
- Meeting attendees shall make a formal determination if the request meets the intent of the MOU and document that decision.
- The request proponent shall be provided a copy of the decision.
 - If the decision is positive, the access will be arranged by FTHCRM.
 - If the decision is negative, any attempts by the proponent to gain access to LRMW shall be considered in the least, trespassing on Federal Property and they shall be charged accordingly.

SOP - ARPA Permitting

Purpose:

Track excavations of archaeological resources on Fort Hood and under its jurisdiction.

Authorities:

Archaeological Resources Protection Act (ARPA), AR 200-4

Application:

All Fort Hood sponsored projects that could include ground disturbance, i.e., Excavations and shovel testing, activities per ARPA and associated regulations.

Procedure:

Proponent requesting a permit for archaeological excavations or related ground disturbing activities submits request to FTHCRM. Request should include the follow information:

- Proponent's name
 - Qualifications
 - Affiliation
 - Purpose of work,
 - Description of the proposed project,
 - Place project in larger context of Fort Hood archaeology,
 - Provide workplan and timeline,
 - Provide SOW that must follow FTHCRM's research, publication and associated SOPs and guidelines in this ICRMP relevant to the scientific project,
 - Outline expected contributions to knowledge about Fort Hood and Central Texas archaeology.
- FTHCRM will review the project for technical soundness and assess proposed contributions.
 - FTHCRM will submit application to CORPS of Engineers, Fort Worth District who issues ARPA permits.
 - Proponent will be notified of the results of their submission.
 - If submission successful, proponent will notify FTHCRM of commencement dates.
 - If submission denied, then the proponent can modify their proposal in accordance with the reasons for denial and re-submit.
 - If successful, proponent will notify FTHCRM of commencement dates.
 - If denied again, proponent has an opportunity to revise and submit at a later date.

SOP - ARPA Apprehension and Prosecutions

Purpose:

To provide procedures for the surveillance, acquisition of evidence and interactions with Law Enforcement officials in the apprehension and prosecution of ARPA violators.

Authorities:

Archaeological Resources Protection Act (ARPA), AR 200-4

Application:

Applies to all persons found or identified as having excavated archaeological materials from any archaeological resources within the jurisdiction of Fort Hood. Whether they have identifiable cultural materials or evidence places them there in accordance with ARPA statues and regulations.

Procedure:

FTHCRM shall monitor all eligible and potentially eligible archaeological resources per SOP - Monitoring and the Monitoring section described in the Management Strategy in Chapter 4. Non-eligible archaeological resources shall be examined as opportunities occur.

- If no evidence of unauthorized ground disturbance is located, the visit to the resource shall be recorded as a normal monitoring action.
- If evidence of unauthorized ground disturbance is located, then the following will occur:
 - A revise site plan locating all disturbance will be recorded,
 - All areas of unauthorised disturbance will be located and described,
 - Pictures will be taken systematically,
 - Any tool, body, and/or footprints will be molded,
 - All left item such as garbage (bottles, cigarette butts, cans, etc) will be collected and catalogued.

All recorded and collected materials will be returned to the FTHCRM office. Photos will be labeled as well as all evidence and secured within the designated locked locker.

- If physical evidence which can identify someone is obtained, the Criminal Investigation Division (CID) of FOrt Hood will be promptly notified. They will be given the opportunity to review the evidence and the resource to determine further investgative actions.
- If no phisycal evidence which can identify someone is obtained, then FTHCRM will log all evidence and information on the unauthorized activity until that time that someone is identified. FTHCRM will continue to pursue improved techniques to identify purpertrators.

SOP - 106 Internal Coordination/Consultation Procedures:

Fort Hood Proponents

Purpose:

Streamline National Historic Preservation Act (NHPA) section 106 coordination and consultation under 36 CFR Part 800 with Fort Hood Directorates, Military units, and all Fort Hood tenants regarding undertakings that have the potential to affect cultural resources as defined in NHPA on Fort Hood property, where Fort Hood is the lead agency or a Fort Hood Tenant organization is the proponent for an action off of Fort Hood property.

Authorities:

National Historic Preservation Act of 1966 and as amended; DoDI 4715; AR 200-2; AR 200-4

Application:

This procedure applies to all undertakings (i.e., projects, training or training support activities) as defined in the NRHP. These undertakings split into four categories that involve potential changes in character defining attributes of known historic properties (i.e., ground disturbance, structural alterations, land use changes, etc) or could result in inadvertent discoveries of human remains. The categories are based on the type of undertaking with the fourth category including other actions that do not fit categories 1 through 3. Types of projects and training activities are listed in Table 1.

1. Civilian Construction

- Includes all civilian supervised projects within and outside of the cantonment to support the installation and related activities. Projects include those overseen and/or advocated by COE; Fort Hood DPW: EPS and ERM, other Fort Hood Directorate sponsors, and tenant organizations.

2. Military Construction

- Includes all military supervised and civilian operations support activities within and outside of the cantonment. Projects include G-3/Range Control/Integrated Training Area Management (ITAM), Engineer Battalion and individual military unit undertakings.

3. Military Training

- Includes all military training that involves ground disturbance such as digging fox holes to tank blinds.

4. Miscellaneous

- Includes but is not limited to habitat mitigations, leases, and projects where control of the area is relinquished.

dures:

Table 5-7. : Examples of projects and training activities classified as undertakings and requiring NHPA review. This list is not exhaustive

Construction (Civilian & Military)	Training Related
Structure Rehabilitation	(Includes actual needs and support)
Structural Additions	Berms
New Structure Construction	Refueling centers
Infrastructure: Includes fencing, roads, parking lots, Utilities, Railways, etc.	Foxholes
New construction	Tank Traps
Rehabilitation	Trenches
Landscape Alterations: Includes areas without structures.	Latrines
Range modifications and layout changes	Bivouacs
Landscape Rehabilitation	Kitchen Sumps
Firebreaks	
Vegetation Clearing	
New land use construction	

Procedure:

Note: Early coordination ensures timely undertaking execution!

Project Managers or Training Coordinators (Proponent) shall incorporate the follow consultation procedure into their planning schedules.

1. During planning of project or training exercise, identify preferred and alternate locations.
2. Contact FTHCRM for consultation appointment.
3. Provide FTHCRM the following information no later then 2 working days prior to the appointment:
 - Detailed description of project or training activity. This can be a list of project drawings or training activities respectively.
 - Minimum 1:50000 map with locations identified.
 - List of UTM coordinates for all locations.
4. During consultation appointment, FTHCRM will discuss identified impacts at requested locations, if any, and work with proponent to develop alternatives to fit their needs if cultural resources are within the undertaking area.
5. Within two (2) working days, FTHCRM will provide proponent a Memorandum For Record (MFR) on final results from consultation appointment.
6. Project Manager/Training Coordinator shall keep a copy of the MFR with project/training information.
7. If case-by-case consultation is required with the Texas State Historic Preservation Office (TxSHPO), such information and a timeline shall be provided in the MFR. A copy of TxSHPO's response will be forwarded to the proponent for inclusion in project records.

8. A copy of the MFR and any accompanying documentation such as a copy of a TxSHPO comment letter shall be submitted with a FTH420X10, Coordination for Excavation Request to expedite processing of FTH420X10 when undertaking commences in accordance with SOP Coordination for Excavation (FTH420X10). If MFR is not included, FTH420X10 shall be treated as a new project and could delay execution of project or training activity.

Note: For a all actions, bringing FTHCRM into the planning process at the point were locations are being chosen will expedite the final execution of the project/training. Improved project/training execution occurs because the required reviews and coordination can be completed well before the proposed execution date. Waiting to coordinate and provide FTHCRM an opportunity to review the project/training until acquisition of the FTH420X10, Coordination for Excavation permit can cause delays in project execution.

Exclusions for Coordination and Consultation:

There are **NO** exclusions.

SOP - 106 External Coordination/Consultation Procedures:**Texas State Historic Preservation Officer and Consulting Parties*****Purpose:***

Streamline National Historic Preservation Act (NHPA) section 106 coordination and consultation under 36 CFR Part 800 with the Texas State Historic Preservation Office (TxSHPO) and other interested parties, regarding undertakings that have the potential to affect cultural resources as defined in NHPA on Fort Hood property, where Fort Hood is the lead agency or a Fort Hood Tenant organization is the proponent for an action off of Fort Hood property.

Authorities:

National Historic Preservation Act of 1966 and as amended, DoDI 4715, AR 200-2, AR 200-4

Application:

This procedure applies to all undertakings (i.e., projects, training or training support activities) as defined in the NRHP. These undertakings split into four categories that involve potential changes in character defining attributes of known historic properties (i.e., ground disturbance, structural alterations, land use changes, etc) or could result in inadvertent discoveries of human remains. The categories are based on the type of undertaking with the fourth category including other actions that do not fit categories 1 through 3. Types of projects and training activities are listed in Table 1.

1. Civilian Construction

- Includes all civilian supervised projects within and outside of the cantonment to support the installation and related activities. Projects include those overseen and/or advocated by COE; Fort Hood DPW: EPS and ERM, other Fort Hood Directorate sponsors, and tenant organizations.

2. Military Construction

- Includes all military supervised and civilian operations support activities within and outside of the cantonment. Projects include G-3/Range Control/Integrated Training Area Management (ITAM), Engineer Battalion and individual military unit undertakings.

3. Military Training

- Includes all military training that involves ground disturbance such as digging fox holes to tank blinds.

4. Miscellaneous

- Includes but is not limited to habitat mitigations, leases, and projects where control of the area is relinquished.

Table 5-8. Project and training activity examples classified as undertakings and requiring NHPA review.

Construction (Civilian & Military)	Training Related
Structure Rehabilitation	(Includes actual needs and support)
Structural Additions	Berms
New Structure Construction	Refueling centers
Infrastructure: Includes fencing, roads, parking lots, Utilities, Railways, etc.	Foxholes
New construction	Tank Traps
Rehabilitation	Trenches
Landscape Alterations: Includes areas without structures.	Latrines
Range modifications and layout changes	Bivouacs
Landscape Rehabilitation	Kitchen Sumps
Firebreaks	
Vegetation Clearing	
New land use construction	

Procedures

1. FTHCRM shall review all undertakings as described in Applications above.

2. FTHCRM shall identify those undertakings determined under 36 CFR Part 800 as "No Historic Properties" or "No Historic Properties Affected" versus those undertakings determined under 36 CFR Part 800 as "Historic Properties Affected". Undertakings will then be processed as follows.
 - a. "No Historic Properties" or "No Historic Properties Affected" qualify for exclusion to case-by-case review and shall be processed as described in section Exclusions for Coordination and Consultation.

 - b. "Historic Properties Affected" shall be processed on a case-by-case approach to allow TxSHPO and as requested, the Advisory Council on Historic Preservation (ACHP) an opportunity to comment on FTHCRM's proposed determination and if necessary, FTHCRM's proposed mitigation.
 - i. TxSHPO shall be sent the following information for consideration and to implement consultation regarding potential adverse effects to cultural resources:
 - A. Undertaking description;
 - B. Map showing undertaking proposed location;
 - C. Description of cultural resources potentially adversely affected by undertaking;
 - D. Justification for inability to relocate, avoid cultural resource, or modify undertaking to maintain character defining attributes.
 - E. Proposed FTHCRM mitigation and justification.
 - F. Request for TxSHPO comment and initiate consultation as needed.

dures:

5. Copies of documentation will be sent to the Advisory Council on Historic Preservation (ACHP) requesting a decision on their participation in consultation regarding the proposed undertaking.

6. Based on TxSHPO's and ACHP's decision to participate in consultation, one of the following conclusive sub-procedures shall be implemented.

6a. TxSHPO accepts the proposed mitigation and the ACHP do not want to participate, an MOA shall be prepared for signature between TxSHPO and the Army, Fort Hood

6b. If TxSHPO accepts the proposed mitigation and the ACHP does want to participate:

i. the ACHP's comments will be considered by FTHCRM and addressed;

ii. TxSHPO will provide comment on ACHP's comments.

iii. An MOA shall be prepared for signature as follows:

A. Between all parties if TxSHPO agrees;

B. Between ACHP and Fort Hood if TxSHPO disagrees.

6c. If TxSHPO do not accept the proposed mitigation and the ACHP has previously not wanted to participate, Fort Hood will request ACHP to participate and mediate with the TxSHPO.

i. the ACHP's comments will be considered by FTHCRM and addressed;

ii. TxSHPO will provide comment on ACHP's comments.

iii. An MOA shall be prepared for signature as follows:

A. Between all parties if TxSHPO agrees;

B. Between ACHP and Fort Hood if TxSHPO disagrees.

7. Copies of the signed MOA shall be distributed to all parties and the proponent.

8. Consultation and Coordination is considered complete.

9. FTHCRM will supervise implementation of MOA stipulations.

10. All correspondence shall be sent certified and registered mail.

11. The Standard 30-calendar day review period starts 7 days from the date of the request for comment letter. As per 36 CFR Part 800, if no response is received within 7 calendars days of day 30 then concurrence by the THC/SHPO is assigned to the undertaking and the undertaking can proceed.

12. During extended consultation where negative comments are under consideration, a 15-calendar day review period shall be implemented for all parties. This review period will start 7 calendar days from the date of the respective correspondence requesting consideration of negative comments.

12a. If a response is not received 7 calendar days from the 15th day, then concurrence is assigned to the non-responding agency and coordination will continue with other parties. When all have concurred or concurrence assigned as a result of non-response, then the undertaking will proceed.

12b. If No comments are received from any party or they are positive, then they will be incorporated and the undertaking will proceed.

Exclusions for Coordination and Consultation:

Though there are on average over a 1000 undertakings implemented each year on Fort Hood, they can be grouped into the types listed in Table 1 above. Proposed components to implement these different types of undertakings can result in FTHCRM determinations of "No Historic Properties" or "No Historic Properties Affected". FTHCRM proposes that undertakings with such determinations be logged and an annual report produced for the THC/SHPO. Any monitoring reports for specific projects will also be included in the report. The criteria for such determinations are as follows:

- a. No Historic Properties
 - No cultural resources are within the area of potential of effect (APE)
- b. No Historic Properties Affected
 - Cultural resources within the APE shall be avoided by the undertaking with a minimum of a 50-meter buffer. Negotiations for a buffer less than this shall result in providing the THC/SHPO an opportunity to comment.

Table 2 lists non-structural projects and Table 3 lists structures projects and if coordination should occur.

Table 5-9. Types of non-structural undertakings expected and if coordination is required.

Archaeological Conditions/ Undertaking	*Non-alluvium *No surface cultural deposits	*Alluvium *Tested- No subsurface cultural deposits	*Alluvium Shallow or impacted *Tested-Results are No subsurface cultural deposits	*Alluvium Shallow or impacted * Not tested	*Alluvium deep and un- impacted * Not tested *Cut banks over 1 meter high *No cultural materials observed	*Alluvium deep and un- impacted * Not tested *Cut banks over 1 meter high *Cultural materials observed	*Alluvium deep and un-impacted * Not tested *No cut banks over 1 meter high
Training	No	No	No	No	No	Yes	Yes
New structures	No	No	No	No	No	Yes	Yes
Utilities	No	No	No	No	No	Yes	Yes
Road upgrading	No	No	No	No	No	Yes	Yes
New roads	No	No	No	No	No	Yes	Yes
Railway upgrading	No	No	No	No	No	Yes	Yes
New railway	No	No	No	No	No	Yes	Yes
Firebreak upgrading	No	No	No	No	No	Yes	Yes
New firebreaks	No	No	No	No	No	Yes	Yes
Fence upgrading	No	No	No	No	No	Yes	Yes
New Fences	No	No	No	No	No	Yes	Yes
Boundary maintenance	No	No	No	No	No	Yes	Yes
New Fences	No	No	No	No	No	Yes	Yes

dures:

Table 5-10. Types of non-structural undertakings expected and if coordination is required

Existing Structures		
Criteria	Activity	Consult?
Structures younger than 50 years that do not meet the exceptional circumstances for considering the building eligible for the NRHP	Interior renovations, upgrades, or demolition	No
Structures older than 50 years that meet the exceptional circumstances for considering the building eligible for the NRHP	Interior renovations, upgrades, or demolition	Yes
World War II temporary building	Interior renovations, upgrades, or demolition	No

SOP - Inadvertant Discoveries

Sometimes, even after an agency has fully complied with Section 106 requirements, historic properties are discovered after work has begun on a project. This often happens in the case of projects that involve excavation or ground-disturbing activities, when previously undiscovered archeological resources may be uncovered during the process of construction or excavation. In other cases, a project has unexpected effects on known historic properties. If an agency discovers properties that have not previously been listed in or formally determined eligible for listing in the National Register, it may assume the properties to be eligible for purposes of Section 106. [Section 800.11(d)(1)]

When FTHCRM has a plan for discoveries:

In cases where newly discovered historic properties are likely, the FTHCRM is encouraged to develop a plan for treating such properties before work begins. Often, agencies will realize as they complete the identification step of Section 106 review [Section 800.4] that discovery of additional properties is likely later on.

For example, an agency planning a surface mine or other project that will involve deep ground disturbance might find that certain portions of its project area contain deep sediments, under which very ancient archeological sites may lie buried. However, it might not be financially or environmentally feasible to remove such sediments before the mining or construction itself gets underway. In such a case, development of a plan to handle discoveries during implementation would be appropriate.

Plans for handling discoveries should be included in the documentation developed during the assessment of effects [Section 800.5] and consultation [Section 800.5(e)] steps of Section 106 review. [Section 800.11(a); see also Section 800.5] In the surface mine example mentioned above, such a plan might provide for stripping the sediment with care and providing time and funds for necessary archeological survey, testing, and data recovery before excavation continues.

When an agency has developed such a plan and then discovers historic properties after completing Section 106 requirements, the FTHCRM simply follows the plan that was approved during the consultation and Council comment steps of Section 106 review. When it has done so, the FTHCRM has met its Section 106 requirements regarding the newly discovered properties. [Section 800.11(b)(1)]

When FTHCRM has no plan for new discoveries:

If an agency has not prepared a plan in anticipation of newly discovered historic properties, the procedure is a bit more complex. In this case, the FTHCRM must afford the Council an opportunity to comment on effects to these newly discovered historic properties in one of the following ways:

The FTHCRM can comply with Section 800.6, which means either consulting to develop an MOA and submitting that MOA for Council review, or requesting Council comments without an MOA. [Section 800.11(b)(i)] If the FTHCRM chooses this option, the Council will provide its comments in a time period consistent with the FTHCRM's schedule, even if this is shorter than the 30 days normally allotted for Council review. [Section 800.11(c)(1)], or the FTHCRM can develop and implement actions to handle the newly discovered properties, taking into account the undertaking's effects on them and comments received from the SHPO and the Council. [Section 800.11(b)(2)(ii)] When an agency chooses this option, it should notify the SHPO and Council at the earliest possible time. The Council will provide interim comments about the plan to the agency within 48 hours of the request, and final comments within 30 days of the request. [Section 800.11(c)(2)], or The FTHCRM can comply with the requirements of the Archeological and Historic Preservation Act (AHPA) instead of Section 106 requirements, if the newly discovered historic property is principally of archeological value and subject to the requirements of AHPA [16 U.S.C. § 469 (a)-(c)]. [Section 800.11(b)(2)(ii)]

When the FTHCRM chooses this option, the FTHCRM provides the SHPO an opportunity to comment on the work undertaken and provides the Council with a report on the work after it has been completed. [Section 800.11(c)(3)]

When a discovery occurs on lands under the jurisdiction of an Indian tribe, the agency consults with the Indian tribe in completing Section 106 requirements. [Section 800.11(d)(2)] If historic properties are discovered after work has begun, Council regulations do not require agencies to stop work on the undertaking. However, depending on the nature of the property and the undertaking's apparent effects on it, agencies should try to avoid or minimize harm to any historic properties until the Section 106 requirements have been met. [Section 800.11(b)(3)] For example, work might be delayed in the immediate vicinity of the discovery while continuing elsewhere.

SOP - Emergency Undertakings

(Source: 36 CFR Part 800 guidelines.)

6 CFR Part 800 makes special provisions for agency actions that are undertaken in response to an emergency situation. [Section 800.12(a)] "Emergency" in this context refers to an officially declared disaster or state of emergency; undertakings that will not be implemented within 30 days of the emergency must go through the Section 106 process outlined in Sections 800.4 through 800.6, rather than following the emergency process. [Section 800.12(d)]

In an emergency, an agency may choose one of two courses of action:

When applicable, a Federal agency may elect to waive the requirements of the Council's regulations and comply instead with 36 CFR Part 78, "Waiver of Federal Agency Responsibilities under the National Historic Preservation Act." [Section 800.12(a)] These regulations, published by the Department of the Interior, spell out procedures by which NHPA requirements may be waived. 36 CFR Part 78 may be invoked only in a limited range of circumstances involving "major natural disaster or imminent threat to the national security"; these terms are defined in 36 CFR Part 78, or

When the FTHCRM proposes an emergency action as an essential and immediate response to a disaster declared by the President or a Governor, the FTHCRM may notify the Council and SHPO of its proposed actions and afford them an opportunity to comment within seven days, if circumstances permit. [Section 800.12(b)] This course of action can also be employed, for purposes of actions assisted under Title I of the Housing and Community Development Act of 1974 as amended [42 U.S.C. § § 5301-5320], in case of an imminent threat to the public health or safety as a result of a natural disaster or emergency declared by a local government's chief executive officer or legislative body. In the latter circumstance, however, if either the SHPO or the Council objects to the undertaking, the undertaking must undergo Section 106 reviews according to Sections 800.4 through 800.6. [Section 800.12(c)]

Section II: Management Procedures

SOP - Collecting Guidelines

Objectives

- To guide the collection of archaeological materials from investigations on Fort Hood lands such that collections are a representative sample of the historic properties and archaeological resources identified during a given project.
- To limit collections to the administrative and scientific minimum needed to comply with the Congressional mandate to preserve the past for the benefit of future generations

II. References

- National Historic Preservation Act, as amended (16 U.S.C. 470 et seq.)
- Archaeological Resources Protection Act, as amended (16 U.S.C. 470aa et seq.)
- Native American Graves Protection and Repatriation Act (25 U.S.C. 3001 et seq.)
- 36 CFR Part 79, Curation of Federally Owned and Administered Archeological Collections

III. Guiding Principles

A. Archaeological projects on Fort Hood may result in a collection that must be curated according to 36 CFR Part 79. There is always at least an administrative record for every archaeological project especially when no archaeological materials are collected. The administrative record must be properly curated because this record documents the decision making process. Documentation for historic properties that are eligible and are not eligible for nomination to the National Register must also be properly curated.

B. Attempts to restrict the amount of archaeological materials generated by an investigation must be based on practical, scientific, and replicable principles. A strict “no collection” policy is not applicable to Fort Hood for four reasons.

1. Field identifications can rarely be verified by subsequent investigations and only at additional costs to relocate specific archaeological materials.

2.. Certain kinds of analyses require physical samples (e.g., radiocarbon assays, elemental analyses, residue analyses, pollen identification and quantification, thermoluminescence, obsidian hydration studies, faunal or floral analyses). If suitable specimens have been collected and curated, they are available for immediate and future investigations, and can eliminate the need and cost to conduct additional fieldwork to secure new samples.

3.. Strict “no collection” policies are difficult to police and result in statistically biased and skewed samples of archaeological resources. Research has demonstrated that most existing federal agency “no collecting” policies all have exceptions such as cases in which artifacts are endangered by environmental factors such as erosion or inherent fragility or by unauthorized collecting.

4. “No collection policies” assume that the only way to conserve the archaeological record is to leave it in situ. However, a “no collection policy” that lacks intensive and aggressive management practices that constantly monitor all impacts to all extant archaeological resources, is insufficient by itself to conserve the archaeological record. These management practices are more costly than curation costs.

C. Statistical (or probabilistic) sampling of archaeological materials can be used to address the objectives of each investigation. Statistical sampling of archaeological materials can reduce the curation load while acquiring sufficient data to address cultural resources management issues. It can minimize negative impacts to the archaeological record by reducing the quantity of testing or intensive excavation needed to address compliance or research questions. Sampling can assess both natural and

human impacts with a known level of statistical confidence, to justify and verify National Register eligibility statements with actual material remains, and to provide statistically unbiased information about the archaeological record. The project research design outlines the scope and objectives of the probabilistic sampling strategy that will provide data to address the research objectives of an investigation. Samples can be designed to address the objectives of each stage of field investigation inquiry, be it survey, subsurface testing, or mitigation.

D. The sampling strategy will be determined by the objectives of the investigation as well as the data generated by the background research conducted for each investigation.

E. Deviations from the collecting standards presented here must be justified by the research objectives of the investigation and detailed in the project research design.

F. Provisions for curation of collections generated by an investigation must be made prior to initiation of fieldwork and must comply with 36 CFR Part 79.

Artifact Collecting

During monitoring, collection of surface artifacts will occur only under the following conditions:

- Collect temporally diagnostic artifacts including complete artifacts or those with sufficient integrity to allow typological and temporal assignment.
- Collect endangered archaeological resources for management purposes to protect that resource. If an archaeological resource is in imminent danger from being lost due to erosion or illegal collecting or from damage from military training, the archaeological resource should be collected.
- Noncollection of significant artifacts:
- Record all noncollected, significant artifacts using drawings, measurements, and black-and-white photographs. Significant noncollected surface artifacts include large and/or heavy artifacts that are impractical or impossible to collect during the initial survey.
- Record a provenience of all collected and noncollected significant specimens using appropriate methods and technologies. Regardless of the provenience accuracy, note the provenience of the collected materials on the site map.

SOP - Coordination For Excavation, FTH420X10

Also known as the "Fort Hood Dig Permit"

Purpose

Supports Training Mission by Identifying Cultural, Natural and non-natural resources, i.e., Utilities, to Avoid Damage or Destruction which Triggers Penalties that Impact Training.

Background:

In order to preserve below and above ground Natural and Cultural resources and avoid potentially contaminated areas during mission requirement excavation activities, Fort Hood Environmental Division has implemented an excavation location review process employing FTH Form 420-X10. Using this form and a map overlay at 1:50,000 scale, ground disturbance, excavations, earth moving, and spill response activities associated with military training and military or civilian construction must be coordinated with DPW ENV Division. Contact DPW CRM Team, 287-1092 or 288-0846, Building 4249, for information.

Authorities:

FH350-40, FH420-2, FH420-27, AR200-3, AR200-4, 36 CFR Part 800, NHPA, ARPA, DODI 4715.3

Application

Military Training:

- Grounding rods in developed areas
- Individual and crew served fighting positions
- Vehicle battle positions and defilades
- Trenches, Bunkers, Berms, Tank traps
- Small, hand dug excavations, foxholes, and fighting positions
- Blasting and Demolitions

Construction: Civilian and Training Support:

- New trails, roads, or crossing sites
- Fire breaks or erosion control structures
- Buildings, Training Support Structures (AA buildings)
- Range modifications
- Blasting and Demolitions

Other activities that require coordination include but are not limited to

- Cutting or clearing trees and underbrush, whether alive or dead.
- Planting trees and shrubs
- Antenna or tent stakes
- Spill Response activities

Acquisition Procedure:

Submission lead-time: Minimum of 3 weeks before proposed excavation commencement date.

Note 1: Early Coordination allows for changes if needed. Construction coordination can be sped up if copies of planning coordination included.

Note 2: During any stage of both the Military and Construction coordination procedures a specific requested excavation location is not "cleared" for the activity, the procedure **MUST** start over with a selected alternative location. Previous "clearance" by a branch or team doesn't automatically "clear" alternative locations for the same activity.

Note 3: A copy of FTH420X10 follows at the end of this SOP.

Military Training (See Diagram on form FTH 420X10)

Person capable of explaining training location requirements visits the following locations (Suggest Unit ENV Coordinator and Training Planner)

- Range Control Plans and Safety office to obtain copy of form FTH 420X10
- Provide requested locations on transparency based on 1:50,000 training map.
- Verify with G3/Range Control Plans and Safety availability of proposed locations.
- Natural Resources Branch (Building 1939)
- Cultural Resources Team (Building 4249)
- Environmental Branch (Building 4219)
- EPS/Utilities/Signal Battalion representatives (Building 4612)
- Visit G3/Range Control to schedule requested area and submit copy of completed form to Plans and Safety.

Construction: Civilian and Training Support (See Diagram on form FTH 420X10)

Person capable or material clearly stating the purpose of the proposed construction activity at the proposed locations is required to process request through the following locations (Construction Project Manager/Forman)

- EPS to obtain copy of form FTH 420X10 (Building 4612)
 - Provide requested locations on transparency based on 1:50,000 training map and/or clear construction plans.
 - Verify with G3/Range Control Plans and Safety availability of proposed locations.
 - Natural Resources Branch (Building 1939)
 - Cultural Resources Team (building 4249)
 - Environmental Branch (Building 4219)
 - EPS/Utilities/Signal Battalion representative (Building 4612)
 - Obtain final environmental "clearance" signature from Environmental division Chief or designee.
 - Copies of form FTH 420X10 must accompany personnel at training or working at the "cleared" locations.
-

Field Procedures

Military Training

- Environmental coordinator and/or field commander must have a copy of form FTH 420X10 available for inspection.
- If cultural material is discovered during excavation, a 50-meter shall be created around the location. Excavation within the area is stopped.

Fort Hood's Cultural Resource Management shall be notified immediately at 254.287.1092/2633 or 288.0427. After normal working hours, leave a message and a return phone number. Have the following information available to report,

- Specific central point Location in UTM Grid,
- Description of material,
- Time of discovery,
- Method of discovery.
- A representative of FTHCRM will respond A.S.A.P. but no later then 24 hours during weekdays and within 42 during weekends and holidays.
- Excavations may continue at other pre-approved locations as per current form FTH 420X10 coordination results.
- Construction: Civilian and Training Support

Field Project manager and/or site foreman must have a copy of FH Form 420X10 available for inspection.

- If cultural material is discovered during excavation, a 50-meter shall be created around the location. Excavation within the area is stopped.

Fort Hood's Cultural Resource Management shall be notified immediately at 254.287.1092/2633 or 288.0427. After normal working hours, leave a message and a return phone number. Have the following information available to report,

- Specific central point Location in UTM Grid,
- Description of material,
- Time of discovery,
- Method of discovery, i.e., hand digging, backhoe trench, etc.
- A representative of FTHCRM will respond A.S.A.P. but no later then 24 hours during weekdays and within 42 during weekends and holidays.
- Excavations may continue at other pre-approved locations as per current form FTH 420X10 coordination.

Application of Penalties:

Penalties will be applied if avoidance of cultural resources is not implemented during military training or construction activities. An investigation determining the amount of damage and ascertaining the cause shall be completed by the appropriate authorities (PMO, G3/Range, FTHCRM) before penalties assessed and implemented.

Environmental damage/destruction will result in the following punitive measures:

- Military Units (level of damage and prior offences determine penalty applied) -

Military damage considered internal action. There is an increased potential to control number of offences therefore a tiered system of punitive measures is applied.

- Rehabilitation of damage, or
- Rehabilitation of damage plus \$1000.00, or
- Archaeological Resource Protection Act (ARPA) violation.

Construction

- Damage due to construction activities is considered an external action. Direct control of contractor to reduce offences is not possible therefore ARPA is implemented immediately.

ARPA violation

Penalties

ARPA Criminal penalties:

- Misdemeanor (\$500 or less) - \$100,000 fine and/or 1 year imprisonment
- Felony (\$500 or more) - \$250,000 fine and/or 2 years imprisonment
- Second Offense (prior misdemeanor or felony conviction; no value/damage limit) - \$250,000 fine and/or 5 years imprisonment, Forfeiture of supplies, equipment, and vehicles

ARPA Civil Penalties

Payment to the government the archeological or commercial value of the items plus cost of restoration and repair of the site

- Damages are doubled for second and subsequent violations
- Forfeiture of supplies, equipment, and vehicles
- Endangered Species Act
- Fined of \$50,000.00 and imprisonment up to one (1) year.

Actions, which violate the ESA, cannot be construed as official business. The regulator has the authority to stop the activity (AR 200-3).

Figure 5-3. Coordination for Land Excavation Form

**Coordination For Excavation, FTH420X10:
Standard Operating Procedure**

COORDINATION FOR LAND EXCAVATION <small>(All Corps & FR Reg 420-2)</small>				CONTROL NUMBER
NAME, RANK, TITLE, AND ORGANIZATION OF REQUESTER				TELEPHONE
				PROPOSED DATES OF EXCAVATION
PURPOSE OF EXCAVATION (PROJECT NO./CONTRACT NO./TITLE, ETC.)				
<p>Completed and approved form required for all ground disturbing activities including but not limited to hand dug footcans, transmitter excavations, utility excavations, structure construction, etc.</p> <p>A person knowledgeable about the project shall take to forms to the respective offices for coordination.</p> <p>I propose to dig at the locations depicted in the attached map, sketch, or overlay. For military operations and construction in undeveloped areas, plot digging locations on transparent overlays that include two grid register marks using standard 1:50,000 topographic maps. For construction activities, provide a clear map identifying the building, cross-roads, and other location identifying information.</p> <p>I understand that the proposed digging or excavation is a requirement within the scope of work to be accomplished. I will not dig or excavate before receiving written approval from the Directorate of Public Works (DPW). I understand my responsibilities and obligations pursuant to safety, property damage, personal injury, and life-threatening hazards associated with digging in the vicinity of underground utilities (including utilities such as electrical cables and pipes containing natural gas, water, sewer, liquefied fuels, and refrigerants). Severe injuries, death, and extensive property damage may occur as a result of digging through underground utilities. If the exact locations of underground utilities are unknown, I will perform whatever work is necessary to determine exact locations and avoid damaging utilities.</p> <p>Unless otherwise permitted, I will not excavate within 50 meters of streams, natural drains, roads, and tank trails. I will not deposit excavated soil within 30 meters of trees.</p> <p>If archaeological resources (arrowheads, charcoal, bones, etc.) are discovered during excavation, I or my representative will notify DPW, 267-1092, and suspend disturbance of the finding until DPW issues guidance.</p> <p>Upon termination of use, I will restore the excavation site including backfilling, reshaping, and seeding to conform with surrounding topography. Topsoil shall be stock piled separately for use as final backfill overlay.</p> <p>I am responsible for damages caused to persons or property as a result of my fault or negligence under all applicable laws and regulations.</p>				
SIGNATURE OF REQUESTER				DATE
REVIEWED OR INSPECTED BY				
ARCHAEOLOGIST	CENTEL	ELECTRIC	GIAS	GS, RANGE DIVISION
ENDANGERED SPECIES	LAND MANAGEMENT	1114TH SIGNAL BATTALION	TV CABLE	WATER & SEWER
<input type="checkbox"/> Approved under the following conditions <input type="checkbox"/> Disapproval for the following reasons				
APPROVED BY				DATE

FORM
FTH OCT 01 420-X10 (DPW) REPLACES ALL PREVIOUS EDITIONS

Figure 5-4. Coordination for Land Excavation Form

**Coordination For Excavation, FTH420X10:
Standard Operating Procedure**

COORDINATION FOR LAND EXCAVATION <small>(All Corps & FH Reg 420-2)</small>				CONTROL NUMBER
NAME, RANK, TITLE, AND ORGANIZATION OF REQUESTER			TELEPHONE	
			PROJECTED DATES OF EXCAVATION	
PURPOSE OF EXCAVATION (PROJECT NO./CONTRACT NO./TITLE, ETC.)				
<p>Completed and approved form required for all ground disturbing activities including but not limited to hand dug footcaves, structure excavations, utility excavations, structure construction, etc.</p> <p>A person knowledgeable about the project shall take to form to the respective offices for coordination.</p> <p>I propose to dig at the locations depicted in the attached map, sketch, or overlay. For military operations and construction in undeveloped areas, plot digging locations on management overlays that include two grid register marks using standard 1:50,000 topographic maps. For construction activities, provide a clear map identifying the building, cross-roads, and other location identifying information.</p> <p>I understand that the proposed digging or excavation is a requirement within the scope of work to be accomplished. I will not dig or excavate before receiving written approval from the Directorate of Public Works (DPW). I understand my responsibilities and obligations pursuant to safety, property damage, personal injury, and life-threatening hazards associated with digging in the vicinity of underground utilities (including utilities such as electrical cables and pipes containing natural gas, water, sewage, liquefied fuels, and refrigerants). Severe injuries, death, and extensive property damage may occur as a result of digging through underground utilities. If the exact locations of underground utilities are unknown, I will perform whatever work is necessary to determine exact locations and avoid damaging utilities.</p> <p>Unless otherwise permitted, I will not excavate within 50 meters of streams, natural drains, roads, and tank trails. I will not deposit excavated soil within 50 meters of trees.</p> <p>If archaeological resources (arrowheads, charcoal, bones, etc.) are discovered during excavation, I or my representative will notify DPW, 267-1002, and suspend disturbance of the finding until DPW issues guidance.</p> <p>Upon termination of use, I will restore the excavation site including backfilling, reshaping, and seeding to conform with surrounding topography. Topsoil shall be stock piled separately for use as final backfill cover by.</p> <p>I am responsible for damages caused to persons or property as a result of my fault or negligence under all applicable laws and regulations.</p>				
SIGNATURE OF REQUESTER				DATE
REVIEWED OR INSPECTED BY				
ARCHAEOLOGIST	CENTEL	ELECTRIC	LIAS	OS, RANCH DIVISION
ENDANGERED SPECIES	LAND MANAGEMENT	1114TH SIGNAL BATTALION	TV CABLE	WATER & SEWER
<input type="checkbox"/> Approved under the following conditions: <input type="checkbox"/> Disapproved for the following reasons:				
APPROVED BY				DATE

FORM
FTH OCT 01 420-X10 (DPW) REPLACES ALL PREVIOUS EDITIONS.

SOP - Research Procedures

The following guidelines are based on how archaeologists typically prepare for and then conduct fieldwork. Although the guidelines are presented serially, it is possible that some tasks may be omitted or combined if warranted. For example, after background research is completed, it is possible no additional fieldwork may be required, or subsurface testing may be a component of field survey.

Background Research.

Conduct background research to identify potential archaeological resources, to assist in generating research questions used in the research design, and to predict the costs of fieldwork, analysis, and curation.

- Identify previous land use. Consult local land records, installation real estate and public works records, histories, previous occupants, current or retired installation personnel, county histories, county and state archives, aerial photographs, and, hazardous and toxic waste surveys. Land-use research should also include discussions with local community members or interest groups, including Native American tribes. Past land use includes both physical changes to a property such as those from farming and construction, and uses that leave no physical remains, such as collection of plants or animals, or performance of rituals or non-religious ceremonies by historical communities.

Previous land use research can identify areas or locales within a project that may be eliminated from further examination and thus, excluded from fieldwork, or labeled sensitive due to the nature of the previous use. Certain areas may have been disturbed to the extent that archaeological materials no longer exist, or hazardous conditions may be documented that would prevent field survey or use of specific locations. These areas should be eliminated from fieldwork following consultation and agreement by the appropriate SHPO.

- Identify geomorphological processes that have affected a project area. Examine soil surveys, geological surveys, and geomorphological studies. Before fieldwork begins, a geologist or a geomorphologist should determine which areas may be disturbed by previous geological processes, which areas may be buried by recent deposits, and which areas may be stable.
- Coordinate research with the natural resources staff. Installation cultural resources staff should also work closely with the natural resources staff to avoid sensitive areas that include wetlands and/ or endangered and threatened species that could be affected by archaeological compliance activities.
- Review previous archaeological investigations within a project area and those that have occurred regionally. Fort Hood maintains a list of previous investigations of a property, noting the author, title, date published, and current location of the report. Additionally, SHPO records, state archaeological site files, state-wide archaeological overviews, and local informants should be consulted.
- Examine existing archaeological collections from the project area. Each installation should maintain a list of repositories curating archaeological collections from the installation. The list should include archaeological site numbers and the types and volumes of materials curated for each site or locale. These data shall be evaluated for their ability to address current research questions. Note gaps in the archaeological record and predict likely volumes and kinds of materials to be encountered in future field survey.

Research Plan

- Identify research questions pertinent to the project area and that data needed to address these questions. These questions should address issues identified by statewide summaries that have been coordinated by the appropriate SHPO or through overviews generated by previous archaeological projects.
- Formulate a research design and sampling strategy for the collection of archaeological materi-

als.

1. Predictive modeling can be used as a planning, but not a compliance tool to estimate the type, distribution, and surface density of anticipated archaeological resources across an installation's landscape or within specific site types. However, any predictions must be verified by fieldwork on the property in question. A predictive model can estimate the number and types of sites to be encountered, and the number and types of archaeological materials that may be present on the surface or per cubic meter or foot of sediment.

2. Use statistical sampling when making field collections so that characterizations of the number and kind of materials represented at a site are statistically describable and can be compared to statistical samples collected in other sites or investigations.

- Probability sampling permits estimation of error in the recovery of archaeological materials regardless of the sample size.
- Select a sampling strategy that is appropriate to the research design and the kinds of archaeological resources that may be present.
- If the background research stipulated here has been conducted previously for a given parcel of land, summarize the results of that research and use them to design the research for the current investigation.
- Retain copies of all data generated during the background research. These become part of the investigation's collection.
- Secure curation services based on the estimated volume and kind of archaeological materials that will be collected.

Fieldwork to Locate Cultural Resources

Archaeological Resources and Historic Properties. Use the sampling strategy designed during the background research and referenced in the Research Design to guide field collection of archaeological materials. The fieldwork to locate previously unknown historic properties or archaeological resources may vary from being exclusively a surface only survey or may also include subsurface examination, when appropriate. Coordination with tribes should be an integral part of the preparations for locating archaeological resources and historic properties. Continued coordination should occur throughout a project.

- Identify all National Register eligible properties. All National Register eligible properties should be identified unless the installation has reached a consensus with the State Historic Preservation Officer(s).
 - Collect surface artifacts only under the following conditions.
 - An artifact type is identified in the research design as necessary for analysis. This may be a particular material class (e.g., obsidian for sourcing analyses) or a particular type of artifact (e.g., fluted projectile points). The research design must identify the material kind and percent sample to be collected consistently from all locations with archaeological materials.
 - Collect temporally diagnostic artifacts including complete artifacts or those with sufficient integrity to allow typological and temporal assignment only when called for in the research design.
 - Collect endangered archaeological resources for management purposes to protect that resource. If an archaeological resource is in imminent danger from being lost due to erosion or illegal collecting or from damage from military training, the archaeological resource should be collected.
 - Record all noncollected, significant artifacts using drawings, measurements, and black-and-white photographs. Significant noncollected surface artifacts include large and/or heavy artifacts that are impractical or impossible to collect during the initial survey.
 - Record a provenience of all collected and noncollected significant specimens using appropriate
-

methods and technologies. The level of provenience accuracy and thus, the kinds of methods and technologies to use are determined by the research design. Note the provenience of the collected materials on the site map.

- Document all field methods and observations. Retain original and security copy of field journals, photographic logs, photographs, feature and artifact drawings, field maps, soil profiles, etc.
- If human remains and associated objects are inadvertently located, stop all work within 30 meters of the remains. Immediately report the existence of the remains to the installation law enforcement personnel and the individual responsible for managing cultural resources. Secure the area until the law enforcement personnel and cultural resources manager arrive. This should occur no later than 24 hours after the inadvertent discovery. The local coroner may need to be contacted. If the remains are not part of a crime scene, but are part of an archaeological site, consult with a qualified professional physical anthropologist and archaeologist to determine if the exposed remains are Native American or not. Do not move or remove any material from the site. If the remains are Native American, then the procedures required under the Native American Graves Protection and Repatriation Act shall be followed. If the remains are not Native American, procedures, such as those in a state's unmarked burial law, should be followed.

Subsurface Testing

Use shovel and auger tests, or hand excavated units to determine the nature of the deposit. In some circumstances such as when deep layers of sterile need to be removed, mechanical equipment, such as power augers and backhoes, may be appropriately used. The following guidelines assume that units are being hand excavated.

- Screen soil from all test units, regardless of unit size, through no larger than 1/4-inch mesh hardware cloth. Smaller mesh sizes and screening of non-hand excavated material may also be appropriate depending on the research design.
- Document all field methods and observations. Retain original and security copy of field journals, photographic logs, photographs, drawings, field maps, computer disks and files, and all other documentation.
- Sample redundant sets of artifacts or materials when called for in the research design. Retain a predetermined percentage of redundant materials or only those portions that will provide further identification. The sample selected should be appropriate to address the research at hand and be justified in the research design (see Table 6, pp 5-68).
- Document all methods and materials used in collecting, processing, and analyzing specimens and material samples.
- The testing results can then be used as supporting documentation to determine if a site is eligible for nomination to the National Register.
- For an inadvertently discovered human remains, see above.

Excavation

When excavating National Register eligible sites, 100% excavation of small sites may occur or a representative sample may be made for larger sites. In either case, the following field procedures should be used.

- Screen soil from all units, regardless of unit size, through no larger than 1/4 inch mesh hardware cloth. Smaller mesh sizes and screening of machine-excavated deposits may also be appropriate depending on the research design.
- Document all field methods and observations, retaining originals and one archival copy of field journals, photographic logs, photographs, drawings, field maps, computer disks and files, and all other documentation.
- Sample redundant sets of archaeological materials when called for in the research design.

Retain a predetermined percent sample of these redundant materials or only those portions that will provide further identification. Table 1-7 of these guidelines provides recommendations for minimum samples to be retained. These minimums should be adjusted according to the research design. In some cases no collections will be made; in others, complete collecting may be required.

- Leave a predetermined percentage of material samples unprocessed for use in future studies, e.g., soil, radiocarbon, pollen, phytolith, microwear, residues on tools.
- For an inadvertently discovered human remains, see above.

Disposal of Excess or Redundant Materials.

Currently there is no legal means for disposing of archaeological materials that are determined to be excess or redundant, once they have been collected from Fort Hood lands. Lacking such a rule, numerous strategies are currently used in different states across the nation to address this problem. For example, some California contractors place a capped PVC pipe in the datum corner of each unit, prior to backfilling the unit. After debitage has been analyzed, a sample is selected for curation, the remainder is placed in the pipe in its unit of origin, the pipe is capped again, and covered with dirt. While this procedure meets the letter of the current law and is designed to make the analyzed sample available to future researchers, it requires additional expense and is of unknown efficacy. Other areas have developed different strategies, including disposal in the local landfill. Presently, disposal strategies must be made explicit in the report documenting the fieldwork. Reports should also include the criteria used to select the retained versus disposed samples (e.g., Were all flakes greater than two grams retained or only complete bricks with makers mark?). Once the materials have been accessioned into a federal collection, the only current legal means of disposing archaeological materials is through consumptive analysis or repatriation of items specified in the Native American Graves Protection and Repatriation Act. In such cases, complete documentation of the chain of custody should be maintained by the repository and ultimately by the federal agency accountable for the collection.

Table 5-11. Guidelines for Collecting Redundant Archaeological Materials While in the Field.

Material Class	Collecting Guidance
<i>Prehistoric Artifacts</i>	
Bone, Antler, Ivory	Count, measure, and weigh all artifacts; retain all formed tools, ornaments, or diagnostic fragments.
Botanicals	Retain all artifacts. Weigh and measure all formed tools.
Ceramics	Count and weigh all specimens; retain all diagnostic specimens and a predetermined sample of redundant materials as specified in the research design.
Chipped Stone	Count and weigh all specimens; retain all formed tools and a predetermined sample of chipped stone artifacts (also debitage) for analysis.
Groundstone	Count and weigh all specimens; retain all complete specimens and those with reconstructable dimensions, residues, or other significant features; retain a representative sample of each rock material type.
Shell	Retain all modified shell, sort by species, and weigh all identified and unidentified shell, then discard all unmodified shell.

<i>Historic Artifacts</i>	
Ceramics	Count and weigh all; retain all diagnostic pieces (e.g. with markers marks, reconstructable forms, decorative patterns), and a predetermined sample of materials for analysis.
Mass Produced Products	Retain significant specimens as identified by research design (e.g., diagnostic parts of tin cans, leather, glassware, metal). Discard all non-diagnostic fragments.
<i>Building Materials</i>	
Brick	Weigh all; note reconstructable dimensions; retain all with maker's marks and a representative sample of those without maker's marks.
Coal	Weigh all; retain predetermined sample.
Daub	Weigh all; retain any with impressions
Glass	Measure thickness of all window glass; retain representative sample of types.
Lumber	Identify and record sizes present; retain unique or diagnostic specimens.
Metal	Retain any with diagnostic features; do not collect non-diagnostic fragments.
Mortar	Retain any specimens with diagnostic features.
Nails	Identify type and number of each type; retain a representative sample; discard remainder.
Shingle/Roofing	Weigh all; retain representative sample of material types.
<i>Prehistoric Materials Samples</i>	
Fire Affected Rock	Weigh all; retain representative sample of rock material types.
Daub	Weigh all; retain any with impressions significant to interpretation.
Charcoal	Retain all samples having provenience data; discard any lacking provenience or compromised by contaminants.
Shell	Weigh all; retain predetermined sample for analysis.
Wood	Retain a representative sample of wood types.
Faunal	After analysis, retain representative sample of all identified fauna present, any modified bone, and a predetermined sample (e.g., selected column sample) of unanalyzed faunal remains.
Botanical	Retain all diagnostic specimens.

Soil	Retain all floated samples and a representative sample of unprocessed soil.
<i>Historic Materials Samples</i>	
Faunal	Weigh all; retain a predetermined sample for analysis and an example (e.g., selected column sample) of unanalyzed faunal remains.
Botanical	Retain all diagnostic specimens.
Shell	Weigh all; retain predetermined sample.
Charcoal	Note presence, do not collect any samples.
Soil	Retain all floated samples and a representative sample of unprocessed soil.

SOP - Curation

As each archaeological investigation is completed, the collection generated by that investigation must be prepared for long-term curation. All investigations will produce associated documentation, some may also produce archaeological materials (artifacts and material samples). All must be prepared for long-term curation. Whether a collection is being processed for the first time or is being rehabilitated, (processed again to bring it up to current standards by reboxing, rebagging, or relabeling the collection), the concerns are the same.

The procedures begin with pre-field planning and continue through each processing step to the final placement of objects and associated records into short-term or long-term storage. These basic procedures are drawn from protocols developed by the MCX-CMAC for the U.S. Army Environmental Center (Mandatory Center of Expertise for the Curation and Management of Archaeological Collections 1998). Modifications and adjustments are made to address the conditions and needs of Ft. Hoods repository.

Procedures

Prefield Planning

Before any archaeological materials or data are collected, pre-field planning should estimate (1) the kinds of archaeological materials that may be present, (2) any conservation treatments that may be needed in the field, (3) the volume and kinds of archival materials that will be required to transport the collection from the field to the laboratory, and (4) how data can best be collected so that they too will be preserved.

Preservation of archaeological materials begins prior to collection. Knowing what kinds of archaeological materials may be present at an archaeological site or region will assist archaeologists in planning the kinds of excavation techniques, conservation treatments, or special supports that may be necessary to transport objects from the field to the laboratory without incurring damage (Longford 1990; Sease 1987; Smith 1983). Use archival quality materials to collect and transport artifacts. Although they are more expensive, they do not add to the deterioration of objects during the interval between the time they are collected and processed, which can range from days to many years. Anticipate the kinds of documents that will be needed in the field to record data and use archival materials to produce them (e.g., field excavation forms, field notes, photographic logs, transit data, maps, level records, videotape). Use archival quality materials in the field. This can reduce the cost of copying information onto archival quality media later. Remember that documentation on electronic media alone is not sufficient because of the lack of long-term stability of these media and their contents. Pre-field planning can also reduce the time and expense of making sure that all documentation has been compiled for submission with the collection. At a minimum, anticipate that the following types of associated documentation will ultimately be created for each archaeological investigation and consequent collection:

Administrative Records

Correspondence, contracts, and curation agreements.

Background

Reference materials that document previous work pertinent to the current investigation, e.g., site record searches, published and unpublished reports, title searches.

Field Records

Data generated in performing current investigation fieldwork, e.g., level records, daily logs, mapping data, topographic maps used to record field data, photographs, videotapes, audiotapes.

Analysis Records

Catalogs, databases, data printouts, analyses, laboratory reports.

Report Records

Draft and final reports.

The documents in each of these categories may be comprised of one or more of the five documentation formats: paper records, cartographic materials, photographic media, audio and videotapes, and electronic media. Each of these formats has specific preservation requirements that are discussed in greater detail in this section.

Creating The Collection

Artifacts

Whether artifacts are collected from the ground surface or excavated from below surface contexts, care must be taken in handling and transporting specimens. Once an artifact is removed from its context and transported to another location, it may undergo significant changes in temperature and relative humidity that may affect the stability or condition of the specimen.

Recovering buried artifacts must always be undertaken with care, even when its condition appears to be stable. Many buried items reach equilibrium with the surrounding soil, thereby stabilizing the condition of the artifact and retarding further decomposition. When the artifact is removed from its soil matrix, it is exposed to an entirely new set of environmental conditions that will introduce agents of deterioration. The artifact condition may also be affected by physical damage incurred during its removal and transport to the laboratory. For example,

- Extremely fragile artifacts should be photographed and sketched in place prior to removal.
- Damp, wet, or fragile artifacts should be removed keeping them embedded in their surrounding matrix. This helps to stabilize the item and reduce the rate of deterioration until the artifact can be placed in an environment that best replicates the original surrounding environment. Place damp artifacts in closed plastic containers or bags that will not absorb the moisture and will best preserve the original environment. These items should be opened and processed as soon as they reach the laboratory. A professional conservator should be consulted concerning the care of any damp, wet, or fragile objects of any size.
- Bulk samples are often also heavy and large in size. They require transport in containers that can sustain the weight with the least amount of damage to the specimens. Polypropylene containers with lids or cloth bags may be used to transport the materials to the laboratory where they may be divided and repackaged for specialized processing, according to the requirements of the research design.
- Other fragile artifacts may require special support or packaging to ensure that they do not move during transport (see Handling, Packaging, and Padding, below).
- Artifacts that may be used in chemical analysis, botanical washes, flotation, or as chronometric samples, must be placed in sample-appropriate containers and marked clearly as potential samples so that they are not damaged accidentally or contaminated by mishandling. Greases, oils, dirty fingers, airborne pollen, plasticizers from polyethylene bags, etc., should not come into contact with these samples. Clean metal tools should be used to remove the samples and place them directly into a container that is appropriate for the intended sample.
- Before going into the field, obtain clear collection and packaging instructions from those indi-

viduals that will be performing the analyses. Cleaning artifacts in the field is not recommended. Important data can be destroyed or the artifact condition can be compromised.

- If field cleaning is absolutely necessary, remove only the surface dirt with gentle brushing. Resist the temptation to wash artifacts, other than those already subjected to wet screening. Note which items have been treated by either method.
- Some artifacts may require consolidation in the field prior to removal from the site. Consolidation should be undertaken in consultation with a professional conservator.
- Document any and all special treatments applied in the field to each artifact.
- Prominently label all containers with provenience, date, and recorder.

Associated Records

Although it is difficult to maintain clean, dry records while in the field, every effort should be made to minimize damage. Keeping records and maps out of direct sunlight, rain, and wind will reduce material deterioration from ultraviolet radiation and moisture and help prevent ink from fading. Using archival field journals, No. 3 or No. 4 pencils, and waterproof paper are some of the precautions that should be taken to reduce damage to records and maps in the field. Number 3 and 4 pencils (or H and 2H lead in mechanical pencils) are recommended because harder leads do not smear as much as soft leads and are considered more durable. For a truly permanent record, however, carbon-based permanent ink should be used.

As with artifacts, a little advance planning can prevent the destruction of records in the field. Temporary storage often becomes permanent storage. Do not use colored, or water soluble inks, avoid adhesives such as tape on paper, and do not use metal fasteners or rubber bands to keep records together. Whenever possible, keep documents in a closed container to reduce the damage created by dirt, dust, and other airborne particulates. Initial arrangement of documentation while still in the field will make the final arrangement of the documents easier and less prone to error. For more detailed discussions of field conservation issues see Longford 1990 and Sease 1987.

From The Field To The Laboratory

Whether archaeological materials are being transported from the field to the laboratory or from one repository to another, proper handling and packing will determine the condition of the collection upon arrival at its final destination. Archival-quality material should be used at all times, beginning with packaging materials in the field, through processing and final curation. Non-acidic archival packaging materials should be used when boxing or bagging materials, especially fragile objects. These containers will serve, at a minimum, as a temporary storage area for the materials (Table 5-8). At a maximum, some field-packed collections might be stored “temporarily” for 20 years or more.

Table 5-12. : Materials for Packing Collections

Do Use	Do Not Use
Acid-free boxes and folders	Cigar boxes, grocery boxes, manila folders, etc.
Polypropylene containers	PVC or plastic containers
Metal containers, rust-free, and well-sealed	Metal containers to contain moist objects
Glass containers (for samples that require clean glass environment) well-padded, and placed within a rigid container	Glass containers without padding and rigid support
Acid-free poster board or polyethylene foam to make rigid supports	Acidic cardboard or Styrofoam

Polyethylene bags (minimum 4-mil thickness) with Ziploc closure	Plastic sandwich bags
Polyethylene sheeting and chips	Plastic wrap, polyurethane chips
Acid-free tissue paper	Toilet paper, facial tissue, newspaper
Polyester batting	Cotton
Aluminum foil for C 14	Paper Envelopes
Spun-boned olefin (Tyvek) for making internal labels for containers with moist contents	Unprotected paper

Preparing collections for transport.

Label everything

It is vital to keep provenience information with the archaeological materials at all times, from the moment materials are removed or documents are created in the field until they reach the laboratory or repository where they can be permanently labeled. If an artifact is nested within several layers of padding, bag, and box, place a label inside the padding, on the bag, and on the box. The label should include sufficient information to relate the object to its original provenience e.g., site number, unit or surface collection location, field specimen number and date collected. Also note any special handling instructions. Polyester fabric (e.g., Tyvek⁷) can be used to make temporary water-resistant labels to accompany soil or midden that is being wet-screened or has not completely dried. It can also be used to make permanent labels since it is an inorganic material that is resistant to mold and pest infestation, but can be fed through laser printers.

Keep handling to a minimum.

Handle the object or records only as much as is deemed necessary, as excessive handling can result in damage.

- Artifacts should be kept in a storage environment that closely resembles their site conditions

Label artifact containers clearly with special condition requirements, so that the artifact will be examined appropriately when it is unpacked at the repository. For example, if an item is removed in a dry condition, it should remain dry; likewise, wet or damp materials should remain wet until they can be stabilized professionally by a conservator.

- Isolate and place special samples in appropriate storage containers

Check with the laboratory for recommendations on the proper excavation, handling, and packaging procedures. Each type of analysis is susceptible to particular contaminants, e.g., residues that will be analyzed using gas chromatography should not be touched with the human hand nor should they be enclosed in polyethylene bags. Organic materials that may be used for radiocarbon dating should be wrapped in aluminum foil, which in turn should be stored in rigid containers with a sealed lid and kept separate from the other excavated material.

- Dry soil and radiocarbon samples thoroughly to prevent mold growth

Small holes should be punctured into the top portion of the polyethylene bag to provide ventilation and prevent the formation of mold. Exercise care in the drying process so that contaminants are not introduced.

- Treat human remains with the utmost care and respect

Separate human remains from other materials and store them by individual and by provenience. Funerary objects or grave goods should be clearly cross-referenced with the individual.

- Use common sense in placing archaeological materials and associated records within boxes for transport

Pack like materials together. Place the heaviest items at the bottom of the box.

- Label the boxes

In addition to provenience information, each box should be labeled to identify contents that are fragile, heavy, or require other special handling. Clear and informative labeling prevents unnecessary opening and handling when particular objects are being retrieved.

- Create a packing list

Prepare a general list of the contents of each box, duplicate the list, and place one copy in the box and collate the second set to serve as the inventory against which the collection can be checked upon arrival at the laboratory or repository.

- Use common sense in transporting collections

Protect collections from abrasion, crushing, vibration, and harmful environmental conditions with a cushioning layer of padding on the floor of the transport vehicle. Place the heaviest boxes on the bottom layer, toward the front of the vehicle. Pack the boxes securely so that they do not slide around. If the vehicle is also carrying field equipment, set aside an area for the collection, distant from any cans of fuel or water, and segregated from heavy field equipment. Do not enclose collections in a vehicle all day, especially in high levels of heat and humidity. If storage at a site must be in a vehicle, ensure that there is good air circulation. In cold weather, the artifacts should not be stored close to a heating vent inside a vehicle. Once at the repository, the artifacts should be promptly removed from the vehicle.

Processing Artifacts and Samples

All artifacts undergo seven processing steps: (1) accessioning; (2) assessment; (3) conservation treatment; (4) cleaning; (5) cataloging; (6) packaging; and (7) record keeping (Table 5-9). These are the basic foundations of good collections management and curation. Each step is designed to build upon the previous one and seeks to establish the optimal environment in which to preserve artifacts for future use and study. Each of these procedures is discussed in detail in the following pages.

Table 5-13. : Basic Steps in Processing Archaeological Materials

Procedures	Comments
Accession collection	Prior to fieldwork obtain agreement to curate and, if necessary, conserve, the anticipated collection at a repository even though accessioning the collection itself occurs after the collection is physically transferred to a repository for long-term care; include funding for curation in the project budget; obtain copies of repository procedures e.g. required specimen number format
Assess collection	Segregate specimens that require special handling e.g., for conservation treatment, submission for analytical testing, "Do Not Clean", etc.
Perform conservation treatments	Minimal conservation treatments, such as construction of supports or padding, should be performed for fragile specimens. These treatments should provide temporary stability so that a specimen can be transported to a professional conservator for consolidation, repair, or specialized cleaning.

Clean objects as necessary	Apply appropriate cleaning methods to specific material classes of objects.
Catalog and label specimens	Sort specimens by material class within each provenience; assign catalog numbers to individual objects and/or lots; label specimens; enter descriptive data into catalog.
Package specimens	Place specimens in artifact and storage containers that are appropriate for the material and for frequency of access (immediate or long-term storage); prepare contents lists for each box and an overall listing of the containers in a collection.
Record keeping	Submit at least one acid-free hard copy of the catalog (as well as disk(s) if in electronic format) to the repository as part of the Associated Documentation.

Accessioning

When a Fort Hood accessions a collection, it usually signifies that title (ownership) of the collection has been transferred to the museum; however, this is not the case for federal collections. ***Title remains with the U.S. Army, no matter where the collection is stored at any given time.*** The collection remains the responsibility of the U.S. Army.

A collection may consist of a single object or document, or many objects and documents. The collection may derive from a single site, or from multiple sites. Decisions on how collections are defined and accessioned are the responsibility of the repository in consultation with the federal agency.

The purpose of the accession number is to match an object or collection with the original documentation that is maintained in an accession record. The accession record typically consists of the accession number, the date the object or collection was accessioned, the nature of the accessioned materials acquisition (e.g., gift, purchase, excavation), the source (e.g., who donated the object) provenience (geographic or cultural origin, maker, etc.), a brief description of the accessioned material, the condition, value, if applicable, and the staff member who accessioned the material. The accession record documents how the collection was made and how it came to be curated at a given repository.

The accession record is the central location of information concerning the collection's previous history, how the repository acquired it, and any conditions attached to the use of the collection. It is also the place where notes concerning objects within the collection can be maintained or cross-referenced with other repository records, such as conservation treatment records, loan documents, photograph collections, citations of published references that include objects from the collection, etc.

Assessment

Two objectives are addressed during the assessment of the collections. First, the inventory list submitted with the collection is compared to the boxes/ specimens present to note any discrepancies and take remedial action. Second, individual specimens are examined by the curator, registrar, or researcher, in conjunction with a conservator, to segregate those that:

- Require some type of immediate stabilization before they can be further processed
- Need special cleaning treatments
- Need no cleaning
- Will be submitted for analytical testing
- Will be set aside as unprocessed samples

As specimens are segregated or removed from the collection for special processing, care must be taken to ensure that all provenience data remain with the objects. These objects should receive specimen numbers immediately (see Cataloging below) so that their location and status can be tracked as they undergo special conservation treatment or analysis. Once these specimens have rejoined the

collection or have been consumed during analytical tests, the collection catalog can be updated for each specimen to record the specific conservation treatments applied, the analytical results, or the specimen destruction during analysis.

A representative sample of each affected artifact type must always remain unaltered (36 CFR Part 79.9(b)(5)iii). All other specimens can be cleaned and cataloged.

Conservation Treatment

Conservation treatments provided at this step in the processing should be restricted to minimal efforts designed to stabilize objects sufficiently so that they can be handled for cataloging and analysis. For many objects that require minimal stabilization, this will consist of the construction of a special acid-free support or box for the object (see discussion of preservation characteristics by material class). Any attempts to mend or consolidate the object or apply other chemical treatments should be referred to a conservator. Even minor conservation treatments should be documented including the materials and methods used should be recorded in the catalog for each affected specimen.

Objects that have been stabilized still require special handling and should be marked as such. By placing objects in boxes or supports, it becomes possible to continue processing the object by handling the container rather than the object. Again, care should be taken to ensure that the provenience data accompany the object at all times.

Cleaning

Artifacts are cleaned in order to permit analysis of the original surface and features of an object, to facilitate the application of a specimen number to the object, and to remove substances that might otherwise hasten the deterioration of an object. In general, cleaning should be kept to a minimum to reduce the possibility of destroying fragile surface features of an object such as impressions or decorations, and to prevent compromise or loss of use-related evidence such as residues, polish, and scratches. A conservator should undertake professional cleaning of an object intended for display.

Artifacts can be cleaned by dry, wet, chemical, or ultrasonic methods. The entire artifact may be cleaned or only the specific area to which the specimen number will be applied regardless of which cleaning process is used, the conservation treatments should be halted immediately if any damage to the artifact is detected. Provenience information should be kept with the specimen at all times. Residues produced during the cleaning (e.g., pollen washes or DNA samples) may be retained and added to the catalog, noting the link between the original specimen and the residue.

Dry cleaning

Can take several forms including dry brushing or dry vacuuming. *Dry brushing* involves using a soft-bristled brush to remove the surficial soil from an artifact. Consolidated soils should be removed by a conservator. *Dry vacuuming* is particularly useful in cleaning porous objects. The vacuum should have low-powered suction and a small aperture nozzle. A rigid nylon or polyester screen may be attached over the nozzle to further reduce the suction and prevent damage to particularly fragile objects. Vacuums suitable for these tasks can be obtained from conservation suppliers or from medical/dental equipment suppliers.

Wet cleaning

With water should never be used for artifacts that are unstable or contain residues that may be useful for chemical analyses. Examples of fragile or unstable materials include organics such as bone, shell, hides, vegetative remains, either processed (e.g., basketry and textiles) or unprocessed, low-fired earthenware ceramics or ceramics with flaking or fugitive decorative surfaces, and metal objects.

Residues found on ceramics, chipped stone, and other artifacts can be useful for phytolith, blood serum, radiocarbon, elemental analysis, macrofossil identification, DNA analysis, etc.

Wet cleaning should be restricted to stable artifacts such as ceramics fired at high temperature, glass, and stone. Artifacts should be cleaned in a tub or wash basin rather than under running water to prevent accidental loss down the drain. Only one artifact at a time should be washed. Stone artifacts and debitage can be cleaned by placing specimens in a screen or mesh bag and gently swishing the bag back and forth in the wash basin.

Ideally, wet cleaned artifacts should be air dried slowly and evenly. Under no circumstances should heat, either direct sunlight or a drying oven, be employed to dry the artifacts. Trays with raised, non-metal screen bottoms should be used to air dry the artifacts or artifacts can be placed on absorbent toweling and turned over to ensure thorough drying. If paper is used to dry artifacts, non-acidic sheets or rolls of paper should be used. Newspaper should not be used because of its acid content.

Ultrasonic cleaning

Can be helpful in loosening stubborn deposits of soil or oxidation. Ultrasonic waves are sent through water in which the artifact is immersed to shake loose adhering dirt. This technique is restricted to stable objects that can withstand immersion and that fit within the ultrasonic cleaner. For example, ceramics and glass with micro-fractures may break apart from high energy waves.

Although the ultrasonic cleaning process was not originally developed for archaeological purposes, it has proven to be effective at cleaning many items such as debitage, projectile points, and sherds. Approximately five minutes or less is needed to strip off stubborn oxidation deposits from artifacts, although more time may be necessary for some artifacts. The progress of the conservation treatment should be monitored regularly. When no further improvement is apparent, remove the artifact, rinse with water, and let dry thoroughly. Again, record in the catalog which objects were cleaned with this process.

Spot cleaning

May be used in instances where it is preferable to clean only the spot on the artifact where the specimen number will be placed. Use a moistened soft-cotton tipped stick to wash an area the size of the intended label. Let the artifact dry completely before the specimen number is applied.

Chemical cleaning

Should be performed or supervised by a professional conservator. Chemical cleaning may be necessary to remove encrustations or the corrosion layer on artifacts, particularly on metals, but also on basketry, bone, or ceramics. The chemicals used are usually acids, bases, chelating agents, or sometimes other depending on the artifact being treated. These chemicals can cause irreversible damage to the artifact if not applied correctly. Also, the use of chemicals may require certain safety precautions and protective clothing. For example, some chemical cleaning should only be performed under a fume hood.

After the artifact is gently dry brushed, it may be immersed in water to wet it thoroughly, then suspended in the chemical solution for specified periods of time, rinsed thoroughly in changes of distilled or deionized water, and allowed to dry slowly. Artifacts that are chemically cleaned should be identified in the catalog, noting the chemical solution used, the time immersed, and the methods used to rinse and dry the object Table 5-10.

Table 5-14. Guidelines for Cleaning Archaeological Materials

Material Class	Recommended Cleaning Method
Bone	Dry brush
Organics (macrofossils, wood, etc.)	Do not clean. If absolutely necessary, dry brush softly or use low powered vacuum through a screen. Retain the soil for possible constituent analysis. Consult a conservator.
Ceramics	Do not clean ceramics that have use residues. Spot clean area to be labeled. If complete cleaning is desired, stable ceramics can be washed in water, or swabbed (or surface cleaned) with damp cotton swabs. If washing is necessary, dry thoroughly before labeling or packing. Unstable or crackled ceramics may require consolidation before processing. Consult a conservator. For ceramics with salt encrustations, consult a conservator.
Glass	Dry brush. Spot clean as necessary. Do not wash unstable, flaking glass. If washing is necessary, dry thoroughly before labeling or packing. Glass with thin films or iridescent glass corrosion should not be scrubbed or aggressively cleaned. Allow to dry.
Leather	Use preventative conservation including optimal storage conditions with a minimum of handling. Consult a conservator.
Chipped stone	Do not clean chipped stone if use-wear studies are to be performed or if there is a possibility that mastic, cordage impressions or other residues are present. Determine what portion of lot samples requires washing to prepare them for analysis. Wash tools and flakes in water; use gentle brush to loosen soil if necessary, or ultrasonic cleaning.
Metals ferrous / non-ferrous	Do not wash. Do not use heat or commercial polishes or dips. Do not remove corrosion crusts. Consult a conservator.
Paper	Do not wash. Consult a conservator.
Samples Bulk shell, soil; flotation, heavy/light fractions	Decide what proportion of samples will be processed. Retain a portion of unprocessed for future analyses. Process as needed.
Samples for Special Analysis (e.g. archaeomagnetic, C-14, phytolith, hydration, residue analyses, etc.)	Do not wash. Consult analytical laboratory for required processing techniques.
Shell	Do not wash. Dry brush, after specimen has been checked for possible residues (e.g., mastic, cordage impressions, food, paint) May need consolidation before processing. Consult a conservator.
Textiles	Do not wash or dry brush. Low powered vacuuming through a screen. Do not use home remedies for fabric cleaning, e.g., washing, spraying, steaming, lubricating, or waxing. May need special support and packaging. Consult a conservator.

Cataloging

This is the process of assigning a unique identifying number to an object and recording a description of the object, its dimensions, and provenience data. The object may also be photographed as part of its documentation. For the purposes of these protocols, the actual placement of the unique number onto the object is the next step in processing.

Specimen number (catalog number)

is the unique identifier that is assigned to each object within a collection during the cataloging process. It provides the link between the object and its associated documentation, including the accession record and any other information pertinent to the collection or to the specific object.

A catalog is the listing of all specimen numbers relevant to a single collection. The catalog may be electronic and/or in a paper format. It lists the number assigned to each object, a physical description of the object, often a typological assignment, and any specific provenience information for each object. Catalogs can also be used to note or cross-reference other records documenting changes in an artifacts status or condition i.e., they can cite original condition, conservation treatments, use of an object for destructive analysis, changes in condition, etc. Copies of catalogs are generally filed with the repository's registrar in the accession record.

Some objects will undergo cataloging more than once. Some may be assigned temporary specimen numbers (sometimes referred to as catalog numbers) either in the field or during analysis, but then are assigned a final specimen number by the repository where the collection is ultimately stored. The final catalog should cross-reference any previous specimen numbers assigned to an object, and it is recommended that previous specimen numbers not be removed from an object when adding the final specimen number.

May be assigned to an individual object or to a group of similar objects collected from a single provenience. The latter strategy is used when cataloging faunal remains, debitage, glass fragments, or other fragmentary, non- diagnostic remains from a single provenience. Generally, if the object will be analyzed as a single specimen, it should be cataloged individually as well. Materials that are analyzed in bulk, such as shell or chipped stone, can be assigned a single lot number. At a minimum, a catalog should list the following classes of information for each object Table 5-11.

No matter how the catalog data fields are organized, all data must be recorded in a consistent and uniform manner, particularly if catalog information is entered into an electronic data management system. Abbreviations should be avoided whenever possible, and if used, an abbreviation key must be kept as part of the catalog.

Table 5-15. Sample Catalog Data

Data Field	Example
Accession number	97-113
Specimen number	97-113-4531
Object description	Projectile Point
Material class	chipped stone; obsidian; Topaz Mountain
Form	Side-notched, basal fragment
Typological assignment	Desert side-notch
Analyst and date analyzed	William Henry Holmes 9/5/89

Quantity	1
Measurements	Length: N/A Width: 15 mm Thickness: 5 mm (note any dimensions that are fragmentary)
Weight (when appropriate)	1.2 g
Provenience: geographic location	26Wp2886
Specific location	Unit 14; 45 cm East, 63 cm South; 35 cm below surface
Associated features/artifacts	Hearth feature #4; adjacent to 97-113-4530
Chronological Data	Obsidian hydration Rim: 3 microns
Collector	D.H. Thomas
Date Collected	6/12/67
Comments on condition, form, conservation treatment, etc.	Fracture is not new

Labeling Artifacts

Once an artifact has been assigned a specimen number, a decision must be made on how best to associate the number with the object, whether to label the object directly or indirectly. Conservation principles dictate that any conservation treatment applied to an object, including the attachment of the identifying specimen number, should be non-invasive and reversible. Labels should be legible, neat, and unobtrusive. Extraneous writing on an object should be avoided.

Direct Labels on Artifacts

Directly labeled artifacts are less likely to lose their specimen number than artifacts that have separate specimen numbers on paper labels or labeled containers. Since the specimen number links the specimen with its provenience data recorded in the collection catalog and/or accession record, it is crucial that this number not be separated from the specimen. For this reason, objects that can be safely labeled directly, should be. One possible exception to this admonition concerns human remains. Many Native American tribes consider it disrespectful to alter human remains in such a manner. Therefore, it is recommended that these not be directly labeled without prior consultation with the tribes or people that are most likely culturally affiliated with the remains.

Careful consideration is necessary for the placement of the label. Labels should not be applied over diagnostic portions of an artifact. For example, a stone tool should be labeled on the unmodified portion, or cortex, of the tool if possible. If a tool has been bifacially worked, label the least photogenic side. Sherds should not be labeled on the broken edges because accurate reconstruction would be inhibited and would prevent observations of the ceramic body. Labels should not cover makers marks or design elements, if possible.

Table 5-16. Steps for Direct Labeling of Artifacts

Step	Procedure
1	Clean, if necessary, the area to be labeled on the artifact.

2	Place a barrier coat on the area to be labeled; a thin narrow coat of clear acrylic resin dissolved in acetone (e.g., Paraloid B-72) or solvent based acrylic varnish are recommended. If the artifact is dark in color, white ink can be used. An alternative that results in legible labels and avoids the problem of finding a white background for a dark object is to type the label information into a computer, using an easily readable font, preferably the smallest font size that is still readable. Print the labels out onto acid-free high cotton rag content paper, using a xerographic process such as a laser printer or a photocopier. Cut the labels out of the paper and dip them briefly in a suitable quality adhesive (Rhoplex a Paraoid B-72 emulsion, or Acrysol, a polyvinyl acetate emulsion). Remove excess adhesive or thin the emulsion with water if necessary, and allow to dry to a clear film. Mistakes then can be rectified by wiping the affected area with a wet cotton swab with acetone and a cotton swab after it has dried.
3	Let the buffer layer dry thoroughly, overnight if necessary.
4	Write the label information: the specimen number and any additional information required by the repository. Water- based ink, such as black india ink, is recommended (see Pencil and Permanent Ink below). White ink may be necessary on dark colored artifacts.
5	After the ink has dried, apply another coat of acrylic resin dissolved in acetone (e.g., Paraloid B-72) or solvent based acrylic varnish (e.g., Soluvar) to protect the label.
6	Let the label dry thoroughly before placing the artifact into an artifact container.
7	Record in the Curation History (see below) the methods and materials used to label the artifacts (chemicals, percentage solution, and solvent)

Sandwich Labeling

A “sandwich” method is recommended for labeling artifacts directly. This involves placing the specimen number in-between a reversible, isolating base coat and a reversible protective top coat. Archival quality solvents should be used and information documenting the chemicals used, should be recorded in the Curation History (see Figure 7). This will make it possible to safely remove the specimen number should it become necessary in the future. Also be careful to work in well-ventilated areas when using solvents (Table 5-11).

Indirect Attached Labels

Some artifacts cannot be labeled directly because they are too small, e.g., small beads can often be labeled with acid-free tags attached with string. Other specimens should not be directly labeled due to unstable surface conditions or fragility. Basketry, leather, textiles, wood, and deteriorating ceramics, glass, or metal should not be directly labeled, but should have an acid-free tag attached if possible, or the object should be enclosed in a container that is labeled (see Loose Labels below). Attaching indirect labels and tags requires careful thought so that the least damaging method is used (Alten 1996:2). Tags and labels can be attached to an object by tying or sewing. A few basic rules apply when attaching them to an object (5-13).

Table 5-17. Basic Rules for Labels Attached with String or Thread

1. The string or sewing thread should be softer than the artifact’s surface.
2. The string/thread should not cut through or into the object.
3. The label should be attached loosely so that it does not cause constriction of the object, but not so loose that it will catch on other objects and result in a tear.
4. Colored string or thread treated with any substance should not be used.

The material used to attach the label or tag should be compatible with the artifact and its storage conditions. For example,

- 100% Cotton String, undyed. This is the most commonly preferred material, with the following exceptions; 100% cotton string should not be used on rubber or plastic artifacts because the aging by-products used to manufacture the rubber and plastic can destroy the cotton thread.
- Plastic tie tags (Zap-Straps) and nylon monofilament (fishing line) in polyethylene tubing are two acceptable ties that can be used for attaching tags to industrial machinery and large artifacts or outdoor displays. The polyethylene tubing protects the artifact from being abraded by the nylon.
- Teflon monofilament is stable, smooth, non-fibrous, does not stretch, and is recommended for attaching tags to greasy or oily artifacts or artifacts with fragile surfaces. Check that the monofilament is not the version that stretches. It is equally important that the material used to make the tags or labels is archival quality and of a material best suited to the object. Tags or labels with metal rims should not be used. Acid-free 100% cotton rag paper is the recommended material type for most tags because it is pH neutral, lignin free, and inexpensive, though subject to damage if it comes into contact with moisture. Stationer's and jeweler's paper tags usually are not acid-free and will yellow, embrittle, become illegible over time, and can stain artifacts.
- Japanese paper labels can be attached with wheat starch paste directly onto most baskets. The past is reversible, the labels are not excessively intrusive, and the labels can be fitted to the surface texture of the basketry. Paraloid B-72 can also be used to attach these labels and to apply a protective topcoat over the paper label.
- Tyvek is a proprietary polyester fabric that is waterproof and inexpensive, and can be used to make labels or tags for small or large items. Tyvek survives well in the outdoors and is appropriate for labeling material such as farm or industrial machinery. It can also be sewn onto textile fabrics. For example, Tyvek #1422 is inert, soft, non-fibrous, and is recommended for attaching tags to plastic items, items stored or displayed outdoors, or oily objects with unstable surfaces.
- Cotton twill tape, a soft inexpensive material, is recommended for textile objects. A length of the tape can be labeled with permanent laundry marking pen and sewn onto the textile using undyed cotton thread.

When labeling a tag or paper label, the writing medium must be easy to apply and able to survive light and water exposure. Felt-tip pens should not be used because these are usually composed of dyes that fade. Waterproof India ink is the preferred form of labeling tags. Black and blue ink are the only recommended colors; red should not be used because it is the least light-fast ink and some colorblind individuals cannot detect red (see below Pencil and Permanent Ink).

Loose Labels

When direct labeling or attaching a label/tag are not possible, an acid-free paper label should be placed in the artifact container, e.g., inside the polyethylene bag or acid-free box containing the artifact. Particularly fragile materials such as basketry fragments, textiles, or wood artifacts may be placed in acid-free boxes that contain inert polyethylene foam (Ethafom) that has been carved, shaped or otherwise modified to support the specimen. These custom supports make it possible to match artifacts with their idiosyncratic supporting structure in addition to having the specimen number visible on the exterior of the box.

Pencil and Permanent Ink

Although the principle of reversibility applies to the conservation treatment of artifacts (excepting those designated for destructive analyses), it is important that artifact labels are inert, yet stable, and capable of withstanding normal use. Many inks, felt tip markers, etc. are labeled as being "permanent" but this often proves to be untrue given sufficient passage of time and/or exposure to ultraviolet radiation. Black india ink has been the standard medium used to label artifacts or artifact tags in many museums. However, not all black India inks are the same. (See Clark 1989). Test inks before using them for long-term curation contexts. Ink is inexpensive; testing is inexpensive. However, the process

of labeling specimen is extremely labor intensive and costly, and unstable labels may compromise the link between specimen and associated provenience documentation.

Ink can be applied using a variety of pens including Crow quill pens, mechanical drafting pens, or ceramic tipped pigma pens. Crow quill pens are inexpensive and they can be inserted into a small block of Ethafoam to keep the tip clean. Mechanical pens are favored for the ease with which the ink is applied to a surface; however, they are subject to frequent clogging and must be cleaned routinely by disassembling them and soaking them in cleaning solution, in an ultrasound cleaner, or in tap water. Pigma pens are more expensive and each batch should be tested for ink quality before using them to label specimens.

It is recommended that any new procedures or materials be tested first before implementing or using them on a collection. It is important to document in a collection's Curation History (see below), all procedures and materials applied generally to a collection. Special conservation treatment of specific objects should be noted in the object catalog.

Packaging Artifacts for Storage

Artifacts stored loose within a drawer are subject to much more damage than those that are placed inside some type of protective artifact container, a bag, box, or special support. These artifact containers, in turn, are often placed within a storage container, e.g., drawers for easy access to type collections or boxes on shelving for long-term curation. The intended use of the specimens and specimen condition will affect how each should be packaged after cataloging. In addition to protecting the artifact, all packaging should be labeled clearly to facilitate access to specific specimens within a collection and to reduce excessive handling of the object.

Artifact Container Guidelines

Determining which container is suitable is influenced by the following.

A. Determine the anticipated use of the material. Determine the frequency to access for the artifact. Should it be stored with type collections materials that are frequently used and therefore placed in drawers or stored in archival boxes that are located on shelving?

B. Segregate and store objects by their material class. When placing specimens or samples in artifact containers, objects from only one material class should be placed in the artifact container. Each material class specifically has an optimal storage environment. This environment is easier to create if similar materials are stored together and can be segregated from the rest of the collection if necessary. For example, all soil samples should be stored under similar conditions; however, they can be arranged by provenience (by site number, excavation unit, level, etc.) within a soil sample storage area. The segregation by material class should extend to the final placement of artifact containers in storage containers. Fragile or lightweight materials should be kept separate from rugged, heavy artifacts.

C. Select the type and size of container appropriate for the kind and size of the object taking into consideration the frequency that the object will be used. Polyethylene resealing (Ziploc) bags. These have become the popular container for most small to medium-sized artifacts and for larger samples of a single material class such as faunal remains, soil samples, etc. They are economical, easy to handle, lightweight and compact, and can be directly labeled. Nevertheless, there are some precautions that should be exercised if polyethylene bags are used.

- Select the size bag that is appropriate for the object. Do not force an object into a bag. Instead, select the next larger size. Do not overfill a bag simply to maintain consistency of bag size when processing a collection.
- Select the most appropriate bag thickness. At a minimum, use bags with a thickness of 4-mil or greater. These provide a measure of cushioning of the artifact and are stronger than thinner bags.

Thicker bags should be used for heavier objects.

- Ventilate the bag for hygroscopic materials. Ventilation is recommended only for hygroscopic materials. Small holes should be placed at the top of the bag, prior to placing the object inside. The holes will permit air circulation and thereby prevent mold or other organic fungi from developing inside a sealed bag. Although all polyethylene bags experience air exchanges over a period of time and none is airtight. Naturally, the holes should be smaller than the diameter of the contents. Generally, a hole punch can be used for most objects, although bamboo skewers are useful for making fine holes.
- Add padding when necessary. Acid-free tissue, polyethylene foam sheets may be used to provide an extra measure of cushioning for objects or to cover a sharp object that might otherwise tear the artifact container.
- Do not store fragile objects in a polyethylene bag. Organic remains and fragile objects should be placed in rigid wall containers (see below).
- Purchase polyethylene from reputable vendor. There are many grades of polyethylene. Some polyethylene sheeting is produced from recycled scraps of polyethylene with unknown formulations and composition. All contain plasticizers and anti-oxidizing agents that are susceptible to leaching and degradation. If the bags are purchased from a supplier of archival materials, there is likely to be greater attention to consistent quality and to backing the product.

Polypropylene rigid wall containers.

More and more containers are being produced in a range of standard sizes from polypropylene film vials to large lidded boxes. These can be used as artifact containers for heavy, bulky objects, and they can be used as the basis for supporting a fragile object needing extra protection. Follow the same principles outlined above for polyethylene bags.

Although these are more expensive, archival acid-free boxes come in a variety of styles, sizes, and strengths, and they should not require repackaging as frequently as polyethylene bags. It is recommended that boxes with telescoping lids be used rather than flap-fold lids. Telescoping lids allow easier access and prevent the container from becoming damaged with use as often happens with flap lids. Custom-designed boxes can also be made for unusual shaped or sized artifacts. These can be hand-built using acid-free poster board adjoined with linen tape or hot melt adhesive. Care must be taken to ensure that the box strength is sufficient to support the weight of the object without any flexure of the container walls. Some vendors will make large lots of odd-sized boxes as well.

The advantages of metal are its rigidity, strength, and potential to provide sterile storage for an artifact or sample. The disadvantage of some metals is that they are susceptible to oxidation that in turn is exacerbated by the presence of moisture and/or heat, particularly if the container has a tight-fitting lid. Some metals are susceptible to chemical interactions with other metals.

Artifacts stored in drawers can also be protected by carving object-specific shapes in a block of polyethylene foam (e.g., Ethafoam) that has been cut to fit the drawer. Each object space can be labeled with the specimen number or any other special information regarding the object.

Unacceptable artifact containers.

These include, but are not limited to, brown paper bags, sandwich baggies, lightweight food storage/freezer bags, non-polypropylene plastics, film vials or pill bottles, or glass containers for which no special provision has been made to store them securely to prevent breakage. Artifact containers should not be closed with tape, twist ties, rubber bands, string, staples, or heat sealing.

- Construct special packaging or support when necessary, and label it as well. As mentioned above, some containers may need to be custom-designed to fit odd-sized objects. They can also be constructed to provide platforms for custom supports of fragile or broken objects that require special support in specific areas or to make portions of these objects visible without handling the object itself. Use archival quality materials in constructing the support and consult a conservator if

in doubt as to which portions of the object are strongest or most fragile and require special consideration. Labeling the packaging/ support will also reduce the amount of handling required to verify the objects specimen number.

- Maintain provenience data at all times. Label all artifact containers so that the contents can always be associated again should they become separated. All artifact containers should be labeled directly with permanent, indelible ink, and they should have an acid-free label placed inside the container.

Storage Container Guidelines

After the artifact has been placed comfortably and securely in its artifact container, the artifact container is usually placed inside a storage container, e.g., inside a larger polyethylene bag, a box, or a storage unit drawer. Many of the same principles listed for the artifact container apply here as well.

- Determine the anticipated use of the material. Determine the frequency of access for the storage container. Should the container be easily opened or can the group of artifacts stored inside be placed in a container that is designed for long-term preservation.
- Segregate and store objects by their material class. Heavy items such as brick, daub, ground-stone, and fire cracked rock, should be stored separately from lighter artifacts to prevent damage caused by shifting when boxes are moved from the shelves or when drawers are opened or closed in storage units. Use archival- quality padding or dividers to help stabilize heavy objects to prevent movement. Ideally, artifact containers should not be stacked atop each other in a box or drawer, but placed in a single layer only. If this is not possible, then the heaviest items should be placed in the box first with lighter items on top of them, even if this means that the artifacts are no longer in sequential order. Each storage container will have a contents list that will assist in locating specific artifacts within that container.
- Select the type and size of container that is appropriate for the kind and size of the object. The storage containers must not be overpacked, distorted by the contents, or made too heavy to handle easily. The maximum weight of a container should be between 20 and 30 pounds. Weights in excess of this range become unsafe to handle.
- Construct special packaging or support when necessary, and label it as well. Artifacts should not be wrapped in packaging material so that the items identity and size cannot be determined unless it is unwrapped. Instead, lay the artifact on a nest of acid-free tissue, then cover it with a protective layer of tissue that can be lifted off without handling the artifact. Segregate and cushion large heavy items that may cause damage if they shift position.
- Maintain provenience data at all times. The exterior of the storage container should list the provenience and the general contents or range of artifacts contained inside. Inside the storage container, place a packing list or box inventory printed on acid-free paper. This list should contain the specific specimen numbers stored in the container. It will facilitate locating and replacing objects in their correct storage container. The storage container can be labeled directly with pencil or indelible ink or with an acid-free paper label placed inside a sleeve on the exterior of the box or shelf.

Record Keeping

Throughout the procedures discussed above, the importance of documenting every action affecting an individual specimen and/or on the collection as a whole has been emphasized. Each repository will undoubtedly have its own procedures and formats for documenting these data on specific forms or by direct entry into an electronic collections management or other centralized tracking system. Museums often refer to these data as Administrative Records. The format in which they are maintained is not as critical as the fact that they have been recorded and are accessible.

Safety Copies

Additionally, 36 CFR Part 79 mandates that these data be maintained in their original form and that a duplicate or safety copy be created and housed in a separate, fire-safe, and secure location. Safety

copies may be made on archival microfilm, acid-free paper, or other media if deemed appropriate. Generally, microfilm and archival paper are used due to their proven permanence, rather than electronic media that are neither stable nor permanent.

Material Safety Data Sheets

One means of documenting the materials used to process collections is by using Material Safety Data Sheets (MSDS). Federal law requires manufacturers to compile a MSDS for each product listing (1) the non-proprietary ingredients in a product; (2) basic handling, use, and storage guidelines; (3) potential chemical interactions; (4) fire hazard; (5) toxicity; and (6) spill clean-up procedures. These should be requested with each order and retained on file until the next batch is received.

It is also prudent to purchase materials from reputable vendors with long-term commitment to archival preservation. Even though the initial expenditure may be costly for archival materials, the highest cost is in the labor to process each object within a collection. Inferior materials will result in shorter “shelf-life” and potentially may be damaging to the objects.

Prior to using new products or new shipments of products routinely used in processing collections, test them. Even reputable manufacturers occasionally have bad “batches”.

Curation History

The curation history of a collection informs future users of the collection not only about the original context or provenience from which an object came, but also notes the original condition and changes to the condition, conservation treatments performed and the specific chemical formulations used, the availability of photographs or analyses, the results of destructive analyses, and even the date an object was noted as broken or missing (Griset 1993). It establishes and assists in maintaining intellectual control over the collection.

The curation history assists future users of the collection in identifying specimens suitable for specific research questions, for interpretation, or for educational uses. It can assist curators and conservators in monitoring changes in collection condition and enables informed choices for future restorations or conservation treatments. It can even aid repositories in identifying curatorial practices that are advantageous, versus those that are deleterious for the long-term curation of collections, by documenting specific conservation treatments and practices.

The curation history should be collection- specific Table 5-14. Curation histories should be active documents that are routinely updated. As a matter of course, there should be a scheduled review, e.g., every two years, to ensure that they are up-to-date and that linkages between data management systems are operating in a consistent manner to track curation data.

Table 5-18. Curation History of a Collection

Procedures	Information Needed
Collection Acquisition	<ol style="list-style-type: none"> 1. Date(s) that the collection was made, by whom, for what purpose, and other relevant details regarding the origin of the collection, such as a general description of the excavation/collection techniques. 2. Date that the collection was accepted by (each) repository and any conditions pertinent to the ownership, access, or curation of the collection. Record the name of the individual that accessioned the collection and the Accession Number.

Processing Techniques	<ol style="list-style-type: none"> 1. Date collection was processed and by whom. 2. General procedures to clean or treat the collection (identified by material class). 3. Specific procedures to treat individual specimens (record each individually). 4. Products and/or formulations used to process the collection.
Collection Inventory	<ol style="list-style-type: none"> 1. Field inventory (if present), and how produced. 2. Final catalog (note specimens that received conservation treatments, analysis, or were lost or damaged in transit or elsewhere) and how produced. 3. Periodic inventories by repository (note any changes from previous inventory).
Storage Conditions	<ol style="list-style-type: none"> 1. General conditions for storing each material class in the collection. 2. Special storage conditions for specific specimens. 3. Type of pest management system used, name of inspector, and frequency of inspections; note any conservation treatments made. 4. Record any changes in these procedures as they occur. Add them to the Curation History. Do not remove previous procedures. 5. Note any natural or human-induced crises that affect the storage conditions.
Conservation Treatments	<ol style="list-style-type: none"> 1. Record for each specimen treated. 2. Maintain list of specimens to be monitored for special conditions.
Collection Use	<ol style="list-style-type: none"> 1. Record types of use (loans, exhibit, research, etc.) and place copies of any publications, photo- graphs, exhibit catalogs, etc. in the collection file. 2. Note any destructive uses of specimens. Include all documentation including original request for use, Department of Defense point-of-contact approval, methods used, and results. 3. Note any restrictions on use (e.g., human remains).

Processing Associated Documentation

Associated documentation or records, by definition (36 CFR Part 79), are the documentary materials generated as a result of an archaeological investigation conducted on federally-owned or administered lands, no matter the scope of the investigation (archival, survey, excavation) or the results. Whether or not artifacts are collected or archival materials are generated, each investigation results in a collection that consists, at a minimum, of the report of results. Even a “negative-findings” letter provides information that may prevent future redundant investigations and waste of funds. If artifacts are recovered, the associated documentation preserves the context in which the collection was made as well as the context from which the artifacts were recovered. Without these contexts, the scientific and educational use of the artifacts and data are seriously curtailed.

Associated documentation contains both a variety of record types and formats. Common record types include administrative materials such as scopes of work, progress reports, and correspondence; background information such as historic oversize maps, historic photographs, and census records; field records such as photographs of excavations, feature and profile forms, and daily logs or journals; analysis records such as catalog cards, database- generated artifact analyses, and photographs of unique artifacts; and report records such as annotated drafts, electronic and hard-copy final reports. Common record formats include paper, photographic records, electronic records, audiovisual materials, and oversize and cartographic records. It is important to note that any and all formats may be found in all record types. The content, or type, of record signifies the value of the record, whereas the format may dictate special storage requirements (e.g., large map flat cabinets for storage of cartographic materials).

The definition of associated records is independent of the investigating organization. The installation is responsible for any and all collections, whether made by installation personnel or contractors. Upon completion of an archaeological project, the contractor should deliver to the installation the

complete archaeological collection artifacts, associated records, and the final reports all of these are considered to be government property. Administrative records generated by contractors may be retained by them; installation administrative records for each project are subject to permanent curation. The retention, disposal, and preservation of agency records should be conducted according to agency directives. Individual Records Managers, or Records Management Officers, are responsible for these records and for ensuring that regulations are followed.

Archival processing of associated records has two primary objectives: (1) to stabilize the collection so that future deterioration is prevented or minimized, and (2) to arrange or organize the records in such a manner that they are easily accessible. Deterioration of paper and other archival mediums (e.g., photographic materials, audio-visual materials, maps, and ephemera) can never be completely halted. It is possible, however, to slow the deterioration to an indiscernible rate and therefore extend the life of valuable information contained in these collections. However, having the information is not enough; one must be able to find the information, preferably in an efficient and timely manner.

The techniques described below may be used to preserve or rehabilitate any type of documentation collection. They consist of general procedures common to all records collections as well as procedures for specific classes of records, e.g., photographs, cartographic data, paper records, or videotape (Figure 8) and addressed in the following sections.

Accessioning/Registering the Documentation

The process of accessioning is also referred to as “registering” the collection, and the paperwork generated from this process may also be referred to as registration or entry documentation. In these protocols, these terms are used interchangeably (refer to Accessioning). All associated documentation, regardless of the format, should be accessioned, or registered, when the repository accepts the collection. Bear in mind that these protocols define an archaeological collection as all materials (documents and/or artifacts) generated or compiled during the course of a single archaeological investigation. In many cases, a collection will consist entirely of associated documentation.

Generally, one accession number is assigned to a single collection, and it is used to identify all collection components: associated documentation, artifacts, and any documentation that is developed during curation of the collection. All of this information is recorded in the accession file. The accession file should include information concerning the receipt of the collection and an initial listing or inventory of the associated documentation files in the collection and notes on any conservation treatments performed on the documents. The physical location of the records collection within the repository should also be noted in the accession file, along with any known requirements for preservation or conservation treatments. A Curation History of the associated documentation should be created, if one has not been submitted with the collection.

Once the collection is accepted and the accession or registration is complete, the association documentation must be archivally processed if this has not been done previously. The steps in processing associated documents for archival storage are discussed below.

Assessment and Conservation Treatment

Before any other measures can be taken to preserve the associated documentation, each type of documentation should be assessed for its current condition, necessary conservation treatments, and general completeness. Separate each document format, if this has not been done previously. Segregate items that require special treatments before they can be handled. Some of these conservation treatments may be performed by a professional archivist; others may require the attention of a professional document conservator. Any materials that are separated, for any reason, should have their original location noted to ensure that cross-indexing may be recorded in the finding aid. Steps are listed in (Table 5-15)

Paper

Documents that require mending, removal of adhesives, humidification and flattening, cleaning, deacidification, cleaning, or encapsulation should be set aside for treatment. Always note where the materials were pulled from in the original arrangement, to maintain the principle of original order.

Table 5-19. Basic Steps in Archival Processing

Procedures	Comments
Accession/Register associated documentation	Generally, associated documentation is assigned the same accession number as the accompanying artifacts. This ensures that the two elements of a collection, artifacts and documents, do not lose their association. In many cases the accession number is used as the collection number. Check with the repository prior to processing so that the documents may be properly numbered prior to submission.
Assess collection and perform minimal conservation treatments	Assess document condition, remove contaminants, and segregate documents that require special handling such as dry cleaning, humidification and flattening, mending, and encapsulation. Consult a document conservator if more than minor conservation treatment is required.
Arrange, refolder, rebox, and number documents	Archival processing mainly consists of the tasks of refolding, reboxing, and arranging the documents in logical sequence (keeping in mind the principle of original order), and numbering appropriate elements (i.e., folders, documents, boxes) according to the specifications dictated by the curation repository.
Package documents	Place documents in containers appropriate to each media, and package according to repository's instructions for immediate access or long-term storage.
Create a finding aid for the associated documentation	The finding aid should enable users to quickly and accurately retrieve specific kinds of information from the associated documentation.
Keep records of all actions performed in processing the documentation.	Document any conservation treatments performed on associated documentation as well as any special information related to the documents. Submit copies (on acid-free paper) of conservation treatment reports, the finding aid, and registration documentation, to the repository (see Procedure #1, above).
Create an archival safety copy	An archival safety copy should be made of all the associated documentation, as well as the finding aid, conservation treatment forms, etc. This safety copy may be produced on acid-free paper or archival microfilm. Electronic media is discouraged because of questions concerning its survivability, stability, and technological obsolescence. The safety copy should be stored at a separate secure location. Safety copies of photographic materials should be made whenever possible.

Cartographic

Procedures and conservation treatments are generally the same as those for paper documents; however, the oversize format may require special support or handling to prevent additional tearing. Never force a tightly rolled document to lie flat without first humidifying and flattening it. Forcing the document open increases the chances of permanently damaging the item by tears and creases. For large format documents, always support the entire document when moving these items. These items should always be stored flat. For extremely long documents (over six feet), cutting the document is unacceptable. Rolling may be necessary, although it will complicate access to the material. We recommend the following.

Obtain two rigid, acid-free cardboard tubes or cylinders, one of no less than three inches in diameter and the other, at least two inches wider in diameter. The smallest tube should be several inches longer than the documents shortest side and the longer tube should be several inches longer than the first tube. Wrap the smaller cylinder with a polyester sheet such as Mylar, in order to protect the document from directly contacting the tube. Then, roll the document onto the tube in the direction of the documents longest dimension. Roll a second sheet of polyester sheet over the document, making sure it covered the document completely, and the leading edge overlaps the trailing edge. Tie the polyester sheet to the tube using a length cotton twill tape or with a self-adhesive Velcro coin under the leading edge. Finally, slide the smaller tube assemblage into the larger tube, ensuring that the twill tape or Velcro coin is not under the document, as it can crease the document. The tube must be labeled either with the number of the document on the roll or with an index number that can be used to index the storage location of the rolled documents.

Photographic

Black and white negatives manufactured prior to 1947 require special assessment to ensure that they are not composed of cellulose nitrate, an unstable and highly combustible material. As the cellulose nitrate deteriorates naturally, it becomes increasingly unstable; if these negatives are stored in high temperatures, there is the potential for spontaneous combustion. Nitrate negatives often may be identified by their format, age, and visible deterioration. Any negatives dating prior to 1947 should be treated as potential nitrate negatives. Many nitrate negatives are larger (four by five-inches and larger) and are often labeled on the edge as "NITRATE" When nitrate negatives begin to deteriorate they often have a silver or reflective sheen on the surface or they may appear iridescent. These materials should be copied, and the original nitrate negatives should be turned over to the local fire department for proper disposal. Cellulose acetate film which replaced cellulose nitrate film, also deteriorates through time, although it is not flammable.

Audiovisual

Check for any signs of damage due to high temperature (warping, embrittlement) or due to conditions of low temperature and high moisture (mold, embrittlement). Segregate these specimens for examination by a conservator specializing in audiovisual media. Note which items need immediate duplication in order to salvage the data. If a written transcript is not available, one should be created as soon as the material is stabilized.

Electronic

Use a machine-operating system such as DOS, Windows File Manager or Windows Explorer to identify the files present on each disk, and to verify the software format. After checking for potential viruses, open each file to insure that all are error-free. Always ensure that a hard copy, (paper copy) of each document is available to protect against irretrievable data loss.

Refoldering, Reboxing, and Numbering Arrangement

Archival collections, like the artifacts they often accompany, are unique entities. Therefore, each document collection should be arranged according to its individual specifications. The principle of provenance is the key, but it often causes confusion to the untrained; "organization according to provenance precludes the uniformity of arrangement provided by library classification systems (Miller 1990:26)."

There is no one-size-fits-all arrangement that can be applied to all documentation collections. There are, however, certain principles and practices to help. The most common arrangements are chronological, topical, numerical, and alphabetical. Any or all of these systems may be used singly or combined, and should be suited to the type of document and the kinds of data present in each. Most often collections can be easily broken down into series and subseries. "Series is defined as file units

or documents arranged in accordance with a filing system or maintained as a unit because they result from the same accumulation or filing process, the same function, or the same activity; have a particular form (2); or because of some relationship arising out of their creation, receipt, or use (Bellardo and Bellardo 1992:32).”

A series is a discrete unit of information, that often can be further divided into subseries. “A subseries is a body of documents within a series readily identifiable in terms of filing arrangement, type, form (2), or content (Bellardo and Bellardo 1992:34).”

For example, one collection may contain the following series: administrative records, survey records, analysis records, and reports. The administrative records can be further arranged in the following subseries: correspondence, meeting notes, and Section 106 compliance documents. Each of these series and subseries should be arranged in the most logical manner chronologically, alphabetically, topically, or any combination thereof. In another collection, it may be more appropriate to arrange data from several archaeological sites into series, with subseries for administrative records, and survey records.

Once the files are physically arranged, the contents of each individual file must then be arranged. Standard archival practice dictates that each files contents be arranged chronologically, from least recent to most recent (e.g., if a file contains documents dating from 1949 to 1970, the file, when opened, would begin with the 1949 data). Undated documents are placed last in the file. If, however, a more logical arrangement of the papers seems appropriate, it is permissible to supersede this practice.

Refoldering and Reboxing

As arrangement progresses, the materials are repackaged in archival quality materials (i.e., acid-free folders and boxes). This is the refoldering and reboxing stage, and the document medium will dictate the best archival document container (see Packaging on page 5-95 for detailed discussion by documentary medium).

The label information or description of each document should be legibly transcribed to the new document containers (e.g., folders or sleeves). At this stage of archival processing, different formats (e.g., photographic, audio-visual, electronic, and cartographic materials) that have not been pulled previously, should be separated from the rest of the collection and their removal noted and indexed in the new document container. Document format often dictates different storage requirements and thus indexing must be imposed and maintained to ensure that the materials are not intellectually separated from the collection (see ????? for more information on storage requirements).

Numbering

Unique identifying numbers should be assigned, both to a single investigation’s associated documentation and to individual document containers, so that (1) the documents can be easily sorted, searched, and managed, and (2) the associated documentation can be linked to the accompanying specimen collections, if present. Often in the case of associated documentation, the accession number is assigned to the collection of artifacts and documents. The accession number is then used as a unique collection number for the associated documentation as a method of preserving the link between the artifacts and documentation from a specific investigation. In some cases, the accession number may be used as a prefix to the numbering system applied to the associated documents. However, some repositories have specific requirements for numbering document collections. Some repositories require that each document be indexed and numbered, but most require that documents be labeled/numbered at the folder level. Contact the repository for directions.

How these numbers are applied depends upon the format of the record. Some labels will be directly applied to the record, others will need to be applied to the document container. The repository may direct the preferred method of numbering and labeling.

Recommendations by Document Type

Paper Documents

It is imperative that all folders have clear label information. It must be legible and describe the contents of the file with clear, concise information. Folders should be of acid-free stock, or as close to pH 7 as possible. Labels can be typed or computer-generated on archival adhesive labels. If these labels are not used, it is permissible to write (i.e., print), LEGIBLY, on the file with indelible ink or #4 graphite (2H) pencil lead. When feasible, indelible ink is the preferred labeling medium. Basic information includes collection name and/or number, series, description of folder contents, and dates. Each folder should also be assigned a unique number according to the numbering system used for the collection.

Cartographic/Oversize Documents

Oversize paper records such as cartographic documents (maps) should be labeled the same as smaller format paper records. Number and label each one. Both the map and the corresponding file from which it was originally separated from should be labeled clearly with the cross-index information. This information should be noted in the file, on the cartographic document, and in the finding aid.

Photographic Materials

Photographic records consist of several different media; negatives, prints, and transparencies from either black-and-white or color film. Each poses particular conservation requirements that are discussed in greater detail in the section below entitled Preventive Conservation. Photographic collections or series should be arranged according to format and numbered according to image. Each unique image receives a unique number, and duplicate images are noted in the finding aid. For example, a single image may be represented in several formats (i.e., a print, a negative, and a slide), but it is only assigned a single unique number. When labeling and arranging this sample collection, the print, the negative, and the slide will each be labeled with the same number (referring to the same image), and each format will be packaged and stored according to its specific requirements. Each image should be recorded in the finding aid, and the corresponding formats noted (see Table 5-16).

Table 5-20. General Rules For Processing Photographic Materials

- | |
|--|
| <ol style="list-style-type: none">1. Never handle photographic materials with your bare hands. Always wear white cotton gloves. Acids present on human skin transfers to and eventually damages or destroys the image.2. Each image should have an unique identifying number. Any corresponding duplicates, negatives, or slides should indicate this fact in the finding aid. It may also be appropriate to record this fact in the label information.3. Each image should be labeled legibly, either directly or indirectly. |
|--|

Photographic materials can be labeled either indirectly or directly. Indirect labels may be used on all photographic media.

Indirect labels

Written on or attached to the exteriors of photographic document containers such as polypropylene or polyethylene sleeves or acid-free or buffered envelopes. Negatives should always be labeled indirectly on their document container, never directly on the negative.

Direct Labels

Should be written in indelible ink on the reverse on photographic prints. When directly labeling photographic prints, it is recommended to record only the identifying number of the back of the print. More detailed label information should be provided in a log or other descriptive scheme. Care should

be taken to write with minimal pressure so that impressions do not crack the emulsion on prints, thus hastening deterioration. Transparencies in cardboard slide holders should be labeled directly on the cardboard holder in indelible ink. As with photographs, care should be taken not to apply too much pressure when labeling slides. Slides should only be labeled on the non-emulsion side. Foil back labels can be attached to the back of prints. These labels, available in a variety of sizes, prevent surface inks from penetrating the label and affecting the images and conversely, the adhesive cannot penetrate the foil and attack the ink, causing excessive fading. They may also be removed, in the short term, if there is a mistake or if they need to be replaced. However, over time, they will be very difficult to remove without damaging the photo.

The photographic log will provide the detailed information that can connect each image with its provenance or collection data, should the two become separated. All labels should be clear and in a consistent format throughout the collection. An example of a label format for photographic prints is provided in Table 5-17.

Table 5-21. Label for Photographic Materials

Field	Sample Data
Unique identifying #	434-P-1001
Date image was taken	5/30/77
Where image was taken	Site CA-Sol-357, Baker Estates
Photographer	Larry Jones
Image Format	4 x 5 color print
Any corresponding images	8 x 10 color print; color slide; 35mm color negative
Description of image	Overview of site facing northwest. Units 3 and 4 in foreground, at 0-20 cm level.

Audiovisual Materials

Audiovisual materials include a wide range of materials. Most common of these are audiocassette tapes, reel-to-reel tapes, phonographic disks, videotapes (including Beta, VHS, and 3/4-inch), moving picture film (including 8mm, 16mm, 35mm, and larger format films), and audio compact disks. Many audiovisual (AV) disks and tapes can be directly labeled with indelible ink. If this is not feasible, use a foil back label and attach it to the tape/disk. The very minimum of information recorded directly on the tape/disk should include the collection number and a unique identifying number for that item. Each storage container should be labeled with the above information and more detailed information to ensure that the original item is not permanently separated from its storage container. Detailed information should also be provided in the finding aid, or in an AV log included with the finding aid. At a minimum, the fields described in Figure 11 should be included.

Whenever possible a transcript of the recorded material should be made. Audiovisual materials are easily damaged, so a transcript will ensure the survival of the basic informational content.

Electronic Media

Electronic records present a multitude of problems for long-term storage. Computer disks and tapes can be partially or totally erased by proximity to magnetic fields. This damage can be caused by something as simple as laying a disk too close to a telephone. Dust and humid conditions can also affect the accessibility of the information, causing lost sectors of information on the disk or tape. Technical obsolescence, however, creates the primary problem with curation of electronic media. Computer technology changes so fast that there is no guarantee that information recorded in electronic

form this year will be retrievable on new generation computers. Added to the hardware difficulty is the problem of software. Changes in software virtually guarantee that information stored in electronic form will not be readable unless that software is still operable. Ultimately, long-term storage of electronic formats is not particularly viable. Even in cases where “permanent” storage solutions such as scanning or digitizing have been used, there is no guarantee that the data will remain viable and accessible. Electronic format records should be viewed as access tools, but should not be used to “replace” the original documentation.

If electronic media is included with an associated documentation collection, every effort should be made to preserve the material. As with audiovisual media, each disk should be labeled directly with the collection number and a unique identifying number for each item. Detailed information should also be provided in the finding aid, or in an electronic materials log included with the finding aid. At a minimum, the fields described in Table 5-18 should be included.

Table 5-22. Label for Audiovisual Materials

Field	Sample Data
Unique identifying #	434-AV-101
Creation Date	5/30/77
A-V Format	16-mm black-and-white film
General description of contents, including interviewer and interviewee if applicable was created	Mabel Smith describing oral history concerning site CA-Sol- 357. Interview conducted by Lee Jones and filmed by Larry Morris.
Location where tape/disk	On-site at CA-Sol-357
Transcript	Transcript 434-TR-001, 15 minutes.

The best means of ensuring the survival of the data contained on electronic media is to provide hard copies of all electronic data, printed on acid-free paper. Each printout should be labeled with the unique identifying number of its corresponding disk, as well as the file name and software name and version.

Packaging

Associated documentation should be packaged in archival quality materials to prolong the life of these records. As with archaeological objects, associated documentation is packed first in a document container; these are then placed within storage containers again, the choice of appropriate container is guided by the preservation requirements of the format (i.e., media), as well as the anticipated need to access each record format.

Table 5-23. Sample Label for Electronic Materials

Field	Sample Data
Unique identifying #	434-E-007
Creation Date	5/30/77
Format	5.25 inch floppy disk
Software Used to Create Disk	Dbase III+, ver. 2.1 database tables and report formats

Creator ARS	Larry Jones
General description of contents	CA-Sol-357 artifact catalog, obsidian hydration rims, and Final Report Tables
File name	SOL357CAT.db
Size of file	356,789 bytes
Date last updated	10/9/77

Document Containers

Document containers should be selected according to the preservation needs of each document format and to the particular size of the records. Do not place documents in containers too small for them. This causes folding and tearing. By the same token, however, placing documents in containers too large will also cause damage because it will allow shifting within the document container.

Paper Records

Paper records should be placed in acid-free or buffered files and folders of appropriate size. Polyethylene, polypropylene, and polyester (Mylar) sleeves or enclosures are also acceptable document containers. Often collections will have varying paper sizes. A single collection may have documents that are letter size (8.5 x 11 inches) and legal size (8.5 x 14 inches). In this case, use legal size folders and boxes (document and storage containers) for both paper sizes so that all folders will fit snugly within the box without shifting from side to side as the storage container is moved.

Cartographic Materials and Oversize Drawings

Maps (cartographic materials) and drawings present storage problems related to space allocation. They tend to be nonstandard in size, often oversized, and require flat, horizontal storage. It is tempting to fold these and place them in legal or letter-size folders for storage. This practice, however, severely shortens the life span of these materials. Creases created by folding severely weaken the paper fibers and lead to tears or losses that are likely to obscure information. Even once folded, these materials can be humidified and flattened for long-term storage, but the material has been weakened by creasing. Fragile and/or frequently used materials may require encapsulation in Mylar .

The preferred storage method for these materials is to place each inside an acid-free folder. This can be quite costly in time and money. At the very minimum, separate each map with a sheet of acid-free tissue or blotter paper before placing it inside the storage container.

Photographic Documents

Every image (print, negative, or transparency) should be stored in its own document container such as a photographic envelope or sleeve. Multiple images improperly stored in a single envelope or sleeve can scratch the emulsion and irreparably damage the image. Envelopes and sleeves should be constructed of either acid-free paper or an inert plastic. Acid-free paper sleeves are available from reputable archival materials suppliers and are made in a variety of sizes to fit common photographic media formats.

Plastics that are considered archivally sound include polyester (Mylar), polyethylene and polypropylene. Mylar is commonly used to encapsulate very fragile documents, especially if they are handled frequently. Polypropylene sleeves pages come in a variety of sizes for single or multiple images as well as for slides or negatives and have become popular due to their low cost and ease of use.

Glassine envelopes, vinyl or other plasticized sheets containing polyvinylchlorides (PVC), and acidic papers including Kraft paper envelopes are unacceptable.

Each photographic document container should have proper label information. Envelopes and sleeves can be labeled directly with indelible ink on the exteriors; metal slide containers will have log sheets inside the container that identify the contents, as well as a label applied to the exterior of the container. See Labeling discussion above for specific details.

Electronic and Audio/Visual Records

Electronic disks can be stored within plastic containers made specifically for this purpose. These come in a range of sizes and can be selected to suit the size of the collection of disks per accession, or can be stored in sequence in a larger disk storage container. Video or audiotapes should be placed in acid-free boxes of appropriate size. A foil back label can be attached to the front of the box, and the spine can be labeled with the Collection and Identifying numbers. Electronic and audio-visual material should be kept in an area free not only from the hazards of nature, but also human-made hazards such as electromagnetic fields that can potentially destroy them (see Preventive Conservation section for more detail). Unless directed otherwise by the repository, each document container should be labeled with the kinds of information listed in Table 5-20.

Table 5-24. Document Container Label

Field	Sample Data
Collection or Accession #	434
Unique Identifying #s	434-AV-001 through 434-AV-010
Container contents	Cassette tape and 16-mm black- and-white film
Site Numbers (if relevant)	CA-Sol-357

Storage Containers

Once documents have been placed in material- appropriate document containers, they will need to be placed in storage containers that are suited to the anticipated level of use that will be required of each set of documents, while maintaining the requisite environmental conditions. For some materials that are rarely used, the document containers may be placed in acid-free boxes and stored in an off-site storage area or facility. Other document containers may be placed in metal storage furniture that permits easy and frequent access (i.e., archival boxes placed on baked enamel shelving units in an on-site storage area).

Paper Records

Paper records should be stored in acid-free or archival boxes of appropriate size. They may also be stored in baked-enamel metal file cabinets, but this practice is discouraged due to the warping of documents that occur in hanging files or even regular file cabinet storage. This warping may also occur in archival boxes, but can be prevented by the use of archival spacer boards.

Maps and Oversize Materials

Flat storage in a baked enamel metal map case is preferred for these materials. These materials may also be stored in appropriately sized acid-free or alkaline-buffered boxes. However, check with a conservator first before using buffered storage materials because using buffered materials may be detrimental to oversize materials produced with early reproduction equipment.

Photographic Documents

Photographic images that have been placed in paper or archival plastic sleeves can next be placed in either acid- free boxes, archival photograph notebooks, or in baked enamel storage cabinets manufactured specifically for photographic media. Prints should be stored flat, in either a horizontal or vertical position, so long as they are kept on a single plane and not permitted to warp. Slides can be placed directly into metal slide boxes if so desired, but should be stored upright. The important issue in storing photographic media is to keep them out of ultraviolet radiation (especially sunlight) in a clean and particulate- free environment, and to maintain a consistent environment as far below <68 F as your HVAC will permit and dependent on human comfort, and a constant Relative Humidity (RH) of 30% (National Information Standards Organization 1995:1). However, it is even more important to maintain constant temperature and relative humidity because drastic swings in either can be extremely stressful to photographic materials.

Electronic and Audiovisual Materials

These materials may be placed in appropriately sized boxes or in baked-enamel metal cabinets. It is imperative that these materials be kept away from electro-magnetic fields and dust. Lower temperature and lower Relative Humidity (RH) will help increase the life expectancy of these materials. It is important to note, however, that “electronic data, even when it is well cared for, may suffer major data loss for no apparent reason” (Balough et. al 1993:31).

Record Keeping

After the documentation has been physically arranged, labeled, and placed into document containers and these in turn are placed in appropriate storage containers, a finding aid should be developed that explains the organization and arrangement of the collection. Also, the pertinent data concerning the contents of the associated documentation and processing techniques used for the collection should be placed in the accession file with the rest of the entry documentation.

Finding Aids

Finding aids are the tools archivists create to assure fast and accurate retrieval of information from document collections. Finding aids are also referred to as guides, registers, checklists, and indexes. An archival finding aid is an essential element in the preservation and research use of archaeological associated documentation. They may be simple or complex, depending upon the collection and the repository's policy on them. The common components of an archival finding aid are listed in Table 5-21.

Table 5-25. Components of An Archival Finding Aid

Field	Sample Data
Introduction	An overview of the contents, origins, and research strengths of the materials.
Scope and Content Note	A narrative description, usually written by the processing archivist, of the collections characteristics, strengths and weaknesses, and any particular notes on information or format contained within.
Series Description	A brief, precise overview of the files contained within the series; includes the series title, description, dates, and the size of the series being described.
Container Listing	A detailed table of contents that provides specific information on the filing order and the contents of the collection. Generally it is a list of folder titles and their identifying number listed in the same order as the physical arrangement of the collection. Also known as a box or folder listing.

Index	A rearrangement of the finding aid into an alphabetical, subject, chronological, or other sequential order to facilitate retrieval of files. With electronic finding aids, indexing is generally done automatically or with the ihfind and searchli commands.
-------	---

Not all finding aids will contain all of the above components. As many components as are needed to present the most complete information should be included in the finding aid. At the very least, a container listing should be provided. Often the curation repository will direct the components that must be included in the finding aid prior to its acceptance of the collection.

Word processing programs are often used to create finding aids because they allow unique information to be easily searched by name. However, it may be very tedious to use this method to search through a large collection of materials such as photographs, particularly if the collection contains multiple images of similar objects or large numbers of images. Retrieval of information can become an extremely time-consuming task. Generally, databases work much better for large collections.

Curation History

Like objects, associated documentation is subjected to a variety of treatments and uses that may affect the preservation and usability of the specimens in the future. Each of these areas also should be addressed specifically for the various media in the associated documentation in the collection. This curation history may be maintained in the accession file or in a master list maintained by the repository.

Safety Copies

A duplicate, or safety, copy of the associated documentation should be created for each collection. It is preferable to use the duplicate copy and store the originals in fireproof and archival conditions in a separate building.

Safety copies may be made on archival microfilm, acid-free paper, or other media if deemed appropriate. Generally, microfilm and archival paper are used due to their proven permanence and low cost. Electronic media that incorporate digital images do not have comparable proven stability or permanence, but are more easily searched. They are also more costly to produce and require more frequent migration or replication.

Decisions as to the appropriate media for security copies should consider the anticipated frequency of requests to access the data, initial production cost, maintenance costs (including routine migration if needed), as well as the stability of the media. Routine periodic inspections of the security copy should be made to ensure its accessibility and stability.

Preventive Conservation: Artifacts and Records

The information presented provides Fort Hood's cultural resource management personnel with the range of potential problems they may encounter in caring for archaeological collections. A professional conservator would be consulted in many cases to draw on their expertise.

Measures can be taken to slow natural deterioration by providing a sympathetic environment for the object or document. The rate of deterioration is dependent upon the inherent chemical stability of the material, in combination with external influences such as the environment, storage conditions, and handling procedures. Environmental factors that can hasten the deterioration include temperature, humidity, light, air pollutants, and biological agents.

Light

Organic materials such as paper, basketry, photographs, textiles, and floral remains must be protected from ultraviolet (UV) radiation and visible light, both of which cause objects to deteriorate and speed up chemical reactions. When possible, these light-sensitive materials should be stored in closed containers, away from sunlight or direct lighting. When they must be handled or exhibited, indirect low light levels, preferably non-UV, or with UV filters in place, should be used.

Temperature

In general, colder temperatures are best for the preservation of objects and documentary materials. However, maintaining collections at cold temperatures is impractical because people use collection areas. More critical than temperature level is temperature consistency. Dramatic changes in temperature, particularly those that occur frequently, are often more damaging than storage in a slightly overheated area. For example, "it has been estimated that the useful life of paper is cut approximately in half with every 10 F increase in temperature. Conversely, with every 10 F decrease, the expected life of paper is effectively doubled (Ritzenthaler 1993:46)." However, many material classes have specific narrow temperature ranges that must be maintained for optimal storage conditions (see Conservation Criteria for Archaeological Materials section).

Relative Humidity

Low and high relative humidity speeds up the rate of deteriorious chemical reactions and encourages mold growth. More critical than relative humidity is relative humidity consistency. Dramatic changes in relative humidity, particularly those that occur frequently, are often more damaging than storage in a constant low or high relative humidity areas. Relative humidity is the measure of moisture in the air relative to the temperature. Archival materials, metals, and organics are very sensitive to moisture and will expand and contract with changing humidity and temperature. While this process cannot be seen with the naked eye, continuing expansion and contraction weakens organic fibers causing weak points that are susceptible to increased damage from handling.

Air Pollutants

Airborne pollutants can also hasten the deterioration of archaeological materials. Gaseous pollutants such as sulfur dioxide and nitrogen dioxide combine with moisture in the air to form acids that are deposited on objects and records. These acids can cause corrosion of metals or deterioration of organic materials. Solid particulates such as dirt and dust transported through the air cause damage through abrasive action as the archaeological materials are handled. In addition, many pollutants can leave permanent stains on objects and records. Air filtration systems can be designed to control the pollution levels from both gaseous and solid pollutants, in addition to prohibiting mold growth.

Biological Agents

Biological agents such as rodents, insects, and mold can rapidly affect the condition of archaeological materials and associated documentation through combinations of physical deterioration and chemical interactions. The best defense against these agents is implementation of an integrated pest management program (IPM) that routinely monitors conditions within the storage area as well as examinations of object and record condition. Infestations or outbreaks of mold can then be treated immediately, thereby reducing the amount of physical damage.

Conservation Criteria: Archaeological Materials

The following section provides basic information on the characteristics and consequent handling and storage requirements of object material classes commonly recovered during archaeological excavations in North America, as well as common associated documentation such as paper records, photographic materials, audio and videotape, etc. This information is provided as a reference for installation personnel so that they can make informed decisions on whether collections under their

control are being curated properly. The information may also assist in discriminating between signs of active deterioration versus inadvertent aging of a specific material class.

This standard operating procedure has provided ranges of temperature and RH for storing various material classes. These ranges provide the optimal conditions, however, any materials recovered from conditions that vary greatly from these ranges should not be subjected to drastic condition changes just to reach the optimums. Objects may be slowly brought into the optimal range or they may have reached equilibrium under the current conditions and should not be changed. These assessments will require consultation between the federal agency POC and repository personnel and may also require the assistance of a professional conservator.

Conservation treatments (e.g., repairing damaged objects or documents) should be performed by, or under the supervision of, a trained professional conservator. Some minimal stabilization efforts can be applied to prevent additional deterioration of a damaged item, but the best way to prevent deterioration of artifacts and documents is to employ the principle of preventive care. The information presented here can assist in planning the storage environment or selecting artifact containers suited to the particular needs of specific material classes. Archaeological materials are listed first, alphabetically. These are followed by an alphabetical listing of material classes within associated documentation.

Bone

All bone, whether human or animal, consists of both mineral (hydroxyapatite) and organic, or protein (collagen) components. These components combine to form different kinds of bone structure, depending on the part or function of the bone. Long bones, for example, consist of an external shell of dense, compact material called lamellar bone which surrounds an inner spongy material known as cancellous bone (Sease 1987:56; Cronyn 1990:275-277; White and Folkens 1991:14).

These materials are preserved in most environments, but the condition and the level of their preservation can vary according to the environmental conditions of their discovery context. The effects of these conditions are further complicated because the two components of bone, inorganic hydroxyapatite and organic collagen, are best preserved at opposite pH levels. In acidic deposits the inorganic hydroxyapatite dissolves, leaving the soft collagen, which shrinks when it dries out. In alkaline environments the organic collagen hydrolyzes (decomposes due to chemical reaction with water) and is attacked by bacteria, leaving the hydroxyapatite brittle and susceptible to crumbling when dried out. In less alkaline deposits there is a softening of the bone surface. Very dry environments or soils that contain high levels of calcium carbonate (e.g., in shell middens) at a moderate pH, produce the best conditions for preservation (Cronyn 1990:277).

Processing of bone artifacts and faunal remains will depend upon the condition in which they are recovered archaeologically. Samples that are recovered in good condition and are stored in areas with appropriate controlled temperature and relative humidity levels may need little treatment beyond dry brushing, cataloging, and packing. Bone (and ivory) recovered from extremely dry or wet contexts, may be stabilized by maintaining those conditions in the storage context. Bone that is in poor condition and actively deteriorating, may require consolidation (the addition of chemicals to restore physical or structural strength) before it can be removed from the archaeological contexts. Other samples may require consolidation in the laboratory to permit handling of the specimens. Others may require treatments to stabilize and slow the degenerative process.

Consolidation should be undertaken upon the advice and supervision of a professional conservator. Many "simple" methods advocated in the archaeological conservation literature (e.g., saturating bone with water-based white glue (National Park Service 1995:P:16)) have associated risks. White glues can cross-link (become less or completely insoluble) with the passing of time and hence, they are not considered to be satisfactory conservation treatments with full reversibility (Sease 1987). Some treatments involve the use of hazardous chemicals that require special handling and disposal. The best

option is to consult a conservator, and be certain that any such treatment is fully documented and added to the Curation History.

Antler

Antler is the outgrowth of the skull bones of deer, elk, moose, caribou and other animals, referred to as cervids. Because antler is an extension of bone it can be treated much the same way as animal bone. Unlike the hollow horns of other animals, antler consists of solid bone. Structurally, antler is very similar to long bones in that they consist of a hard outer layer surrounding a spongy central area. Unlike long bones, antlers do not have a central marrow cavity. For consolidation and preservation of antler see the recommendations above for faunal remains.

Ivory

True ivory comes from the upper incisors, more commonly referred to as the tusks, of elephants and mammoths. However, this term is frequently used to describe the teeth and tusks of other animals such as walrus, hippopotamus, and narwhal. Ivory is formed of successive layers of dentin that are hygroscopic. Deterioration usually occurs between the layers due to absorption or loss of water, or migration of salts from the interior to the exterior surface. Like bone, ivory swells and warps at high humidity, and shrinks and cracks at low humidity (< 40% RH, Rose 1992:151). High humidity levels cause soluble salts in the ivory to rehydrate, crystallize, and cause the layers of dentin to split (Lamb and Newsom 1983:30). Very dry environments or soils that contain high levels of calcium carbonate (e.g., in shell middens) at a moderate pH, produce the best conditions for preservation (Cronyn 1990:277).

Human Remains

In general, human bone is compositionally similar to animal bone and can be treated in much the same way, however greater care is necessitated by the nature of the material. Human remains typically offer a greater degree of information about the past lives of groups of people than faunal remains (White and Folkens 1991). Coupled with the emotional and psychological aspect of dealing with deceased humans, great care should be employed when consolidating, stabilizing, and conserving these remains.

All human remains should receive respectful handling and storage procedures. Native American human remains must be treated according to the requirements of NAGPRA. This law stipulates that culturally affiliated federally recognized tribes and lineal descendants of Native American human remains should be consulted regarding the disposition of the remains. Stabilization and preservation of Native American remains should be undertaken only after consultation with affiliated peoples has been completed.

Botanicals (see also Textiles, Wood)

Botanicals (or flora remains) are collected from archaeological contexts in a variety of forms. They may have been processed as foodstuffs or used to manufacture tools, housing, or textiles. They may also appear as unprocessed samples of the flora extant at the time the site was used. Each of these forms poses unique requirements for processing and for long-term storage. The one factor common to all botanicals is their fragility. They must be handled with great care and packaged so that they are not crushed or contaminated.

Flora food remains may consist of charred fragments of stems, seeds, or other portions of plants. These may be collected directly from the midden during excavation, from residues on other artifacts, or they may be floated from soil samples that are processed with water after the excavation has been completed. Care should be taken to keep these samples as free from contaminants as is possible. Oils from hands, plasticizers from artifact containers, can all affect their future use as research specimens.

If the botanical specimens have been processed with water (i.e., floated) they must be thoroughly air-dried before they are placed into rigid walled, inert containers, and the containers must be vented to permit air circulation and prevent mold growth.

Some botanical remains may survive only as impressions cast in baked or sun dried clay, asphaltum, or some other medium. These too should be handled carefully and placed into rigid walled containers.

Pollen samples that have been processed for analysis have undergone extensive chemical manipulations. They must remain in liquid storage if they are to preserve beyond their initial analysis. Often, these samples are stored in glass or polypropylene test tubes. Long-term storage should focus on maintaining the physical integrity of the sample by supporting the tubes in specially constructed trays or racks, and by routine periodic inspections to ensure that the wet medium has not evaporated. Data concerning the chemicals and techniques used to process the samples should be entered into the Curation History.

Ceramics

In many archaeological sites, both prehistoric and historic ceramic sherds constitute a significant amount of the total volume of artifacts recovered and they have the potential to reveal a tremendous amount of data about a site and/or group of people. The term ceramics refers to a wide variety of fired clay products, including pottery. Many types of pottery exist, from low-fired aboriginal earthenwares to higher-fired, often glazed, earthenwares, stonewares, and porcelains (Cordell 1983:63). The raw clays used to make pottery are basically aluminum silicates, however, the clays vary in chemical composition and in the nature and quality of impurities. Additionally, many clays are tempered with other materials such as ground shell, rock, organics, etc. Because of differences in composition and hardness, the reaction of pottery when buried will vary depending on the burial conditions, but generally speaking, well fired ceramics will survive better in all types of soil conditions (Sease 1987:93). Soil conditions that can damage pottery are excessive acidity, alkalinity, and salinity.

Acidic soils exert a weakening effect on certain types of pottery, generally those that are low-fired ceramics and those with temper that is easily affected by the acidity, such as crushed limestone and shell tempers. Acids can react with these temper types and leave the pottery exceedingly porous (Cordell 1983:63).

Alkaline soil conditions will result in the deposit of carbonates, sulfates, or silicates of calcium on the surfaces of sherds. These compounds are referred to as insoluble or slightly soluble salts because they are not readily dissolved in water. Again, low-fired pottery is more susceptible to encrustation and penetration of these compounds. Calcium carbonate is the most frequently encountered insoluble salt that leaves a whitish encrustation on sherd surfaces. Ceramics located in semi-arid environments or buried in shell middens also produce these encrustations (Cordell 1983:63-64; Cronyn 1990:146).

Soluble salts can saturate pottery in varying environments, particularly in areas located in marine environments, but soluble salts can also occur in pottery buried in semi-arid conditions and in tropical environments. The soluble salts impregnate ceramics and when the moisture evaporates, the salts crystallize and move to the surface of the sherds through capillaries in the clay bodies (Cordell 1983:64). This crystallization can exert tremendous force and may cause spalling or disintegration of the ceramic body. Most common soluble salts are chlorides, nitrates, phosphates, sulfates, and carbonates. The chlorides, nitrates, and phosphates are more readily dissolved in water while the sulfates and carbonates have slower dissolution in water and are thus referred to as insoluble salts (Paterakis 1987:67). Salts cause more damage to pottery than any other agent. If the salts are not removed, they promote loss of surface decoration and can eventually cause complete disintegration of the ceramic body.

Cleaning and repair are the two treatments commonly applied when processing ceramics. However, as more techniques are developed to analyze residues found on ceramic sherds, complete cleaning is

giving way to spot cleaning of the area needed for labeling the specimen. The most common methods of cleaning are drybrushing or washing with water. Ceramics with salt encrustations should be cleaned under the supervision of a professional conservator to ensure that the proper techniques are applied. All ceramics, especially the low-fired varieties, are porous, and any ceramics that are cleaned with water or another solution must be permitted to air dry thoroughly before any additional processing can proceed. They should not be enclosed in airtight bags until they are completely dry.

Some ceramics are friable or actively deteriorating and require special treatment and handling before cleaning can begin. If pottery needs to be consolidated or has already been consolidated, it should not be washed. Some consolidants may alter the physical and chemical properties of pottery, thereby altering their suitability for certain kinds of analyses. Consolidation should be undertaken only after consulting a professional conservator to verify the type of stains, salts, or other problems that may be affecting the ceramics. Be certain to document every specimen that receives some form of special cleaning, consolidation, or repair.

Large fragments or whole pots frequently require external support to provide structural reinforcement or protection during storage and handling. These supports can be made of ethafoam, padded cotton knit tubes, or other supports similar to those constructed for large baskets (see Clark 1988). The support will also provide a safer means of transporting or handling the specimen. When it is necessary to handle a whole pot directly, use both hands to lift it by the base, never by the rim or handles. Storage environments should provide stable temperature and humidity ranges of 55F / 75 F and 40% / 60% RH for low-fired ceramics, and 45F / 55 F and 45% / 55% RH for high-fired ceramics (National Park Service 1990:P:21).

Composite Materials

If artifacts are composed of two or more different materials that require dissimilar conservation techniques, a decision must be made as to which artifact component is more important and then the appropriate preservation method for that component should be employed (National Park Service 1995:17; Sease 1987:65; Cronyn 1990:94). Examples of some composite items include furniture, knives, pistols, rifles, and cutlery. It is recommended that the artifact not be disassembled for conservation.

Glass

Glass is composed of silica that is fused with other elements or modifiers such as potassium (potash), sodium (soda ash), lead, or calcium (National Park Service 1990:P:8; Sease 1987:72). These are referred to as fluxes. They lower the melting point of silica and allow it to fuse more readily. However, fluxes may compromise the stability of the final glass product (Cronyn 1990:128; Sease 1987:72).

Additional materials such as lime, magnesia, or iron are also added to act as stabilizers. They, in turn, can influence the color of the glass, e.g., manganese gives glass a purple color whereas iron gives glass a green color (Cronyn 1990:128; Guldbek and MacLeish 1990:187; National Park Service 1990:P:8).

Absorption of moisture is the primary cause of chemical and physical changes in glass, which result in weathering and/or decay. The kinds and rates of absorption are dependent upon the chemical composition of the glass, the firing history, the post-use deposition matrix, and the length of time that the glass has been deposited in the matrix. If the glass contains insufficient quantities of silica, it is more susceptible to absorption of moisture and consequent weathering or decay. If there is more or less than the optimum 10% lime flux, the glass will also be unstable. Soda glass (glass containing soda ash) is almost twice as durable as potash glass. Glass will be reasonably well preserved in acidic soils. Alkaline soils will cause severe deterioration because under alkaline conditions the flux is leached preferentially to the silica, and will render the glass porous, pitted, and covered with layers of carbonates (Sease 1987:72; see also Shapiro 1983).

Glass decays when its chemical composition is unstable and compounds leach from the glass body out to the surface of the glass. Iridescence, crizzling, weeping, efflorescence, and encrustation are all terms used to describe the effects of specific compounds (see Newton and Davison 1989, Cronyn 1990, and National Park Service 1990, Appendix P for detailed descriptions).

Glass decay is irreversible, but it can sometimes be stabilized. Guldbek and MacLeish (1990:188) recommend maintaining an ideal relative humidity level between 45% / 47%, although a range of 40% / 55% is acceptable; Plenderleith and Werner (1976:346) recommend < 42% RH; and Sease (1987:74) suggests < 40%.

Handling precautions may also prevent additional glass decay. Bare hands can transfer moisture, oils, and acids onto the surfaces of the glass, and these can accelerate inherent deterioration. Snug-fitting latex gloves are recommended over cotton gloves because the glass surface might be slippery. Glass should never be handled by any knobs, rims, handles, or decorative motifs. Jewelry such as rings, bracelets, and long necklaces should also be removed from the person handling the glass so that scratches or chips do not accidentally occur (National Park Service 1990:P:19).

Leather and Other Animal Skin Products

Leather artifacts recovered from archaeological sites provide numerous preservation problems. Control of temperature, humidity, and ventilation are crucial to the preservation of leather. Extreme heat will harden and embrittle leather. Drying will cause leather to shrink, curl, crack, and become brittle and inflexible. Low relative humidity (< 40%) will cause the leather to dry out; high humidity (> 60%) promotes the growth of bacteria and fungi, increases the chances of infestation, and may also cause changes in dimension and flexibility. Leather may also provide a source of food for various pests including moths, beetles, and rodents. Once deteriorated by whatever cause, leather cannot be returned to its original condition. Therefore, the most important elements in conserving leather goods are optimum storage conditions and appropriate handling, in other words, preventive conservation. (See Cronyn 1990, Guldbek 1969; Guldbek and MacLeish 1990; Sease 1987).

If the leather is in a dry, stable condition, no treatment may be necessary. Leather dressings should not be applied to dry stable leather. Items that need to be cleaned, repaired, or reshaped should probably be referred to a professional conservator, especially one specializing in leather care.

Moisture and heat cause the majority of problems for leather objects. Moist leather may mold or mildew and should be kept damp and refrigerated until it can be properly conserved; leather should never be allowed to freeze.

Red rot is the common term used to designate the deterioration of leather objects, particularly vegetable tanned skins, due to reaction with sulfuric pollutants (Rose 1992:148). It is not reversible though it may be slowed with the use of a potassium lactate buffer solution. Red rot is commonly found on leather bookbindings made between 1850 and 1900.

Virtually all leather stabilization treatments will result in some shrinkage, though the degree will vary. For this reason, the size and shape of leather artifacts should be recorded prior to and following treatment. One method of stabilization is to replace the water in the leather with a more stable material, one that will coat the fibers and thereby prevent cross-linking on drying (Cronyn 1990:273). Humectants (hygroscopic chemicals which bond to the organic material in question) such as glycerol or sorbitol can be used for this purpose since both contain oils and tannins that are vital for leather stabilization (Cronyn 1990:245, 273-274). Treatments should be performed by a professional conservator.

A special caution should be noted regarding handling of leather specimens. Many treatments of leather objects advocated and performed well into the 1970s involved the use of arsenic and other hazardous chemicals. All older specimens should be assumed to contain potential skin-absorbent

toxins unless they have been analyzed by a professional conservator and are certified to be free of such chemicals. These specimens should never be handled without gloves and the gloves should also be disposed properly after a single use (consult your local Hazardous Materials disposal guidelines; see also Carson and Mumford 1994).

Masonry

Masonry refers to stonework or brickwork used in constructing structures. Examples of stonework collected from prehistoric or historic sites should be treated according to the conditions discussed in Stone; brickwork is a manufactured Ceramic material and should be treated accordingly.

Metals

Metals are broadly classed as either ferrous or non-ferrous. Ferrous metals contain iron; non-ferrous metals do not. Ferrous objects will attract a magnet if there is sufficient sound metal (iron and steel) remaining; non-ferrous metals, with the exception of nickel, will not attract a magnet (National Park Service 1995:1920).

Ferrous metals (e.g., cast iron, wrought iron, and steel) generally comprise the majority of metal artifacts from historic sites. The major cause of ferrous metal deterioration is rust or oxidation. Metals such as copper, brass, lead, tin, pewter, and silver are examples of non-ferrous metals commonly found at historic sites.

Metals are referred to as base or noble metals. Base metals corrode more easily than noble metals. The chart below depicts reactivity of metals to chemical corrosion, from the most reactive base metals to the least reactive noble metals (Cronyn 1990:171).

(base) Zinc|Iron|Tin|Lead|Copper|Silver|Gold (noble)

Metal artifacts are generally affected by oxidation or corrosion in surface or subsurface environments. The degradation of the metal results from electro-chemical reactions that form mineral encrustation. The rate of these reactions is dependent upon the nature of the metal and the microenvironment of the surrounding soil (e.g., soil pH, porosity, naturally occurring salts, moisture content) and pollutants in the air (e.g., oxygen, carbon dioxide, salts) (Wilson 1983:39; National Park Service 1995:19; Hamilton 1976). Metal that is exposed to these chemicals forms corrosion products such as oxides, carbonates, and sulfates (Cronyn 1990:171). Once a metal object has been deposited into a deposit, it will begin to corrode in order to achieve a state of equilibrium with its surroundings. When the item is excavated and placed into a new environment, the equilibrium is destroyed, allowing for further corrosion (Wilson 1983:40; Scott et al. 1991). Most metals will also tarnish in dry air, though the introduction of water will accelerate this process. Even more stringent requirements must be met for preserving metals that are excavated from wet contexts (Hamilton 1976). All metal storage environments should be dry.

Conservation of metal objects is difficult at best, and should be referred to or performed under the supervision of metal conservators. Before any treatment can be undertaken, the composition and stability of the metal or its alloys must be identified and assessed. The condition of the artifact and the type of metal will determine the process to be used to clean and stabilize the object. Corrosion products are extremely difficult to remove without causing damage to the object; in some instances the corrosion products are actually harder and stronger than the metal itself. Scraping dirt off with a metal tool or brush may scratch the objects surface. If little or no metal remains, cleaning by an inexperienced person may cause disintegration or irreparable damage to the object. One method that is used by conservators to identify and decide on conservation treatment is X-ray radiography.

Because metal conservation is expensive and time-consuming, only a select group of artifacts may undergo treatment beyond the initial cleaning stage. These should be chosen for their suitability to

treatment and for their potential research or exhibit value. Wilson (1983) uses a tripartite classification of the stages of deterioration to evaluate potential specimens for their suitability for further treatment:

- Metal objects with substantial metal cores and consolidated surfaces that are capable of withstanding any of the various conservation treatments;
- Metal artifacts that are badly corroded but retain their shape. Little core metal remains and it is so weak that most treatments would damage the object; and
- Artifacts that are so badly corroded the only treatment is consolidation, or in the case of encrusted objects, casting is the only means of preservation or recovery of the object.

Many metal objects are better left untreated, providing they can be placed in a stable storage environment. Preventive conservation may be the best option for the bulk of archaeological metal objects.

Because lead is toxic, a handling and storage caution is warranted for all lead artifacts. Handling should be kept to a minimum. The use of gloves is recommended to protect the artifact and the handler. Avoid breathing particles from the corrosion products. Prolonged exposure requires the use of a respirator or mask when handling lead objects. Lead artifacts should also be stored separately so that the acids and vapors from organic materials (e.g., paper, cardboard, wood, cotton) that can cause lead to corrode, are not placed in or near the lead objects storage container (Sease 1987:83).

Plaster

Plaster is a combination of earth and other constituents, that is applied in a wet state to structures; upon drying, it acts as a protective sealing coat or a smooth final surface that can be decorated. Plaster or “mud” as it is still referred to today, consists of a mixture of clay or earth, to which sand, animal blood, hair, grass, etc. are added to improve the workability and strength of the material, and to prevent shrinkage and cracking upon drying. Mud-lime, an even stronger combination, contains lime produced by burning shell or limestone.

In various regions of the United States, prehistoric structures were plastered to protect the construction and, in the case of ceremonial structures, to provide a smooth surface on interior walls to which ceremonial paintings could be applied. Walls constructed prehistorically and historically with techniques such as wattle and daub, rammed earth, and adobe brick all require the application of a protective plaster top coat to seal out moisture that would otherwise compromise the strength of the walls and hasten the deterioration of the construction materials.

Plaster was also used to provide a smooth coat on interior walls that could then be decorated with paint, paper, or cloth, as seen in prehistoric kiva paintings, colonial silk wall coverings, or the many layers of painted plaster found in historic American structures. Plaster can be used with any type of construction e.g., wood, stone, or brick, by applying the mud to a wood lath, metal screen, or other roughened surface that facilitates the adherence of the mud and application of several layers to produce a final smooth surface. This technique has evolved into today's prefabricated plaster wallboard that receives a final coating of mud to fill in any seams or fissures to produce the desired smooth surface.

Up until the close of the 19th century, plaster was made primarily of calcined lime (calcium carbonate); this was gradually replaced by calcined gypsum (calcium sulfate) plaster (MacDonald 1989:3). “Historically, gypsum made a more rigid plaster and did not require a fibrous binder. However, it is difficult to tell the difference between lime and gypsum plaster once the plaster has cured (MacDonald 1989:4).”

Plaster was also used extensively to create decorative architectural elements that were appended to ceilings and walls. This technique fell out of favor during much of the 20th century, although the preservation and rehabilitation movements of the 1970s have created a new interest in the use of plaster as a decorative technique.

Plaster will be retained in archaeological collections for a variety of reasons e.g., as documentation of construction techniques, to record original paint colors used in historic structures, to preserve decorative architectural elements, or to preserve decorated wall panels that may have religious significance or potential for interpretive uses.

Because plaster is dried earth mixed with aggregates and other materials, moisture presents the greatest hazard to its preservation. Absorption of moisture in any form will weaken the original bond and cause swelling, distortion, decomposition, cracking upon re-drying, and eventual loss. Depending upon the constituent materials and how well they were proportioned and mixed, whether multiple layers had similar shrinkage rates, whether the plaster cured under optimum conditions (5570 F), some plaster may have inherent structural problems that lead to cracking or crumbling (MacDonald 1989:7).

Plaster reaches an equilibrium with the water content in the environment; samples removed for study or storage should not be subjected to rapid desiccation, nor should they be enclosed in airtight containers that might promote mold growth. If polyethylene bags are used to transport the sample, they should be punctured to permit air exchanges.

Plaster is also very brittle and requires external support to maintain its original structure. Place samples in rigid walled containers, adding support with custom-fitted ethafoam if needed. Extremely brittle or crumbling plaster may require consolidation by a professional conservator. Plasters containing botanical or proteinaceous materials may attract infestation and should be monitored routinely.

Plastics

Plastic materials are manufactured from “complex organic compounds produced by polymerization, capable of being molded, extruded, cast into various shapes and films, or drawn into filaments used as textile fibers (Riverside Publishing Company 1994:900).” Natural plastic materials such as amber, horn, bone, tortoiseshell, shellac, lacquer, and latex, etc. have been used for many centuries to manufacture items by heat treating and shaping the original material into the desired shape.

In the early 19th century, industry’s search for materials that were both flexible and moldable, resulted in “semi-synthetic” plastics manufactured from natural materials in combination with various chemicals. These included materials such as vulcanized rubber (vulcanite) and cellulose nitrate (known by various names such as Parkesine (1860s), celluloid (1870s onward), and cellophane) (Katz 1984:9). Nitrocellulose was widely used between the 1870s and the 1920s to make common household items such as dresser sets (mirrors, combs, brushes), cutlery handles, toys, eyeglass frames, buttons, and other plastic items. Objects manufactured prior to 1920 that have the appearance of clear plastic are likely to be cellulose nitrate. The first true synthetic plastic, Bakelite, was manufactured from phenol formaldehyde in the 1900s. The combinations since then have been limitless.

All plastics pose preservation problems because they are susceptible to rapid deterioration through oxidation. Depending upon their formulation, the off-gassing byproducts of deterioration can be hazardous to other materials, especially metals, and to humans. The semi-synthetics such as cellulose nitrate and cellulose acetate are inherently unstable and cellulose nitrate in particular is flammable, particularly if stored in conditions with poor air circulation. In general, the semi-synthetics are more susceptible to deterioration, while many recent plastic materials include anti-oxidants as part of their formulation. Nevertheless, all plastics remain susceptible to rapid degradation and deterioration under adverse conditions. Deterioration can cause loss of flexibility and strength, shrinkage, cracking, color change, or changes to the surface composition.

The rate of deterioration by oxidation can be further affected by temperature and light levels. Another cause of deterioration is exposure to caustic chemicals such as sulfur dioxide and nitrogen dioxide, especially when coupled with high humidity. High humidity will also promote fungal growth on cellulose nitrate materials. Physical stress can also cause breakage that leads to additional deterioration.

Morgan (1991) identifies light, relative humidity, temperature, and ventilation as the prime factors to be considered in preserving plastics. He cautions, however, that ideal conditions are material-specific e.g., cellulosic materials require low humidity about 40%, whereas cellulose nitrate and nylon become brittle at low RH and require an optimum of 60% (Morgan 1991:10). If humidity cannot be controlled, serious damage can be avoided if plastics are placed in minimal light, cool stable temperatures, and good ventilation. The latter is particularly important, as plastics tend to off-gas as they undergo chemical reactions. Cellulose nitrate objects should be segregated from other materials and never enclosed or touching one another. These objects should be routinely monitored for any sign of active deterioration that would indicate unstable, dangerous conditions.

Other plastics or synthetic rubbers should also be kept in an environment that is dry and has low temperature and light levels. Do not place these materials in sealed polyethylene bags, as the off-gassing vapors can accumulate and accelerate the deterioration (see Dubois 1943; Roff et al. 1971; Johnson 1976; Katz 1984; CCI ICC Notes 1986; Selwitz 1988; Williams 1994).

Shell

Shell is composed of layers of calcium carbonate. Exposure to acids in surface and subsurface environments weakens and softens these layers causing exfoliation and crumbling. Worked shell (e.g., beads, buttons, gorgets, etc.), regardless of its appearance of stability, should be treated by a conservator. Many of these artifacts may require some form of consolidation before they can be processed further.

Examine all shell carefully before cleaning. Unmodified shell can be cleaned gently with a soft brush to remove surface dirt. Although dry brushing is the preferred method of cleaning, if shell is washed, it must be done so very gently as it is highly susceptible to damage from abrasion as well as exfoliation due to absorption of water. Some unmodified shells may have been used as containers for food or pigments and should not be cleaned.

Shell should be thoroughly air-dried before packaging. Because it is hygroscopic (absorbs moisture easily), it should never be stored in air-tight containers. Vent bags or rigid-walled containers.

Shell is susceptible to degradation by Byne's disease, an efflorescence that is triggered by storage environments with high levels of carbonyl pollutants (Grzywacz 1995:197). Large collections of shell will require well ventilated storage areas and pollutant monitoring and filtration. Prevent rapid or frequent fluctuations in temperature and humidity.

Soil Samples

Soil samples from archaeological sites are collected so that one or more tests can be performed on the soil, each of which can reveal different things about the site or geographical location. Soil analysis of hearths, the contents of a vessel, or the remains on a floor of a structure, can reveal what types of organic matter were utilized during the occupational period of the site. Soil analysis can also answer questions about the climate and environment during a particular period of time.

Various types of analysis from soil include pollen, phytoliths, radiocarbon (C^{14}), thermoluminescence (TL), particle size analysis (PSA), archeomagnetometry, phosphate and acidity levels, and heavy and light fractions from flotation (National Park Service 1995:910; Smith 1983:57). Each soil sample is treated differently in terms of the collection techniques and analysis, yet outside contamination can ruin any sample. It is recommended that the individual doing the analysis instruct the field archaeologist on how and where to remove the soil samples. Better yet, if possible, the expert should remove the samples themselves to ensure proper removal techniques and to minimize the possibility of contamination.

Given the cost of storing archaeological materials, there is a temptation to discard bulk soil samples that may not have been processed during the original investigations analysis of the collection. Like all archaeological remains, once soils have been excavated, they cannot be replaced in their original contexts or duplicated by samples from other locales within a given archaeological site. A representative minimum (1000 cm³) should be retained of each soil sample collected in the field.

Soil samples should be stored in a dry environment (< 65% RH) to prevent the growth of microorganisms that would cause deterioration of any organic content and contamination of the sample. They should be thoroughly air-dried before being placed into a storage container. The storage container, be it polyethylene bagging or a rigid container, should contain a label on the inside as well as on the exterior. Tyvek can be used to make interior labels that are moisture and grime resistant.

Stone

By definition, stone is concretionary earthy or mineral matter (Riverside Publishing Co. 1994:1142). The formulation of the mineral content, the types and kinds of inclusions, the hardness, the porosity and consequent permeability, and the environmental conditions in which the stone is deposited, all affect the durability of each specimen (National Park Service 1990:P:11; Shapiro 1983).

Moisture and temperature are the primary agents of stone deterioration. Atmospheric water and the chemicals it transports, combined with the permeability of stone (the ease with which fluids pass through) affect the rate of deterioration. The more caustic the solution and the more permeable the rock, the greater the deterioration. Airborne pollutants such as carbon monoxide, nitrogen oxides, hydrogen oxides and sulfur oxides, as well as particulates of dust, coal, and soot are deposited directly or as part of atmospheric water. Temperature comes into play when fluid-saturated stone is frozen or dried. Water increases approximately 9% in volume upon freezing, thus causing expansion pressure upon the stone material (National Park Service 1990:P:16). The greater the number of freeze/thaw cycles, the more likely the stone will undergo fissuring from this expansion, and ultimately segments of rock will spall from the parent rock. If the liquid contains soluble salts, the salts will crystallize upon drying and will appear as an efflorescence layer on the surface of the stone, or if they crystallize beneath the surface they will exert pressure that may cause delamination of the surface or fissures in the body of the stone. The hardness (resistance to scratches as measured with a Mohs scale) of the stone will also determine how susceptible it will be to abrasion from bioturbation or from wind-borne particles prior to its collection.

Stone that has been fragmented by any of these processes will be more susceptible to increased rates of deterioration as well as attack by algae, fungi, or botanical growth in the fissures. Although these forces should no longer be in effect in a controlled environment in a storage area, all archaeological specimens will have undergone weathering in situ prior to their excavation and collection. This will determine the amount of care or treatment required to stabilize them for long-term curation. Curated stone specimens remain susceptible to abrasion from poor storage conditions or mishandling, particularly when specimens are very large or heavy. Stone can also absorb oils from hands or stains from other materials used in storing, studying or exhibiting them.

Within the last ten years, cleaning stone artifacts has become the exception rather than the rule. This is due, in large part, to the increase in techniques to analyze microwear patterns and residues via techniques such as electronmicroscopy, pollen washes, serum analyses, and gas chromatography. Unless the specimen must be cleaned for exhibit purposes or to enable special analyses, only the small area needed to label the specimen should be spot cleaned using a cotton tipped swab and water (distilled or deionized water would be preferred; tap water is okay). If stone is to be cleaned completely, the cleaning methods should be suited to the hardness and durability of the stone material. For example,

- Soapstone, sandstone, and limestone are soft and can be damaged if cleaned with a hard bristled brush. Polished alabaster should not be washed.
- Mica tends to delaminate and may require consolidation by a professional conservator before

attempting any further processing.

- Porous granitics, fire-affected rock, or vesicular basalt should be examined first for stability, before any cleaning is attempted.
- Specimens with powdery white deposits on the surface probably contain salts. These should be referred to a conservator for consolidation (if necessary) and removal of the salts.
- Prehistoric ground stone objects requiring repair should be referred to a conservator who can determine the best adhesive or consolidant for the particular type and weight of stone prior to further processing.
- Never use acidic cleaning solutions (found in most commercial stone cleaners).

Any stone that is cleaned with water should be permitted to air dry thoroughly before it is processed further. Artifact bags should be ventilated unless the specimen has been protectively wrapped to preserve its depositional matrix for special analyses. Large stone items such as metates should not be stored directly on the floor and should be protected from dust by using closed containers or sheets of polyethylene as covers over open storage.

Stable stone objects should be stored in environments having a temperature range of 55F / 75 F and RH of 40% / 60%. (National Park Service 1990:P16:21). Stone suspected to contain soluble salts should be stored in dry conditions (e.g., <35% RH).

All stone specimens should be protected from abrasion due to movement within the storage container. Each formed tool or artifact should be stored in an individual artifact container, padded as necessary. Debitage or rock samples may be stored in bulk lots.

Textiles

Textiles are made from animal and vegetable fibers, and in the 20th century, from natural and synthetic polymers (National Park Service 1995:25; Keck 1974). The primary causes of the deterioration of textiles are the natural instability of the fibers, mechanical damage, detrimental environmental conditions, and attack by insects or microorganisms. Mechanical damage may result from internal stress, exposure to the elements, or handling and use. Damage that resulted from original use may be preserved as a record of the artifacts function and use. Damage from improper curation should be documented and stabilized until a professional textile conservator can evaluate the specimen and make any requisite repairs. Minor treatments should be restricted to providing support for weak or damaged areas until they can be professionally treated.

Environmental conditions such as light, heat, and pollution can damage textiles, particularly those made from organic materials that are more susceptible to aging. Insects and microorganisms may utilize textiles as habitation sites and/or as a food source. Organic textiles are also subject to attack by molds and bacteria, and if in subsurface contexts, they are also susceptible to deterioration by the chemical and physical conditions of the soil. Moisture can destroy vegetable fibers and excessive heat will cause desiccation and embrittlement of the fibers. Exposure to light will cause dyes to fade and the textile fibers to deteriorate.

Recommendations for optimum environmental conditions for textiles vary slightly; 6070F, 3550% RH according to Commoner (1992:88) and 5568 F, 4050% RH per Orlofsky (1992:80), but the important factor is to choose levels within these ranges and maintain them. Textiles should be stored in the dark when not in use. Light levels for examination or display should be 50 lux (5 footcandles), and for limited duration only (Orlofsky 1992:80).

When handling textiles, always wear gloves to protect the artifact from transfer of oils and acids from human skin. Cloth gloves are recommended unless the textile has frayed surfaces that might snag more easily on cotton gloves; in those instances, use polyethylene gloves.

A professional conservator should be consulted regarding any attempt to humidify, soften, unfold, or stabilize textiles, or to repair or strengthen weak or torn areas. If the textile is folded or crumpled, no attempt should be made by anyone other than a textile conservator, to unfold or flatten the textile. Four contributing factors cause the deterioration of textile objects (National Park Service 1990:K:12; Florian et al. 1990).

- The natural deterioration of fibers composing the textile object. This includes chemical and physical instability of the material, interaction with other incompatible materials, and the degradation of by-products used in the manufacturing of the textile object.
- Damage resulting from excessive handling, inadequate storage and display environments, natural disaster, and vandalism.
- In-house environmental effects (i.e., pesticides, light, smoke, carbon dioxide).
- Damage resulting from insects and microbiological infestation.

If cleaning of textiles is necessary, a gentle vacuuming with a low suction vacuum equipped with a rheostat to control the speed, is the most effective and least harmful method of removing most dirt and microorganisms. Vacuum through a nylon screen or with a nozzle covered with cheesecloth, and use an up and down motion rather than back and forth. Avoid direct contact between the vacuum nozzle and the textile. Additional cleaning treatments should only be undertaken if absolutely necessary and only when under the supervision of a professional textile conservator. These include wet or dry cleaning methods that employ solvents, including water.

Any treatment used to clean and/or stabilize a textile artifact should be thoroughly documented on a treatment record that notes the materials and procedures used, the date of the treatment, and the name of the person performing the treatment. If the appearance of the artifact will be significantly altered by the treatment, before-and-after photographs should be taken to document the appearance and condition of the artifact.

Textiles should be placed in an acid-free environment as soon as possible. Textiles can be padded with unbuffered acid-free tissue to avoid any undue stress on vulnerable areas and to prevent creasing or folds. Unbuffered acid-free tissue is best for protein-based textiles such as silk, wool, fur, or leather. Textiles should be stored in the dark whenever not in use. If exhibited or under study, light levels should be maintained at 50 lux or less, with the maximum acceptable UV level of 75 μ W/lumen (a proportion of the visible light level) and relative humidity levels between 50% / 55% (National Park Service 1990:K:19-20). Hunt (1992:133) recommends that light and temperature levels not exceed 5 footcandles and 65 F (18 C) for natural fibers.

Basketry and Cordage

Basketry and cordage are considered to be textile materials because they are manufactured from botanical materials. Both may be recovered from prehistoric as well as historic sites. They are usually very fragile and require special handling and are extremely perishable. Basketry or cordage that survive in the archaeological record are generally found under very dry or very wet conditions. These factors will temporarily act as stabilizers for the materials while they are in situ. Materials removed from these environments must be packaged and stabilized according to their condition. In general, after treatment, optimal environmental conditions are the same as those for textiles and for botanicals, that is RH of 50-55% and a temperature range between 55-70 F.

Dry basketry or cordage tends to be brittle and highly prone to breakage. Extra care must be taken when handling these materials. These materials benefit from custom-designed supports or packing (Clark 1988). Supports provide both structural reinforcement as well as a means to handle the specimen container without coming into direct contact with the specimen. When handling specimens directly, whole baskets should never be lifted by the rim or any handles because of the risk of breaking them. They should be lifted by placing both hands beneath the basket if feasible, or one hand against the side of the basket for support.

Large fragments may be placed on a nest of acid-free tissue paper in an acid-free cardboard box deep enough to allow closure of the box without applying pressure to its contents. Do not place this box inside a bag. Tie the lid of the box with a piece of cotton twill tape, being careful not to tip or turn the box over. Label the exterior of the box with handling information such as "Fragile", "Do Not Tip", or a directional arrow indicating the top of the box. Small fragments of basketry or cordage may be placed in boxes with shape-specific padding or immobilized by encapsulation in two polyester sheets (e.g., Mylar) closed with double-sided tape.

Wood

Wood preservation at most archaeological sites is generally very poor. An exception is wood that is preserved in arid caves, tombs, or in anaerobic conditions such as underwater or submerged in silt. Wood is vulnerable to damage from a host of agents, particularly moisture, light, fire, acids, alkalines, salts, infestation, and human reuses (Merrill 1974; National Park Service 1995: 2526).

Wood is hygroscopic, shrinking and swelling with variations in relative humidity. It is also anisotropic which means that the shrinkage and swelling are not dimensionally uniform. The combination of these two traits leads to cracking and distortion of the original shape of the wood (National Park Service 1990:N:9).

Wood that is dry should never be exposed to water. Cleaning should be limited to dry brushing, vacuuming, or careful cleaning with wooden tools (metal tools may damage wood artifacts). Moist wood should be kept moist immediately after excavation until it can be treated by various methods for removing the water without causing the cells to collapse due to the lack of support. Wood and other organic materials that is found in wet environments can be irreversibly damaged if allowed to dry out for even a short period of time. A conservator should be consulted for assistance with these methods. Large wooden artifacts can be packed in wet polyethylene sheeting until they can be treated. Small artifacts may be triple bagged in zip-lock bags then refrigerated. Objects that are discovered in fully wet environments should be moved directly to wet storage so that they never are allowed to dry.

Fungal activity is the single greatest cause of biodeterioration of wood. Fungi are found nearly everywhere, and various species are capable of staining or consuming wood. Fungal activity may be reduced or eliminated by controlling humidity, and avoiding direct exposure to water.

Relative humidity levels for wood storage is dependent on the area of the country that the repository is housed. The National Park Service Museum Handbook (1990:N:31) states that the relative humidity level should be 50% / 5%. However, in a drier climate such as that of the desert Southwest, recommended relative humidity levels should be between 35% / 40% and along moist coastal zones 55% / 60% is acceptable (1990:N:31). The most important thing to remember is to maintain a constant level of humidity and prevent excessive fluctuations because of wood's sensitivity to water. Temperature is critical in so far as it affects relative humidity and should be maintained at the lowest comfort level to reduce agents of deterioration (i.e., mold and fungal growth)(National Park Service 1990:N:3132).

Light levels should not exceed 200 lux for exposed wooden objects that are finished and 300 lux for unfinished wooden objects (National Park Service 1990:N:32). Hunt (1992:133) recommends an optimum of no more than 5 foot candles and 65 F or 18 C. Light can damage dyes, finishes, the natural color of heartwood (the center portion of a tree from which many wooden items are constructed), and any upholstery on the wooden item.

Exposure to handling and airborne contaminants should also be kept to a minimum. Dust accumulations can be abrasive and cause scratching of the surface. Oils from hands can also be damaging.

Audiovisual Materials

The most important thing to remember about audiovisual materials is that they must be kept free of dust. Dust and other particulates can abrade and scratch tapes. These scratches may distort sound or picture, or may result in blank areas on the tape. Disc-recordings should be stored in a vertical position at all times; do not allow them to lean because of the possibility of warping. Inner sleeves should be replaced with archivally sound sleeves. Disk recordings should be handled on the edges and only when wearing cotton gloves. Reel-to-reel and cassette tapes should be stored away from stray magnetic fields which can erase all or part of the recording. Vertical orientation on shelves is recommended. Cassette tapes are not considered a good medium for long-term storage and should be transferred to reel-to-reel tapes, if possible. Videotapes should be kept in an environment similar to reel-to-reel tapes. They should be stored in the played position and rewound only at the time of the next use.

Tapes, both audio and video, should always be rewound slowly. The use of fast-reverse or fast-forward speeds will create fluctuating tension in the tape and can be damaging. Tapes should only be handled by their housing and bare hands should never touch the tape surfaces. Also remember that each time these materials are played, the playback heads, even if well maintained, will cause degradation to the tape (Ritzenthaler 1993:74).

A special note needs to be made here concerning historic movie films. These may be 8- mm, 16- mm, 35- mm, or 72- mm films. Those produced prior to 1950 should not be handled any more than necessary. Earlier films were made with nitrate negatives (see Photographic Materials) and are extremely dangerous. When stored in improper conditions these films deteriorate and form a highly combustible chemical coating. In extreme cases the spark from opening a film canister or friction from unrolling the film just to see what it depicts is enough to cause these materials to burst into flames. These materials should only be opened by trained individuals and in fire-retardant areas. Do not discard these materials in a dumpster or with household trash. Nitrate film and negatives must be transferred to fire protection officials for proper destruction.

Because of the more stringent storage requirements for audiovisual materials, they should be removed from the collection and stored elsewhere (e.g., locking cabinets) in the repository. When these materials are removed from collections, indexing and cross-references must be provided for research use. This practice ensures that the materials are not permanently separated from the rest of the document collection and intellectual control is maintained.

Technical obsolescence (as in the case of phonographs) or other damage can render audio and visual recordings unusable. Transcripts ensure that the informational content is preserved. For this reason, transcripts should be made of all audio-video materials as soon as possible. In this manner, conversations and their content are preserved, even if picture or voice inflection is lost.

Dust and particulates may be lessened by proper packaging and by installing filtering systems on environmental controls (i.e., HVAC systems). As with other archival materials, lower temperature and relative humidity (<68 F and <35% RH) will prolong the lifespan of these materials. Fluctuations in temperature and relative humidity (greater than a rate of 3% and 5% RH per month) will hasten the deterioration of these materials (Ritzenthaler 1993:74).

Cartographic Materials/Oversize

Drawings Due to their size and the damage inherent to larger formats, these materials are frequently those that require the most conservation. All too frequently these items are dirty, torn, and generally mishandled.

Dry cleaning can be performed with a soft bristled brush and a vinyl eraser used for gentle cleaning. These activities must ensure that no damage or residue is left on the document. Vigorous cleaning often does more damage than leaving the document soiled. Some documents can be safely washed in

water or solution, but care should be taken that the inks on the document are not washed away. This should only be undertaken by a professional conservator. In cases of extreme acidity, the archivist may wish to deacidify the document. Wei T'o deacidification solution comes as a liquid or as a spray. Again, as in wet washing, the inks on the document must be tested first to ensure that they will survive the deacidification process. Never fully submerge documents in liquid solution of any type unless you are positive permanent damage will not result. Documents can be treated with Japanese tissue and wheat starch to mend rips and tears. Adhesives such as tape or glue can be removed through careful physical removal or the use of solvents.

Folded or rolled materials may be humidified and flattened prior to storage in order to lessen the damage made along creases. Humidification introduces small amounts of moisture into paper fibers through the use of an enclosed humidification chamber. The process relaxes the paper fibers and allows the gentle unrolling or unfolding of the document. The flattened document is then placed between two clean, dry sheets of alkaline-buffered blotter paper. This "sandwich" is then weighted down by evenly distributing weights on top of the "sandwich". The document is allowed to air dry slowly. Once dry, the flattened document can then be properly stored (Ritzenthaler 1993:184185).

Finally, fragile or frequently handled documents, regardless of their size, may be encapsulated in sheets of Mylar film. The rigid mylar provides extra support for these documents, prevents further transfer of acids from the users hands, and provides a translucent surface through which both sides of the document can be viewed. Still, care must be taken in handling encapsulated documents. Encapsulation consists of cutting two sheets of mylar, one inch larger than the dimensions of the document. Archival double-sided polyethylene tape is affixed to all four edges of one sheet, save for a small vent in one corner. The document is then placed atop the taped sheet and carefully centered so that one-half inch of space is left between all edges of the document and the tape. The second sheet of mylar is placed on top of the document and gently pressed to adhere the two sheets of mylar and remove trapped air through the corner vent. Paperweights can also be used to remove the air, seal the tape, and prevent slippage of the document. Encapsulated materials should be periodically checked to make sure that the document has not slipped and is not in direct contact with the tape.

For further reading on the above techniques, see Appendix D in Ritzenthaler (1993). None of these treatments should be performed without consulting a qualified document conservator. Any and all treatments performed must be recorded in the Curation History or documented in the accession file.

Even if no treatments are necessary, cartographic or oversize materials are usually separated from the rest of the collection so that they may be stored appropriately in large size containers. Cross-index notes should be left in the original file and with the oversize material. This cross-index and separation must also be reflected in the finding aid.

Electronic Media

Electronic media may be classified into two general typesmagnetic and optical. Magnetic media includes materials such as diskettes or floppy disks, hard drives, DAT tapes, and conventional tape backups. Magnetic media can be partially or totally erased by electromagnetic fields. This damage can be caused by something as simple as laying a disk too close to a telephone or stray static electricity from the users clothes. Dust and humid conditions can corrupt the disk, causing lost sectors of information on the disk or tape much the same way as with audiovisual material.

Optical media is physically more stable than magnetic media and includes CD-ROM, WORM (Write-Once, Read Many), magneto-optical disks, and phase change disks. These materials are not susceptible to destruction through dust light, heat, or humidity (Balough 1993:36). While more stable than magnetic media, optical media is not considered archival or permanent either.

Technical obsolescence, however, creates the primary problem with curation of electronic media. Computer technology changes so quickly there is no guarantee that information recorded in electronic

form this year will be retrievable on the next generation of computers. Software poses an additional layer of difficulty; changes in software virtually guarantee information stored in electronic form will not be readable unless that software (and that particular version) is still operable. Even in the case of optical media, ten years is approximately the life span one can expect and there is no guarantee the new equipment can read older disks (Balough 1993). It is important to remember: "even if the media lasts, if the machine and all the software necessary to interpret it are not usable, the information may as well not exist because it will not be accessible [sic]" (Balough 1993:28).

Long-term storage of electronic formats is not viable. If electronic media are submitted, the following provisions must be made: (1) routine inspection of software to ensure readability, (2) duplication of all files in hard copy format and on disk, and (3) routine transfer of files into formats compatible with new software and hardware. Store magnetic tape in cool, dry environments of 40F / 70 F and 20% / 30% RH, with variations of no more than 3 F and 5% RH (Wheeler 1998).

Microform

"Microforms are photographic images that are 20 to 150 times smaller than the original" (Balough 1993:17). This reductive ratio enables a large number of images to be recorded onto a small space. While microform, like electronic media is machine dependent, issues of technological obsolescence are not as critical. Archival microfilm has proven stability and too much has been invested in it to "switch over" to another medium easily. Finally, microfilm may be read with a microscope, if all else fails.

Generally microform is produced on film with a life expectancy (LE) of 500 years (Fox 1996:3031). The procedures for microfilming and the materials used are standardized and accepted throughout the archival and library communities. When preservation microfilm is produced, three copies are made: a master negative, a printing master, and a service copy (Fox 1996:32). As long as the printing master and/or master copy is available, service copies may be made for a relatively low cost.

Microform is available in a variety of formats and sizes: 35 mm, 16 mm, 105 mm, and microfiche. 35 mm is the standard for preservation purposes (Fox 1996:31). Long-term storage areas should be kept dark, dust-free, protected from natural disasters, and temperature and relative humidity should not exceed accepted standards. Medium-term storage should have the same basic conditions, but the temperature and relative humidity standards are slightly less stringent. For a full discussion on all stages of microfilming see Fox (1996).

Paper

Paper, due to its organic nature and the manufacturing process used to produce it, is extremely acidic. Today's paper has a life expectancy of less than fifty years. Acidic paper turns yellow and brittle with age and eventually disintegrates. This natural degradation can never be completely halted, but it can be slowed to a much lower rate. This deterioration may be partially combated by photocopying the information onto acid-free paper or by applying a buffering agent to acidic paper. Acid-free paper has a pH close to neutral or may be slightly alkaline. It is more stable and lasts longer than acidic paper. Acid-free papers may be ordered with varying pH values (see Table 5-22). Other paper types commonly encountered in archival collections include onionskin paper and newsprint. Of these two types, newsprint is the most unstable and acidic. It should be replaced immediately if found in the collection. Not only will newsprint deteriorate rapidly, but it will transfer its acidity to any other paper it touches. Onion skin paper should also be copied onto acid-free paper if at all possible.

Obviously the paper itself is of secondary importance to the data recorded upon it. Carbon ink, Chinese ink, India ink, carbon ribbon inks, and most printing inks are permanent and pose fewer problems for long-term storage and preservation than colored inks. Colored inks and many of the inks used in felt tip pens are water soluble and very unstable. Even ballpoint ink is relatively unstable; it

sits on the surface of the paper and is soluble in many solvents. There is always the danger that the ink will run and become illegible if it is exposed to liquids or extreme moisture levels.

Adhesives are a concern in preservation of paper for several reasons. First, they are often misapplied and cause damage to a wide variety of materials. Adhesives may break down over time, losing their tackiness; they also may permanently stain documents and initiate harmful chemical reactions that hasten the deterioration of paper.

Deteriorating adhesives can also attract insects and other pests. Some common adhesives are tape, glue, and rubber cement.

Metal fasteners such as staples and paper clips can rust, leaving permanent stains; they also can function as cutting edges against which paper will break as it is flexed over a period of time. Rubber bands deteriorate, dry out, and attach to paper fibers, making them virtually impossible to remove without damaging the document. Alternative methods of attaching paper include zip-staplers and archival paper clips.

The rate of paper deterioration is dependent upon the inherent chemical stability of the material, in combination with external influences such as the environment, storage conditions, and handling procedures. It is susceptible to embrittlement and deterioration by high temperature, humidity, and light levels, as well as chemical and physical attack by airborne pollution and biological agents.

Paper is hygroscopic; it readily absorbs and releases water vapor, and these fluctuations strain the organic fibers. Most chemical reactions that cause paper objects to deteriorate occur twice as fast with each 10 F increase in temperature (National Park Service 1990:J:7). When relative humidity is low (< 40%) yet temperature is high (> 70 F), paper becomes embrittled. Any adhesives on the paper will dry out, bookbindings will crack, and paint will begin to flake. However, if the relative humidity is high (> 60%) and the temperature is high, then the excessive dampness will result in cockling, paint loss, hydrolysis of adhesives and parchment, mold growth, and staining on paper products (Shelley n.d.:29).

In general, dark, dry and cool are the operative factors in preserving paper. If humans are also using the area where paper collections are stored, a constant temperature between 60F / 72 F is optimum; if the area is for storage of paper only, then temperatures can be maintained at less than 60 F and between 30% / 35% RH (Van der Reyden 1995:332).

The fading and drying effects of light on paper objects are cumulative. Paper that is on exhibit should have no more than a maximum of 50 lux or 5 footcandles for no longer than a total of six months (National Park Service 1990:J:3738). Black ink on white rag paper is less apt to fade than colored inks or colored paper. Ultraviolet radiation should be screened from windows or from storage and collection use areas at all times. Archival materials must be protected against ultraviolet (UV) radiation and active visible light, both of which have a damaging effect on paper and speed up chemical reactions. Direct sunlight can be very damaging. The easiest way to combat this threat is through fluorescent, nonUV light systems, or better yet incandescent lights, set up where documents are exposed.

Airborne pollutants can also hasten the deterioration of archival materials. Gaseous pollutants such as sulfur dioxide and nitrogen dioxide combine with moisture in the air to form acids which then attack the fibers in paper. Solid pollutants such as dirt and dust transported through the air can damage archival materials through abrasive action. In addition to abrading paper and thereby obscuring information, many of these pollutants also permanently stain paper. Air filtration systems control the pollution levels from both gaseous and solid pollutants, in addition to prohibiting mold growth.

As an organic product, paper is a natural food source for a variety of pests. Adhesives on the paper often provide additional incentive for infestation. Preventive Integrated Pest Management measures are essential in ensuring that paper is protected from this source of deterioration.

Table 5-26. Classes of Paper Based on Acid Content (Balough 1993:14)

Type	Acidity	Life Expectancy (LE)
One	pH 7.5-9.5	Several hundred years
Two	pH 6.5-7.5	50-100 years
Three	pH 5.5-6.5	About 50 years
Four	pH under 5.5	Under 50 years

Finally, paper is also very susceptible to damage incurred during handling. Paper should be supported when transported (e.g., placed in a folder before moving from one location to another). Paper should not be creased or folded so that the fibers remain intact rather than bent or broken. This will preserve the original strength of the paper fabric. Duplicate or microfilm copies may be made for day-to-day use or exhibit, thus lessening the damage incurred from frequent handling. Paper conservation techniques such as cleaning, mending, deacidification, encapsulation, and humidification, and flattening are discussed under Cartographic Materials/Oversize Documents above.

Photographic Materials

General Photographic materials pose a unique set of difficulties for long-term storage. Twentieth-century photographic images include prints, negatives, slides (or transparencies), and digital images. Earlier images include materials such as daguerreotypes, ambrotypes, ferrotypes, cabinet cards, carte-de-visites, tintypes, and albumen prints, just to name a few. The discussion below addresses prints, slides, and negatives which may be black-and-white, color, or sepia toned. Should other nineteenth century images be noted, contact a trained document/ photograph conservator immediately. It should be noted, however, that all types of photographic materials are unstable and require more stringent handling and storage requirements.

The first rule of handling photographic materials is always wear cotton gloves. Although the acid from human skin is invisible, it transfers to the image and will chemically attack the emulsion. Ideally, a copy of the print, negative, or slide should be created, and the original used only to make additional copies.

Every image (print, negative, or slide) should be stored in its own envelope or sleeve. Envelopes and sleeves should be constructed of either acid-free paper or an inert plastic. Plastics that are considered archivally sound include polyester (Mylar), polyethylene and polypropylene. If photographic materials are improperly stored in a single envelope or sleeve, the emulsion can become scratched or dented thus irreparably damaging the image.

Photographs and slides should be indirectly labeled. Never write directly on an image; write on the back of prints, on slide or negative sleeves, and on the cardboard border of slides. Do not use ballpoint pens or pencils - the pressure used to write the label will make an irreversible impression on the front of the photograph. These impressions crack the emulsion on the photograph, thus hastening deterioration. This danger, however, does not mean that photographs should not be labeled. If label information is not recorded, valuable information will be lost and value of the photograph limited.

The storage environment is the second significant factor in determining the longevity of photographic materials. Issues that must be addressed include: light, airborne pollutants, humidity, and temperature. As with paper documentation, ultraviolet radiation hastens the fading and embrittlement of photographic prints. This issue is particularly of concern when dealing with sepia tone or color images. These materials have an extremely short life span, and exposure to light only hastens the loss of color and definition in these images.

Air pollution can also be a source of print degradation as airborne acids attack the emulsion and particulates abrade photographic surfaces. Other types of pollutants may permanently stain images. These pollutants can also induce mold and mildew growth, which in turn, may attract insects and rodents. Much of these pollutants may be eliminated from storage areas by placing appropriate filters on the environmental systems (e.g., HVAC Systems).

High relative humidity levels (> 60%) will promote the growth of microorganisms such as mold. Fluctuating humidity levels will impose considerable strain on the adhesion of the gelatin to the support as it expands and contracts. (Hendriks n.d.:41). Ideally, the optimum relative humidity level for processed photographic material is between 30-35% (Hendriks n.d.:42).

Temperature levels also play an important role in determining the longevity of photographic materials. High temperature levels combined with high humidity levels will accelerate the decomposition of photographs, though even high temperature alone will play a factor in the photographs decomposition. For glass plates and paper prints, temperature levels should range between 59-77 F, though excessive fluctuations should be prevented. For film, a temperature below 68 F is recommended (Hendriks n.d.:42). It is recommended that photographic experts be consulted for optimum ranges in specific locales.

SOP - Monitoring

Fort Hood shall support protection with the following procedures:

Unsurveyed Areas

Fort Hood shall ensure that an archeological survey of unsurveyed area is conducted as project's require, in a manner consistent with the Secretary of the Interior's Standards and Guidelines for Identification (48 FR 44720-23) and taking into account NPS publication, The Archeological Survey: Methods and Uses (1978: GPO stock # 024-016-00091) and Fort Hood's Cultural Resource Management Plan 1995-1999. The survey shall be conducted in consultation with the TxSHPO, and a report of the survey shall be submitted to the TxSHPO for review and comment.

Fort Hood shall evaluate properties identified through the survey in accordance with 36 CFR § 800.4(c) and Significance Standards for Prehistoric Cultural resources: A case Study from Fort Hood, Texas (USACERL Technical report CRC-94-04). If the survey results in the identification of properties that are eligible for the National Register, Fort Hood shall comply with 36 CFR § 800.5.

Monitoring (Undertakings)

Construction over 100 meters from known resource:

Fort Hood will ensure that particular care is taken during construction to avoid affecting any archeological remains that may be within 100 meters of proposed construction. Restrictions on construction work and areas will be accomplished by flagging of the resource and contractor notification. Suitable arrangements for archeological monitoring will be made prior to construction in the area of question. If additional archaeological materials and features are still discovered during construction, they will be recorded, and recovery and curation of uncovered remains will occur where practicable.

Construction where deeply buried or otherwise obscured resources may occur:

Fort Hood will ensure that a predictive assessment of the likelihood of encountering sub-surface resources is produced before construction begins. This will include review of the distribution of key geomorphological sediment layers that are know to have produced resources elsewhere on Fort Hood and groundtruthed with 4 inch core borings to bedrock or at a minimum, 15 feet in deeper sediments. Depending on proposed depth of ground disturbance to meet the proposed project requirements, further sampling of sediments will be undertaken. Specific sampling procedures as required will be developed in consultation with the TxSHPO.

Monitoring (ARPA Violations)

Fort Hood will ensure that a controlled random visitation will occur at resource where previous looting and vandalism has occurred. If evidence of new looting and/or vandalism activity is present, then the evidence will be recorded, removable evidence collected, and a full assessment of damage will be in accordance with the Archaeological Resources Protection Act (ARPA) and using the Federal Law Enforcement Training Center's guidelines from their ARPA training manual. Evidence and associated documentation will be turned over to Fort Hood's Criminal Investigation Division (CID) for further investigation. A reward program is being considered to supplement information gathering.

Mitigation for damage will be proposed in accordance with the damage assessment recommendations.

Monitoring (Property Condition)

Fort Hood shall ensure that resources will be monitored in a systematic manner to identify changes in protected resources' conditions. This includes identification of unauthorized disturbances such as construction and military training activities, effects of natural activities such as erosion, and observance of any other impacts not included in the previously described monitoring plans.

Artifact Collecting

Refer to Collection Procedures (above).

SOP - Public OutReach and Education

Every effort will be made to market and promote the FTHCRM program to the interested public. The goal of these marketing efforts is to raise public awareness and encourage community members to become responsible stewards of cultural resources. A FTHCRM press package containing basic archaeological information, program specifics, and contact information should be on file with the Fort Hood Public Affairs Office (PAO) and other local medial outlets (i.e. Killeen Daily Herald). The press package will be updated annually or as needs arise. Information will be posted on the Fort Hood web page and updated as necessary.

CRM staff members will disseminate information on a regular basis regarding archaeological investigations, historical research, special finds, and program activities. Articles, press releases, announcements, and the like intended for internal release (i.e. within the installation) should be sent to the Sentinel Editor at PAO. Similar items intended for external release (outside the confines of Fort Hood) must be reviewed by the PAO Media Relations Officer. Contact the Media Affairs Officer at 287-0106, or the PAO at 287-0103. Provisions for this review process are addressed in Army Regulations 600-2 (paragraph 2-6e) and 360-5. Local media (television, radio, etc.) are aware of the above-mentioned restrictions, however CRM staff should remind media members to contact PAO.

Formal presentations addressing any aspect of the Fort Hood CRM program, and given at meetings of learned societies or professional organizations, must also be approved by the PAO. The Media Relations Officer will need to see the text of the presentation along with any visual aids (slides, prints, videos, etc.). Informal presentations to local community organizations, schools, or scout groups do not require approval from PAO. However, PAO should be notified of these types of events so that they may not have the opportunity to cover the event.

Procedures:

- At the beginning of each field season a press release will be prepared and forwarded to PAO. This release will describe upcoming projects and anticipated results of each project. Indicate to PAO if the release is for internal or external release, or both.
- Special finds and periodic project updates will be addressed as they arise. A press release will be prepared when a particularly interesting archaeological or historical discovery is made on the installation. These special finds can be isolated or part of an ongoing excavation. Periodic project updates should also be released to PAO, especially if the project is lengthy or the information is particularly interesting to the public. In some cases these finds may warrant television coverage. Indicated to PAO if the release is for internal or external release, or both, and if the television media should be contacted.
- Information regarding special events, exhibits, displays, lectures, openhouses, site tours, and the like should be widely publicized. Flyers can be put up around the installation in the PXs, library, and other public areas. Contact PAO and request that they help publicize the event by first posting announcements in the Sentinel and then providing media coverage during the event.
- Occasionally the CRM staff is contacted by members of the public regarding archaeological finds or site discoveries, or requesting information. If the find is located off the installation a CRM archaeologist may go to the site or ask the person to bring the find to the office. The archaeologist will provide as much information as possible to the individual and advise them on how to properly deal with the find. If the find is on the installation the archaeologist will request that the individual turn over the artifact to CRM. The archaeologist will then determine if the find is isolated or from a site, and whether the site is recorded.

SOP - Recycling and Waste Disposal

Introduction

This SOP addresses general procedures for recycling and waste disposal. Fort Hood Regulations 755-725 and 420-6, and DoD form 1348-1 provide guidance for recycling. While recycling is not mandatory, all Fort Hood personnel are expected to recycle and dispose of waste in the prescribed manner. Items not properly recycled are sent directly to the landfill along with other waste.

Policy

Designated recycle bins are located in the CRM office. New bins can be obtained from the Recycle Center or ordered through the GSA catalog. Acceptable recycle items are outlined below. It is the responsibility of each individual to recycle items properly and dispose of items generated in personal work areas that cannot be recycled. These items should be placed in a dumpster. Note the contracted cleaning service disposes of waste from restrooms.

Procedure

Below is a detailed list of items CRM staff should recycle, how these items should be sorted, and where they are to be disposed. Recycle bins for cans, plastic, and glass should be lined with plastic trash bags. The Fort Hood Recycle Center is located in Building 4621 on Clarke Road. Hours of operation are Monday through Friday, 0730-1545. The phone number is 287-6732.

- **Cardboard:** All cardboard must be clean, disassembled, and flat. CRM staff takes cardboard directly to the Recycle Center.
- **Newspaper, white paper, mixed paper, publications:** All the listed paper items can be placed in the same bin in the CRM office. Newspaper includes Sunday magazines and slicks (ads, coupons); basically anything that comes with the paper. White paper is the type used in printers, notebook paper, etc. Mixed paper includes colored paper, cover stock, envelopes, etc. Publications (i.e. FH regulations, draft reports, manuals, etc.) must be disassembled prior to recycling. Remove the staple, fasteners, or binding and take off the covers before placing in recycle bin. The sticky portion of Post-It Notes should be torn off and put the garbage. The rest of the note can be recycled with mixed paper. Recycle Center staff regularly picks up paper from the CRM office.
- **Aluminum cans:** This category includes soda-type cans only. Aluminum foil, food tins, and other aluminum items cannot be recycled with cans. Aluminum cans must be rinsed out and free of any trash prior to recycling. Recycle Center staff regularly picks up aluminum cans from the CRM office.
- **Glass:** All colors of glass can be mixed together. Glass must be rinsed out and free of any trash prior to recycling. Glass is ground at the Recycle Center and used by DPW as filler for maintenance projects. Recycle Center staff regularly picks up glass from the CRM office.
- **Plastic:** This includes soda bottles, milk jugs, dish soap bottles, plastic cups, etc. Plastic does not include plastic bags, packing materials, or overlays. Bottles should be rinsed out prior to placing in recycle bin. Recycle Center staff regularly picks up plastic from the CRM office.
- **Toner cartridges:** All types of toner cartridges should be recycled. CRM staff members take cartridges directly to the Recycle Center.
- **Maps:** Maps cannot be recycled with other paper because they are coated with a water repellent substance. Maps can be recycled separately however. CRM staff members take maps directly to the Recycle Center.
- **Steel:** Steel cans and food tins fall into this category. CRM staff members take steel directly to the Recycle Center.
- **Fluorescent light bulbs:** Light bulbs are considered hazardous materials and are not recycled or

deposited in dumpsters. Instead, light bulbs are taken to the HAZMAT Yard located at xxxxxxx.

- Metals, lumber, tires, etc. These types of items cannot be recycled but should not be placed in dumpsters with regular trash. Instead, they should be taken to DRMO located in Building 4291. DRMO hours of operation are Monday through Friday 0800-1530. Their phone number is 287-2723.

Bibliography

Bibliography

Briuer, F. L. and C. M. Niquette (1983) Military Impacts to Archaeological Sites. American Society for Conservation Archaeology, Proceedings 1983.

Department of the Army, Survivability, Field Manual 5-103 (10 JUN 85).

Appendix A:

Acronyms

DRAFT

Appendix A: Acronyms

AAPPSO - Army Acquisition Pollution Prevention Support Office

ACHP - Advisory Council on Historic Preservation

ACSIM - Assistant Chief of Staff for Installation Management

ACTS - Army Compliance Tracking System. Now known as the Environmental Quality Report (EQR)

AEARC - Army Environmental Awareness Resource Center

AEC - Army Environmental Center (also USAEC)

AHERA - Asbestos Hazard Emergency Response Act of 1986

AHPA - Archeological and Historic Preservation Act of 1974

AICUZ - Air Installation Compatible Use Zone

AIRFA - American Indian Religious Freedom Act of 1978

ALMC - U.S. Army Logistics Management College

AMEDD - Army Medical Department.

AR - Army Regulation

ARPA - Archeological Resources Protection Act of 1979

ASA (IL & E) - Assistant Secretary of the Army for Installations, Logistics, and Environment

ASA (RDA) - Assistant Secretary of the Army for Research, Development, and Acquisition

AST - Above-ground Storage Tank

BACT - Best Available Control Technology

BCP - Base Realignment and Closure (BRAC) Cleanup Plan

BCT - BRAC Cleanup Team

BEC - BRAC Environmental Coordinator

BMP - Best Management Practice

BRAC - Base Realignment and Closure

BTC - Base Transition Coordinator

CA - Comprehensive Agreement

CAA - Clean Air Act

CAAA-90 - Clean Air Act Amendments of 1990

CBE - Categorization of the Built Environment

CEIHOT - Center for Environmental Initiatives and Hands-On Training

CEQ - Council on Environmental Quality

CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act of 1980 amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA)

CERFA - Community Environmental Response Facilitation Act

CERL - Construction Engineering Research Laboratory (also USACERL)

CEQ - Council on Environmental Quality
CFCs - Chlorofluorocarbons
CFR - Code of Federal Regulations
CM - Continuing Management
COB - Command Operating Budget
CONUS - Continental United States (including Alaska, Hawaii, Puerto Rico, Guam and the Virgin Islands)
CPSC - Consumer Products Safety Commission
CRM - Cultural Resource Manager
CRMP - Cultural Resource Management Plan (Superseded by ICRMP)
CRREL - United States Army Cold Regions Research Engineering Laboratory
CSA - Chief of Staff, Army
CTC - Cost-to-Complete
CWA - Clean Water Act (1972-1987)
CX - Categorical Exclusion
DA - Department of the Army
DA PAM - Department of the Army Pamphlet (also PAM)
DASA (ESOH) - Deputy Assistant Secretary of the Army (Environment, Safety and Occupational Health)
DASA (P) - Deputy Assistant Secretary of the Army (Procurement)
Db - Decibel
DCSOPS - Deputy Chief of Staff for Operations and Plans
DDESB - Department of Defense Explosives Safety Board
DEH - Directorate of Engineering and Housing
DEP - Directorate of Environmental Programs (also ODEP)
DERA - Defense Environmental Restoration Account
DERP - Defense Environmental Restoration Program
DESCIM - Defense Environmental Security Corporate Information Management
DIS - Directorate of Installation Support
DMI - Definition of Management Issues
DoD - Department of Defense
DOI - Department of Interior
DOL - Directorate of Logistics
DON - Department of the Navy
DONFPO - Department of the Navy Federal Preservation Officer
DOT - Department of Transportation
DPTM - Directorate of Plans, Training and Mobilization
DPW - Directorate of Public Works

DRAFT

DRMO - Defense Reutilization and Marketing Office
DSERTS - Defense Site Environmental Restoration Tracking System
DSHE - Directorate (Department) of Safety, Health and Environment
DSN - Defense System Telecommunications Network
EA - Environmental Assessment
EBS - Environmental Baseline Survey (replaces the Preliminary Assessment Screening (PAS) and covers Community Environmental Response Facilitation Act (CERFA) requirements)
ECAR - Environmental Compliance Assessment Report
ECAS - Environmental Compliance Assessment System
EIS - Environmental Impact Statement
ELS - Environmental Law Specialist
ENF - Enforcement Action
EO - Executive Order
EPA - United States Environmental Protection Agency
EPCRA - Emergency Planning and Community Right-to-Know Act of 1986
EPR - Environmental Program Requirements
EQCC - Environmental Quality Control Committee
EQR - Environmental Quality Report
ER,A - Environmental Restoration, Army
ESA - Endangered Species Act of 1973
FFA - Federal Facilities Agreement
FFCA - Federal Facility Compliance Act
FFDCA - Federal Food Drug and Cosmetic Act of 1938
FIFRA - Federal Insecticide Fungicide and Rodenticide Act of 1972
FNSI - Finding of No Significant Impact (also FONSI)
FONSI - Finding Of No Significant Impacts (also FNSI)
FOSL - Finding of Suitability to Lease
FOST - Finding of Suitability to Transfer
FR - Federal Register
FRA - Federal Records Act
FS - Feasibility Study
FSI - Forecast Significance of Impacts
FUDS - Formerly Used Defense Sites
FWS - U.S. Fish and Wildlife Service
FY - Fiscal Year
GIS - Geographic Information System

GOCO - Government-Owned Contractor-Operated
HABS - Historic American Building Survey
HAER - Historic American Engineering Record
HAP - Hazardous Air Pollutant
HAZMATS - Hazardous Materials (also HM)
HAZCOMM - Hazard Communication
HAZMIN - Hazardous Waste Minimization
HM - Hazardous Materials (also HAZMATS)
HMCC - Hazardous Materials Control Center
HQDA - Headquarters Department of the Army
HSMS - Hazardous Substances Management System
HSWA - Hazardous and Solid Waste Amendments (1984)
HPP - Historic Preservation Plans (superseded by ICRMPs)
I & M - Inspection and Maintenance
IAG - Interagency Agreement
IAP - Installation Action Plan
IAW - In Accordance With
ICAP - Installation Corrective Action Plan
ICRMP - Integrated Cultural Resources Management Plan
ICUZ - Installation Compatible Use Zone (now part of INMP)
ID - Identification
IM - Implementation
INMP - Installation Noise Management Program (incorporates the former Installation Compatible Use Zone (ICUZ) program)
INRMP - Integrated Natural Resources Management Plan
IOSC - Installation On-Scene Coordinator
IPM - Integrated Pest Management
IPMP - Integrated Pest Management Plan
IPR - In Progress Review
IR - Installation Restoration
IRA - Interim Response Action
IRDMIS - Installation Restoration Data Management Information System
IRP - Installation Restoration Program
IRT - Installation Response Team
ISCP - Installation Spill Contingency Plan
ISR - Installation Status Report

ISWM - Integrated Solid Waste Management
ITAM - Integrated Training Area Management
JAG- Judge Advocate General
LBP - Lead-based paint
LCTA - Land Condition Trend Analysis
LEPC - Local Emergency Planning Committee
LO - Lack of Objections
LRA - Local Reuse Authority
LRAM - Land Rehabilitation and Maintenance
LRC - Long-Range Component
LURS - Land Use Requirements Studies
MACOM - Major Army Command
MACT - Maximum Available Control Technology
MBTA - Migratory Bird Treaty Act
MC - Management Concerns
MCL - Maximum Contaminant Level
MFC - Memorandum For Correspondents
MILSPECs - Military Specifications
MOA - Memorandum of Agreement
MOA - Military Operations Area
MOU - Memorandum of Understanding
MP - Management Priorities
MPEO - Master Plan Environmental Overlay
MR - Military Munitions Rule
MSDS - Material Safety Data Sheet
NAAQS - National Ambient Air Quality Standards
NAF - Non-appropriated Fund
NAGPRA - Native American Graves Protection and Repatriation Act of 1990
NARA - National Archives and Records Administration
NAVFAC - Naval Facilities Engineering Command (also NAVFACENCOM)
NAVFACENCOM - Naval Facilities Engineering Command (also NAVFAC)
NAVFACINST - Naval Facilities Instruction
NAVFACHQ - Naval Facilities Headquarters
NAVFACNOTE - Naval Facilities Engineering Note. Executive summaries of HARP issues.
NCP - National Contingency Plan
NEPA - National Environmental Policy Act of 1969

NESHAP - National Emission Standards for Hazardous Air Pollutants
NFPA - National Fire Protection Association
NHPA - National Historic Preservation Act
NMFS - National Marine Fisheries Service
NOA - Notice of Availability
NOI - Notice of Intent
NOV - Notice of Violation
NO_x - Nitrogen Oxide
NPDES - National Pollutant Discharge Elimination System
NPL - National Priorities List
NPS - National Park Service
NRHP - National Register of Historic Places
NTHP - National Trust for Historic Preservation
O & M - Operation and Maintenance
OB/OD - Open Burning/Open Detonation
OCLL - Office of the Chief of Legislative Liaison
OCONUS - Outside the Continental United States
OCA - Office of the Chief of Public Affairs
ODEP - Office of the Directorate of Environmental Programs (also DEP)
ODC - Ozone-Depleting Chemical
ODS - Ozone-Depleting Substance
OEBGD - Overseas Environmental Baseline Guidance Document
OLA - Office of Legislative Affairs
OMB - Office of Management and Budget
OPNAVINST - Operations Navy Instructions
OPP - Office of Pesticide Programs, a division of the EPA
OSHA - Occupational Safety and Health Administration
P&D - Planning and Decisionmaking
PA - Programmatic Agreement
PAM - Army Pamphlet (also DA PAM)
PAO - Public Affairs Office
PAS - Preliminary Assessment Screening. Replaced by the Environmental Baseline Survey (EBS)
PA/SI - Preliminary Assessment/Site Inspection
PCBs - Polychlorinated Biphenyls
pCi/L - Picocurie per liter
PDSC - Professional Development Support Center (Army Corps of Engineers)

pH - A measure of a liquid's acid/base properties
PLS - Planning Level Survey
POL - Petroleum Oil and Lubricant
POM - Program Objective Memorandum
POTW - Publicly Owned Treatment Works
PPBES - Planning Programming Budget and Execution System
PVNTMED - Preventive Medicine Activity
PWTB - Public Works Technical Bulletin
RA - Remedial Action
RAB - Restoration Advisory Board
RAP - Remedial Action Plan
RCRA - Resource Conservation and Recovery Act (1976)
RCS - Report Control Symbol
REC - Record of Environmental Consideration
REO - Regional Environmental Office
RFA - RCRA Facility Assessment
RFI - RCRA Facility Investigation
RFRA - Religious Freedom Restoration Act
RI - Remedial Investigation
RI/FS - Remedial Investigation/Feasibility Study
RMW - Regulated Medical Waste
ROD - Record of Decision
ROI - Region of Influence
RONA - Record of Non-Applicability
RPA - Reasonable and Prudent Alternatives
RPM - Reasonable and Prudent Measures
RPMP - Real Property Master Plan
RRSE - Relative Risk Site Evaluation
RTLTP - Range and Training Land Program
RTV - Rational Threshold Values
S&G - Standards and Guidelines
SARA - Superfund Amendments and Reauthorization Act (1986)
SDWA - Safe Drinking Water Act (1974)
SECARMY - Secretary of the Army
SECNAVINST - Secretary of the Navy Instruction
SERC - State Emergency Response Commission

SHPO - State Historic Preservation Officer (or Office)
SIP - State Implementation Plan
SJA - Staff Judge Advocate
SNAP - Significant New Alternatives Policy
SOFA - Status of Forces Agreement
SOK - Status of Knowledge
SOP - Standard Operating Procedure
SPCCP - Spill Prevention Control and Countermeasures Plan
SUA - Special Use Airspace
SWMU - Solid Waste Management Unit
TASC - Training and Audiovisual Support Center
TB - Technical Bulletin
TBEC - Treatment of Built Environment Categories
TBMED - Medical Technical Bulletin
TCA - Methyl chloroform, an industrial solvent
TCP - Traditional Cultural Property (or Place)
TG - Technical Guide
TJAG - The Judge Advocate General
TM - Technical Manual
TRADOC - United States Army Training and Doctrine Command
TRI - Training Requirements Integration
TRI - Toxins Release Inventory
TSCA - Toxic Substances Control Act of 1976
TSD - Treatment Storage Disposal
TSDF - Treatment Storage Disposal Facility
TWA - Time Weighted Average
UFAS - Uniform Federal Accessibility Standards
USAEC - United States Army Environmental Center
USACE - United States Army Corps of Engineers
USACHPPM - United States Army Center for Health Promotion and Preventive Medicine
USACERL - United States Army Construction Engineering Research Laboratory (also CERL)
USACPW - United States Army Center for Public Works
USAEC - United States Army Environmental Center
USAES - United States Army Engineer School
USATCES - United States Army Technical Center for Explosives Safety
USATHAMA - United States Army Toxic and Hazardous Materials Agency, now known (since 1993) as the United

States Army Environmental Center (AEC)
USC - United States Code
USD (A) - Under Secretary of Defense for Acquisition
UST - Underground Storage Tank
VOC - Volatile Organic Compound
WES - United States Army Waterways Experiment Station
WRMP - Water Resources Management Plan

Appendix B:

Geography and History

Appendix A: Geography and History

Geographic Context

Vegetation and Wildlife

Climate and Air Quality

Topography

Geology

Soils, Petroleum, and Minerals

Historical Context

Native American History

Early European History

Agriculture, and Settlement

Camp Hood

World War II to the Present

Appendix C:

Army Command Standards

DRAFT

Appendix C: Army Standards

Table C-6. Compliance Standards

COMPLIANCE						
Standard	Resource Type	Dictating Policy, Law, Regulation, or Compliance Document	No rating	Green	Amber	Red
Installation commander has designated a qualified/trained Cultural Resources Manager, if required, who routinely tracks new and upcoming cultural resources regulations and requirements. (AR 200-4, paragraph 1-9.b)	General	AR 200-4, Command ISR	No Cultural Resources Manager required	Designated and trained	Designated, but not trained	Neither designated nor trained
All cultural resources technical work is conducted either by individuals who meet the applicable professional qualification standards established by the National Park Service in 36 CFR 61, Appendix A (AR 200-4, paragraph 1-9.b) or, when appropriate, by members of Federally-recognized Native American tribes or Native Hawaiian organizations.	General	AR 200-4, Command ISR	No cultural resources technical work conducted	Yes	[no selection available]	No
Components of the ICRMP are clearly identified and compatible with the Installation's Master Plan, Range Development Plan, Integrated Natural Resources Management Plan, Endangered Species Management Plan, Pest Management Plan, Real Estate Plan, etc.	General	AR 200-4, Command ISR	No ICRMP required	Full compatibility or only minor incompatibility	Moderate incompatibility	Significant incompatibility
Appropriate command group, mission, and tenant personnel, including environmental compliance officers, receive appropriate cultural resources awareness training and staff professional/technical on-going training needs are being met.	General	Command ISR	No Cultural Resources Manager required	Awareness provided and professional/technical staff receiving on-going training	Some awareness provided and some professional/technical staff receiving on-going training	Neither awareness provided nor professional/technical staff receiving on-going training
Currently due stipulations in NHPA Programmatic Agreements and Memoranda of Agreement are being met.	General	NHPA, Command Standard	No NHPA Programmatic Agreements or Memoranda of Agreement		[no selection available]	
Economic analyses for National Register eligible/listed buildings programmed for demolition are complete.	Historic Buildings	AR 200-4, Command Standard	No demolition programmed	All economic analyses completed	All economic analyses have been initiated	Economic analyses not completed or initiated
Archaeological site protection procedures are in effect, IAW the Archeological Resources Protection Act (ARPA).	Archeology	ARPA, Command Standard	Installation has no archaeological sites or Installation is OCONUS	Yes	[no selection available]	No
Installations have completed Native American Graves Protection and Repatriation Act of 1990 (NAGPRA) (Sections 5 and 6) consultation requirements with Federally-recognized Native Americans and Native Hawaiian organizations. If installation has no "cultural items", as defined by NAGPRA, in collections, consultation is not required.	Native American Issues	NAGPRA, Command ISR	Installation has no "cultural items"	All requested cultural items repatriated	Consultation initiated but not complete	Consultation not initiated
Percentage of collections curated (by cubic feet) IAW 36 CFR 79.	Curator	36 CFR 79, Command Standard		90-100%	50-89%	0-49%

Table C-7. Protective Management Standards

PROTECTIVE MANAGEMENT						
Standard	Resource Type	Dictating Policy, Law, Regulation, or Compliance Document	No rating	Green	Amber	Red
Completion status of the installation's ICRMP	General	Command ISR	No ICRMP required	Up-to-date and Approved	Partially complete	Not initiated
Cultural resources issues and conditions are impacting the management of the installation	General	Command ISR		No	Maybe	Yes
OPTEMPO, CPRED, procurement, RDT&E/PAA/AWCF, or service school training funds have been used or have been diverted to fund cultural resources management requirements.	General	Command ISR		No	Minor amount	Major amount
The State Historic Preservation Office (or host nation equivalent), Advisory Council on Historic Preservation, Indian Tribes, and interested parties are consulted during all phases of all projects, as appropriate, that may have an effect on historic properties.	General	Command ISR		Always	Usually	Seldom or never
Completion status of the installation's historic buildings and structures planning level survey.	Historic Buildings	Command ISR	This PLS is not required	Complete	In Progress	Not initiated
Completion status of the installation's archeological resources planning level survey	Archeology	Command ISR	This PLS is not required	Complete	In Progress	Not initiated
Procedures are in place, if required, for providing access to, or protection of, Federally-recognized Native Americans' and Native Hawaiian organizations' sacred sites and Traditional Cultural Properties (TCPs). If no sites/TCPs have been identified, procedures are not required.	Native American Issues	Command ISR	No procedures needed	Yes	(no selection available)	No
Protection of cultural resources sites, to include Native American or Native Hawaiian sacred sites and Traditional Cultural Properties (TCPs), is causing an adverse impact to mission.	Native American Issues	Command ISR	No sacred sites or TCPs known	No	Minor impact	Major impact
Accommodating Native American or Native Hawaiian access to installation lands is impacting the ability of units to train or is impacting on the mission of the installation.	Native American Issues	Command ISR	No sacred sites or TCPs known	No	Minor impact	Major impact

DRAFT

Appendix D:

FTHCRM Standards

DRAFT

Appendix D: Fort Hood Standards

Table <D>-8. Fort Hood Standards

Standard	Resource Type	Dictating Policy, Law, Regulation, or Compliance Document	No Rating	Green	Amber	Red
The number of formal Advisory Council notices of deficiencies received during the most recently completed FY.	General	Section 105		0	N/A	>0
Fort Hood is consulting with the Installation Cultural Resources Manager (CRM) as required whenever planning any undertaking that may affect historic properties.	Archaeological Resources, Historic Buildings and Landscapes, Traditional Cultural Properties	Section 105		No projects are being planned or completed without appropriate review by FTICRM.	Some projects are not being reviewed prior to implementation, but the impact on cultural resources has been minimal.	Several projects have not been reviewed prior to implementation, and the impact on cultural resources has been significant. Cultural resources have been damaged or lost.
Are troops following environmental training standards (e.g., environmental coordination maps, range regulations, Fort Limits regulations, ITAM environmental awareness guidelines, etc.) at a rate that prevents training activities from being a causative agent or major contributing factor in noncompliance with cultural resource laws, agreements, and protection of historic properties on Fort Hood?	Archaeological Resources, Historic Buildings and Landscapes, Traditional Cultural Properties	Section 105		Yes	Resource threatened but not damaged.	Serious damage or loss of resource.
Inventory survey for historic properties is complete and up-to-date at Fort Hood.	Archaeological Resources	Section 100		(A) Archaeological inventory survey is complete for all training lands. AND (B) intensive survey for undertakings other than training (e.g., in the conservation area) are completed as required on a project-by-project basis, and completed forms are provided to interested parties for review.	(A) Archaeological inventory survey for all training lands is scheduled and programmed into the military budget cycle. The deadline for survey completion is not past. AND/OR (B) Project-driven archaeological resource inventories are done and presented to interested parties for review, but the Army or others discover a limited number of projects do not receive either survey or review. The Army is taking steps to move this condition back to "Green" status.	(A) Archaeological resource suffer adverse effects: archaeological inventory survey is not scheduled, or not programmed into the military budget cycle. OR (B) Archaeological resource suffer adverse effects from projects that did not receive pre-archaeological inventory survey and the Army has not taken steps to correct the condition.
	Historic Buildings, Structures and Landscapes	Section 100		All buildings, structures and landscapes which are 50 years old or older have been identified. Future inventory requirements have been identified in the Environmental Program Requirements for the installation. Procedures are in place to take care of any out-of-cycle evaluations that might arise.	All buildings, structures and landscapes which are 50 years old or older have been identified. Future inventory requirements, however, have not been identified in the Environmental Program Requirements for the installation.	The inventories of buildings, structures and landscapes which are 50 years old or older is out of date.
	Traditional Cultural Properties	Section 100		All traditional cultural properties have been identified. Future inventory requirements have been identified. Procedures are in place to take care of any out-of-cycle evaluations that might arise.	Inventory of traditional cultural properties is incomplete, but programmed.	The inventory of traditional cultural properties has not been completed or programmed.

Standard	Resource Type	Dictating Policy, Law, Regulation, or Compliance Document	No Rating	Green	Amber	Red
NRHP eligibility evaluations for all historic properties is complete and up-to-date at Fort Hood.	Archaeological Resources	Section 110		Determinations of eligibility for listing on the National Register of Historic Places (NRHP) have been made for all cultural resources.	Determinations of eligibility for listing on the National Register of Historic Places (NRHP) have not been completed for all cultural resources, but remaining evaluations have been scheduled and programmed into the military budget cycle.	Determinations of eligibility for listing on the National Register of Historic Places (NRHP) have not been completed for all cultural resources, and remaining evaluations have not been scheduled and programmed into the military budget cycle.
The integrity of the historic district is preserved through the compatible architectural design of new buildings and landscapes. New construction follows the Secretary of the Interior's Standards for the Treatment of Historic Properties and Cultural Landscapes.	Historic Buildings and Structures, and Landscapes	Section 110		All new construction within or adjacent to the historic district is compatible with the historic landscape and the scale of the surrounding historic buildings, and uses building materials and design details which relate to the historic facilities. The siting of the new facility follows the same setbacks as its neighbors, and does not visually intrude within the district. New construction outside of the historic district, but within visual range of other identified historic buildings and structures, follows the same guidelines.		New buildings and other construction are being built which are incompatible with the historic district or other adjacent historic buildings and structures or landscapes features. Their appearance is such that the architectural and landscape character of the district/building is compromised and adversely affected.
Fort Hood is reducing or eliminating the loss of historically significant buildings and historic landscapes that can occur as a result of Public Works operations.	Historic Buildings and Structures and Landscapes	Section 110 / 108		No loss of historically significant buildings or structures or landscapes.	Loss of historically significant buildings, structures or landscapes, but mitigated through Cultural Resources Management Program (CRMP).	Loss of significant buildings, structures or landscapes, but NOT mitigated through CRMP.
Fort Hood is maintaining its historic buildings and structures in a sound manner, buildings are not deteriorating due to lack of maintenance. Routine maintenance management practices are being followed, and building condition assessments are done on an annual basis.	Historic Buildings	Section 110		Building condition is such that there are either no maintenance problems, or the maintenance requirements that do exist are only cosmetic in nature, and will not lead to more serious deterioration of building features. In general, the building needs only routine maintenance. No fewer than 75% of the total inventory of historic buildings and structures are maintained at fair level, and all of the buildings and structures are maintained at good to fair condition levels.	The number of historic buildings and structures maintained at a green level falls below 75% of the total inventory of historic buildings and structures, and no more than 5% of the total inventory of the buildings and structures are maintained at poor condition levels.	The number of historic buildings and structures maintained at a green level falls below 50% of the total inventory of historic buildings and structures, and more than 5% of the total inventory of the buildings and structures are maintained at poor condition levels.

DRAFT

Standard	Resource Type	Dictating Policy, Law, Regulation, or Compliance Document	No Rating	Green	Amber	Red
Archaeological site protection procedures are in effect at Fort Hood IAW the Archaeological Resources Protection Act (ARPA). Procedures should minimally include ARPA permitting policies and procedures for archaeological investigations on Fort Hood as well as ARPA policies and procedures to protect archaeological resources from vandalism and illegal trafficking in archaeological artifacts, and to prosecute such actions if and when they occur. In addition, a DPAW Dig Permit [PTH420X10] procedure for all military undertakings on the installation is in effect, requiring all installation activities to acquire clearance from the CRM office (among others) of DPAW prior to initiating any mechanical or manual digging. IAW the Fort Hood Regulation 350-40—Range Regulations.	Archaeological Resources	ARPA		Yes (all procedures are in effect at Fort Hood)		No (all procedures are NOT in effect at Fort Hood)
Protection of unmarked Native American cemeteries	Native American Issues			An inadvertent discovery of a Native American burial has not occurred or has been resolved pursuant to the Native American Graves Protection and Repatriation Act and its implementing regulations.	An inadvertent discovery of a Native American burial has occurred, but steps are being taken to resolve the situation pursuant to the Native American Graves Protection and Repatriation Act and its implementing regulations.	An inadvertent discovery of a Native American burial has occurred and resolution does not appear to be imminent.
Traditional Use Opportunities	Native American Issues	Memorandum of Agreement 1994		A.) Traditional use opportunities remain at or near historic levels. Reductions in traditional use opportunities occur only when required to protect personnel safety or to sustain the viability of local resources. AND E.) Management strategies protect known cemeteries and promote healthy and sustained resource availability.	A.) Traditional needs are met but traditional use opportunities are recognized to be reduced from historic levels for reasons unrelated to management for the safety of the users, protection of cemeteries, and the health and sustained viability of local resources. AND E.) Management strategies protect known cemeteries and promote healthy and sustained resource availability.	A.) Traditional needs are not met because traditional use opportunities are significantly reduced from historic levels. AND E.) Management strategies are unable to protect known cemeteries and to promote healthy and sustained resource availability.
Government-to-Government Relations with Indian Tribes	Native American Issues	Presidential Memorandum on Government-to-Government Relations with Native American Tribal Governments.		All communication and consultation with Indian Tribes affiliated with Fort Hood have maintained government-to-government relations.	Representatives of Indian Tribes have acknowledged to the Fort Hood Commander or installation staff that some communication and consultation with Fort Hood has not maintained government-to-government relations with the Tribes.	Government-to-Government relations with Indian Tribes affiliated with Fort Hood have become seriously jeopardized such that communication is halted.

Standard	Resource Type	Dictating Policy, Law, Regulation, or Compliance Document	No Rating	Green	Amber	Red
Archaeological site protection procedures are in effect at Fort Hood IAW the Archaeological Resources Protection Act (ARPA). Procedures should minimally include ARPA permitting policies and procedures for archaeological investigations on Fort Hood as well as ARPA policies and procedures to protect archaeological resources from vandalism and illegal trafficking in archaeological artifacts, and to prosecute such actions if and when they occur. In addition, a DPAW Dig Permit [PTH420X10] procedure for all military undertakings on the installation is in effect, requiring all installation activities to acquire clearance from the CRM office (among others) of DPAW prior to initiating any mechanical or manual digging. IAW the Fort Hood Regulation 350-40--Range Regulations.	Archaeological Resources	ARPA		Yes (all procedures are in effect at Fort Hood)		No (all procedures are NOT in effect at Fort Hood)
Protection of unmarked Native American cemeteries	Native American Issues			An inadvertent discovery of a Native American burial has not occurred or has been resolved pursuant to the Native American Graves Protection and Repatriation Act and its implementing regulations.	An inadvertent discovery of a Native American burial has occurred, but steps are being taken to resolve the situation pursuant to the Native American Graves Protection and Repatriation Act and its implementing regulations.	An inadvertent discovery of a Native American burial has occurred and resolution does not appear to be imminent.
Traditional Use Opportunities	Native American Issues	Memorandum of Agreement 1994		A.) Traditional use opportunities remain at or near historic levels. Reductions in traditional use opportunities occur only when required to protect personnel safety or to sustain the viability of local resources. AND B.) Management strategies protect known cemeteries and promote healthy and sustained resource availability.	A.) Traditional needs are met but traditional use opportunities are recognized to be reduced from historic levels for reasons unrelated to management for the safety of the users, protection of cemeteries, and the health and sustained viability of local resources. AND B.) Management strategies protect known cemeteries and promote healthy and sustained resource availability.	A.) Traditional needs are not met because traditional use opportunities are significantly reduced from historic levels. AND B.) Management strategies are unable to protect known cemeteries and to promote healthy and sustained resource availability.
Government-to-Government Relations with Indian Tribes	Native American Issues	Presidential Memorandum on Government-to-Government Relations with Native American Tribal Governments.		All communication and consultation with Indian Tribes affiliated with Fort Hood have maintained government-to-government relations.	Representatives of Indian Tribes have acknowledged to the Fort Hood Commander or installation staff that some communication and consultation with Fort Hood has not maintained government-to-government relations with the Tribes.	Government-to-Government relations with Indian Tribes affiliated with Fort Hood have become severely jeopardized such that communication is inhibited.

DRAFT

Appendix E:

FTHCRM EPR Projects

DRAFT

Appendix E: FTHCRM EPR Projects

The following project list are those identified as of the date of this document. The first section are those in the EPR System and the section section are those recently identified and being prepared for entry. This Appendix is very dynamic as these project are completed and others are added. The format of the entries are as follows:

Agency Project Number, CRM Project Number, Project Name, Date Entered, Progress Code, Date Completed, Narrative, Project DO, Project Contract Number, Law/Reg, ECAT, Class, Requirement, Local Priority, Enforcement Action (EA), Training Readiness (TR), Return on Investment (ROI), Infrastructure (INF), Command Priority

No Fort Hood Number, Maintenance and Updating of Computer Software 9/21/00"Program employes Arcview, FrameMaker and other software programs which require consistant updating and maintenace to use effectively and be able to retrieve data efficient-ly."MULTPGMT0"\$50,000.00"696780

FH000F00112National Register Eligibility Testing of Resources9/21/004"Laws: NHPA, 200-4,PA; ECATs: EVAL, INVE, PAMA, CRPL; As part of the CRM program described in Ft. Hood's CRMP and implemented by the accompanu\ying PA, Ft. Hood has agreed to test resources for NRHP eligibility as funding becomes available. There are approximately 400 resources that require testing but are prioritized based on availability of funding and mission requiriements. Funding request is based on implementing testing at approximately 10 sites a year depending on size. Cost per cubic meter is \$4500 as of Nov 2000. This project consolidates anticipated future program national register testing needs eliminating separate NRHP testing project numbers FH0089F021, FH0089F020, FH0089F019, FH0089F015."NHPAEVAL"2, ESDF""\$2,000,000.00"292740

FH000F00123Cultural Resource Mechanized Vehicle Avoidance System9/21/00"Laws: NHPA, ARPA, 200-4; EACTs: MTNR, MITM, PAMA; Fort Hood's CRMP and implementing PA state Ft. Hood will abid by the above referenced laws and retgs to protect resources. Past training practices and lack of adherence to avoidance of identified restricted areas on maps has resulted in damage by tracked vehicles to archaeological resources as identified by recent 15-6 investigations. This project proposes combining new digital technology available to mechanized divisions and FTHCRM's digital location data layer to provide mechanized vehicle operators the latest and most accurate information enabling them to avoid restricted areas more effectively. A beeper warning system is proposed that will go off as the vehicle approaches a specified buffer area. In addition, the onboard graphical displays will identify the restricted areas in accordance with training objective specified restrictions such as chemical release area or mine field. This project will reduce tactical impacts to resources and thus the need for scheduling high cost data recovery (\$5500 per cubic meter) to remove a resource from the traing area."NHPA MITM"1, ESDP""\$500,000.00"112340

4Holocene Alluvial Sediment Distribution and Predictive Model of Buried Cultural Resources9/21/00Project will enable program to identify alluvial sediments with a high probability of producing buried cultural resources if sediments are disturbed. This information will enable CRM program to efficiently target high probablity sediments for sub-surface testing as part of normal evaluation activities and respond to mission needs for construction requests with more detailed information reducing the need for exploratory CRM to be incorporated into future infrastructure construction and mission training. This is supported by Texas SHPO state requirement to test all alluviums before construction can occur. Currently additional costs and project deadlines have been extended to meet this requirements if project can not be moved in the planning stages. Will also enhance protection of sub-surface cultural resources through knowledge of location enabling project planning modifications. Project is planned as a four year project once funding is obligated."NHPA, 200-4""EVAL, MITM, CRPL""\$1,000,000.00"292740

DRAFT

FH000F00135Reduction/Elimination of Archaeological Resource Erosion9/21/001"Laws: NHPA, ARPA, 200-4; ECATs: MITM, MTNR; Ft. Hood's CRMP and implementing PA agreed to protect archaeological resources as per NHPA and other laws and regs listed above. Review of historic archaeological resource records and field visits have identified erosion as a major impact affecting long-term protection efforts. Cause of erosion range from natural run-off to direct training impacts. Field observations however have identified different soil compositions that respond to erosion differentially. Additional review of historic photographs taken before the establishment of Ft. Hood, suggests that some of this differential erosion response is inherent in the soil matrix. This project aims to identify the disparate soils and their distribution across the installation. This information will then be used to define appropriate long-term measures to reduce erosion at protected archaeological resources. This is a one time project with cost based on examining the entire installation using remote imagery analysis and groundtruthing of preliminary results. Project will incorporate the scanning and rectification of historic Ft. Hood imagery. Continued erosion causes continual resources impacts reducing resource integrity and its potential to provide archaeological information, a major NRHP eligibility criterion. If erosion can not be reduced and preferably controlled, these resources should be scheduled for data recovery. Minimum cost of data recovery is \$5500.00 per cubic meter (as of Nov 2000). Additionally, this information will support implementation of new ICRMP and associated program research plan. The project will be phased based on training land groups as applicable enabling preliminary information to be applied as the project progresses."NHPA MTNR"1, ESDP ""\$350,000.00"252340

FH000F00146Digitization of Cultural Resource Data9/21/001"Laws: NHPA, 36 CFR 79, 200-4; ECATs: CURA, MTNR; This project will make Cultural Resource data and resulting documents more accessible to the public and researchers by implementing new archival and imaging technology. Mission requirements will be met more effectively and efficiently as a result of the increased speed of accessing digital information. This will improve tracking of curated materials enabling sub-collections to be loaned. Digitization of documents will preserve the originals as they can then be archived and handled only in special circumstances. Cost covers equipment and translating of documents. This also provides a searchable database to improve assessment of all archaeological data and not restrict landscape assessment to only the NRHP eligible sites database." NHPACURA"2, PSDF""\$950,000.00"3910340

FH000F00157Precision Relocation of Cultural Resources9/21/004"Laws: NHPA, ARPA, 200-4; ECATs: EVAL, MTNR, MITM; Existing geographical information layer originated from scanning hand drawn resource boundaries on 1:400 scale maps. The resulting information was then transformed from GRASS to ArcView. During this process, the military changed their North American Datum (NAD) reference from the 1927b point to the 1983 point then onto the World Grid System (WGS) 1984. Various training and construction impacts over the last three years have shown that errors have crept into the accuracy of the data layers. This project will employ a high-end geographical positioning system (GPS) to gather new boundary information. Existing resource records will be used to locate boundaries. Resource condition will also be updated. This project is a class one as previous impacts from training have been found via 15-6 investigations not to be precise enough for training purposes. This locational precision will enable buffered areas to be reduced and thus free up maneuver areas."NHPAMITM"1, ESDP""\$300,000.00"112340

FH000F00188Hi-resolution Excavations9/21/004"Laws: NHPA, ARPA; ECATs: EVAL, MTNR, CUR, MITM, PAMA; Excavations result on Ft. Hood to meet different management needs as expressed in the CRMP implemented by the PA. Circumstances occur which require excavation in response to immediate damage of a resource such as inadvertant digging, i.e., mitigation. Other excavations occur to provide additional information about the resources which enable further management decisions to be made that could free up additional training areas. Project provide funding avenue for expected future excavation either as management tools or as mitigation measures."NHPA MITM"1, CMPA""\$4,500,000.00"112340

DRAFT

FH000F00199NRHP Assessment of Killeen Base Nuclear Warhead Storage Facility 9/21/004
 "Laws: NHPA, 36 CFR 79, 200-4; ECATs: EVAL, CRPL; Under Ft. Hood's CRMP implemented by the PA, Ft. Hood agreed to assess all cultural resources for potential National register Eligibility. Within this pervue are cold war era resources many of which are turning 50 years old. The storage facility was built in 1948 to store nuclear materials for Defensive use. It was one of the first three facilities built. There are two tunnel systems both of which contained nuclear material storage areas, as well as other mateirals to make nuclear bombs if ordered. The facility was initial run by Dept of Energy personnel under the Air Force. Oversight was later transferred directly to the Air Force and in 1963, the facility along with the Air Field, was transferred to the Army at Fort Hood. Not long after this transfer, advances in technnology resulted in more stable nuclear mateirals and enabling nuclear weapons to be stored closer to deployment apperatuses, I.e. within missiles, etc. The facility was then the home of the testing command at Fort Hood until the 1980s. Since then, the facilty has been used at most for storage space. Recent examination of the tunnel structures indicate they are in reasonable shape overall. The faciltiy also has potential as a curation facility with it's compartimentalized design: different areas could be set up for different environmental conditions to meet different curation needs. Expected product would be a context and condeition assesment of the facility and the facilities relavance to the overall opeation and contribution of Fort hood to the Cold War era.
 "NHPAEVAL"2, ESDF""\$400,000.00"356340

FH000F002010Curation Facility Upgrade: Reuse of Killeen Base Nuclear Warhead Storage Facility 9/21/004
 "Laws: NHPA, 36 CFR 79; ECAT: CUR, MTNR; Ft. Hood's curation facility will be out of space by the end of FY2001. Ongoing inhouse projects, required contracted work and projected future research work by University staff indicated a long-term need for additional storage and processing space. A potentially eligible Cold War structure is proposed for re-use to meet these needs. As this is a large facility, there is a possibility of renting out space to other federal organizations such as COE in the area. This could be turned into a reimbursable cost situation that would result in free curation costs of Fort Hood's materials and improve our current compliance status. Funding is designed to implement re-use in the first year with two follow up years if need be. This study would identify the feasibility of rehabilitating the tunnels into a curation facility for Fort Hood and open the remaining square footage (approx 150,000 total) for use on a reimbursable basis to other federal and state agencies. Reimbursable costs would cover the maintainence and staffing needs of the facility over time which is an accepted practice for all curation and musuem facilities."NHPACUR2
 "\$600,000.00"356340

FH000F002111Study of Military impacts on Surrounding communities 9/21/001
 "Laws: NHPA, 2004; ECAT: SURV, INV, EVAL, CRPL; Under Ft. Hood's CRMP implemented by the PA, assessment of the pre-Ft Hood communities has been a focus to prduce a context for historic period archaeological resources. Eight communities were displaced and six more split by the establishment of Ft Hood in 1942. In 1953, six more comminties were displaced by the expansion of Ft. Hood. Remaining communities were differentially affected by Ft. Hood's growth. Recent projects produced a historic context for the 1942 comminuties that ends with the establishment of Ft. Hood. This project picks up at 1942 and examines the impact of Ft. Hood on the remaining communities including those subsumed in the 1953 extension to Ft. Hood. This additional context will provide information to assess historic archaeological resources on properties acquired after 1942-43. These properies encompass approximately a quarter of Ft. Hood."NHPASURV"2, PSDF""\$450,000.00"396340

FH000F002212Assessment of Cold War Significance 9/21/001
 "Laws: NHPA, 2004; ECAT: EVAL, INVE, CRPL; In 1953 Fort Hood was designated a permanent installation; the early part of the cold war era. As many as 500 structures and associated landscapes, excluding the housing communities, were built during this era to support Fort Hood's function as the training facility for the Army's mechanized divisions. This project has two phases. First to inventory which structures and landscapes within the cold war context and second to record those structures and landscapes at the appropriate HABS/HEAR level as mission needs have a potential to affect them. Cost per structure will vary to record depending on the size of the structure and how many are done on one contract. In 2003, approximately 100 of these structures will become 50 years old, the trigger for assessing historic

DRAFT

properties. If Ft. Hood does not begin assessment in 2002, then the context for assessing the buildings will have to be done on a case-by-case as projects are proposed that would affect the structures and landscapes. This will be more costly."NHPAINVE"2, ESDF""\$500,000.00"252540

FH000F002313Analysis of Resource Characteristics from NR Testing9/21/00"Laws: NHPA, 2004; ECAT: EVAL, INVE, MTNR; Ft. Hood's PA implementing the CRMP states Ft. Hood will protect cultural resources from impacts. To refine the list of resource protected, an analysis of resource characteristics is proposed to produce a foundation for future planning of excavations to reduce training restrictions. Past assessment of archaeological resource NRHP eligibility was based on individual characteristics and not contributions the resource characteristics could make to understanding the relationships between resources in large maneuver areas. Examination of potential patterns of landusage as indicated by resource characteristics could reverse some resource's current eligibility status without the need for further testing/excavation and thus reduce the need for extensive data recovery excavations to preserve data in the maneuver areas."NHPAEVAL"1, CMPA""\$400,000.00"252340

FH000F002414Micro-scale Geomorphology Determination9/21/001"Laws: NHPA, 2004; ECAT: EVAL, INVE, MTNR, CRPL, CRMP; Ft. Hood's CRMP supported by PA, states alluvial deposits must be tested for the presence of sub-surface cultural material before ground disturbing activities can be approved. A micro-scale geomorphological data layer is needed to accurately assess alluvial terraces and associated landforms could contain sub-surface cultural deposits. Identification of these landforms will improve impact assessment efficiency for training and construction projects and reduce testing and data recovery excavation costs by eliminating landforms which are not likely to contain subsurface deposits. Without this data, individual project areas must be visited and preliminary assessment for the presence of sub-surface cultural deposits determined. If there is a likelihood of deposits, then sub-surface testing is required to establish extent and eligibility of deposits. This could take days to schedule and months to implement if excavations are to occur. Data would support other projects. Project is planned for two year period once funds are obligated."NHPAEVAL"1, CMPA""\$600,000.00"252340

FH0098F03015Remote Intruder Detection Program10/16/984"Law: ARPA, NHPA, 200-4, CRMP; ECAT: EVAL, MTNR; Identification of long-term on-going looting of archaeological resource on FTH indicates past protective measures have not been effective to meet preservation responsibilities. Inability to protect resources from looting put us out of compliance with the above referenced laws, regs, and the CRMP and PA. The need to protect these resources IAW these bodies has been identified and supported by the TxSHPO. The project incorporates the acquisition of eight (8) remote sensing devices which will record activity at a site when triggered by movement. Project also includes the testing and implementation of video monitoring as technology enables this component to be added. The eight units will be placed at resources known to be actively looted. The units will be moved as looting activity shifts. As prosecution of recorded individuals results in a reduction of looting activity, the units will be placed at remaining high activity or sensitive locations and/or placed randomly to provide a deterrent."ARPAMTNR2"\$750,000.00"112346

FH0098F03116Geostabilization of NR Eligible Sites10/16/984"Law: NHPA, ARPA, 200-4; ECAT: EVAL, CUR, MTNR, MITM, PAMA ; Monitoring of archaeological resources has identified erosion as a major cause of resource damage. Though erosion has a variety of causes, this project proposed to stabilize remaining resource components against erosion actions. Other projects are programmed to deal with the causes. This project proposes to stabilize up to five archaeological resources affected by erosion. Priority for treatment will be based on mission training needs and the intensity of erosion occurring. Stabilization will use a variety of methods that will be defined in consultation with Natural resources personnel to reduce and preferably stop erosion. These can include the placement of geofabric and seeding, laying soil and seed, or placing gully plugs to slow down water movement. The number of resources stabilized each year will depend on the size of the area needing treatment."NHPAMITM1"\$1,400,000.00"112341

DRAFT

FH0096F00117Native American Repatriation12/5/954"Law: NAGP, ARPA, NHPA, AIRFA; ECAT: EVAL, INVE, MTNR, MITM, CONS: Approximately 149 prehistoric archaeological sites have the potential to produce human remains if excavated. Native American preference is to leave the remains in place and protect the location. The minimum cost to provide such protection is approximately \$7500.00 per site. However, some of these locations are within manuver areas and may require excavation of remains and repatriation in order to protect the remains from long-term manuver damage. The cost of excavation of such sites is \$5500.00 per cubic meter (current mininum). Tribes decide the final treatment for the burials. Consultation is covered in FH0094F002."NAGP MITM3"\$1,275,000.00"356346

FH0095S00418CNS-Contract Employee Salaries2/7/959IPA SalariesMILTPGMT0 "\$5,600,000.00"112342

FH0094F00219Leon River Medicine Wheel and Repatriation Cemetery MOU Consultation10/12/944"Laws: NHPA, ARPA, AIRF, 200-4; ECATs: MTNR, CURA, PAMA; The Leon River medicine wheel is a spiritual location of significance to Native Americans and particularly to Tribes historically associated with the lands encompassed by Fort Hood. Since its discovery it has been a focus of traditional spiritual activities by members of these recognized tribes. Protection of and access to this resource is supported by the above laws. In association with the Wheel, a repatriation cemetery was established in 1991 to relocate native American remains from federal propoerty, particularly Ft. Hood. An MOU was instituted in 1991 to cover access and upkeep of the wheel and cemetery. This MOU has become outdated and requires consultation with the tribes to address oversight and access responsibilities which has recently defaulted to Fort Hood in order for the installtion to meet all legal responsibilities. Consultation will produce a new MOU or PA that will cover operation of the cemetery and wheel including repatriation procedures. The MOU or PA will be reviewed and reaffirmed every five years until a signatory requests revisions at which time the current MOU or PA will terminate upon the acceptance of the new MOU or PA. Establishment of the MOU will avert a potential restriction or hold-up of training which could occur if traning activity unearths Native American remains in major manuver areas."AIRF CONS1"\$421,500.00"292343

FH0095S00320National Register Site Monitoring2/2/956"Law: NHPA, ARPA, 200-4; ECAT: PAMA, MTNR, EVAL, CUR, CONS, CRPL; All cultural resources detemined eligible or potentially eligible for listing on the National Register of Historic Places (NRHP) must be monitored to asses whether protective measures are working enabling adjustments if they are not. Monitoring identifies training, environmental, and crimial impacts on protected eligible resources. Protection measures are funded through other line items. This project is budgeted to cover on field position and associated supplies, and equipment support needed to visit and assess identified impacts under NHPA, ARPA, and 200-4. Impacts to resources that result in damage and reduced integrity of NRHP eligible characteristics trigger potential mitigation requirements and possible ARPA investigations."NHPA MTNR3"\$1,310,000.00"112343

FH0089F02121National Register Testing 117 Sites in Mod Impact10/31/896Law: NHPA; ECAT: EVAL; This project will be superceded by FH000FH0011 as of 2002. Current estimate of 117 sites requiring National Register testing are based on reported recommendations on all of the 360 sites shovel tested. 10 sites were funded for testing in 1993. CRMP schedule calls for completed testing in moderate impact area by end of fy1998. CRMP implemented by PA signed by DA Dec 1994. 16 sites remain to be tested. Lithic resource procurment testing protocol problem settled with SHPO. NHPAEVAL2"\$2,905,000.00"5563126

FH0089F02022National Register Testing of 58 Prehistoric Sites10/31/896"Law: NHPA; ECAT: EVAL; This project will be superceded by FH000FH0011 as of 2002. Assumed originally that only 45 sites in the light impact area will require formal National Register testing. CRMP currently programs 58 sites for this work for 1997, 1998, and 1999. The CRMP schedule is now fully implemented with PA, but PA signed by DA Dec 1994. Established General Deadline."NHPAEVAL 2"\$1,149,502.00"1163122

DRAFT

FH0089F01923National Register Testing 30 Historic Sites10/31/896"Law: NHPA; ECAT: EVAL; This project will be superceded by FH000FH0011 as of 2002. Work under this project will be completed by the end of FY2001. This project calls for formal National Register testing of 30 historic era sites in the very heavy, heavy, or moderate training impact zones. If we are prepared to continue to protect these sites (all 30) as if they were National Register, CRMP established schedule for this work, implemented by formal PA signed Dec 1994. This project becomes class 2 in 1996. 14 sites funded for test 1996."NHPAEVAL2"\$1,258,255.00"1163122

FH0089F01524Historic Site Evaluation10/31/896"Law: NHPA; ECAT: EVAL; Final Project documentation due FY 2001. Any further testing will be under FH000FH0011. It is estimated about 150 sites of the historic period will show enough archival significance to require revisiting and preliminary subsurface testing/ 84 sites shovel tested during fy1996. Delay due to SHPO recommended changes in 1942 acquisition study requires FY98 for determination of 19953 plus acquisition area sites for formal testing. Historic site testing and analysis will be completed by the end of fy2000. After this project, about 30 sites will require formal National Register testing. At that point nearly 10000 sites will no longer require protection. CRMP now programs this project for fy1995-96. PA signed by DA Dec 1994 is a compliance agreement that implements schedule. Goes class 2, high, must fund because of schedule."NHPAEVAL1"\$538,933.00"1123122

FH0089F01325Historic Site Significance Research10/31/896Project is designed to assess National register significance of over 1000 historic sites through integrated archival research and Cadastral map analysis. Project was part of the original HPP and NEW CRMP implemented under PA with June 1995 as established deadline. Delays due to compliance with SHPO recommended changes have extended schedule through fy2000. Final documents will be delivered FY 2001.NHPAEVAL2 "\$335,000.00"1163126

FH0098F02726Paluxy Sands Sites Data Recovery10/16/986"Law: NHPA, ARPA; ECAT: MITM; This project implements mitigation for damage to several NRHP eligible prehistoric archaeological resources as a result of cedar clearing and emergency firebreack construction. Mitigation was developed in coordination with the Texas SHPO who supported such mitigation in their response dated March 20, 1998 where they considered the damage as a violation of FT. Hood's NHPA responsibilities. It was agreed by FTH and TxSHPO three sites would be tested and the site with the best preliminary information would undergo data recovery on a portion of the resource. Projected project completion is FY 2001. Funding requests are based on when funding occurs."NHPAMITM1"\$1,000,000.00"112346

FH0098F02827Burned Rock Feature Site Data Recovery10/16/986"Law: NHPA, ARPA, 200-4; ECAT: EVAL, MITM, MTNR, CUR; Damage occurred to archaeological resources during Cedar Clearing and emergency fire Breack construction between 1996 and 1998. In addition to improving project coordination process, FTH agreed withTxSHPO to undertake additional testing of archaeological resources with Burned rock middens and mounds. This information will be used to select future sites for Excavation as mission requirements do not enable protection of the resources from training and other impacts. Project will focus on 10 prehistoric archaeological sites."NHPAMITM1 "\$1,000,000.00"112346

FH0098F02928Rockshelter Data Recovery10/16/986"Law: NHPA, ARPA, NAGPR, 200-4; ECAT: EVAL, MITM, MTNR, CUR; Rockshelters on FTH often contain Native American burials. This knowledge has attracted looters since before FTH's establishment. Current Stewardship responsibilities under the the above laws require mitigation when looting has occurred. Project programmed to implement NRHP Testing at 13 resources known to have been looted. Consultation with appropriate tribes will be implemented under a consultation project."NHPAMITM1"\$1,000,000.00"112346

FH0096F00629Mitigation of Damaged Resources11/13/964"Law: NHPA, ARPA, NAGPRA, 200-4, CRMP; ECAT: MITM, MTNR, CON, CUR; Damage of resources occur periodically from a variety of sources on and off FTH and include not reading maps or construction design correctly to

DRAFT

disregarding established officially agreed upon restrictions. This produces a violation of the above laws, regulations and FTH's CRMP where protection of resources in place is the efficient and cost effect management method. To show good faith to the community and regulatory bodies, mitigation measures must be followed through in a timely manner. Based on historical data, this project enables one archaeological resource to be mitigated using detailed excavation techniques to gather, analyse, preserve data and answer archaeological questions. If an archaeological resource is not the focus of recent damage, other resources may be assessed according to their needs."NHPAMITM1 "\$3,000,000.00"1123125

FH000F002930Identification of Sub-surface Cultural Deposits in Alluvium Potential10/6/001 "Laws: NHPA; ECATs: EVAL, MTNR; Many of the large creeks have alluvial deposits at least 3 meters thick. In addition, many tributaries have alluvial deposits with depth. Based on historical testing of such sediments, it is likely these alluvial terraces contain buried cultural deposits. Identification of water shed development across the landscape over time delineates sediment deposition. This project supports training by identifying tributary stream sediments and sub-surface sediments which have a high potential to contain cultural materials. Knowledge of the location of these sediments enables CRM to specifically define areas of controlled use and identify areas for avoidance and excavation. This information streamlines training planning both by reducing the need to investigate all areas with creek sediments and clearing areas the would otherwise need long-term avoidance until testing could be performed. Project is scheduled as a two year project to aquire and process data, and present results."NHPAEVAL"2, PSDF""\$500,000.00"292340

FH000F003131Paleontological survey and evaluation10/6/001"Laws: NHPA, AR 200-4; ECATs: SURV, EVAL, INVE; A promenant geologic layer within Fort Hood's boundaries is a caliche limestone resulting from the cretaceous period when Central Texas was part of the Gulf of Mexico. Many paleontological materials have eroded out of streambeds and have been brought to our attention. Under NHPA, 36 CFR Part 800 (1999) and AR 200-4, Fort Hood's CRM program has responsibilitiy for protection significant paleontological deposits. This project will identify the presence of such deposits and recommend protective measures if necessary for such deposits. This project is scheduled as a two year project."NHPA EVAL"2, PSDF""\$250,000.00"696780

FH000F003032Archaeological Collection Standards Update10/6/004"Laws: NHPA, 36 CFR Part 79; ECATs: CURA, MTNR; Funding is required to bring 200 cubic meters up to 36 CFR Part 79 compliance standards. Requested funds reflect a one-time cost of processing and repackaging artefacts for long-term curation."NHPACURA"1, CMPA""\$200,000.00"116341

33 Public OutreachLaws: NHPA; ECATs::; Funding is required to support public outreach activities.

34 Military landscape assessment

35Coorelation of known environmental resources with site distribution

36 Determination of palaeo-botanical resources and temporal distributions.

37 Identification of military activity requirements for ground disturbance

38 Assessment of military activity's impacts on different soil conditions with respect to depth of eligible characteristics of eligible and and potentially eligible resources

39 Assessment of eligible and potential eligible resource characteristics

40 Sediment profiles for archaeological resources

41 Coorelation of sediment profiles with eligible and Potentially eligible resource charactersitics

- 42 Determination of artifact movement through established sediment profiles
- 43 Development of historical dig layer based on hard copy permit info
- 44 "Digitization of historic maps: vegetation, hydrology, habitation/plat maps"
- 45 Develop Range/TA usage history
- 46 Develop prehistoric context with respect to Central Texas and State Archaeology
- 47 Digitization of Archival Documents
- 48 "Re-printing of public outreach material: books, brochures, etc"
- 49 Development of structural rehabilitation procedures
- 50 Location of property purchase surveys
- 51 Development of historic context for 1950's acquisition property
- 52 Development of Historic archaeological site research design
- 53 Ethnographic study of Native American usage of Fort Hood region
- 54I identification of Traditional Cultural Properties: European
- 55I identification of Traditional Cultural Properties: Native American

DRAFT

Appendix F:

ICRIF

DRAFT

Date: _____	Recorded By: _____	OAHP No.: _____	Field Survey Number: _____
County: _____	Organization: _____	NADB No.: _____	
Location Information Restrictions: <input type="checkbox"/> - YES <input type="checkbox"/> - NO <input type="checkbox"/> - UNKNOWN			
Reasons: _____			
Report Type (check one) <input type="checkbox"/> Original <input type="checkbox"/> Update			

I. Site Designations:

Site Name: _____

Other Designations _____

II. Location: (Use site datum as site location point. Show site datum on site sketch.)

USGS or AMS Map
Name, Scale, Date & NAD _____

UTM Zone _____ Easting _____ Northing _____

GPS UTM Zone _____ Easting _____ Northing _____

Township & Range 1/4 _____ 1/4 _____ 1/4 _____ Section _____ Township _____ Range _____

Triangulation Attach USGS map section with Triangulation shown, points marked, and readings given for each line.

Site Datum:

Temporary **Description:** The site Datum is _____ Continued? Yes ___ No ___

Permanent

III. Site Access:

Describe:
(check off)

___ Main roads

___ Distance from Land Marks

___ Other

Continued? Yes ___ No ___

IV. Previous investigations:

Continued? Yes ___ No ___

V. References:

Continued? Yes ___ No ___

DRAFT

DRAFT

Date: _____	OAHP No.: _____	Field Survey Number: _____
-------------	-----------------	----------------------------

VII. Site Description:					
Site Type: _____		(Historic, Prehistoric, Traditional Use, Other?)			
Site Size:	Axis Direction	Meters	Feet	Acres: _____	(1 acre = 43,560 sq. ft.)
Length:	_____	_____	_____	M ²	Depth _____
Width:	_____	_____	_____		
Assumed site purpose or activities:		(Homestead, Hudson Bay Company, lithic scatter, root ground, village, etc.)			

Description:	Describe: (check off)
	<input type="checkbox"/> Type:
	<input type="checkbox"/> Historic
	<input type="checkbox"/> Prehistoric
	<input type="checkbox"/> Size
	<input type="checkbox"/> Area
	<input type="checkbox"/> Densities
	<input type="checkbox"/> Site Depth
	<input type="checkbox"/> Activities
	<input type="checkbox"/> Other
	<input type="checkbox"/> Features and Artifacts:
	Elaborate in Features and Cultural Material Sections
Continued? Yes <input type="checkbox"/> No <input type="checkbox"/>	

VIII. Photographs / Slides:	(Give roll and frame number. Identify film type, direction, and describe.)

DRAFT

Date: _____ **OAHP No.:** _____ **Field Survey Number:** _____

IX. Features Description:

- Describe:
(check off)
 Features
 Material
 Type
 Function ?
 Style

Continued? Yes No

X. Cultural Material Description:

- Describe:
(check off)
 Artifacts:
 Singular
 Debris
 Materials
 Material Type
 Artifact Type
 Function ?
 Other

Continued? Yes No

Collection Made: Yes No Repository: _____

Collection Method:

Continued? Yes No

DRAFT

Date: _____ **OAHP No.:** _____ **Field Survey Number:** _____

XIII. Site Integrity:	(Discuss the condition of attributes that define the site: i.e., features, cultural materials, disturbance/damage, etc..)	Describe: (check off) <input type="checkbox"/> Integrity <input type="checkbox"/> Significance <input type="checkbox"/> NRHP eligibility <input type="checkbox"/> Supporting Evidence <input type="checkbox"/> Other
	<p style="text-align: right;">Continued? Yes ___ No ___</p>	

XIV. Recommendations:	(Justify level of further testing and/or protection recommended.)	Describe: (check off) <input type="checkbox"/> Type: <input type="checkbox"/> Protect <input type="checkbox"/> Mitigate <input type="checkbox"/> Future Work or Testing? <input type="checkbox"/> Supporting Evidence
	<p style="text-align: right;">Continued? Yes ___ No ___</p>	

XV. Continuation:
<p style="text-align: right;">Continued? Yes ___ No ___</p>

Date: _____	OAHP No.: _____	Field Survey Number: _____
--------------------	------------------------	-----------------------------------

XVI. Site Sketch:	Show: (check off)	Legend, Scale, and North Arrow (Magnetic and True)
	<input type="checkbox"/> Site Datum <input type="checkbox"/> Contours <input type="checkbox"/> Creeks <input type="checkbox"/> Drainages <input type="checkbox"/> Features <input type="checkbox"/> Vegetation <input type="checkbox"/> Fences <input type="checkbox"/> Access Roads <input type="checkbox"/> Other	

DRAFT

DRAFT
