CAMP STANLEY STORAGE ACTIVITY
INTEGRATED NATURAL RESOURCE MANAGEMENT PLAN
2013 - 2018

FINAL

Prepared for:

CAMP STANLEY STORAGE ACTIVITY
BOERNE, TEXAS

April 2013

This page left intentionally blank

DOCUMENT NOTES

CAMP STANLEY STORAGE ACTIVITY
INTEGRATED NATURAL RESOURCE MANAGEMENT PLAN
2013 – 2018
FINAL

1. Final deliverables of this report were printed on 100% recycled post-consumer waste, Green Seal certified paper (www.greenseal.org) and paper certified by the Forestry Stewardship Council (www.fscus.org/paper).
2. Scientific names are listed at first appearance; the common names are used thereafter.
3. Units are provided as English units, followed by metric units parenthetically.
4. Suggested Citation:
   U.S. Department of the Army, Camp Stanley Storage Activity. (2013). *Camp Stanley Storage Activity Integrated Natural Resources Management Plan, 2013 – 2018.* Prepared for Camp Stanley Storage Activity Environmental Program Office, Boerne, Texas. Prepared by Parsons Government Services, Austin, Texas. April, 2013.

This page left intentionally blank

SIGNATURE AUTHORITY AND ENDORSEMENT

The Camp Stanley Storage Activity Integrated Natural Resources Management Plan meets the requirements of the Sikes Act (16 U.S. Code 670a *et seq.*), as amended.

Jason D. Shirley
Installation Manager,
Camp Stanley Storage Activity
Boerne, Texas

Signature

21 MAR 13
Date

Adam Zerrenner
Field Office Supervisor
U.S. Fish and Wildlife Service
Austin Ecological Services Field Office

Signature

March 14, 2013
Date

Carter Smith
Executive Director
Texas Parks and Wildlife Director

Signature

15 April 2013
Date

This page left intentionally blank

CAMP STANLEY STORAGE ACTIVITY INTEGRATED NATURAL RESOURCE MANAGEMENT PLAN REVISIONS

Part	Date	Revision Notes
Section 4.1.2, Page 4-5	02/13/2014	Hunting Program paragraph updated to indicate that pond stocking is currently not practiced at CSSA.
Section 4.3.3.9, Page 4-15	02/13/2014	Updated to indicate that pond stocking is currently not practiced at CSSA.
Section 4.3.3.10, Page 4-16	02/13/2014	Updated to indicate that pond stocking is currently not practiced at CSSA.
Section 5.7.5, Page 5-4	02/13/2014	Updated to indicate that pond stocking is currently not practiced at CSSA.

This page left intentionally blank

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ACRONYMS AND ABBREVIATIONS

°F	degrees Fahrenheit
°C	Degrees Celsius
AOC	Area of Concern
AR	Army Regulation
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CSSA	Camp Stanley Storage Activity
CWA	Clean Water Act
CX	Categorical Exclusion
DoD	U.S. Department of Defense
EA	Environmental Assessment
EIS	Environmental Impact Statement
EO	Executive Order
EPR	Environmental Program Requirements
ESA	Endangered Species Act
ESMP	Endangered Species Management Plan
GIS	Geographic information system
HCP	Habitat Conservation Plan
IBMS	Integrated brush management systems
INRMP	Integrated Natural Resources Management Plan
JBSA-CB	Joint Base San Antonio Camp Bullis
MOU	Memorandum of Understanding
mph	Miles per hour
NDAA	National Defense Authorization Act
NWCG	National Wildfire Coordinating Group
NEPA	National Environmental Policy Act
NOAA	National Oceanic and Atmospheric Administration
NRCS	Natural Resource Conservation Service
RCRA	Resource Conservation and Recovery Act
REC	Record of Environmental Consideration
RMU	Range management unit
SAIA	Sikes Act Improvement Act
SARA	San Antonio River Authority
SAWS	San Antonio Water Supply
SCADA	Supervisory Control and Data Acquisition
SDSFIE	Spatial Data Standards for Facilities, Infrastructure, and Environment
SWMU	Solid Waste Management Unit
TAC	Texas Administrative Code
TCAP	Texas Conservation Action Plan
TCP	Traditional cultural property
U.S.	United States
U.S.C.	United States Code

This page left intentionally blank

EXECUTIVE SUMMARY

Military installations and training areas that are used for training and testing provide a foundation for military readiness. Military lands are becoming more ecologically important as residential, commercial, and industrial development continues on surrounding non-federal lands. Military lands often provide habitat for a broad spectrum of state and federally protected threatened and endangered species or other special status species, and contain many important natural resources such as wetlands, native grasslands, and forests. Consequently, military lands are managed for both their military value and for their natural resources. Camp Stanley Storage Activity (CSSA), located in northwestern Bexar County, Texas, actively engages in a natural resource management program that balances military readiness with natural resource stewardship and compliance. Such a balance achieves a reduction of conflicts with the regulatory community, as well as maintaining a "no net loss" of the CSSA military mission.

The Sikes Act (16 U.S.C. 670a et seq.) requires the U.S. Department of Defense to carry out a program for the conservation and rehabilitation of natural resources on military installations. The Sikes Act has been reauthorized and modified numerous times since the initial passage of this important natural resource law in 1960. In 1997, the Sikes Act was reauthorized and modified as the Sikes Act Improvement Act, which requires eligible military installations with significant natural resources to prepare Integrated Natural Resource Management Plans (INRMP).

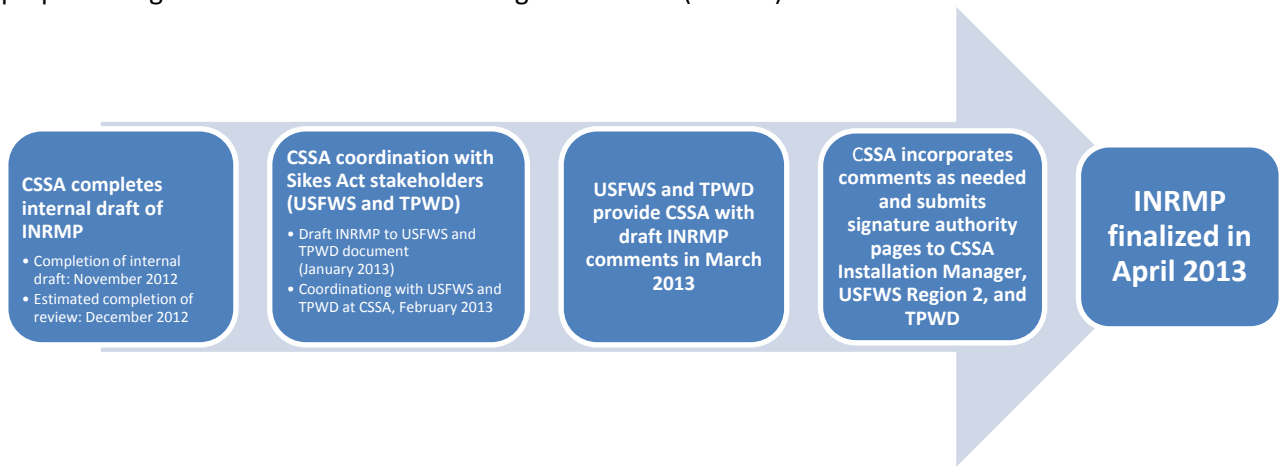


Figure ES-1: Camp Stanley Storage Activity Integrated Natural Resources Plan Development

This INRMP represents a completion of a five-year update and review by the CSSA Installation Manager, CSSA Environmental Program Manager, and cooperating natural resource management agencies (U.S. Fish and Wildlife Service Austin Ecological Services Field Office and Texas Parks and Wildlife Department). The CSSA Environmental Program Manager, with technical assistance from the U.S. Fish and Wildlife Service and Texas Parks and Wildlife, has developed 19 INRMP projects. The IRNMP has followed the schedule shown in Figure ES-1. Table E-1 lists each project and the reference section within this plan.

Contents of the CSSA INRMP are organized by section, described below:

- ***Section 1 Overview:*** A general description of the CSSA military mission, natural resources management philosophy, authority of the INRMP, and stakeholder descriptions.

- ***Section 2 Current Conditions and Use:*** Information relevant to natural resources on installations considered in the CSSA INRMP, including ecological descriptions of the facilities and surrounding areas.
- ***Section 3 Environmental Management Strategy and Mission Sustainability:*** A discussion of the NEPA process relevant to CSSA, ESA consultation requirements, opportunities for public outreach and cooperation, and coordination with state comprehensive wildlife plans.
- ***Section 4 Natural Resource Program Elements and Integrated Natural Resources Management Plan Projects:*** A description of program areas relevant to CSSA.
- ***Section 5 Implementation:*** A discussion of how the CSSA INRMP will be implemented, including sources of funding, cooperative agreements, and how the implementation of the INRMP will not cause a net decrease in the military mission.
- ***Section 6 References:*** A list of literature cited in the INRMP.

Five appendices are included in the CSSA INRMP, intended to capture additional information that does not appropriately fit within the body of the INRMP. The appendices included in this INRMP are listed below:

- ***Appendix A – Current U.S. Fish and Wildlife Service Programmatic Biological Opinions and 2012 Annual Report:*** CSSA has two current programmatic Biological Opinions in effect for activities that may affect ESA-listed species. This appendix includes copies of these two programmatic Biological Opinions, as well as a copy of the 2012 Annual Report, which may be used as a template for future annual report submissions to the U.S. Fish and Wildlife Service. The 2012 annual report combines reporting requirements for both Biological Opinions into one report.
- ***Appendix B – INRMP Projects Consistent with Department of Defense Migratory Bird Treaty Act Obligations:*** This appendix lists projects that contribute either directly or indirectly to migratory bird conservation.
- ***Appendix C – Fire Management Policy at Camp Stanley:*** This appendix includes a discussion of how the CSSA addresses conservation issues relevant to birds and their habitats to promote and support migratory birds in compliance with the MBTA, EO 13186, and other cooperative agreements.
- ***Appendix D – Hunting and Fishing Activities:*** This appendix contains general information relevant to the recreational use of CSSA. These activities primarily include hunting and fishing.
- ***Appendix E– Sikes Act Cooperator Agency Comments:*** The comments provided by the U.S. Fish and Wildlife Service Austin Ecological Services Field Office are included in Appendix E.1, and comments provided by Texas Parks and Wildlife Department are included in Appendix E.2. A comment and response matrix is included in Appendix E.3 on how comments were addressed and whether the comments affected text changes in the document.

All projects are subject to available funding, with the highest priority given to projects that fulfill a regulatory compliance requirement. The total implementation cost of all 19 projects within this INRMP is expected to be $482,000. Compliance with natural resource regulatory obligations (the highest priority projects with a priority level of C /I) are projected to cost $125,000 through 2018. Natural resource projects that support military mission activities (priority code M / II) are projected to cost $176,000, while stewardship projects that are beyond compliance or military mission activities are estimated to cost $181,000.

Table ES--1: Integrated Natural Resources Management Plan Projects, 2013 – 2017

INRMP Project Name	Priority Level	IRNMP Reference Section
ESA-listed Bird Surveys	C / I	Section 4.3.1.1
Section 7 ESA Annual Reporting Requirements	C / I	Section 4.3.1.2
Section 7 ESA Programmatic Biological Opinion Renewal	C / I	Section 4.3.1.3
INRMP Training and Implementation	C / I	Section 4.3.1.4
Brush Management Needs Assessment	M / II	Section 4.3.2.1
Mechanical Treatment of New Fuel Breaks. Roads, Security Setbacks	M / II	Section 4.3.2.2
Prescribed Fire Operations for Fuels Management	M / II	Section 4.3.2.3
Mechanical Brush and Grasslands Treatment for Fuels Management	M / II	Section 4.3.2.4
Update CSSA Enterprise GIS	M / II	Section 4.3.2.5
Oak Wilt Awareness Program	S / III	Section 4.3.3.1
Red Imported Fire Ant Assessment	S / III	Section 4.3.3.2
Food Plot Installation	S / III	Section 4.3.3.3
Deer Census	S / III	Section 4.3.3.4
Upland Gamebird Estimates	S / III	Section 4.3.3.5
Determination of Harvest Numbers	S / III	Section 4.3.3.6
Mammal Predator Control	S / III	Section 4.3.3.7
Brown-headed Cowbird Control and Assessment	S / III	Section 4.3.3.8
Fish Population Analysis	S / III	Section 4.3.3.9
Pond Stocking	S / III	Section 4.3.3.10

NOTES:

INRMP projects are classified as type and priority. C = Compliance, M = Maintenance, S = Stewardship. Compliance includes projects that must be conducted to ensure the continuance of military mission activities. For example, compliance with U.S. Fish and Wildlife Service Biological Opinions is a requirement for CSSA to continue activities that may adversely affect ESA-listed species. Maintenance projects are routine and continuing activities that support military mission activities. Stewardship activities are activities that are above and beyond compliance with natural resource regulatory frameworks. Priority codes are provided below:

C / I Compliance Class I - Current compliance obligations
M / II Maintenance Class II - Maintenance requirements
S / III Stewardship Class III - Stewardship actions / beyond compliance

1 INTRODUCTION

Camp Stanley Storage Activity (CSSA), formerly known as Leon Springs Military Reservation, is located in Bexar County, northwest of downtown San Antonio, Texas. The post is located immediately east of State Highway 3351, approximately one half mile east of Interstate Highway 10 (see Figure 1-1). CSSA comprises 4,004 acres, divided into an inner and an outer cantonment.

CSSA is a subinstallation of McAlester Army Ammunition Plant, United States (U.S.) Army Field Support Command, Army Materiel Command, U.S. Army. The primary mission of the installation is receipt, storage, and issuance of ordnance as well as quality assurance testing and maintenance of military weapons and ammunition. In addition, a restricted hunting program is conducted by military and installation personnel.

1.1 PURPOSE AND SCOPE

The primary purpose of the CSSA Integrated Natural Resources Management Plan (INRMP) is to ensure that natural resource management activities and military activities are integrated, consistent, and compliant with federal stewardship requirements. Therefore, the CSSA INRMP serves as the Installation Manager's comprehensive plan for natural resource management to attain and sustain stewardship requirements while enhancing the facility mission. The scope of the INRMP covers all CSSA mission lands, which encompass both the inner and outer cantonments.

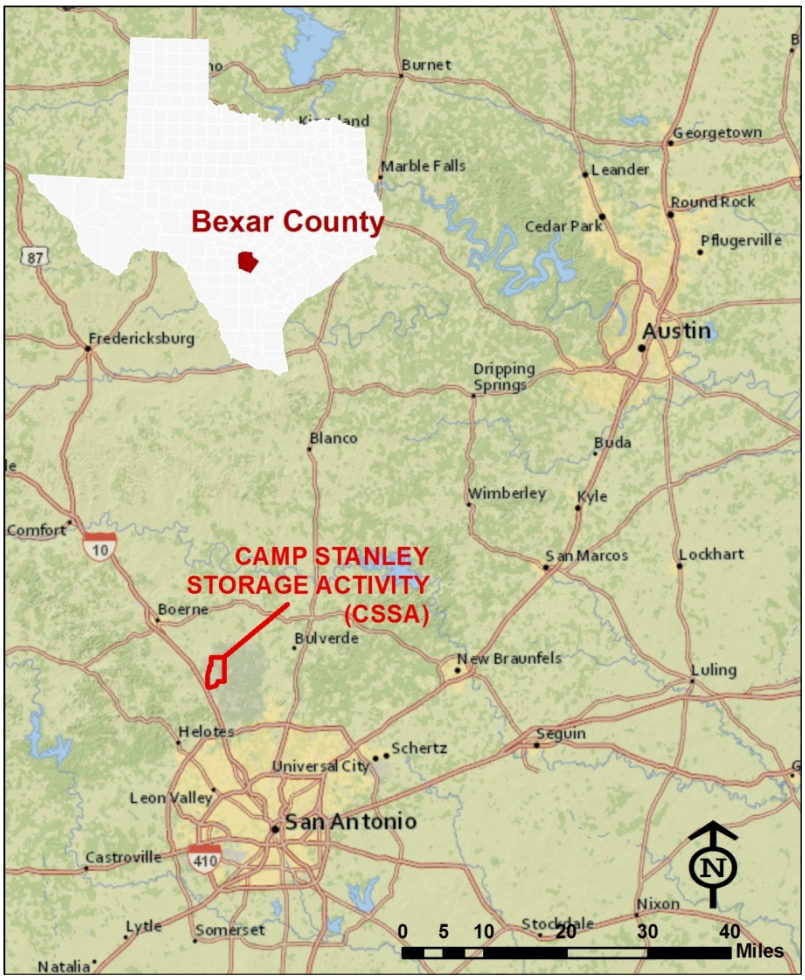


Figure 1-1: Location of Camp Stanley Storage Activity

1.2 AUTHORITY

The Sikes Act (Title 16, United States Code [U.S.C.] 670a *et seq*.), as amended through 1997, provides the primary legal basis for the Secretary of Defense to carry out a program that provides for the conservation and rehabilitation of natural resources on military lands. To facilitate such a program, the Act requires each military department to prepare and implement INRMP documents at appropriate installations. Further, such plans shall be prepared with, and reflect the mutual agreement of, the Secretary of Interior (acting through the U.S. Fish and Wildlife Service director) and the head of each appropriate state resource agency.

1.3 CAMP STANLEY STORAGE ACTIVITY NATURAL RESOURCE MANAGEMENT PROGRAM

1.3.1 STEWARDSHIP AND COMPLIANCE

This section provides an overview of stewardship and compliance obligations relevant to activities at CSSA. Section 3.1, Natural Resources Regulatory Frameworks, discusses consultation pathways for each applicable regulatory framework for natural resources at CSSA.

1.3.1.1 Sikes Act Improvement Act (SAIA)

The Sikes Act Improvement Act (SAIA), simply referred to as the Sikes Act, requires an integrated natural resources management plan be prepared and implemented for any Department of Defense (DoD) installation with significant natural resources. SAIA requires INRMPs to address the following elements:

- Fish and wildlife management, land management, forest management, and wildlife-orientated recreation;
- Fish and wildlife habitat enhancement or modifications;
- Wetlands protection, enhancement, and restoration where necessary for support of fish, wildlife, or plants;
- Integration of, and consistency among, the various activities conducted under the INRMP;
- Establishment of specific natural resources management goals and objectives and time frames for proposed actions;
- Sustainable use by the public of natural resources to the extent that the use is not inconsistent with the needs of fish and wildlife;
- Public access to the military installation that is necessary or appropriate for sustainable use by the public of natural resources, subject to requirements necessary to ensure safety and military security;
- Enforcement of applicable natural resource laws;
- No net loss in the capability of military installations to support the military mission of the installation;
- Regular review of the INRMP and its effects, not less often than every five years; and,
- Provisions for spending hunting and fishing permit fees exclusively for the protection, conservation, and management of fish and wildlife, including habitat improvement, and related activities in accordance with the INRMP.

1.3.1.2 National Environmental Policy Act (NEPA)

The National Environmental Policy Act of 1969 (NEPA) requires disclosure of environmental impacts created by major federal actions. The intent of NEPA is to better inform decision makers of potential impacts from proposed projects and to utilize this information early in the planning process. The analytical process established by NEPA requires that for Federal actions having the potential to significantly impact the environment, agencies must:

(1) Identify and analyze environmental consequences of proposed Federal actions in comparable detail to economic and operational analyses;
(2) Assess reasonable alternatives to agency proposed actions;
(3) Document the environmental analysis and findings; and

The National Environmental Policy Act (NEPA) provides the basic national charter for the protection of the environment.

NEPA was signed into law on January 1, 1970 by President Richard M. Nixon.

(4) Make environmental information available to public officials and citizens before agency decisions are made (DoD 2004).

The CSSA INRMP will serve as a source document for various NEPA documents, such as:

- ***Record of Environmental Consideration (REC) Documents*** - A brief document that is used to describe and document a proposed action and explain why further environmental analysis is not required. A REC is used for projects that have already been addressed in existing documentation or have been categorically excluded (CX) from requiring more detailed environmental review.
- ***Environmental Assessments (EAs) –*** A study required by NEPA to determine if significant environmental impacts are expected from a proposed action. EAs are an intermediate level of environmental analysis and are conducted when an action does not fit an existing CX or its potential for significant impacts are unknown.
- ***Environmental Impact Statements (EISs) –*** An EIS is conducted when significant environmental impacts will occur resulting from the proposed action, at the most detailed level of environmental analysis.

1.3.1.3 Endangered Species Act (ESA)

Passed in 1973 and reauthorized in 1988, the Endangered Species Act (ESA) regulates a wide range of activities affecting plants and animals designated as endangered or threatened. By definition, an endangered species is an animal or plant listed by regulation as being in danger of extinction. A threatened species is any animal or plant that is likely to become endangered within the near future. A species must be listed in the Federal Register as endangered or threatened for the provisions of the ESA to apply.

The Endangered Species Act (ESA) was signed into law by President Richard M. Nixon on December 28, 1973.

ESA protects threatened and endangered species, and the ecosystems upon which they depend.

The ESA prohibits the following activities involving endangered species:

- Importing into or exporting from the United States.
- Taking (includes harassing, harming, pursuing, hunting, shooting, wounding, trapping, killing, capturing, or collecting) within the United States and its territorial seas.
- Taking on the high seas.
- Possessing, selling, delivering, carrying, transporting, or shipping any such species unlawfully taken within the United States or on the high seas.
- Delivering, receiving, carrying, transporting, or shipping in interstate or foreign commerce in the course of a commercial activity.
- Selling or offering for sale in interstate or foreign commerce.

CSSA's Section 7 ESA consultation requirements are explained in more detail in Section 3.2.

1.3.1.4 Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) of 1918 implemented the 1916 convention between the U.S. and Great Britain for the protection of birds migrating between the U.S. and Canada. Similar conventions between the U.S. and Mexico (1936), Japan (1972) and the former U.S.S.R (1976) further expanded the scope of

Birds are indicators of ecological health and quality and are enjoyed by a growing number of U.S. citizens.

A main goal of the MBTA is to keep common birds common.

international protection of migratory birds. Each new treaty has been incorporated into the MBTA as an amendment and the provisions of the new treaty are implemented domestically. These four treaties and their enabling legislation, the MBTA, established Federal responsibilities for the protection of nearly all species of migratory birds, their eggs, and nests.

The MBTA prohibits the taking, killing, or possessing of migratory birds unless permitted by regulation. The species of birds protected by the MBTA is codified in 50 Code of Federal Regulations (CFR) 10.13. In total, 836 species of birds are protected by the MBTA, 58 of which are currently hunted legally as game birds. On December 2, 2003, President George W. Bush signed the 2003 National Defense Authorization Act (NDAA), which amended the MBTA to allow the Secretary of the Interior to prescribe regulations that exempt the Armed Forces from the incidental taking of migratory birds during military readiness activities authorized by the Secretary of Defense.

Congress defined military readiness activities as all training and operations of the Armed Forces that relate to combat and the adequate and realistic testing of military equipment, vehicles, weapons, and sensors for the proper operation and suitability for combat use. Congress further provided that military readiness activities do not include: (a) the routine installation of operating support functions, such as administrative offices, military exchanges, commissaries, water treatment facilities, storage facilities, schools, housing, motor pools, laundries, morale, welfare, and recreational activities, shops, and mess halls; (b) the operation of industrial activities; or (c) the construction or demolition of facilities used for a purpose described in (a) or (b).

The final rule authorizing the DoD to take migratory birds during military readiness activities was published in the Federal Register on February 28, 2007. The regulation can be found in 50 CFR Part 21. The regulation provides that the Armed Forces must confer and cooperate with the U.S. Fish and Wildlife Service on the development and implementation of conservation measures to minimize or mitigate adverse effects of a military readiness activity if it determines that such activity may have a significant adverse effect on a population of a migratory bird species.

116 species of birds have been observed at CSSA, as of 2012. Neotropical songbirds, raptors, and various waterbirds are known to breed at the installation.

The requirement to confer with the U.S. Fish and Wildlife Service is triggered by a determination that the military readiness activity in question will have a significant adverse effect on a population of migratory bird species. An activity has a significant adverse effect if, over a reasonable period of time, it diminishes the capacity of a population of migratory bird species to maintain genetic diversity, to reproduce, and to function effectively in its native ecosystem. A population is defined as “a group of distinct, coexisting, same species, whose breeding site fidelity, migration routes, and wintering areas are temporally and spatially stable, sufficiently distinct geographically (at some point of the year), and adequately described so that the population can be effectively monitored to discern changes in its status.” Assessment of impacts should take into account yearly variations and migratory movements of the impacted species.

Migratory bird conservation relative to non-military readiness activities is addressed separately in a Memorandum of Understanding (MOU) developed in accordance with Executive Order (EO) 13186, signed January 10, 2001, “Responsibilities of Federal Agencies to Protect Migratory Birds.” The MOU between DoD and the U.S. Fish and Wildlife Service was signed on July 31, 2006. DoD responsibilities discussed in the MOU include, but are not limited to:

(1) Obtaining permits for import and export, banding, scientific collection, taxidermy, special purposes, falconry, raptor propagation, and depredation activities;
(2) Encouraging incorporation of comprehensive migratory bird management objectives in the planning of DoD planning documents;
(3) Incorporating conservation measures addressed in Regional or State Bird Conservation Plans in Integrated Natural Resource Management Plans;
(4) Managing military lands and activities other than military readiness in a manner that supports migratory bird conservation;
(5) Avoiding or minimizing impacts to migratory birds, including incidental take and the pollution or detrimental alteration of the environments used by migratory birds; and,
(6) Developing, striving to implement, and periodically evaluating conservation measures for management actions to avoid or minimize incidental take of migratory birds, and, if necessary, conferring with the Service on revisions to these conservation measures.

1.3.1.5 Department of Defense Instructions and Regulations

DoD Instruction 4715.3 (effective since May 3, 1996) implements policy, assigns responsibilities, and prescribes procedures for the integrated management of natural and cultural resources on property under DoD control.

Army Regulation (AR) 200-1 (*Environmental Protection and Enhancement, December 2007*) implements SAIA on Army lands and identifies general requirements for the contents of installation INRMPs, as well as criteria for achieving integration with the military mission. The cooperative agreements with federal and state resource agencies referred to in AR 200-1 are superceded by the resource agencies' approval of the INRMP.

1.3.2 NATURAL RESOURCES MANAGEMENT PHILOSOPHY

1.3.2.1 Ecosystem Management

Both the DoD and the Department of the Army, along with 12 other federal agencies, are signatories to an MOU that fosters a philosophy of the ecosystem management approach to natural resource management (MOU 15 Dec 1995). The policy portion of the MOU states:

> *"The federal government should provide leadership in and cooperate with activities that foster the ecosystem approach to natural resource management, protection, and assistance. Federal agencies should ensure that they utilize their authorities in a way that facilitates, and does not pose barriers to the ecosystem approach. Consistent with their assigned missions, federal agencies should administer their programs in a manner that is sensitive to the needs and rights of landowners, local communities, and the public, and should work with them to achieve common goals."*

In addition to the MOU, DoD Instruction 4715.3 (1996) provides policy on general conservation management, and natural and cultural resource management.

1.3.2.2 Multiple Use

Performing the military mission at CSSA while simultaneously managing natural resources, is the basis for the principle of multiple-use. Multiple-use refers to the "…integrated management of all natural resources, each with the other, to achieve optimum use and enjoyment while maintaining the

environmental qualities, ecological relationships and aesthetic values in proper balance…." (U.S. Army 1995). CSSA multiple–use activities that require integrated management include:

- Military mission activities;
- Facilities management;
- Hunting;
- Cultural resource protection;
- Vegetation management / brush control (primarily for fuels management);
- Wetlands protection;
- Endangered species protection and habitat management; and
- Invasive species control.

1.3.2.3 Adaptive Management

Adaptive management is a systematic process for continually improving management policies and practices by learning from the outcomes of operational programs, and is defined by the Natural Resource Council (2004) as:

> *"[a decision process that] promotes flexible decision making that can be adjusted in the face of uncertainties as outcomes of management actions and other events become better understood. Careful monitoring of these outcomes both advances scientific understanding and helps adjust policies or operations as part of an iterative learning process. Adaptive Management recognizes the importance of natural variability in contributing to ecological resilience and productivity… Its true measure is in how well it helps meet environmental, social, and economic goals, increases scientific knowledge, and reduces tensions among stakeholders."*

The concept employs management programs designed to experimentally compare selected policies or practices by evaluating alternative hypotheses about the system being managed. Adaptive management incorporates research into natural resource management actions. Specifically, it is the integration of design, management, and monitoring to systematically test assumptions to learn from past management practices, and to adapt future management plans. Implementation of projects on CSSA associated with resource management activities will involve principles of adaptive management.

1.3.2.4 Ecological Restoration

Ecological restoration is an intentional activity that initiates or accelerates the recovery of an ecosystem with respect to its health, ecological integrity, and sustainability (Society of Ecological Restoration 2004). The project descriptions are designed in adherence to Society of Ecological Restoration guidance for planning ecological restoration (Society of Ecological Restoration 2004) and The Nature Conservancy general guidelines for conservation planning (The Nature Conservancy Conservation Action Planning Toolbox 2007). Both sets of planning guidelines follow an adaptive management framework (Williams et al. 2007, Holling 1978, and Salafsky and Margoluis 1999), a management practice that allows for the involvement of stakeholders to modify management activities in response to changing conditions or new information.

The Society of Ecological Restoration recommended elements for restoration plans are listed in

Table 1-1, along with how the INRMP will address each element.

Table 1-1: Elements of Restored Ecosystem Plans and Inclusion in the INRMP Update

Restoration Plan Element	INRMP Update Inclusion
A baseline ecological description of the ecosystem designated for restoration	Planning Level Surveys
An evaluation of how the proposed restoration project integrates with other parts of the regional landscape	Each INRMP project description will be referenced to its regional context. For example, a wetlands restoration project is designed to be similar in function and aesthetics to similar wetlands in the area.
Explicit plans and schedules for all onsite preparation and installation activities	Required for INRMP inclusion
Well-developed and explicit performance standards for evaluating projects	Included in INRMP project descriptions
Monitoring protocols for the performance standards	Included in INRMP project descriptions
Provision for the procurement of suitable plant materials and for supervision to guarantee proper planting	Included in INRMP project descriptions with a list of suitable seed suppliers (Bammert Seed Company, Pogue Seed Company, etc.)
Well-developed and explicit performance standards for evaluating project	Included in INRMP project descriptions

In order to properly plan ecological restoration activities on CSSA, the term "recovery" must be explained. An ecosystem has recovered, and is restored, when autogenic processes function on the landscape (Whisenant 1999), or in other words, it contains sufficient biotic and abiotic resources to continue its development without further assistance or subsidy (Society of Ecological Restoration 2004).

Monitoring success of the INRMP projects will be evaluated in relation to these attributes, listed below (Society of Ecological Restoration 2004):

- *The restored ecosystem contains a characteristic assemblage of the species that occur in the reference ecosystem and that provide appropriate community structure.*
- *The restored ecosystem consists of indigenous species to the greatest possible extent.*
- *The physical environment of the restored ecosystem is capable of sustaining reproducing populations of the species necessary for its continued stability or development along the desired trajectory.*
- *The restored ecosystem apparently functions normally for its ecological stage of development, and signs of dysfunction are absent.*
- *The restored ecosystem is suitably integrated into a larger ecological matrix or landscape, with which it interacts through abiotic and biotic flows and exchanges.*
- *Potential threats to the health and integrity of the restored ecosystem from the surrounding landscape have been eliminated or reduced as much as possible.*
- *The restored ecosystem is sufficiently resilient to endure the normal periodic stress events in the local environment that serve to maintain the integrity of the ecosystem.*
- *The restored system is self-sustaining to the same degree as its reference ecosystem*.

1.4 RESPONSIBILITIES, STAKEHOLDERS, AND INTERESTED PARTIES

1.4.1 U.S. DEPARTMENT OF DEFENSE STAKEHOLDERS

1.4.1.1 Camp Stanley Storage Activity and McAlester Army Ammunition Plant

CSSA, a sub-installation of McAlester Army Ammunition Plant, is an Army Materiel Command installation and is responsible for implementing this INRMP. Implementation will be the responsibility of the Environmental Program Manager. The Installation Manager of CSSA has overall responsibility for preparation and implementation of an INRMP that fulfills both stewardship and legal requirements. The Environmental Program Manager is assigned day-to-day responsibility for development and implementation of the INRMP.

1.4.1.2 Joint Base San Antonio-Camp Bullis and Joint Base San Antonio-Fort Sam Houston

Camp Bullis Military Training Reservation (also known as Joint Base San Antonio-Camp Bullis [JBSA-CB], or simply Camp Bullis), a sub-installation of Joint Base San Antonio-Fort Sam Houston (Fort Sam Houston), is adjacent to CSSA and shares many natural resource management issues common to the region. Under a separate command structure than CSSA, JBSA-CB maintains a robust natural resource program and has engaged in various ESA-listed species surveys with upland bird and karst habitats.

1.4.1.3 U.S. Army Environmental Command

The U.S. Army Environmental Command (USAEC), headquartered at Fort Sam Houston, Texas, provides oversight, centralized management, and execution of Army environmental programs and projects. It has support capabilities in the areas of NEPA, natural resources, cultural resources, environmental compliance, and related areas.

Major program areas within the USAEC Natural Resources Support Division include:

- Army Forestry and Agricultural/Grazing Outlease Program
- Conservation Assistance Program
- Ecosystem Management Program
- Fish and Wildlife Conservation Program
- Installation Environmental Program Management Guide
- Reimbursable Programs Tracking System
- Threatened and Endangered Species Management
- Wildland Fire Management

1.4.1.4 U.S. Department of Defense Partners in Flight

Partners in Flight began in 1990 in response to growing concerns about the declines in the populations of many land bird species and in order to emphasize the conservation of birds not covered by existing conservation initiatives. DoD promotes bird conservation on military lands by promoting a partnership with PIF.

1.4.2 SIKES ACT COOPERATING AGENCY STAKEHOLDERS (U.S. FISH AND WILDLIFE SERVICE AND TEXAS PARKS AND WILDLIFE DEPARTMENT)

In accordance with Army policy, this INRMP has been prepared in cooperation with the U.S. Fish and Wildlife Service and Texas Parks and Wildlife Department. Copies of the Draft CSSA INRMP have been provided to these agencies for review and input to the Final CSSA INRMP. As per SAIA guidance, the Final INRMP was submitted to the U.S. Fish and Wildlife Service and Texas Parks and Wildlife Department for concurrence and to establish a mutual agreement of the parties concerning conservation, protection, and management of fish and wildlife resources. Contacts between the CSSA Environmental staff and U.S. Fish and Wildlife Service and Texas Parks and Wildlife Department personnel occurred in early 2013, which allowed the resource agencies to provide initial technical guidance on natural resource project development.

- **U.S. Fish and Wildlife Service** - CSSA has engaged in informal Section 7 ESA consultation with the U.S. Fish and Wildlife Service Austin Ecological Services Field Office, which will review the INRMP.
- **Texas Parks and Wildlife Department** – CSSA has requested technical assistance from Texas Parks and Wildlife Department personnel for the development of natural resource projects and INRMP review. Texas Parks and Wildlife Department will review the completed INRMP.

1.4.3 OTHER INTERESTED STAKEHOLDERS

1.4.3.1 U.S. Environmental Protection Agency

The U.S. Environmental Protection Agency (USEPA) has the responsibility of maintaining and enforcing national standards under a variety of environmental laws, in consultation with state, tribal, and local governments. It delegates some permitting, monitoring, and enforcement responsibility to U.S. states and Native American tribes. USEPA's enforcement powers include fines, sanctions, and other measures. The agency also works with industries and all levels of government in a wide variety of voluntary pollution prevention programs and energy conservation efforts. USEPA is currently working with CSSA on a variety of environmental restoration activities, pursuant with the agency's authority under the Resource Conservation and Recovery Act (RCRA) and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

1.4.3.2 Texas Commission for Environmental Quality

The Texas Commission for Environmental Quality (TCEQ) is responsible for protecting human health and the environment, ensuring clean air and an adequate supply of water, and ensuring safe and proper disposal of hazardous waste and pollutants. TCEQ is currently working closely with CSSA and CSSA contractors to assist CSSA in meeting environmental compliance and restoration requirements.

1.4.3.3 Conservation Organizations, Regional Governments, and Neighbor Organizations

The following agencies, organizations and interested parties may be interested in natural resource management activities at CSSA:

- ***Bexar County Audubon Society:*** The Bexar County Audubon Society is the local chapter of the National Audubon Society. This organization's mission is to conserve and restore natural ecosystems, focusing on birds, other wildlife, and their habitats for the benefit of humanity and the biological diversity.

- ***Alamo Area Council of Governments:*** The Alamo Area Council of Governments reviews planning and environmental documents from San Antonio's numerous military installations. This agency has completed the Camp Bullis Joint Land Use Study which contains land use study information relevant to CSSA (Alamo Area Council of Governments 1995).
- ***Neighborhood associations and individuals:*** In addition to sharing a border with JBSA-CB Military Reservation, CSSA's neighbors include various residential developments and the nearby municipalities of Fair Oaks and Leon Springs.

1.4.3.4 Native American Tribes

Three federally recognized Native American tribes used the CSSA area in historic times, including the Comanche, the Mescalero Apache, and the Tonkawa, although the Comanche and Mescalero Apache may not have had permanent settlements in the area. Two additional tribes claim descent from Native Americans that once lived in the CSSA area, the Lipan Apache Band of Texas and the Tap Pilam Coahuiltecans. Both of these groups claim descent from missionized Native Americans, and both have petitioned for federal recognition (Parsons 2005a). These tribes, however, are not currently federally recognized.

Concerns specific to Native Americans usually revolve around the identification and preservation of Traditional Cultural Properties (TCP), access to sacred and ceremonial sites, and preservation of cemeteries or burial grounds. CSSA has not been surveyed for TCPs, and there has been no effort to consult with Native American groups to identify their presence. No Native American burial sites have been located during previous archeological surveys at CSSA, and there is low potential for their presence (Parsons 2005a).

1.5 Integrated Natural Resources Management Plan Review and Revision Process

The INRMP will be evaluated based on the following criteria:

- Achievement of planned goals and objectives;
- Effectiveness of management standards and guidelines;
- Correctness of labor, resource, and budget planning; and
- Relevance of INRMP to new or changing conditions.

The INRMP will be updated at least every 5 years, or more frequently if the CSSA Environmental Program Manager determines the need to address new or changing natural resource conditions.

1.6 Integrated Natural Resources Management Plan Organization

The CSSA INRMP is organized in accordance with Department of the Army guidance. An outline of the document is listed below:

- ***Section 1 Overview***
  A general description of the CSSA military mission, natural resources management philosophy, authority of the INRMP, and stakeholder descriptions.
- ***Section 2 Current Conditions and Use***
  Information relevant to natural resources on installations considered in the CSSA INRMP, including ecological descriptions of the facilities and surrounding areas.

- ***Section 3 Environmental Management Strategy and Mission Sustainability***
  A discussion of the NEPA process relevant to CSSA, ESA consultation requirements, opportunities for public outreach and cooperation, and coordination with state comprehensive wildlife plans.
- ***Section 4 Natural Resource Program Elements and Integrated Natural Resources Management Plan Projects***
  A description of program areas relevant to CSSA.
- ***Section 5 Implementation***
  A discussion of how the CSSA INRMP will be implemented, including sources of funding, cooperative agreements, and how the implementation of the INRMP will not cause a net decrease in the military mission.
- ***Section 6 References***
  A list of literature cited in the INRMP.

Five appendices are included in the CSSA INRMP, intended to capture additional information that does not appropriately fit within the body of the INRMP. The appendices included in this INRMP are listed below:

- ***Appendix A – Current U.S. Fish and Wildlife Service Programmatic Biological Opinions and 2012 Annual Report***
  CSSA has two current programmatic Biological Opinions in effect for activities that may affect ESA-listed species. This appendix includes copies of these two programmatic Biological Opinions, as well as a copy of the 2012 Annual Report, which may be used as a template for future annual report submissions to the U.S. Fish and Wildlife Service.
- ***Appendix B – INRMP Projects Consistent with Department of Defense Migratory Bird Treaty Act Obligations***
  This appendix lists projects that contribute either directly or indirectly to migratory bird conservation.
- ***Appendix C – Fire Management Policy at Camp Stanley***
  This appendix includes a discussion of how the CSSA addresses conservation issues relevant to birds and their habitats to promote and support migratory birds in compliance with the MBTA, EO 13186, and other cooperative agreements.
- ***Appendix D – Hunting and Fishing Activities***
  This appendix contains general information relevant to the recreational use of CSSA. These activities primarily include hunting and fishing.
- ***Appendix E– Sikes Act Cooperator Agency Comments***
  The comments provided by the U.S. Fish and Wildlife Service Austin Ecological Services Field Office are included in Appendix E.1, and comments provided by Texas Parks and Wildlife Department are included in Appendix E.2. A comment and response matrix is included in Appendix E.3 on how comments were addressed and whether the comments affected text changes in the document.

2 CURRENT CONDITIONS AND LANDUSE

Section 2 describes the current physical and ecological conditions and various land use activities at CSSA that contribute to achieving the installation military mission. Section 2.1 describes the current and past land uses on CSSA, as well as the surrounding land use activities adjacent to the installation. Section 2.2 provides a detailed description of the installation military mission. The physical environment (climate, geology, soils, topography, and hydrological features) is described in Section 2.3. Section 2.4 provides a detailed description of the biological environment (vegetation community types, aquatic sites, wildlife communities, and species that occur on CSSA that have special regulatory status. Section 2.5 provides an overview of cultural resource management issues, and Section 2.6 discusses the potential impacts of the military mission on the local environment.

2.1 LAND USE

2.1.1 CURRENT LAND USE

The inner cantonment of CSSA, comprising 1,760 acres, is used for storage of ammunition in igloos, light industrial activities, such as maintenance and cleaning of weapons, warehouse storage, and offices. Eleven houses where personnel and their families live are located within the western inner cantonment. The 2,244 acres of the outer cantonment is used for munitions test ranges and wildlife hunting. Much of the East and North Pastures are unimproved to provide a protection area around the firing range. Wildlife is hunted by military and civil service personnel, retired employees, and other authorized persons. Figure 2-1 provides a map of the general administrative areas of CSSA.

The mission of CSSA is not anticipated to change; therefore, land use changes on the facility are not anticipated. Land use in the surrounding area is not anticipated to change, except for increased residential development in undeveloped areas west and north of CSSA. Increased residential development is anticipated to result in increased demand on the public water supply, which is supplied from both local wells and the San Antonio Water System (SAWS) regionalized distribution system.

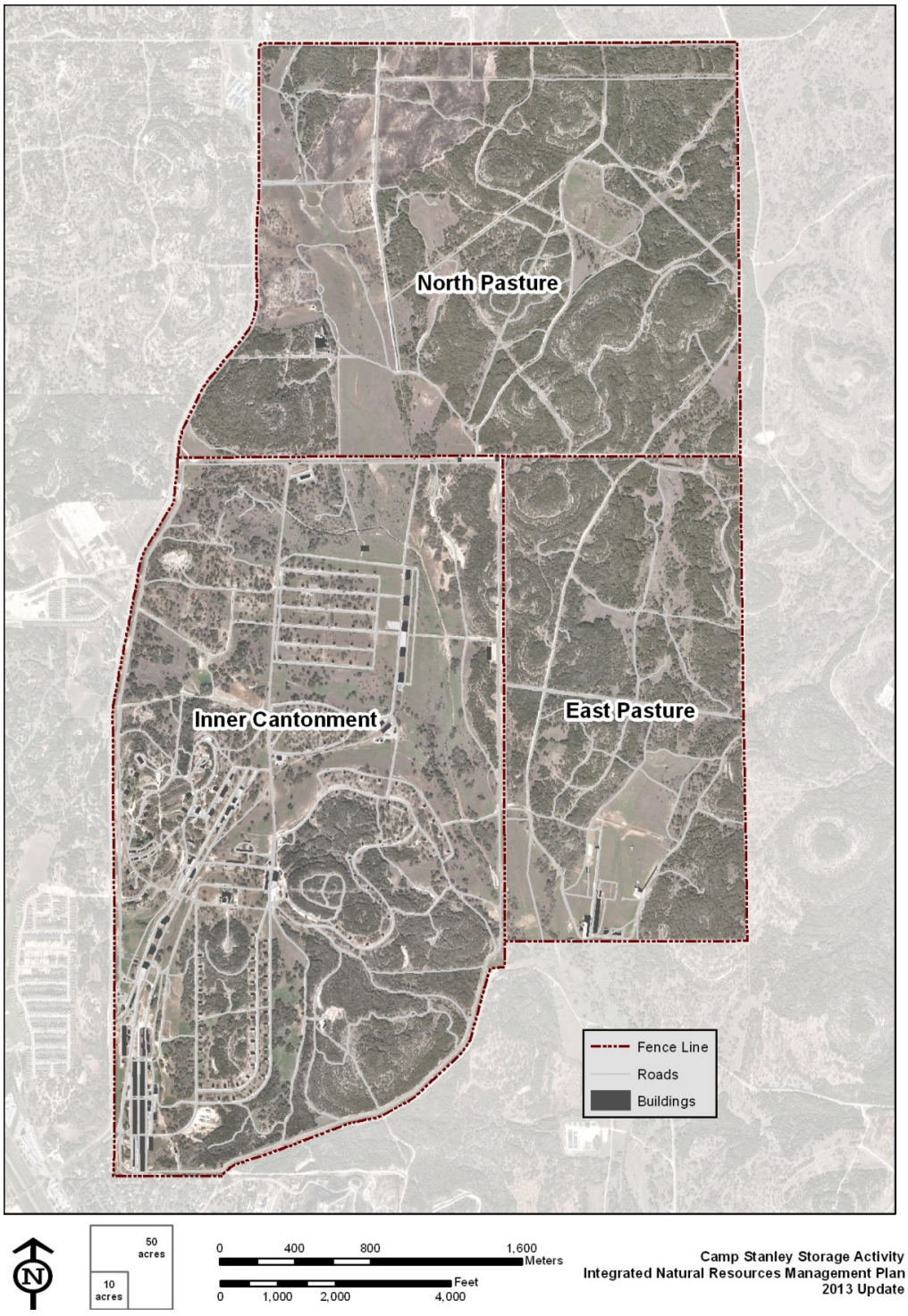
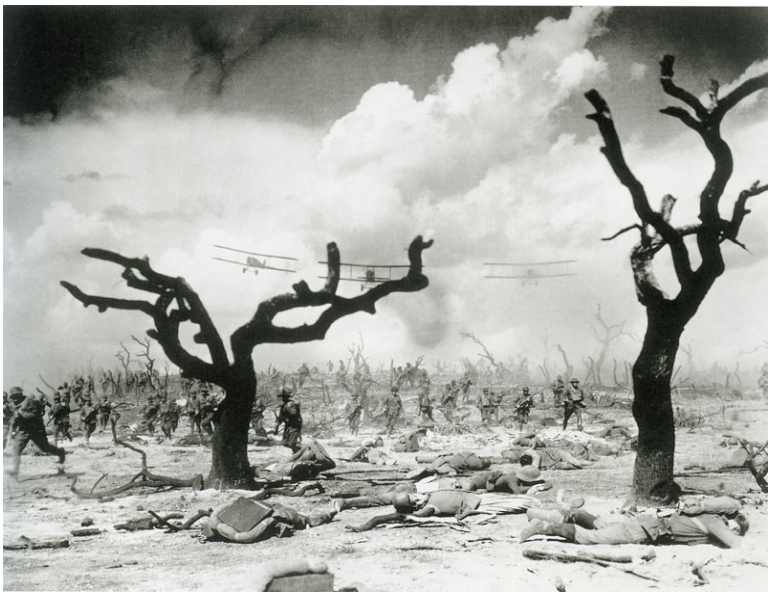


Figure 2-1: Camp Stanley Installation Map

2.1.2 SITE HISTORY AND PRE-MILITARY LAND USE

The land on which CSSA is located was used for ranching and agriculture until the early 1900s (U.S. Army 1990). During 1906 and 1907, six tracts of land were purchased by the U.S. Government and designated the Leon Springs Military Reservation. The reservation, which included campgrounds and cavalry shelters, was used for maneuvers by Army and National Guard units.

In October 1917, the post was designated Camp Stanley. United States involvement in World War I spurred extensive construction to provide housing for temporary cantonments and installation support facilities. Camp Stanley was also used as a film location for the 1927 motion picture, *Wings* (Wellman 2006). Figure 2-2 shows the film's climax, a scene from the Battle of Saint-Mihiel, with numerous charred live oak trees. In 1931, Camp Stanley was selected as an ammunition depot, and construction of standard magazines and igloo magazines began in 1938 under direction of the Work Progress Administration. Camp Stanley was transferred to the jurisdiction of the Red River Army Depot in 1949. In addition to ammunition storage, CSSA lands were used to test, fire, and overhaul ammunition components.



Source: Wellman 2006

Figure 2-2: Scene from the 1927 Motion Picture, *Wings*

2.1.3 SURROUNDING LAND USE

In accordance with the TCEQ Texas Risk Reduction Program, a land use survey was completed December 15 and 16, 1999, covering the area within a 1-mile radius of CSSA. Preliminary land use information was obtained from Texas highway maps, United States Geologic Survey topographic maps, and aerial photography. The surrounding area was surveyed on foot and by vehicle as accessible from public roads and CSSA property. Preliminary land use information was updated when discrepancies were observed.

Land use is primarily single-family residential, with a smaller amount of commercial use. Although the area surrounding CSSA is primarily rural, the density of residential development to the west and south of the installation is increasing. Adjacent and nearby communities include Fair Oaks, a large-lot single-family subdivision to the west and northwest, Leon Springs to the south, and the Dominion, another large-lot single-family subdivision towards the southeast. Three new subdivisions, Stonehaven, the Heights of Lost Creek and Lost Creek Development, are in various phases of construction, being constructed and established in the past five years by Centex Homes (later taken over by Pulte Homes) across Ralph Fair Road adjacent to the west side of CSSA. CSSA is bordered to the west by Ralph Fair Road. Fair Oaks Elementary School is located on Ralph Fair Road just northwest of CSSA. The northern boundary of CSSA is bordered by commercial property, vacant land, an electrical substation, and a remote portion of JBSA-CB. JBSA-CB also forms the entire eastern boundary and part of the southern

boundary. JBSA-CB serves as the field training installation in support of all military activities in south Texas. Eleven major training areas are located on JBSA-CB. Activities are conducted for weapons training, field training, and maneuvers.

2.2 CAMP STANLEY STORAGE ACTIVITY MILITARY MISSION

CSSA is charged with implementing a diverse scope of military mission activities. The major elements include operations and management of the facility, as well as range activities, and are discussed in the following sections. Figure 2-3 shows a summary diagram of installation activities.

2.2.1 INSTALLATION RESTORATION PROGRAM

Figure 2-3: Camp Stanley Storage Activity Military Mission

CSSA has a total of 84 Installation Restoration Program sites, including 39 SWMUs, 40 AOCs, and five Range Management Units (RMU) (Figure 2-4). To date, TCEQ has approved closure or delisting of 69 sites, and closure has been requested for two additional sites. Of the remaining 15 sites, investigation and/or remediation is in progress at three sites. The remaining sites are in the safety fan for the active CSSA range and will not be closed until such time that the range on CSSA is ever closed.

Solvent contamination (tetrachloroethene, trichloroethene, and cis-1,2-dichloroethene) was first detected in a water supply well at CSSA during routine monitoring by the Texas Department of Health in 1991. Between 1992 and 1999, CSSA undertook a series of investigations to identify potential source areas for the groundwater contamination, which identified Solid Waste Management Units (SWMU) B-3 and O-1 and Area of Concern (AOC) 65 as likely candidates. SWMUs O-1 and B-3 are centrally located within CSSA. SWMU O 1 was a lined oxidation pond and nearby B 3 was a landfill where spent solvents were utilized as an accelerant for burning refuse. AOC-65 is located near the post southwestern boundary in an area where ordnance maintenance and testing operations were historically conducted. Starting in 1996, the first of 87 monitoring wells were installed, and groundwater monitoring continues today.

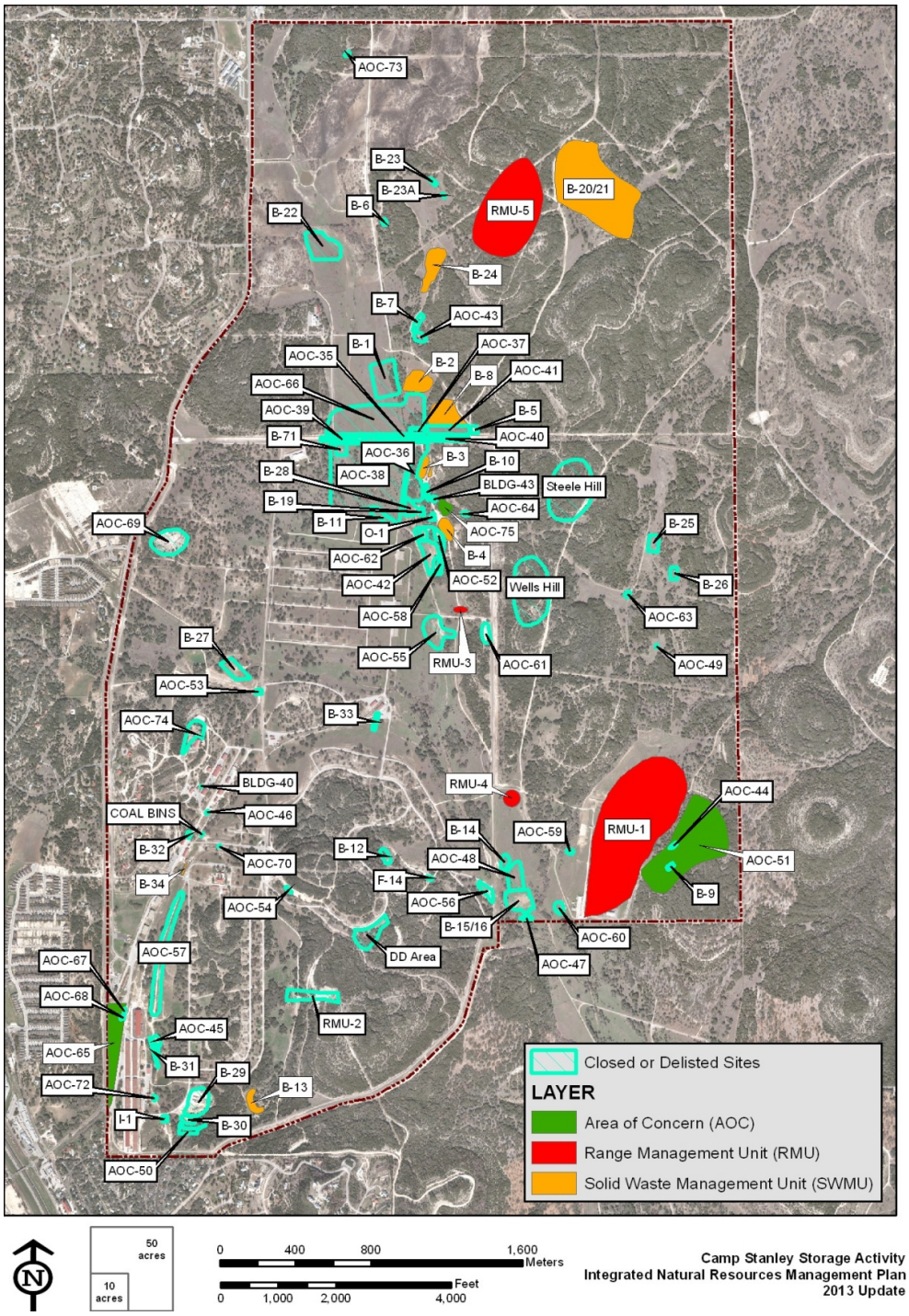


Figure 2-4: Areas of Concern, Range Management Units, Solid Waste Management Units, and Closed Sites

2.2.2 PERSONNEL HOUSING AND FACILITY ADMINISTRATION

There are approximately 200 buildings at CSSA, including 120 munitions igloos housing conventional weapons and ammunition. Most of the present buildings at CSSA were constructed between 1939 and 1952, although some were built as early as 1917. An unknown number of temporary structures were removed in the past.

Fourteen quarters for personnel are located on CSSA. Other current uses for buildings include administration, offices, engineering, storage, hazardous materials storage, shipping and receiving ammunition, weapons rehabilitation, surveillance, vehicle storage and maintenance, utilities, water and waste testing, a guard shelter, and several vacant buildings.

The road system at CSSA was originally built to serve cavalry operations. Additional roads were added over time, and the current road system includes asphaltic concrete roads, hard surface gravel roads, various well-maintained roads, and several low water crossings and concrete bridges.

2.2.3 AMMUNITION STORAGE ACTIVITIES

The inner cantonment of CSSA, comprising 1,760 acres (712 hectares), is used for storage of ammunition in igloos, light industrial activities, such as maintenance and cleaning of weapons, warehouse storage, and offices. The 2,244 acres (908 hectares) of the outer cantonment is used for munitions test ranges and wildlife hunting. Much of the east and north pastures are unimproved to provide a protection area around the firing range. Wildlife is hunted by military and civil service personnel, retired employees, and other persons authorized to go on site.

The magazine and igloo storage areas are located in the inner cantonment. The magazine storage areas are built of reinforced concrete and have loading docks. The igloos are mounded with an earthen blanket and sodded with native grasses. The magazine and igloo areas were constructed in 1939 and 1940.

2.2.4 MUNITIONS TESTING

Since the 1940's, various portions of the north pasture in the outer cantonment at CSSA have been used for demilitarization activities (i.e., munitions burning) and for munitions testing.

Currently, the only munitions testing carried out at CSSA is for munitions stored at the installation. There is currently no routine on-site disposal of munitions at CSSA. Routine explosive ordnance disposal previously took place at CSSA; however, these activities were discontinued in 1987 (U.S. Army 2007). Munitions testing may discover dud munitions or munitions evaluated as unstable by explosive ordnance disposal experts. In these instances, dud munitions or munitions determined to be unstable may be blown on-site. Alternatively, and depending on the stability of the munitions, CSSA may transport unusable munitions to appropriate DoD/Army disposal facilities for evaluation and potential reuse. Because of increasing urbanization, especially west of CSSA, future demilitarization of large munitions is not planned at the installation.

2.2.5 OPERATIONS AND MAINTENANCE

Operation and maintenance of the installation often requires removal of vegetation from roads and trails, training and maneuver areas, and in areas where specific projects will occur. All maintenance that will require removal of trees is coordinated through the Environmental Manager before work begins. Oak tree removal occurs only when absolutely necessary for continued use of the area. Tree removal is usually confined to juniper removal. In non-endangered species habitat (golden-cheeked warbler) areas, the long-term goal will be to not allow the areas to become overgrown with juniper. Clearing in endangered species habitat is restricted to the terms and conditions of the 2008 and 2012 Biological Opinions (U.S. Fish and Wildlife Service 2008, U.S. Fish and Wildlife Service 2012). In addition to regular maintenance, site-specific projects may impact vegetation resources. As with maintenance activities, all

work is coordinated through the Environmental Manager before work begins. All efforts are made to restrict project work to the same standards as maintenance work.

2.2.6 BRUSH AND FUELS MANAGEMENT ACTIVITIES

2.2.6.1 Brush Management

Brush management activities are conducted by the Department of Public Works at CSSA. The objective of brush management is to increase training opportunities as well as improve habitat for woodland, edge and grassland savanna species. This objective is realized through selective removal of juniper and other brush, and is limited to flat or gently sloping watershed divides and wide stream valleys. The decision to remove brush from any given area is a well thought out process that considers historic photographs and references, cultural and natural resource needs, and the goals of the training community on CSSA.

2.2.6.2 Prescribed Burning

Prescribed burning has been used as a management tool for maintaining grassland savannas at CSSA since the mid 1970s. Juniper is a fire sensitive species with young plants up to about 5 feet (1.5 meters) in height easily killed by fire under cool burn conditions. Hardwood species within grassland areas tend to be fire resistant, and are seldom harmed as long as a high fuel load does not exist in close proximity. Areas that have been subjected to repeated burns have developed into a mosaic of grassland and mixed brush, including juniper, depending on terrain and soil condition. Deeper soils within burn areas tend to remain in a grassland configuration, while shallower soils that produce a lesser amount of fine fuel (grass) gradually are occupied by scattered woody species. The plant community mosaic resulting from prescribed burns provides wildlife food and cover as well as open military maneuver space and tactical concealment opportunities.

Since 2008, CSSA received technical assistance from U.S. Fish and Wildlife Service for conducting prescribed burns and safe removal of brush piles. Safe fuels management is crucial to the munitions storage military mission area at CSSA. On September 7, 2011, a large fire occurred in the north pasture of CSSA. A total of 219 acres were burned, including 29 acres of golden-cheeked warbler habitat, none of which were occupied during the 2011 bird survey season. The cause is unknown but the fire started off Camp Stanley in the vicinity of a City Public Service utility substation, just north of CSSA's fenceline. (See October 2011 report that was submitted to USFWS as part of CSSA's 2011 annual report at Appendix C).

Constraints on prescribed burn programs include drought conditions, state and local restrictions, military mission activities, and ESA-listed species habitats.

2.2.7 LIVE FIRE RANGE ACTIVITIES

A large active firing range is located in the East Pasture. It is used to fire small arms ammunition, grenades, mines, pyrotechnics, and demolition items during testing and training activities.

2.2.8 CONSTRAINTS ON THE MILITARY MISSION AND NATURAL RESOURCE MANAGEMENT OPPORTUNITIES

Operational and natural resource constraints inhibit the location of proposed and notional projects that are needed to advance the installation military mission. Operational constraints include munitions storage quantity distance arcs, range fan buffers and safety zones, and existing infrastructure (e.g. roads, buildings, fences, water and sewage facilities). Natural resource constraints include topographic

constraints, floodplain locations, heritage tree locations, ESA-listed species habitats. Identification of constrained areas is essential for the CSSA Environmental Program Manager. By locating natural resource efforts in constrained areas, this reduces the likelihood of conflicts with other aspects of the military mission. Figure 2-5 shows the location of operational and natural resource constraints at CSSA.

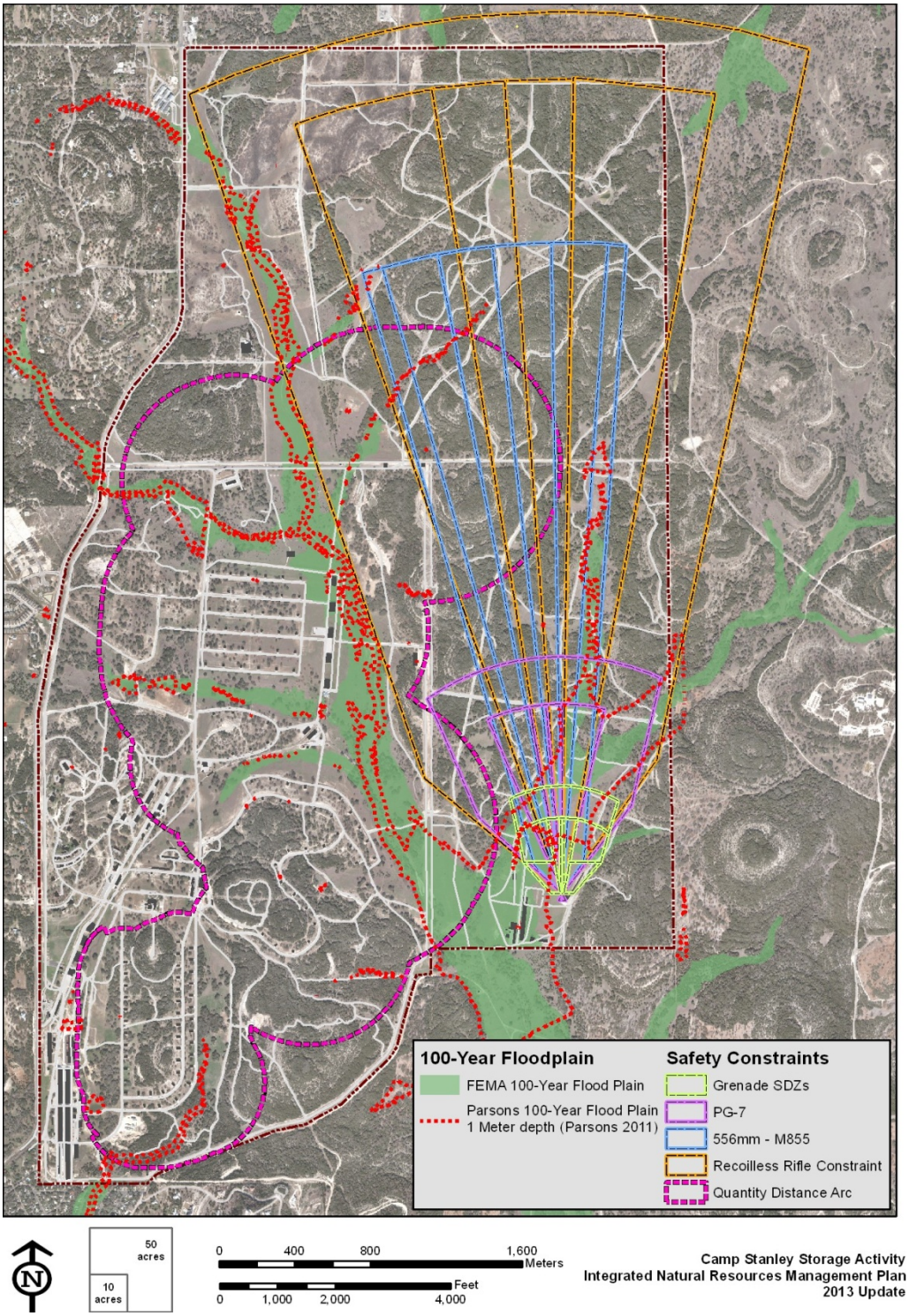


Figure 2-5: CSSA Constraints and Opportunities Map

2.3 PHYSICAL ENVIRONMENT

2.3.1 CLIMATE

Climate at CSSA is a modified subtropical climate, predominantly marine during the summer months and continental during the winter months. The resulting weather in Boerne, TX is characterized by hot summers with daily temperatures above 90 degrees Fahrenheit (°F) over 80 percent of the time and mild winters with below-freezing temperatures occurring on an average of only about 20 days per year. The first occurrence of 32°F is in late November and the average last occurrence is in early March. Average annual temperature is 65.8°F. The highest average daily maximum temperature is 94.1°F in August, and the lowest average daily minimum temperature is 35.4°F in January. Temperature extremes in Boerne, TX for the period of weather records (1931 through 2010) range from -4°F to 112°F (NOAA 2012).

CSSA is situated between a semi-arid region to the west and the coastal area of heavy precipitation to the east. The 30-year record (1981-2010) shows a mean annual rainfall average of 38.10 inches in Boerne, Texas (National Oceanic and Atmospheric Administration 2012). Precipitation is fairly well distributed throughout the year, with the heaviest amounts occurring in May, June, and October. Approximately 55 percent of the rainfall occurs over the period from April through September and is primarily due to thunderstorms. Damaging hail seldom occurs, but light hail is common with springtime thunderstorms. Since CSSA is only 140 miles from the Gulf of Mexico, tropical storms occasionally affect the installation with strong winds and heavy rains. Measurable snowfall occurs only once every three or four years.

The highest relative humidity occurs during the early morning hours (0600 hours) and averages about 84 percent over the year. Monthly averages range from 79 to 88 percent. Between 1200 and 1800 hours, relative humidity averages about 53 percent, with monthly averages ranging from 45 to 59 percent.

Northerly winds prevail during most of the winter. Strong northerly winds occasionally occur in conjunction with “northers,” cold southward flows produced by an area of high pressure that invades the United States from Canada. Southeasterly winds from the Gulf of Mexico are predominant in the summer but also occur frequently during the winter. The average annual prevailing wind direction is from the southeast, and the average annual wind speed is 9 miles per hour (mph) with monthly averages ranging from 8 mph to 10 mph. The windiest months are typically March and April; September and October have the least wind.

Skies are clear to partly cloudy on average about 225 days per year, or more than 60 percent of the time, and cloudy conditions occur less than 146 days per year, or less than 40 percent of the time. CSSA has more than 70 percent of the possible sunshine during the summer months, and about 50 percent during the winter months.

CSSA maintains two weather stations to monitor rainfall, wind speed and direction, relative humidity, and temperature. Weather station data is readily available through a Supervisory Control and Data Acquisition (SCADA) system to environmental, engineering, and facility management via SCADA workstations.

2.3.2 SURFACE AND SUBSURFACE GEOLOGY AND KARST ENVIRONMENTS

Figure 2-6 is a map of surface geology at CSSA. The oldest and deepest known rocks in the CSSA area are Paleozoic age (225 to 570 million years ago) schists of the Ouachita structural belt. They underlie the predominant carbonate lithology of the Edwards Plateau. Cretaceous age sediments were deposited as onlapping sequences on a submerged marine plain and, according to well logs and outcrop observations, thicken to the southeast. These sediments represent the Trinity Group Travis Peak Formation shallow marine deposits. The Travis Peak Formation attains a maximum thickness of about 940 feet and is divided into five members, in ascending order: the Hosston Sand, the Sligo Limestone, the Hammett Shale, the Cow Creek Limestone, and the Hensell Sand. Overlying the Travis Peak Formation, but still a part of the Cretaceous age Trinity Group, is the Glen Rose Formation.

The Hosston Sand is generally composed of conglomerate, sandstone, and claystone, becoming increasingly more dolomitic and shaley downdip to the southeast. The Sligo Limestone exists downdip where the Hosston grades into a sandy limestone. Overlaying the Sligo is the Hammett Shale, which has an average thickness of 60 feet. It is composed of dark blue to gray fossiliferous, calcareous, and dolomitic shale. It pinches out north of CSSA and attains a maximum thickness of 80 feet to the south.

Above the Hammett Shale is the Cow Creek Limestone. It is a massive fossiliferous, white to gray, shaley to dolomitic limestone that attains a maximum thickness of 90 feet downdip in the area. At CSSA, it averages about 75 feet in thickness.

The youngest member of the Travis Peak Formation is the Hensell Sand, locally known as the Bexar Shale. The shale thickness averages from 80 to 150 feet. It is composed of silty dolomite, marl, calcareous shale, and shaley limestone, and thins by interfingering into the Glen Rose Formation. At CSSA, it averages about 60 feet in thickness.

The upper member of the Trinity Group is the Glen Rose Limestone. The Glen Rose Limestone was deposited over the Travis Peak Bexar Shale and represents a thick sequence of shallow water marine shelf deposits. This formation is divided into upper and lower members. At CSSA, the Glen Rose is exposed at the surface and in stream valleys. Figure 2-6 shows the surface locations of the various Glen Rose members at CSSA and the surrounding area.

The Upper Glen Rose Limestone consists of beds of blue shale, limestone, and marly limestone with occasional gypsum beds (Hammond 1984). Based on well log information, the thickness of the upper member reaches 500 feet in the Bexar County. The thickest sequence of the Upper Glen Rose exists in the southern portion of the post at Schasse Hill, where there is as much as 400 ft of Upper Glen Rose Limestone. The full thickness of the Upper Glen Rose is present just south of the post at Hidden Springs Estates, which is capped by the basal section of the Edwards Group.

The Lower Glen Rose Limestone, underlying the Upper Glen Rose, consists of a massive fossiliferous limestone, grading upward into thin beds of limestone, marl, and shale (Ashworth 1983). The lower member, according to area well logs, is approximately 320 feet thick in the CSSA area. The Lower Glen Rose bedrock crops out at CSSA into topographically low areas of Salado Creek and its tributaries, which bisects the post from northwest to the southeast.

The boundary between the upper and lower members of the Glen Rose Limestone is defined by a widespread fossil stratigraphic market known as the Corbula bed (Whitney 1952), or interval E on Figure 2-6. The Corbula Bed is 0.5 to 5 feet thick and contains small pelecypod clamshells, which are

3 to 5 millimeters in diameter. Presence of the Corbula fossil indicates a slightly more saline depositional environment than fossils found above and below the Corbula bed. A gypsum bed has also been identified close to the Corbula bed.

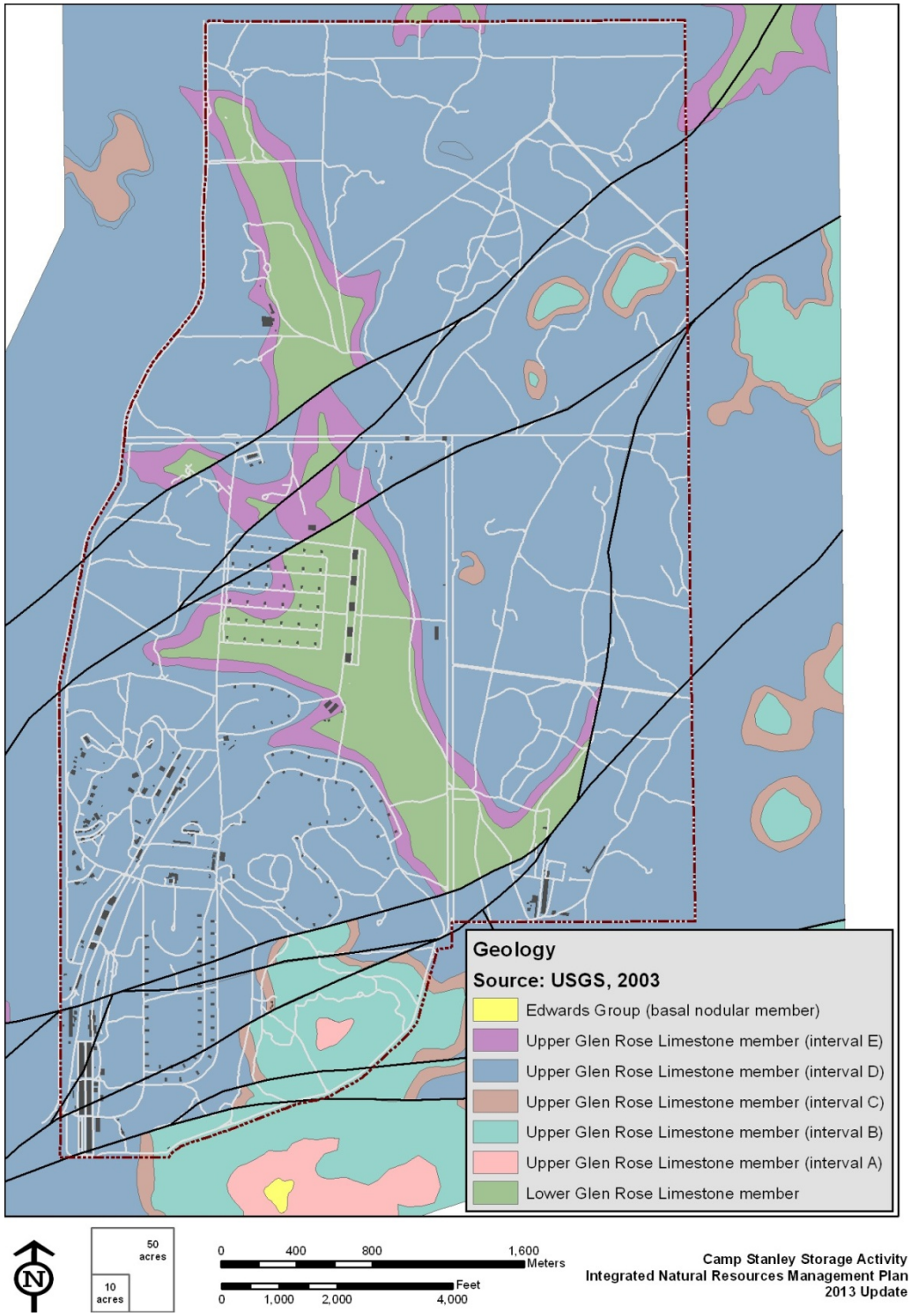


Figure 2-6: Surface Geology

Fredericksburg Group sediments, including the Edwards Formation, overlie the Glen Rose Formation in many areas as erosional remnants outcropping as topographic highs. For this report, the Fredericksburg Group limestones will not be discussed because of the lack of outcrop in the immediate vicinity of CSSA. Normal faulting has occurred near the central area and the southeastern boundary of the installation. Regionally however, two major trends of fractures extend northwest-southeast and northeast-southwest. Faulting in the limestone units has juxtaposed strata of different ages, but fault scarps and traces are almost absent because the similar calcareous lithologies weather similarly. The faults are northeast-southwest trending, but most are not as continuous as the fractures.

Sinkholes and caverns are present on the surface and in the subsurface, primarily in areas where porous and fractured limestone formations are exposed. The sinkholes and caves result from dissolution of limestone and gypsum by infiltrating surface water. There is evidence of karst development along some of the streams on post. Estavelles, vertical karst conduits, are present in the Salado Creek streambed at several locations in the northern portion of the inner cantonment. These karst features provide a direct pathway for stream flow to recharge the shallow groundwater and can contribute to the rapid recharge response observed in the on-post wells. Figure 2-7 is a map of karst features at CSSA (Veni 2002).

2.3.3 TOPOGRAPHY AND HYDROLOGY

CSSA is characterized by a rolling terrain of hills and valleys in which nearly flat-lying limestone formations have been eroded and dissected by streams draining to the east and southeast. River and stream dissection of limestone is the major surface feature at CSSA. Most major rivers and streams originating in the Edwards Plateau to the northwest of CSSA tend to follow the northwest-southeast regional fracture patterns. Resistive limestone beds crop out as topographic highs, but none of these beds form buttes or mesas. Rather, the predominant physiography is hills and “saddles” which lead to stream valleys. Topographic relief across the area ranges from about 1,100 feet to 1,500 feet above sea level. Figure 2-8 is a shaded relief map of CSSA.

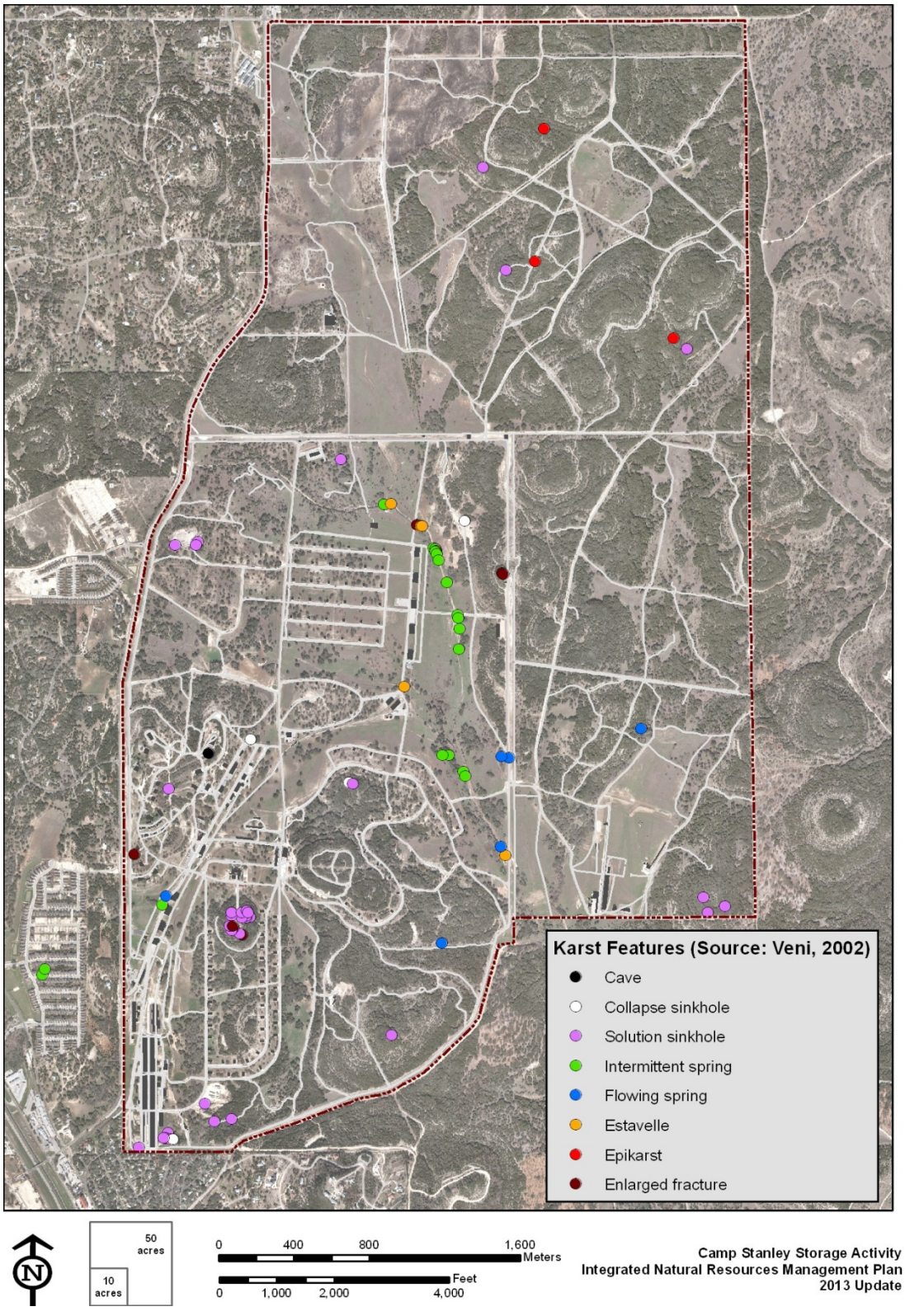


Figure 2-7: Karst Features

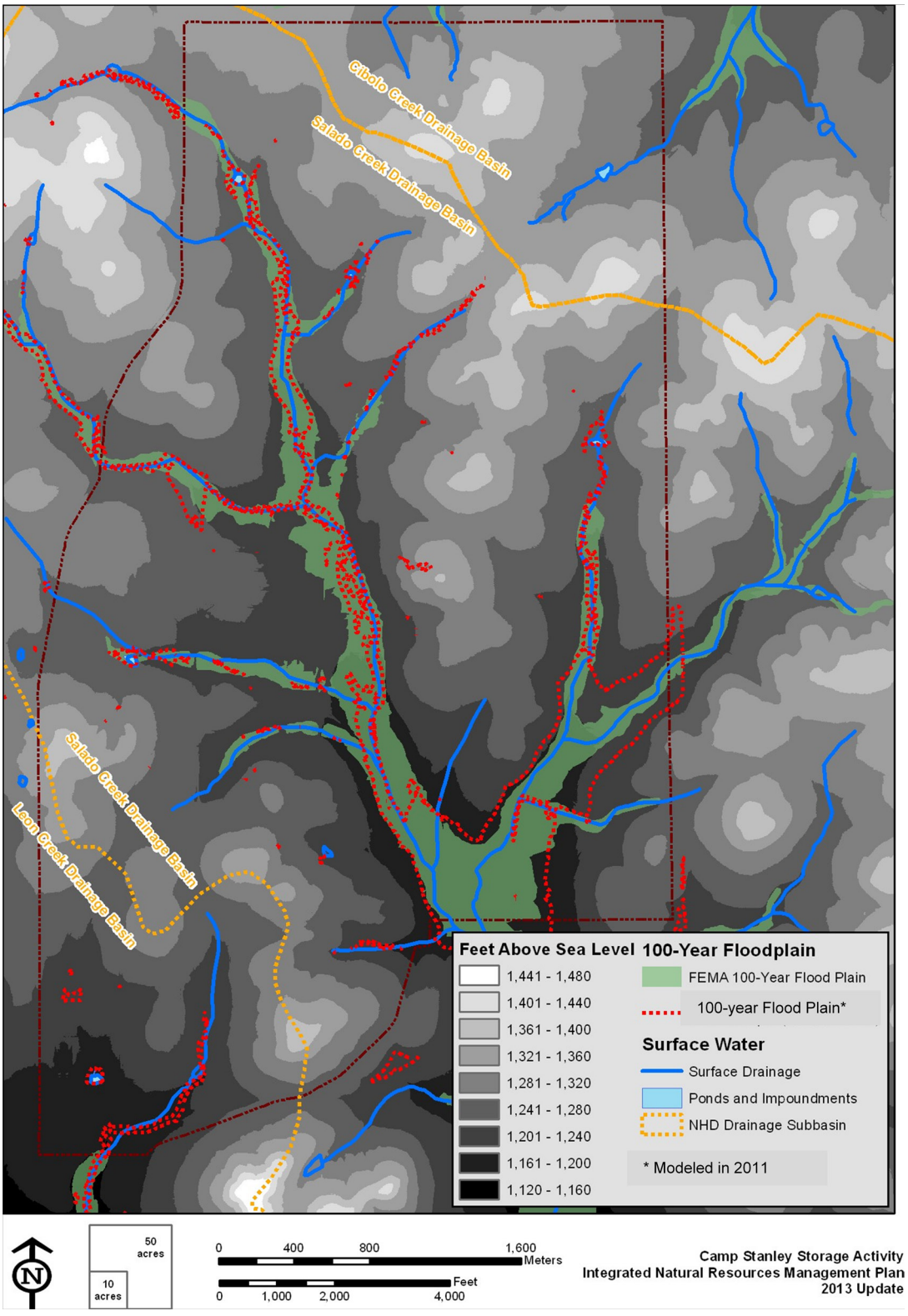


Figure 2-8: Topography and Recent Floodplain Mapping

2.3.4 SOILS

In general, soil at CSSA is thin, dark-colored, gravely clay and loam. The soil types are strongly influenced by topography and the underlying limestone. All soil classifications used for this report are taken from the U.S. Department of Agriculture Soil Conservation Service (now the Natural Resource Conservation Service [NRCS]) soil survey series for Bexar County, Texas (U.S. Department of Agriculture 1991). Figure 2-9 shows the eight soil types occurring at CSSA as percentage of composition, and Figure 2-10 provides a map of soil distribution on the installation.

- **Brackett Soil.** Brackett (BrE) soil occurs over 12.8 percent (512.5 acres) of CSSA lands. This soil covers a large portion of the East Pasture and the inner cantonment at CSSA. The soil occurs on slopes of 12 to 30 percent, such as those found on Steele, McFarland, and Schasse Hills, as well as Taylor Ridge. This loamy and clayey soil is thin (about 4 inches deep), grayish-brown, and strongly calcareous. Gravel and cobblestone lithics occur at the surface and shallow subsurface. The soil can develop over soft limestone and is underlain by hard limestone, which gives the slopes a stairstep appearance. Topographic relief associated with Brackett soil is expressed as steep, cone-shaped hills with "saddles" between them. Brackett soil is nonarable and best suited to native grasses.
- **Tarrant Soils.** At CSSA, Tarrant soil occurs along the outer edges of the Salado Creek floodplain. The soil is thin and forms over hard, fractured limestone. The surface layer is usually about 10 inches thick and is a dark grayish-brown, calcareous, clay loam with scattered gravel and cobblestones within, and on the surface layer. Two types of Tarrant soil occur at CSSA: Tarrant Association, gently undulating, and Tarrant association, rolling.
    - **The Tarrant association (TaB**), gently undulating, areas are typical of prairie and plateau topography. It occurs primarily in areas not occupied by streams, such as the north-central area of the inner cantonment, as well as the west sides of Steele and Wells Hills and the hills north of the inner cantonment. This soil type covers 14.3 percent (572.6 acres) of CSSA. The soil is dark colored, very shallow, calcareous, and clayey, and is best suited for native grasses and range use.
    - **Tarrant association (TaC),** rolling, is found on the eastern sides of Anderson and Schasse Hills, in areas not occupied by streambeds. This soil type occurs over only 1.3 percent (52.1 acres) of CSSA lands. The slopes tend to have a gradient of 5 to 15 percent. The soil is dark colored, very shallow, clayey, weakly calcareous, and typically more stony than Tarrant association, gently undulating.
- **Brackett-Tarrant Association.** Brackett-Tarrant association soil (Bte) covers 24.9 percent (997.0 acres) of CSSA. The soil is formed on hills with 8 to 30 percent slopes and consists primarily of soil that developed over limestone. At CSSA, this soil type is found north of the inner cantonment, in the North Pasture. The slopes of ridges are Tarrant soil which is clayey, calcareous, and very dark grayish-brown. The Brackett soil is light grayish-brown and calcareous. Tarrant soil makes up 65 percent of the association, and Brackett soil makes up 20 percent. Neither soil type is suited to crops, because stones and topography make the use of machinery difficult.
- **Crawford and Bexar Stony Soil.** Crawford and Bexar Stony soil (Cb) occupies portions of both the inner and outer cantonments, for a total of 16.9 percent (676.7 acres) of CSSA. It occurs in broad, nearly level to gently undulating areas with slopes of 0 to 5 percent. The soil is stony, very dark gray to dark reddish brown, noncalcareous clay, about 8 inches thick. Bexar soil ranges from a cherty clay loam to gravely loam. The soil is nonarable and suited for native grasses, such as Texas winter grass, little bluestem, sideoats grama, and buffalo grass.

- **Trinity and Frio Soil.** The Trinity and Frio soil (Tf) covers 8.8 percent (352.4 acres) of CSSA. The soil is frequently subjected to flooding, because it forms the main channel soil for Salado Creek and a large tributary that joins the creek in southwestern CSSA. Some areas are subject to thin sediment depositions, while other areas are scoured. Channels are poorly defined and are of small capacity. Trinity soil is 3 to 5 feet deep and composed of clayey to gravely loam. Frio soil is a dark grayish-brown clay loam, 3 to 4 feet deep. Vegetation may consist of elm, hackberry, oak, mesquite, and other thorny shrubs, Texas wintergrass, Johnson grass, buffalo grass, bermuda grass, and annual weeds.
- **Krum Complex.** The Krum Complex soil (Kr) makes up the remaining soil covering the streambeds and floodplains, approximately 20.0 percent (800.8 acres) of CSSA. The soil is dark grayish-brown or very dark grayish-brown, calcareous, and approximately 30 inches thick. The soil developed from slope alluvium of the limestone prairies. It occurs on slopes of 2 to 5 percent and occupies "foot" slopes below Tarrant and Brackett soil. The Krum Complex soil receives sediments and runoff from higher elevation soil, and is highly prone to hydraulic erosion if unprotected.
- **Lewisville Silty Clay.** A minor soil type found at CSSA is the Lewisville silty clay (LvB) found on slopes of 1 to 3 percent. This soil type covers only 1.0 percent (40.0 acres) of CSSA. It typically occupies long, narrow, sloping areas separating nearly level terraces from upland soil. It can be found in small areas south of Dietz Elkhorn Road and north of the inner cantonment boundary around Moyer Road. Surface soil is dark grayish-brown and about 20 inches thick. This is a highly productive soil, but is also susceptible to hydraulic erosion if unprotected.

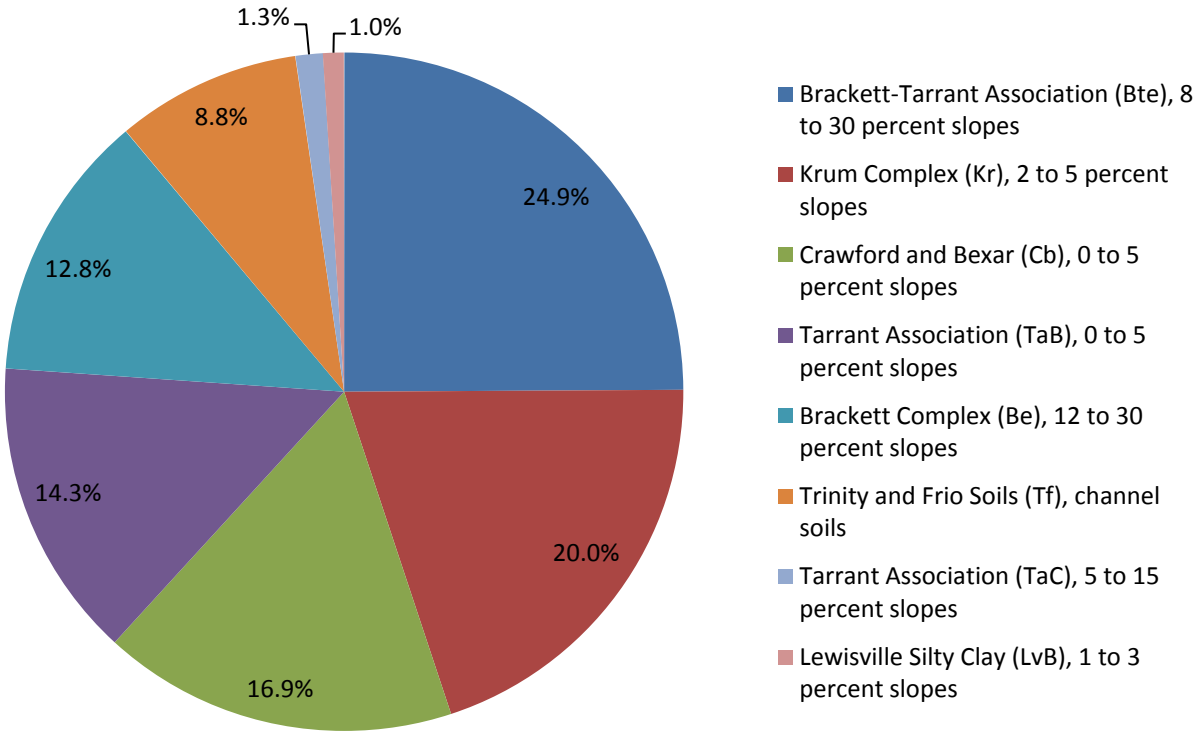


Figure 2-9: Soil Units, Percent of Surface

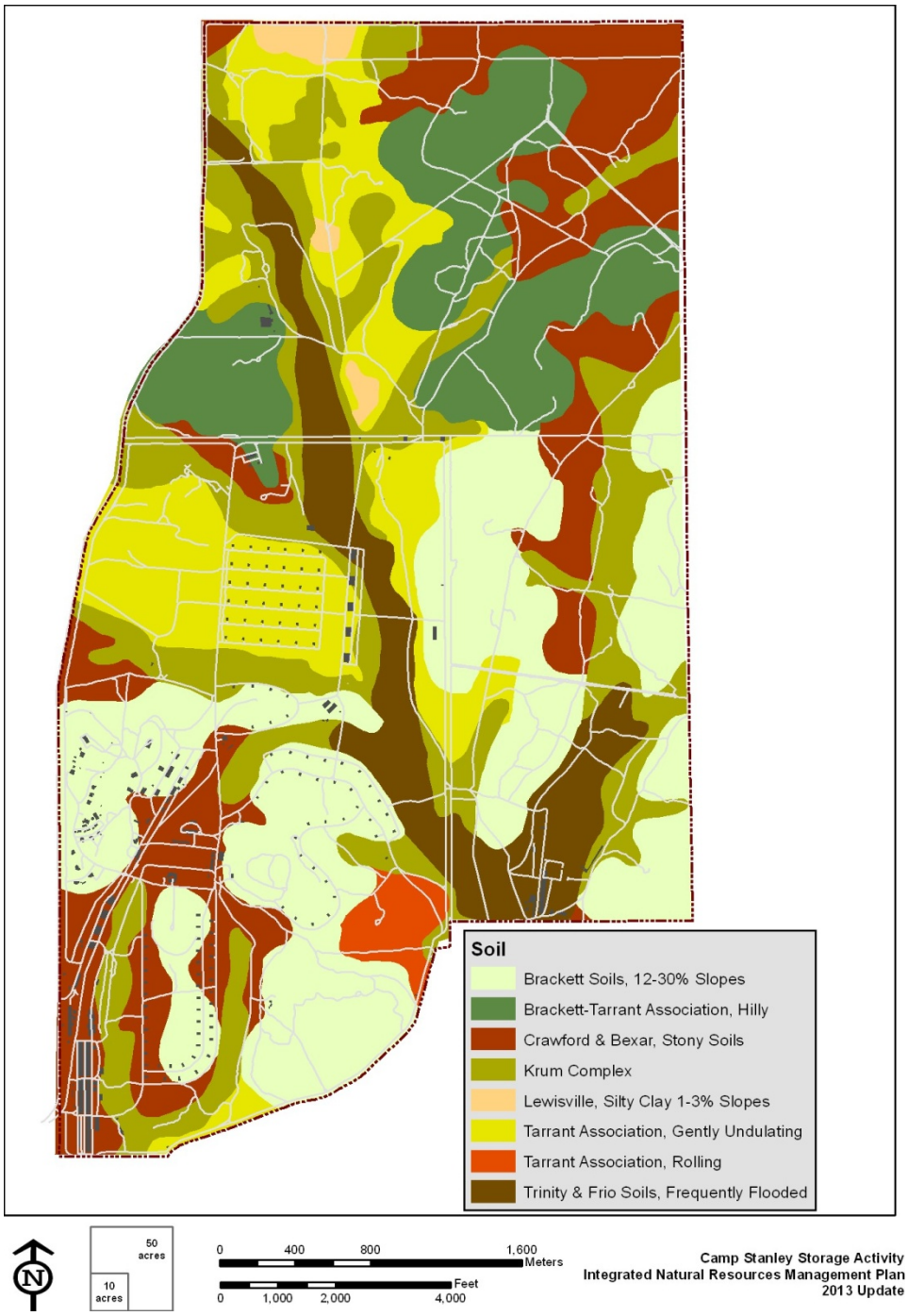


Figure 2-10: Soil Unit Map

2.3.5 SURFACE WATER AND DRAINAGE

Salado, Leon, and Cibolo Creeks drain surface water from CSSA (Figure 2-11). Approximately 75 percent of CSSA is in the Salado Creek watershed, 15 percent in the Cibolo Creek watershed, and 10 percent in the Leon Creek watershed. Most of the active-use areas of CSSA are in the Leon Creek watershed. These streams are intermittent at CSSA. Natural stream channels on CSSA generally have broad floodplains, and portions of CSSA are in the 100-year floodplain. Waste water was previously discharged (via an on-

site waste water treatment facility) into a tributary of Leon Creek at the southern boundary. Currently, wastewater from CSSA discharges through the San Antonio Water System.

The Salado Creek watershed on CSSA extends in a broad swath from northwest to southeast with the Salado Creek headwaters located in adjacent Fair Oaks subdivision. Impervious cover in Fair Oaks is currently estimated at 5 to 10 percent. As residential development continues west of Ralph Fair Road (Stonehaven by Centex Homes, later taken over by Pulte Homes), additional runoff from Salado Creek tributaries is crossing into CSSA. As a result, CSSA has constructed a "berm" northwest of Central Road and U-26 to mitigate the increased runoff due to the Stonehaven residential development.

Drainage from JBSA-CB to the east also flows across CSSA to Salado Creek. Impervious cover for CSSA within the Salado Creek watershed is substantially less than 5 percent, with much of the area undeveloped except for dirt and gravel roads.

As shown in Figure 2-8, there are four ponds within the Salado Creek drainage area of CSSA, one pond in the Cibolo Creek drainage area, and one in the Leon Creek drainage area. In the developed areas of CSSA, rainfall runoff is conveyed to natural stream flow channels by ditches and sheet flow. CSSA has sufficient relief to allow the rapid conveyance of runoff from developed areas. In the undeveloped areas, runoff flows overland to natural channels. The 100-year flood plain has recently been modeled for CSSA.

2.3.6 GROUNDWATER

The primary groundwater source at CSSA and surrounding areas is the Middle Trinity Aquifer, the most prolific producer with the best quality of water of the three Trinity Aquifers. The Middle Trinity Aquifer consists of the LGR Limestone, the Bexar Shale (as a facies of the Hensell Sand), and the Cow Creek Limestone. The average combined thickness of the aquifer members is approximately 460 feet.

In the vicinity of CSSA, the Lower Glen Rose Limestone portion of the Middle Trinity Aquifer derives its recharge from direct precipitation on the outcrop and stream flow infiltration. Likewise, over the same area, the Bexar Shale acts as a hydrologic barrier to vertical leakage except where faulted. Most recharge to the Cow Creek Limestone comes from overlying updip formations. Where structurally compromised, it is inferred that the Cow Creek Limestone can be in natural hydraulic communication with the Lower Glen Rose due to the extensive Balcones fault zone faulting. The bottom of the Cow Creek Limestone forms the base of the Middle Trinity Aquifer.

In the CSSA area, most water production wells are completed as open boreholes to maximize groundwater yield. These wells include varying lengths of surface casing to facilitate borehole stability or isolate less desirable groundwater strata. Observation wells at CSSA consist of cased and screened wells that discretely monitor 25-foot segments of the Lower Glen Rose, Bexar Shale, or Cow Creek Limestone. Often, these wells are arranged in clusters at a single location. By monitoring individual members of the aquifer, an assessment regarding the occurrence and distribution of contaminants within the Middle Trinity Aquifer can be ascertained.

Information regarding the subsurface was compiled from borehole data, geophysics, and surface mapping to create a conceptual stratigraphic model. Data indicate that the Lower Glen Rose is typically an average thickness of 320 feet, and is overlain by a thin layer of the Upper Glen Rose which is normally 50 feet in thickness, but the thickness depends on the local topography. However, the Upper Glen Rose comprises nearly 90 percent of the surface outcrop, while exposures of the Lower Glen Rose only

typically occur in the lowlands and creek beds. The underlying Bexar Shale is normally 60 feet in thickness, and the facies do not outcrop anywhere in the Texas Hill Country. The underlying Cow Creek Limestone unit is typically 75 feet in thickness, and locally is known only to outcrop along the Guadalupe River to the northeast. Drilling operations typically only penetrated the upper 15 feet of the Hammett Shale for logging purposes.

Based on measurements at observation wells, the regional groundwater flow is generally to the south-southeast. The Lower Glen Rose typically has a southward gradient that deviates around mounding which occurs near the central and northern portions of the facility (CS-MW4-LGR). The Bexar Shale exhibits the potential for either northward or southward flow, depending on the season. Likewise, the Cow Creek Limestone exhibits erratic flow paths, with seasonally radial flow from mounded areas, to a northeastward flow possibly related to on- and off-post pumping along Ralph Fair Road. Long-term pumping of the LGR and Cow Creek members in association with the SWMU B-3 remediation effort locally affects groundwater flow in that vicinity. Seven wells associated with that remedial effort creates a localized "cone of depression" to capture and treat contaminated groundwater associated with that site.

Long-term monitoring shows that groundwater response to precipitation events can be swift and dramatic. Depending on the severity of a precipitation event, the groundwater response will occur within several days, or even hours. Average precipitation events do not invoke much response from shallower wells within the Lower Glen Rose, yet main aquifer body wells will respond within a week. Such observations indicate that the preponderance of recharge observed occurs elsewhere on the outcrop, and not necessarily within CSSA.

2.4 BIOLOGICAL RESOURCES AND ECOLOGY

2.4.1 VEGETATION COMMUNITIES

CSSA is located within the Balcones Canyonlands subregion of the Edwards Plateau natural region. Evergreen woodlands and deciduous forests dominate this subregion of steep slopes and high-gradient streams. Grasslands are restricted primarily to drainage divides, usually in the context of open woodlands or savannas. Some of the woodlands and a majority of the native grasslands on the Edwards Plateau have been destroyed by historic human settlement of this region. Overall, vegetation at CSSA is similar to that of the region. Past land uses at CSSA resulted in a patchwork of open grassland/disturbed savanna delineated by stands of Ashe juniper-oak (J*uniperus ashei-Quercus* spp.) woodlands.

The vegetation communities at CSSA consist of grasslands, woodlands, and savannas. Each vegetation community can be further divided into community types. Eight vegetation community types were mapped as part of the black-capped vireo and golden-cheeked warbler surveys conducted in 2005 (Parsons 2005b). Definitions of vegetation communities are based on classification schemes provided by the U.S. Fish and Wildlife Service (Underwood 2005), which are derived from the NRCS and Diamond, et al. (1988). Vegetation community types at CSSA include:

- ***Juniper-Live Oak Woodlands*** - Composed of woody species ranging between 3 to 10 meters tall, with a canopy closure of 71 to 100 percent. Ashe juniper dominates with a large Live oak component.
- ***Juniper Woodlands*** - Composed of woody species ranging between 3 to 10 meters tall, with a canopy closure of 71 to 100 percent. Ashe juniper dominates; few other woody species are present.

- ***Live Oak-Juniper Woodlands*** - Composed of woody species ranging between 3 to 10 meters tall, with a canopy closure of 71 to 100 percent. Live oaks *(Quercus fusiformis*) dominate with a large Ashe juniper component. Other oak species persist in lower abundance, such as Spanish oak (*Quercus buckleyi*) and shin oak (*Quercus sinuata*).
- J**uniper Dominant Shrublands** - Ashe juniper dominates and is less than 3 meters tall, few other woody species are present.
- ***Live Oak Dominant Shrublands*** - Live oaks and shin oaks under 3 meters tall, with other shrubs and shorter statured tree species such as flame-leaf sumac (*Rhus lanceolata*), Texas persimmon (*Diospyros texana*), and agarita (*Berberis trifoliolata*).
- ***Herbaceous Bluestem and Short Grass Prairie*** - Woody species compose less than 25 percent of ground cover, dominated by herbaceous vegetation, including grasses of different heights.
- ***Mixed Oak Savanna*** - Woody species composed primarily of live oak, shin oak, Texas persimmon, and Ashe juniper, form 25 to 50 percent cover.

2.4.2 WILDFIRE HISTORY

Wildfires occur on CSSA in some years. These fires were usually associated with the range impact area and caused by tracer ammunition and pyrotechnics. While some areas tend to burn annually, most burn only after fuel has increased sufficiently to carry a fire–every five to ten years. Repeated fires occurring at this rate tend to keep succession at an early stage that promotes habitat conditions conducive for the black-capped Vireo. Current policy on CSSA is to allow fires to burn if there are currently no unsafe weather condition forecast, if the fire is contained within roads or firebreaks, and they pose no threat to military or civilian structures, wildlife habitat or public safety. Additionally, areas that are steep terrain, where more damage would be done to the plant communities and soils by the firefighting equipment, are generally allowed to burn. Removal of juniper while retaining the hardwood canopy decreases the potential for crown fire in warbler habitat by creating shady firebreaks adjacent to habitat.

Recently, CSSA was subject to a wildfire originating off base in September 2011. The cause of the fire is unknown. The fire began in the vicinity of a municipal electric substation just north of CSSA and just west of JBSA-CB in the corner between the two installations. Approximately 219 aces on CSSA were affected, of which 29 acres had been golden-cheeked warbler habitat (see October 2011 memo to U.S. Fish and Wildlife Service contained in Appendix C).

2.4.3 WETLANDS AND AQUATIC HABITATS

Wetlands are areas inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions (hydrophytes), including swamps, marshes, bogs, and similar areas (33 Code of Federal Regulations, Section 328.3(b); 40 CFR, Section 230.3(t)). Wetlands and waters of the U.S. delineation field surveys were conducted at CSSA in November/December 1995 and April 1996. In November 1996, a wetlands specialist from the U.S. Army Corps of Engineers visited the site to verify the findings of the delineation (SAIC 1997a). Based on the survey results, four jurisdictional wetlands totaling 1.1 acres and seven non-jurisdictional wetlands totaling 3.2 acres occur on CSSA. The non-jurisdictional wetlands are all man-made impoundments. However, two impoundments are classified as jurisdictional because they intercept flows from defined channels, springs, or seeps. The other jurisdictional wetlands appear to be associated with either springs or seeps. In addition, approximately 32,250 linear feet of ephemeral stream drainages on CSSA have defined channels and are potentially jurisdictional waters of the U.S. (SAIC 1997a). However, since these streams are ephemeral (run few days per year) and have no or indirect ties to permanently flowing surface

waters, it is questionable whether they are jurisdictional waters. The San Antonio River Authority (SARA) completed some field surveys in the Fall of 2012 of Salado Creek and its tributaries on CSSA. Although a report has not been received as of the writing of the CSSA INRMP, it is the understanding of CSSA that these tributaries on CSSA are ephemeral.

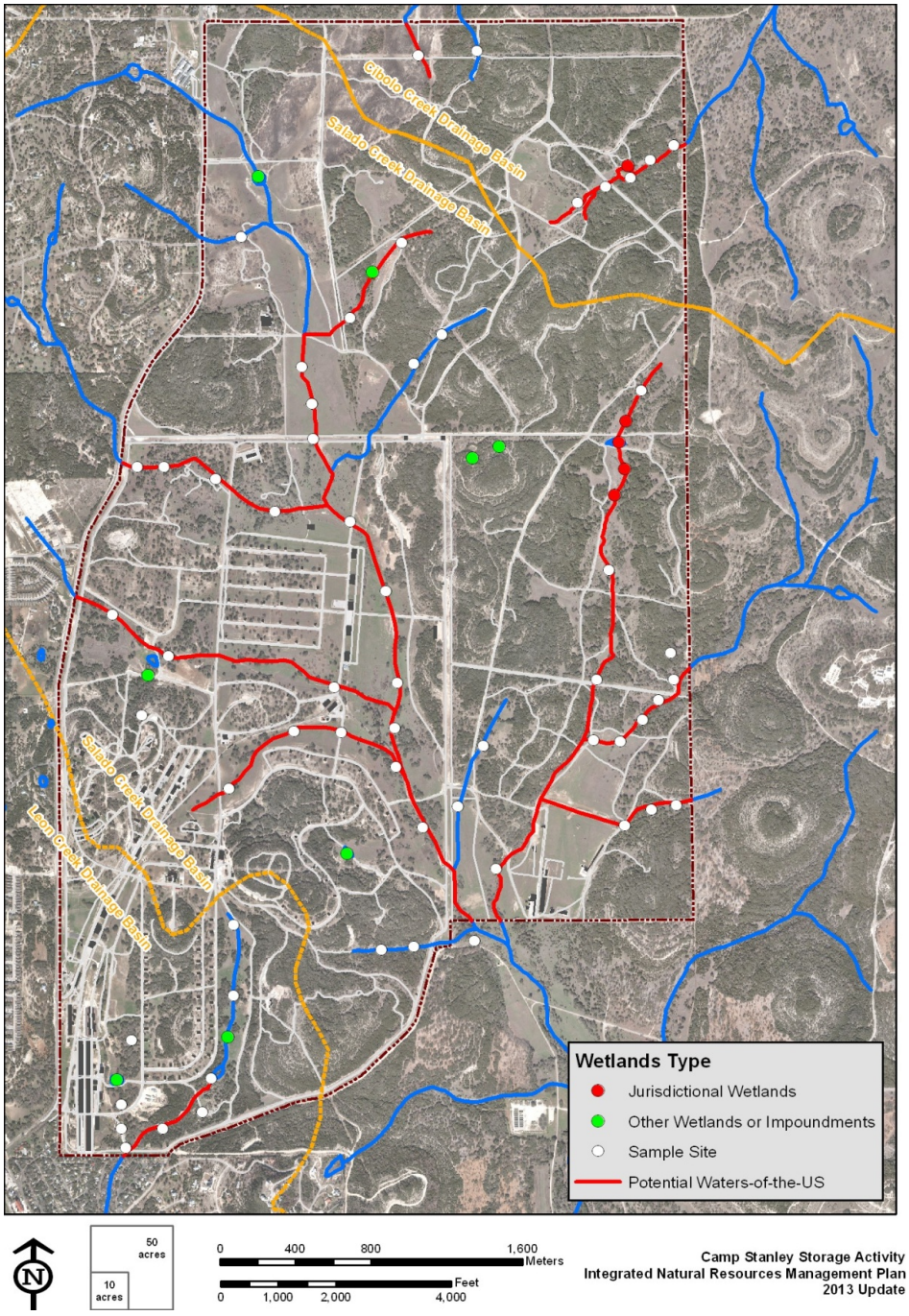


Figure 2-11: Drainage Basins, Wetlands and Potential Waters of the U.S.

2.4.4 WILDLIFE COMMUNITIES

Faunal surveys included an inventory of all birds, mammals, reptiles, and amphibians, which were directly observed or indirectly detected (e.g., audible calls, scat, tracks).

Since the initial survey effort in 2005, 116 individual bird species have been observed. These species are represented by 36 families. Overall avian species richness has apparently declined since 2005, with an initial 90 species observed in 2005, 80 species observed in 2007, 75 species observed in 2009, and 81 species in 2011. This represents a 10% decline in species richness between 2005 and 2011; however, each of 10 new species also were observed in 2011.

Factors affecting the avian biodiversity could include (1) intense and prolonged drought conditions throughout Central Texas, (2) habitat removal and fragmentation on adjacent lands (primarily to the west of Ralph Fair Road), and (3) parasitism primarily by brown-headed cowbirds and rat snakes. Activities at CSSA are unlikely to factor into the apparent decline of avian diversity at CSSA because similar declines have been observed throughout conservation lands in Central Texas (Travis County Audubon Society, 2009) and the small amount of habitat removed as permitted in the programmatic Biological Opinion has occurred primarily outside of the breeding season for passerines.

Several game species are known to occur at the installation, including: white-tailed deer (*Odocoileus virginianus*), axis deer (*Axis axis*), wild turkey (*Meleagris gallopavo*), dove (*Zenaida macroura*), ducks, quail, rabbits (*Lepus californicus* and *Sylvilagus floridanus*), squirrel (*Sciurus niger*), raccoon (*Procyon lotor*), and coyotes (*Canis latrans*). Other species likely to be found at CSSA include skunk (*Mephitis mephitis*), opossum (*Didelphis marsupialis*), ring-tailed cat (*Bassariscus astutus*), bobcat *(Lynx rufus*), and a variety of rodent species (SAIC 1997b).

2.4.5 SPECIAL STATUS SPECIES

A species is considered to have “special status” if there are regulatory listings assigned to the species either by the U.S. Fish and Wildlife Service or by the State of Texas. Both Texas Parks and Wildlife Department and the U.S. Fish and Wildlife Service maintain lists of species with regulatory protections.

Table 2-1 provides a list of these species known or potentially occur in Bexar County. The only species with special regulatory status are the golden-cheeked warbler and black-capped vireo.
Currently, monitoring and surveys of black-capped vireos and golden-cheeked warblers are conducted biannually on CSSA. Installation wide monitoring of the black-capped vireo and for the golden-cheeked warbler began in 2005. These monitoring efforts consist of point count surveys for the warbler and presence/absence surveys for the black-capped vireo. Additional presence/absence surveys for the warbler are conducted in all other known habitat areas on CSSA. Two programmatic agreements to minimize impacts on these species are in effect on CSSA. These agreements are discussed in detail in Section 3.2 (Section 7 Endangered Species Act Consultation Requirements).

2.4.5.1 Golden-cheeked warbler

Life History and Status

The golden-cheeked warbler was listed as federally endangered in 1990 (U.S. Fish and Wildlife Service 1990). In the spring and summer, golden-cheeked warblers breed in woodlands of central Texas that contain a mix of mature Ashe juniper (*Juniperus ashei*) and oak (*Quercus* spp.) and provide necessary food and nesting resources. Across the breeding range, the variability in the known number of

confirmed individuals or territories is mainly related to survey effort. In order to plan and track specific threats, populations, and recovery efforts, the U.S. Fish and Wildlife Service has divided the breeding range into eight recovery units (U.S. Fish and Wildlife Service 2010). Thus far, survey effort has focused on a relatively small fraction of the species' range. For example, Recovery Region 3 encompasses Fort Hood and contains about 5–10 percent of the species' potential habitat, yet recent population estimates suggest this region supports an estimated 4,482 breeding males, or approximately 51 percent of the known population. Regions 7 and 8, however, contain 35 to 55 percent of the species' potential breeding habitat, yet combined estimates from surveys within these regions account for about five percent of the known population (U.S. Fish and Wildlife Service 2010). The Southern Edwards Plateau Habitat Conservation Plan (HCP) is a draft (December 2011) regional HCP. It is a small expansion on the draft Recovery Unit Five, and if finalized and implemented, would provide appropriate long-term golden-cheeked warbler habitat preservation and management for non-federal parties.

Threats within the Southern Portion of the Edwards Plateau

The U.S. Fish and Wildlife Service assesses threats to the golden-cheeked warbler based on five broad factors: (1) threatened destruction, modification, or curtailment of habitat or range; (2) over-utilization for commercial, recreational, scientific, or educational purposes; (3) disease or predation; (4) inadequacy of existing regulatory mechanisms; and (5) other natural or human-made factors affecting the continued existence of golden-cheeked warblers (U.S. Fish and Wildlife Service 2010). Within the Recovery Unit 5, the most significant threat factors appear to be the threatened destruction, modification, fragmentation, or curtailment of habitat or range attributed to planned transmission line corridors, road construction, and division of large land tracts into smaller parcels (U.S. Fish and Wildlife Service 2010).

Status at Camp Stanley Storage Activity

CSSA provides approximately 1,167 acres (472 hectares) of golden-cheeked warbler habitat. Warblers have previously been documented in the majority of the areas on the installation with suitable habitat. This acreage was updated with a vegetation survey in 2012 and the updated figure of 1,167 acres represents an approximate 30 percent increase in the amount of Potential Habitat for the golden-cheeked warbler. The previous habitat assessments in 2005 recorded 873 acres (353 hectares) of golden-cheeked warbler habitat. Most of this increase occurs within the range fan and explosive safety arcs. Seven years of vegetation growth apparently resulted in much more warbler habitat now being in existence at CSSA. In 2011, 19 golden-cheeked warblers were identified within these habitat areas within the range fan.

Table 2-1: Special Status Species within Bexar County

Major Taxonomic Group	Species Name		Federal Status	State Status	Presence / Absence
	Common Name	Scientific Name			
Amphibians	Comal Blind Salamander	*Eurycea tridentifera*	-	Threatened	Not Likely
	Cascade Caverns salamander	*Eurycea latitans complex*	-	Threatened	Not Likely
	Texas Salamander	*Eurycea neotenes*	In review	-	Not Likely
Arachnids	Braken Bat Cave Meshweaver	*Cicurina venii*	Endangered	-	Not Likely
	Cokendolpher Cave Harvestman	*Texella cokendolpheri*	Endangered	-	Not Likely
	Government Canyon Bat Cave Meshweaver	*Cicurina vespera*	Endangered	-	Not Likely
	Government Canyon Bat Cave Spider	*Neoleptoneta microps*	Endangered	-	Not Likely
	Madla Cave Meshweaver	*Cicurina madla*	Endangered	-	Not Likely
	Robber Baron Cave Meshweaver	*Cicurina baronia*	Endangered	-	Not Likely
Birds	American Peregrine Falcon	*Falco peregrinus anatum*	-	Threatened	Not Likely
	Black-capped Vireo	***Vireo atricapillus***	**Endangered**	**Endangered**	**Present**
	Golden-cheeked Warbler	***Dendroica chrysoparia***	**Endangered**	**Endangered**	**Present**
	Interior least tern	*Sterna antillarum athalassos*	Endangered	Endangered	Not Likely
	Mountain plover (1)	*Charadrius montanus*	Candidate	-	Not Likely
	Sprague's pipit (1)	*Anthus spragueii*	Candidate	-	Possible migrant
	White-faced Ibis	*Plegadis chihi*	-	Threatened	Not Present
	Whooping Crane	*Grus americana*	Endangered	Endangered	Not Likely
	Wood Stork	*Mycteria americana*	-	Threatened	Not Likely
	Zone-tailed Hawk	*Buteo albonotatus*	-	Threatened	Likely Present
Fish	Toothless Blindcat	*Trogloglanis pattersoni*	-	Threatened	Not Present
	Widemouth Blindcat	*Satan eurystomus*	-	Threatened	Not Present
Insects	A Ground Beetle	*Rhadine exilis*	Endangered	-	Not Likely
	A Ground Beetle	*Rhadine infernalis*	Endangered	-	Not Likely
	Helotes Mold Beetle	*Batrisodes venyivi*	Endangered	-	Not Likely
Mollusks	False spike mussel	*Quincuncina mitchelli*	-	Threatened	Not Present
	Golden orb	*Quadrula aurea*	-	Threatened	Not Present
	Texas fatmucket	*Lampsilis bracteata*	-	Threatened	Not Present
	Texas pimpleback	*Quadrula petrina*	-	Threatened	Not Present
Reptiles	Indigo Snake	*Drymarchon corais*	-	Threatened	Not Present
	Texas Horned Lizard	*Phrynosoma cornutum*	-	Threatened	Not Present
	Texas Tortoise	*Gopherus berlandieri*	-	Threatened	Not Present
	Timber/ Canebrake Rattlesnake	*Crotalus horridus*	-	Threatened	Not Likely

Sources: U.S. Fish and Wildlife Service 2004 and Texas Parks and Wildlife Department 2005
Key: E = endangered, T = threatened, NL = not listed, DL = delisted, C = candidate.
(1) Sprague's pipit and mountain plover status under the ESA is discussed in more detail in Section 3.1.1.5.

Outside the range fan, the habitat is more discontiguous and composed of three smaller patches, relative to the larger blocks of habitat found within the range fan. One habitat area is located in the southwestern portion of the north pasture along Ralph Fair Road. In 2011, one golden-cheeked warbler was detected in this area. However, most of the juniper on the northern 18.5 acres of this area was cleared in September 2012 as part of a mitigation Biological Opinion with corresponding mitigation credit purchased from a mitigation bank. Another area of habitat is located in the south central portion of the inner cantonment, and in 2011, this area supported two males counter singing. The third area is located in the southeastern portion of the outer cantonment. No golden-cheeked warblers were detected here in 2011.

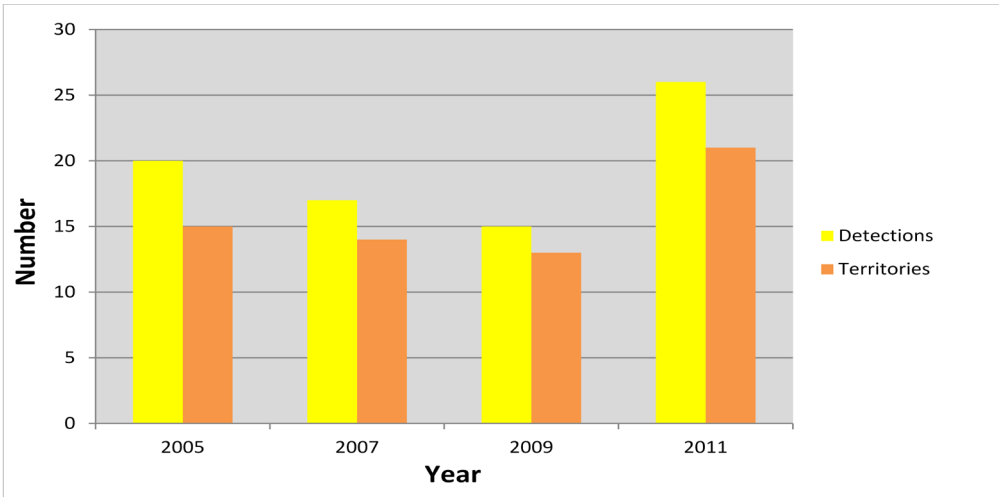


Figure 2-12: Golden-cheeked warbler Detections and Estimated Territories, 2005 - 2011

Warblers have also been observed in areas surrounding CSSA, including JBSA-CB, Eisenhower Park to the south, Friedrich Wilderness Park to the southwest, and some private lands over a mile to the west.

CSSA has conducted biennial surveys for the presence of golden-cheeked warblers since 2005 using meandering surveys along defined routes. These surveys are designed to provide a relative density of breeding males per hectare. All known and suspected habitat is surveyed for the presence/absence of warblers. This methodology has provided the installation with a history of the relative density of the species, and has begun to provide information about the size of territories and has provided a better understanding of the distribution of warblers on CSSA. This data is used by the installation for planning and monitoring purposes to measure potential impacts from training, off post urban development, or other activities that might have an effect on the population of warblers.

The results of the 2011 survey indicate the continued population growth of warbler on CSSA (Parsons 2011), see Figure 2-12. Several factors, both on and off CSSA, could be contributing to this growth. Surrounding pressures include development around CSSA that result in destruction of habitat and a reduction in the amount of available habitat. Possible factors on CSSA include an increase in available habitat as younger vegetation matures and improved management actions. Figure 2-13 shows the potential habitat found at CSSA for the golden-cheeked warbler.

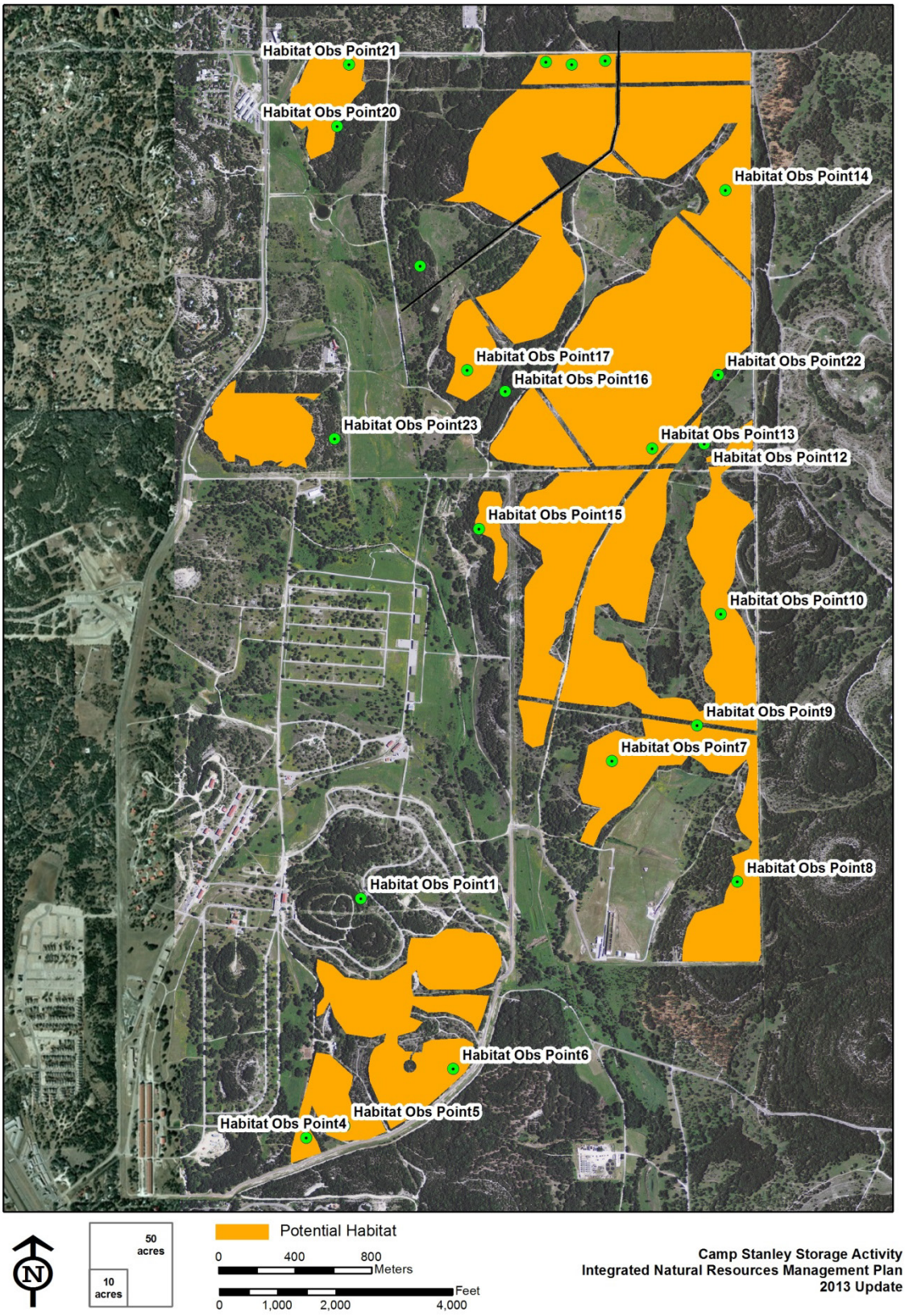


Figure 2-13: Potential Habitat at CSSA

2.4.5.2 Black-capped Vireo

Black-capped vireos nest in Texas from April through July, and winter along the western coast of Mexico. In general, nesting habitat for this species includes a patchy arrangement of well-developed shrubs and mid-successional overstory irregularly interspersed with bare or grassy openings. The brush component should be complete to the ground to provide suitable nest sites. The species composition of the vegetation tends to be less important than its structure, but broad-leaved species are more favorable than others, and juniper may be underrepresented in occupied habitat. Suitable habitat development for this species is strongly associated with the rocky soil of the Lower Cretaceous limestones of the Fredericksburg Group.

Black-capped vireos are known to nest in Bexar County, including at JBSA-CB, which is located east of and adjacent to CSSA. One pair of black-capped vireos was documented in the northeastern portion of CSSA in the spring of 1993. A single detection of a black-capped vireo was recorded during the 2005 surveys in the East Pasture; no other detections have been recorded of the black-capped vireo on the installation.

2.5 CULTURAL RESOURCES

2.5.1 CULTURAL RESOURCES MANAGEMENT

The Environmental Program Manager has the primary responsibility for managing cultural resources at CSSA on a day-to-day basis. Consultation with State Historic Preservation Office is initiated by the Environmental Program Manager. Administration of cultural resource management activities are described in the Integrated Cultural Resources Management Plan (Parsons 2005a) and therefore only the following short summary is provided.

2.5.2 HISTORIC ARCHITECTURAL RESOURCES

CSSA contains approximately 200 buildings and structures, along with infrastructure that includes roads, railroad sidings, and landscape elements. The buildings are concentrated in a rural setting within the inner cantonment which consists of a variety of building types primarily associated with munitions storage and support buildings that include administration, residences, operations, warehouses, vehicle storage, and utility related structures.

Overall, CSSA retains marginal integrity of architectural resources. While most of CSSA buildings dating to the 1930's and 1940's remain intact, many have been modified. Only a handful of structures possess the classic historic features of the San Antonio area such as limestone facades and tile roofs (like Fort Sam Houston or Randolph AFB possesses in much greater quantities). The facility has undergone limited new construction since the end of World War II. Although many of the historic buildings have undergone alterations that include window replacement and additions, none of the changes have significantly diminished the ability of the majority of the facility's buildings to convey their World War II-era significance.

2.5.3 HISTORIC AND PREHISTORIC ARCHEOLOGICAL RESOURCES

There are 40 known archeological sites at CSSA, seven of which are potentially eligible for listing in the National Register of Historic Places (NRHP) (Kibler, et al. 1998; Scott, et al. 1998; Parsons 2005a). Of these sites, 19 are considered historic sites and 21 are considered prehistoric sites. The prehistoric sites were interpreted as open campsites or lithic scatters. Historic sites were either classified as pre-military (before 1906) or military (1906-1945). Military components represented World War I training trenches,

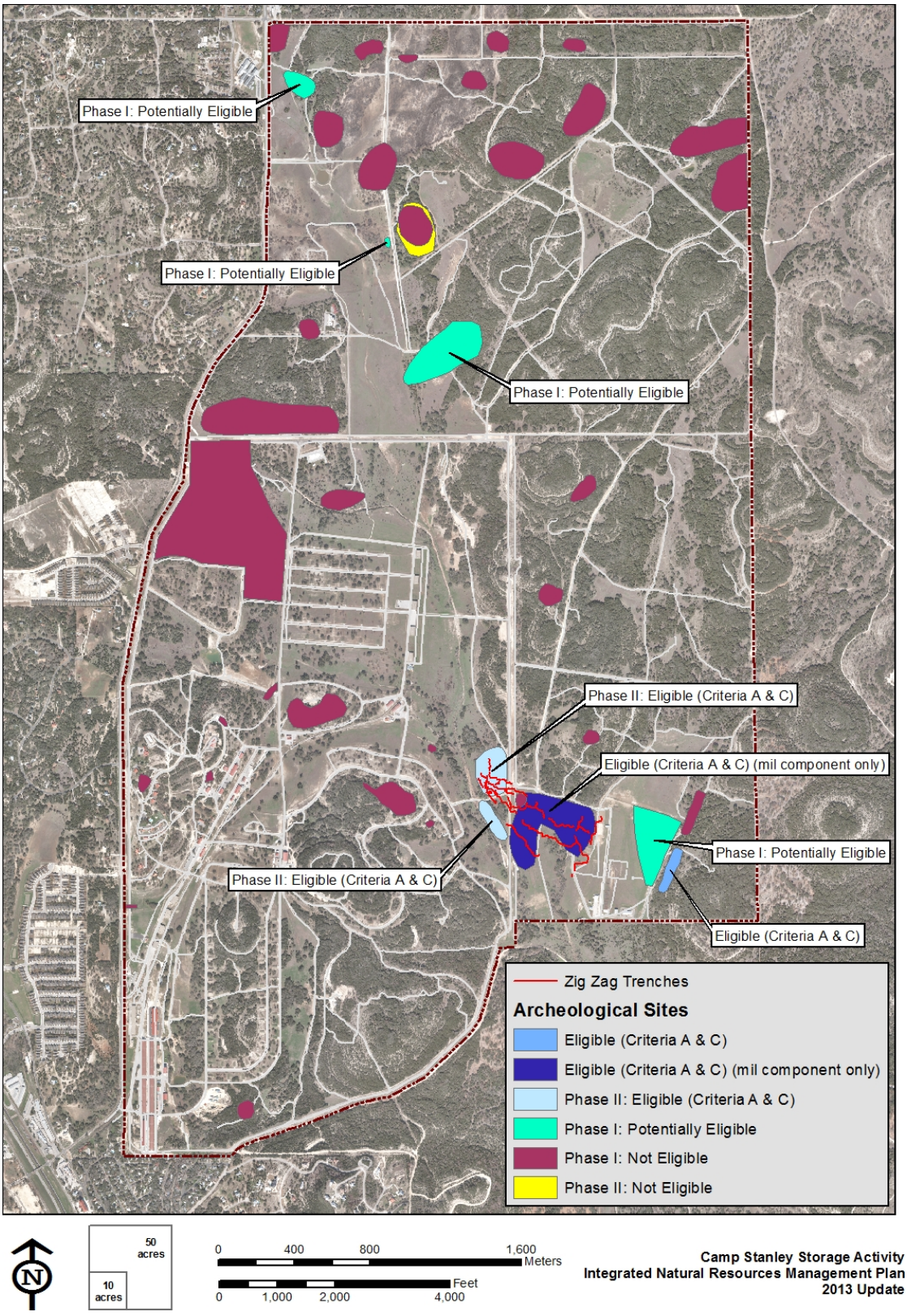


Figure 2-14: Cultural Resources

utilities, and infrastructure, facility plans, housing properties, service/support properties, and unidentified property types. The pre-military sites included a 19th Century homestead, 20th century ranches, and a possible 20th-century saloon (Parsons 2005a).

Three sites were recommended by archeologists as eligible for the NRHP. Four sites were recommended by archeologists as potentially eligible for the NRGP, pending further archival investigations to assess their significance, but have not had formal determinations of eligibility made by a federal agency. The Texas Historical Commission (THC), hereafter the State Historical Preservation Office concurred with these findings.

2.6 MILITARY MISSION IMPACTS TO THE LOCAL ENVIRONMENT

The purpose of this subsection is to estimate future impacts to the local environment based on the description of the military mission activities (described in Section 2.2, Military Mission), past activities and planned or notional activities. Table 2-2 lists each mission area and associated impact.

Table 2-2: Military Mission Impacts to the Local Environment

Mission Area		Impacts Associated with the Mission Area Activities
Operations & Management	Ammunition Storage	Storage of ammunition is conducted in compliance with DoD regulations. There is no impact to the local environment associated with ammunition storage.
	Personnel Housing	Maintenance of housing units at CSSA requires routine grounds maintenance.
	Scientific Studies, Compliance, Remediation	Remediation actions require soil and sediment removal, necessitating removal of vegetation.
	Brush Management and Fuels Reduction	The goal of fuels reduction is to remove fuels around critical infrastructure. Vegetation is removed and herbaceous vegetation is maintained at a low state of succession. Also, in non-endangered species habitat areas, brush management activities may occur to promote plant and animal species diversity.
	Facilities Management	Construction and maintenance activities require vegetation removal for new infrastructure or repairs to existing infrastructure.
	Security Management	Security setbacks are necessary for compliance with DoD installation standards. This requires maintaining low vegetation and high visibility along fencelines and around critical infrastructure.
Range Operations	Munitions Testing	Munitions testing produces percussive sounds which have minor impacts to wildlife.
	Range Operations	Range operations require grounds maintenance and vegetation removal to maintain targets, recover ordnance, scoring, and maintain competencies.

2.6.1 MILITARY MISSION IMPACTS TO AQUATIC HABITATS AND GROUNDWATER

Most of the impacts associated with aquatic habitats and groundwater are associated with the installation restoration program. These activities include groundwater remediation activities described

in Section 2.3.6. The goal of these programs is to improve groundwater conditions in compliance with regulatory orders and oversight by the TCEQ and USEPA.

2.6.2 MILITARY MISSION IMPACTS TO WILDLIFE COMMUNITIES

The primary impact to wildlife from military mission activities is vegetation removal for fuels management, security, and facilities management activities. Vegetation is either removed or maintained at a low state of succession through brush clearance followed by a periodic mowing regime. While the removal of shrubland vegetation (low visibility along fencelines, for example) may remove some screening habitat for deer and various avian species, the creation of more open areas will benefit grassland birds and may improve forb production for deer.

A secondary impact to wildlife is impulse and non-impulse noise produced from munitions testing, construction activities, and general vehicular operations on the facility. Categories of potential impacts from exposure to explosions and sound are direct trauma, hearing loss, auditory masking, behavioral reactions, and physiological stress. Potential negative nonphysiological consequences to terrestrial animals from noise include disturbance of foraging, roosting, or breeding; degradation of foraging habitat; and degradation of habitats. In general, military installations support healthy wildlife communities because of a lack of overgrazing of cattle and exclusion of environmental stressors found on non-military lands (Andersen et al. 2004, Lee Jenni et al. 2012).

2.6.3 MILITARY MISSION IMPACTS TO SPECIAL STATUS SPECIES

Activities at CSSA may affect the golden-cheeked warbler and black-capped vireo habitat and individuals. Based on current distribution data of other federally listed species and current land use practices at CSSA, only the golden-cheeked warbler and black-capped vireo are considered in this analysis. Effects to these two species may range from beneficial effects to adverse effects (as defined by ESA). No activity at CSSA is expected to jeopardize the continued existence of the golden-cheeked warbler or black-capped vireo, and no critical habitat occurs on CSSA. CSSA natural resource planners; however, anticipate potential incidental take of golden-cheeked warblers and black-capped vireos as a result of future actions and day-to-day operations at the facility.

Section 9 of ESA and federal regulations pursuant to Section 4(d) of ESA prohibit the take of threatened and endangered species without special exemption. Under the terms of Section 7(b)(4) and Section 7(o)(2), “taking” of species that is incidental to and not intended to be part of activities at CSSA are not prohibited by ESA, as long as such taking is in compliance with an Incidental Take Statement. CSSA has been in consultation with the U.S. Fish and Wildlife Service to assess impacts of the day-to-day activities associated with the military mission and ecological management activities, resulting in two Biological Opinions (January 2008 and August 2012) and several informal consultations. Any future projects that are not covered by existing consultations would necessitate additional consultation with the U.S. Fish and Wildlife Service.

2.6.4 TRAINING AND OPERATIONS RESTRICTIONS

As part of the INRMP implementation, CSSA will adhere to certain activity restrictions in order to minimize and avoid adverse effects to listed species. The INRMP projects, described in Section 4, Natural Resource Program Elements and INRMP Projects for 2013 - 2018, were designed to have the smallest footprint possible on the military mission at CSSA. Indeed, many projects in the INRMP serve the military mission goals and provide ancillary ecological, and in some cases, recreational benefits. Restrictions on

activities at CSSA are associated with endangered species habitat. Activity restrictions are adapted from current natural resource planning policies at JBSA-CB (JBSA-CB ESMP 2005).

Core habitat is defined by a 200-meter buffer surrounding a detection of a black-capped vireo or golden-cheeked warbler. Core habitat designations are updated after avian surveys (occurring every two years), and are valid for three years. Non-core habitat is determined by the presence of primary habitat elements, which include vegetation species composition and structure within vegetation communities, as well as abiotic factors, such as slope and aspect of slope.

This page left intentionally blank

3 NATURAL RESOURCE REGULATORY REQUIREMENTS AND MISSION SUSTAINABILITY

Section 3 provides the installation manager, Environmental Program Manager, and support staff with an overview of regulatory requirements to ensure compliance with existing applicable regulatory frameworks concerning natural resources. Section 3.1 discusses the various natural resource regulatory frameworks applicable to CSSA activities, such as ESA consultation requirements and processes, installation MBTA obligation, permitting and certification procedures for activities that impact wetlands and Waters of the U.S. subject to Clean Water Act authority, and the NEPA decision making framework. Section 3.2 provides a discussion regarding public outreach, encroachment partnering, and regional wildlife strategy planning. Awareness and interaction with the public and natural resource professional community "beyond the fence" is important for CSSA installation mission sustainability.

3.1 NATURAL RESOURCES REGULATORY FRAMEWORKS

3.1.1 SECTION 7 ENDANGERED SPECIES ACT CONSULTATION REQUIREMENTS

CSSA is required to confer with the U.S. Fish and Wildlife Service Austin Ecological Services Field Office if range activities, operations and maintenance activities, natural resource management activities, or other activities would potentially affect ESA listed species, species considered for ESA listing, or recently delisted recovered species where proposed actions would necessitate relisting. In addition, if critical habitat designations were located on CSSA properties or adjacent areas that would be subject to indirect effects of CSSA mission activities, CSSA would be required to evaluate in consultation with the U.S. Fish and Wildlife Service if activities would present an adverse modification to critical habitat designations.

Section 7 of the ESA outlines procedures for interagency cooperation to conserve federally listed species and designated critical habitats. Section 7(a)(1) requires Department of the Army installations to use their authorities to further the conservation of listed species, which may be accomplished by implementation of installation-level INRMPs. Section 7(a)(2) requires Department of the Army installations to consult with the U.S. Fish and Wildlife Service to ensure that they are not undertaking, funding, permitting, or authorizing actions likely to jeopardize the continued existence of listed species or destroy or adversely modify designated critical habitat. This section of the ESA defines the consultation process, which is further developed in regulations promulgated at 50 CFR § 402. Section 7 also establishes the requirement to conduct conferences on proposed species and allows applicants to initiate early consultation.

CSSA and the U.S. Fish and Wildlife Service have worked through the Section 7 consultation process to apply two programmatic Biological Opinions to provide a framework for most of the activities that require golden-cheeked warbler and black-capped vireo habitat removal. Figure 3-1 shows the decision process to determine the appropriate Section 7 ESA consultation framework. The first Biological Opinion was finalized in January 2008, and covers relatively small takes of habitat on an annual basis. The process for following the 2008 programmatic Biological Opinion is described in Section 3.2.1, Programmatic Biological Opinion for Small Habitat Removal. These relatively small habitat removals may result from such projects as routine firebreak maintenance, small remediation projects, roads maintenance, and small infrastructure construction or maintenance activities.

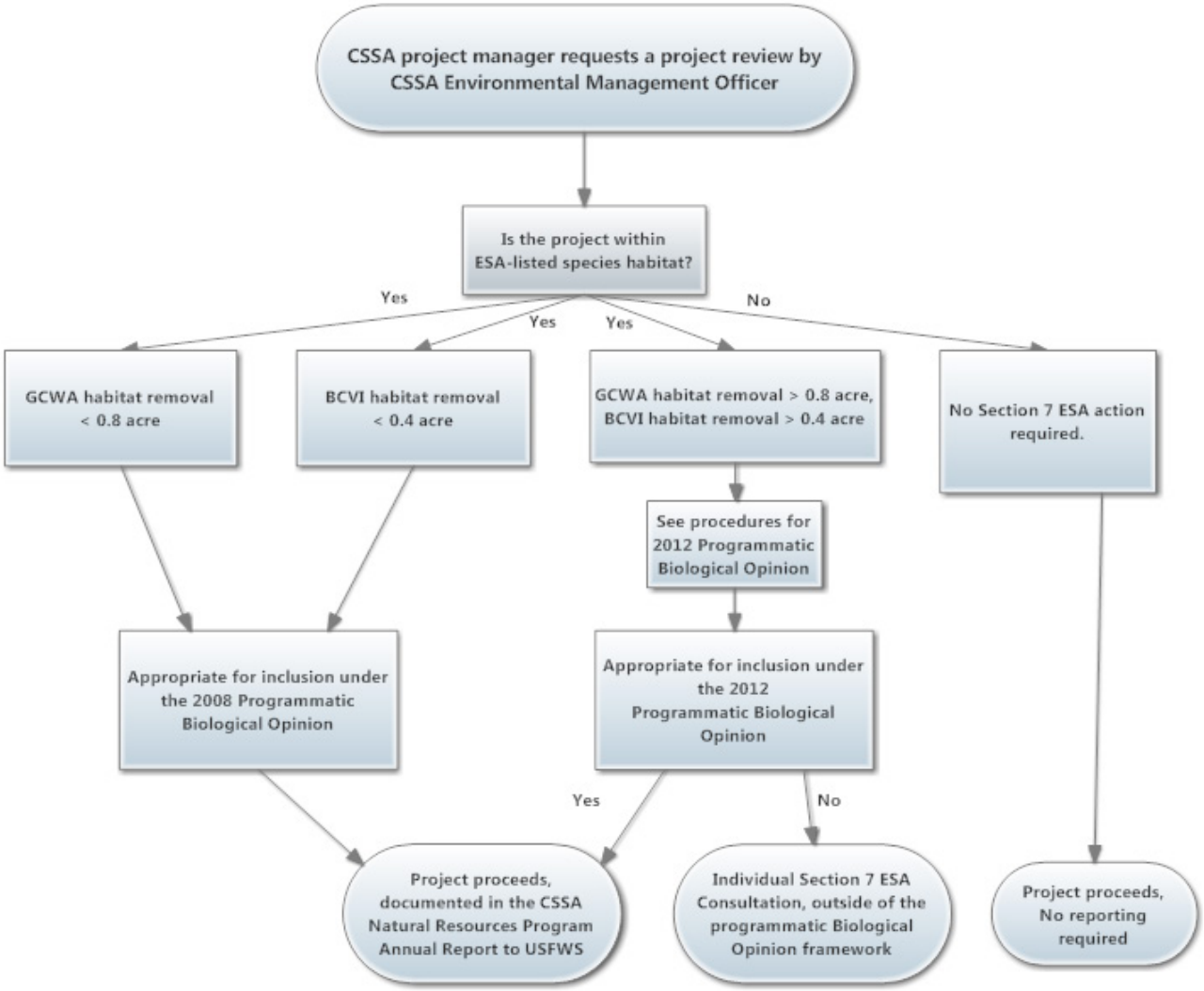


Figure 3-1: Flowchart for Determining Section 7 Consultation Framework

A second programmatic Biological Opinion was signed in August 2012, which provides for a framework to mitigate habitat removal in larger amounts. These larger habitat removal actions may result from larger construction projects or larger remediation requirements. The process for following the 2012 programmatic Biological Opinion is described in Section 3.2.2.

In the event that a future project may not be appropriate for inclusion under either programmatic Biological Opinion, CSSA must engage in a separate and individual Section 7 ESA consultation with the U.S. Fish and Wildlife Service Austin Ecological Services Field Office. A project may not be applicable under the programmatic agreements for such reasons as (1) the project is highly complex with effects on ESA-listed species occurring on CSSA not anticipated by either programmatic Biological Opinion, (2) the project occurs outside of the valid period of either programmatic Biological Opinion, or (3) the project impacts newly listed species that are not covered under either programmatic Biological Opinion. Section 3.2.3 describes the process for engaging in separate individual Section 7 ESA consultations outside of the frameworks established by the programmatic Biological Opinions.

3.1.1.1 Programmatic Biological Opinion for Small Habitat Removal

On 14 January, 2008, the U.S. Fish and Wildlife Service Austin Ecological Services Field Office provided a programmatic Biological Opinion to expedite projects on CSSA with relatively minor effects to ESA-listed species (Consultation number 2-1450-2007-F-0128). Projects that either exceed the thresholds specified in this programmatic agreement must either qualify for the 2012 programmatic Biological Opinion (discussed in Section 3.2.2) or be considered in a separate individual ESA consultation. Based on the activities occurring at CSSA and anticipated to occur during the programmatic Biological Opinion period of validity (2008 – 2017), CSSA is permitted to incidentally take from operations and maintenance, range management, and natural resource management activities:

- Potential take of golden-cheeked warbler habitat is anticipated to occur over the next ten years in the amount of 8 acres subject to permanent removal, at an average rate of 0.8 acres per year. Temporary adverse effects to golden-cheeked warblers are anticipated to occur over the next ten years for 30 acres of habitat, at an average rate of 3 acres per year.
- Potential take of black-capped vireo habitat is anticipated to occur over the next ten years in the amount of 4 acres subject to permanent removal, at an average rate of 0.4 acres per year. Temporary adverse effects to black-capped vireos are anticipated to occur over the next ten years for 10 acres of habitat, at an average rate of 1 acre per year.
- Potential take of the number of golden-cheeked warblers that may be found within 3.8 acres of habitat per year in the form of harm, harassment, disturbance, or mortality as a result of CSSA activities.
- Potential take of the number of black-capped vireos that may be found within 1.4 acres of habitat per year in the form of harm, harassment, disturbance, or mortality as a result of CSSA activities.

These estimates are based on similar estimates of incidental take on other DoD installations for similar activities, and CSSA understands that these values may be adjusted in the future if necessary.

3.1.1.2 Programmatic Biological Opinion for Large Habitat Removal

On 8 August 2012, the U.S. Fish and Wildlife Service Austin Ecological Services Field Office finalized a programmatic Biological Opinion for activities affecting up to 204 acres of golden-cheeked warbler habitat (Consultation number 02ETAU00-2012-F-0151). The 2012 programmatic Biological Opinion allows for CSSA to implement several military mission improvements (e.g. infrastructure for training, water supply infrastructure) that may impact the golden-cheeked warbler. Location of these proposed and notional projects are constrained by munitions storage quantity distance arcs, range fan buffers and safety zones, existing infrastructure (e.g. roads, buildings, fences, water and sewage facilities), and various natural resource constraints (e.g. topographic constraints, floodplain locations, heritage tree locations, ESA-listed species habitats).

The 2012 programmatic Biological Opinion approves CSSA's proposal to obtain an adequate number of credits from a U.S. Fish and Wildlife Service-approved conservation bank. CSSA estimated that the maximum number of credits would be 204 credits, although between 50 and 60 credits may meet CSSA requirements. The effects of habitat removal would be mitigated by permanently preserving habitat in an accredited conservation bank. The U.S. Fish and Wildlife Service also approved a framework for establishing mitigation credit requirements. The framework calls for habitat to be classified as (1) unoccupied, but potential habitat, (2) buffer habitat, and (3) occupied habitat.

Table 3-1 shows the mitigation requirements for each of these classifications. Figure 3-2 shows the workflow for implementing the 2012 Programmatic Biological Opinion. A copy of the 2012 Programmatic Biological Opinion is included in Appendix B-2.

Table 3-1: Mitigation Ratio Requirements Specified under the 2012 Programmatic Biological Opinion

Category of Golden-cheeked Warbler Habitat	Ratio of Off-Installation Acres in Conservation Stewardship to On-Installation Acres Affected
Category 1: Unoccupied / Potential Habitat	1:1
Category 2: Buffer Habitat	2:1
Category 3: Occupied Habitat	3:1

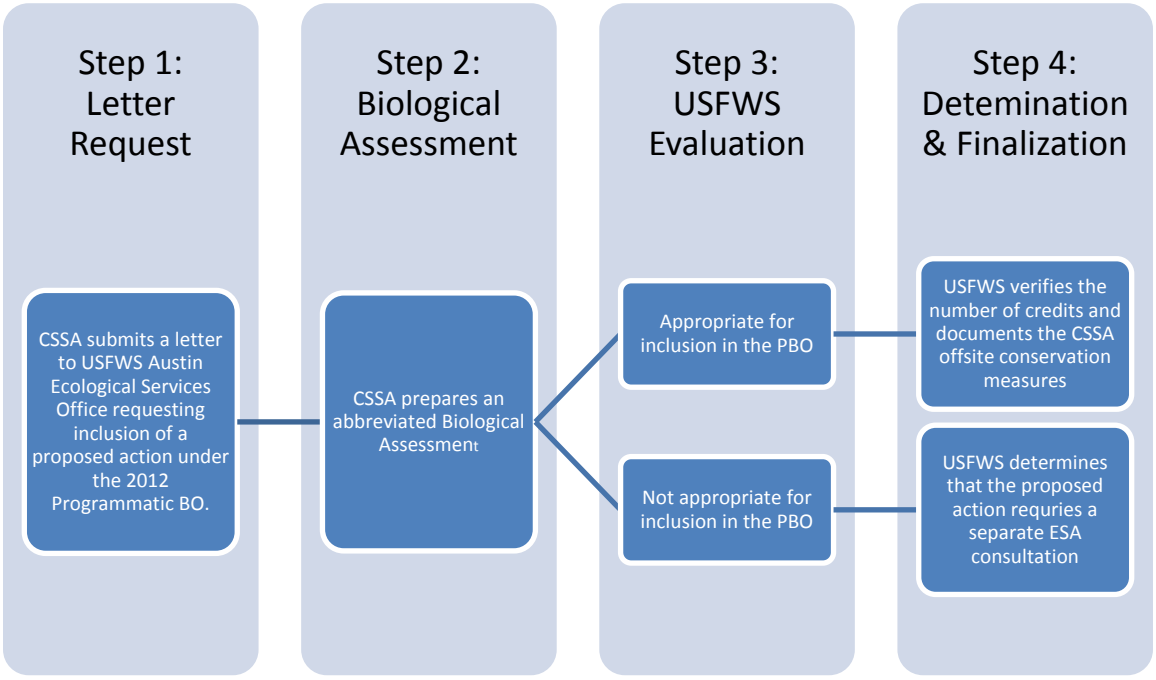


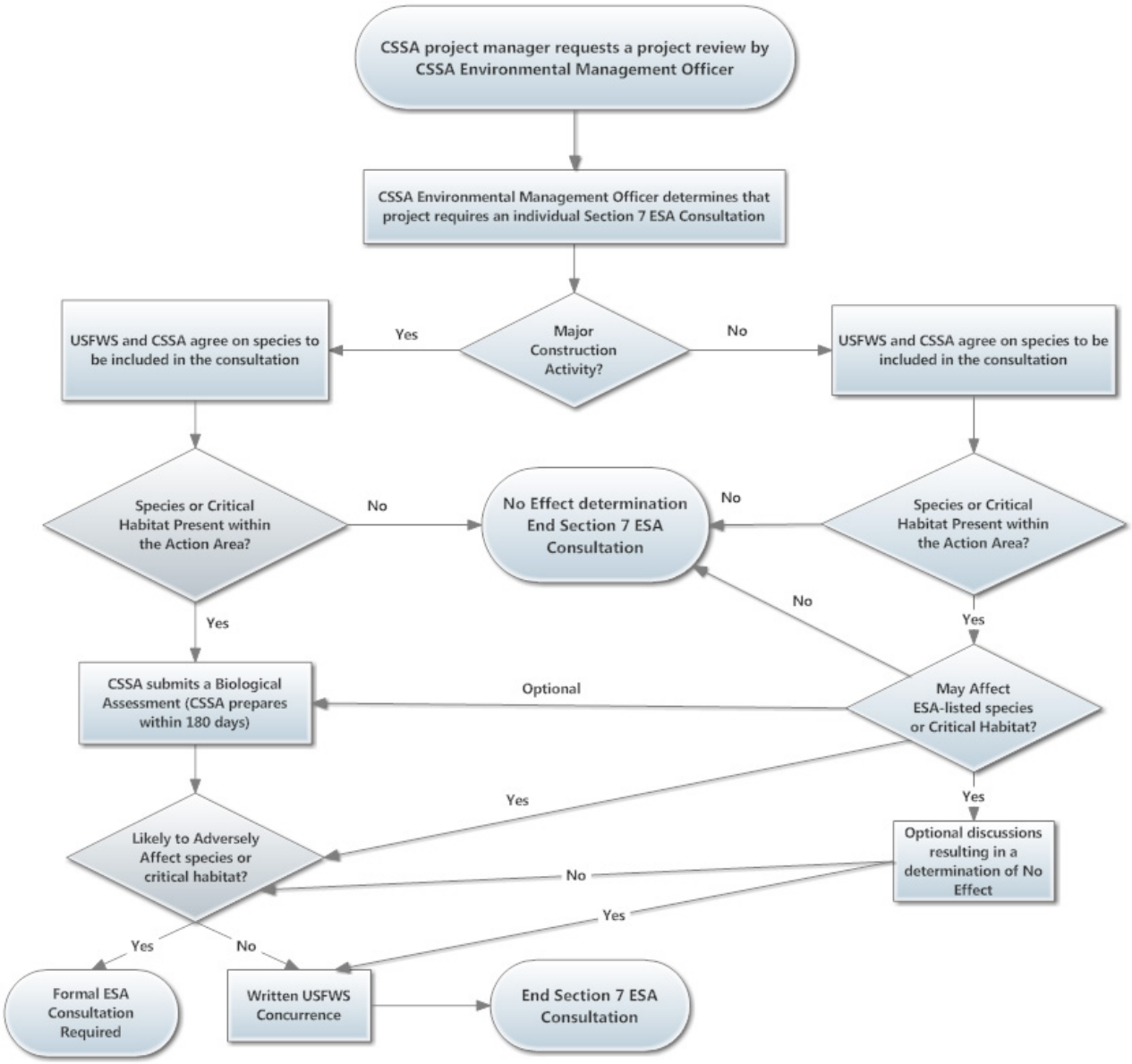
Figure 3-2: Flowchart for Implementing the 2012 Programmatic Biological Opinion

The 2012 Programmatic Biological Opinion also specified additional conservation measures. The measures will serve as non-discretionary guidelines and should provide appropriate golden-cheeked warbler habitat protection so that CSSA can maintain compliance with the Terms and Conditions of the 2008 Biological Opinion and management goals, while meeting the military mission requirements. These measures are described below:

- Habitat alteration associated with a project shall occur when golden-cheeked warbler are not present in the Action Area.
- Black-capped vireo habitat will be specifically avoided. Any take of black-capped vireo habitat will be addressed under the 2008 Biological Opinion.
- Federally listed karst invertebrate preserves will be specifically avoided.
- All brush/slash piles shall be burned or mulched in place, or moved to another area and burned or mulched in place. Burning of slash material will be considered as the preferred method, and only with prior concurrence from the CSSA Environmental Manager, who is responsible for prescribed burning. Mulching and/or disposing of brush and slash will reduce the danger of ladder fuels in the event of wildfire, and will reduce habitat opportunities for Texas rat snakes (*Elaphe obsoleta lindheimeri*), a major predator of golden-cheeked warblers. Timely removal of brush/slash piles is imperative before the onset of the next breeding season.
- All construction trails, equipment storage areas, and equipment staging areas associated with habitat alteration will be located outside remaining golden-cheeked warbler habitat, and in non-endangered species habitat areas.
- To prevent the spread of oak wilt disease (*Ceratocystis fagacearum*), damage to Texas oak (*Q. buckleyi*) and live-oak trees will be minimized. Immediately sealing oak injuries with pruning paint and performing modification during the winter months should reduce disease infection and spread.

3.1.1.3 Individual Section 7 ESA Consultations

For CSSA, the consultation process begins when CSSA requests a species list, or a verification of a species list, from the U.S. Fish and Wildlife Service Austin Ecological Services Field Office. Informal consultation is an optional process that includes all discussions and correspondence between CSSA and the U.S. Fish and Wildlife Service, prior to formal consultation, to determine whether a proposed federal action may affect listed species or critical habitat. This process workflow is shown on Figure 3-3. This process allows the federal agency to utilize the U.S. Fish and Wildlife Service expertise to evaluate CSSA's assessment of potential effects or to suggest possible modifications to the proposed action which could avoid potentially adverse effects. Informal consultation ends when CSSA determines that the action would have no effect on listed species or critical habitat or it is determined that the action is not likely to adversely affect listed species or critical habitat and written concurrence of this determination is provided by the U.S. Fish and Wildlife Service Austin Ecological Services Field Office.



Source: U.S. Fish and Wildlife Service and National Marine Fisheries Service (1998): Section 7 Endangered Species Act Consultation Handbook

Figure 3-3: Flowchart for Individual Informal Section 7 ESA Consultations

3.1.1.4 Reporting Requirements

In accordance with both programmatic Biological Opinions, CSSA is required to provide, by October 31 of each year, an annual report summarizing the natural resource management activities, particularly those activities requiring effects to ESA-listed species and habitats. The 2012 annual report is included in Appendix B-3, and may be used as a template for future annual reporting for years that are covered by the programmatic Biological Opinions.

3.1.1.5 Future Requirements

Renewing Existing Programmatic Section 7 ESA Consultations

The two programmatic Biological Opinions described in Section 3.2.1 and Section 3.2.2 will expire while this INRMP is in effect (see Figure 3-4). The 2008 Programmatic Biological Opinion will expire on 13 January 2018, and the 2012 Programmatic Biological Opinion will expire on 7 August 2017. As shown on Figure 3-4, the expiration of the programmatic consultations and the renewal of the next INRMP will roughly be proximate. It is highly suggested that the Sikes Act coordination and the ESA consultation be combined as much as possible to ensure that there is no loss of coverage for the installation.

Figure 3-4: Timeline for Programmatic Biological Opinion Expirations

Future Listing ESA Species Listings

The U.S. Fish and Wildlife Service may add species to the threatened and endangered species list, according to a strict rule making process. A species is added to the list when the U.S. Fish and Wildlife Service determines the species to be endangered or threatened because of any of the following factors:

- The present or threatened destruction, modification, or curtailment of its habitat or range;
- Overutilization for commercial, recreational, scientific, or educational purposes;
- Disease or predation;
- The inadequacy of existing regulatory mechanisms; and,
- Other natural or manmade factors affecting its survival.

The process of how a species actually reaches an ESA-listing status is important for the CSSA Environmental Program Manager and Installation Manager. The process is shown on Figure 3-4, and usually begins when the U.S. Fish and Wildlife Service receives a petition for listing. A “90 Day Finding” will result in either an “Unsubstantial Finding” or a “Substantial Finding.” If a Substantial Finding is issued on a particular species, a determination of “warranted,” “not warranted,” or “warranted but precluded” accompanies the 90 Day Finding. A warranted finding will initiate the U.S. Fish and Wildlife Service rule making process, which by law has a 60 day comment period for the receipt of comments.

This 60 day comment period is an opportunity for interested DoD stakeholders to provide comments to the U.S. Fish and Wildlife Service, which will be incorporated into the Final Rule.

The U.S. Fish and Wildlife Service has been subject to a barrage of litigation regarding the listing of species. Petitions to list more than 1,000 species have been filed since 2007, and this has created an enormous backlog for species awaiting listing determinations. In 2011, two conservation groups (WildEarth Guardians and the Center for Biological Diversity) reached a settlement with U.S. Fish and Wildlife Service regarding the backlog of species listings; the settlement called for the U.S. Fish and Wildlife Service to develop a work plan to address scheduling commitments for species considerations. The work plan commits the U.S. Fish and Wildlife Service to systematically, over a period of six years, review and address the needs of more than 250 species.

Awareness of the U.S. Fish and Wildlife Service rule making process is critical for the CSSA Environmental Management Officer. Based on the scientific studies that occur on CSSA, input can be provided to the U.S. Fish and Wildlife Service to reduce conflicts with regulators and the military mission.

Awareness of what species that may occur on CSSA and are currently in the review process for ESA listing will assist in planning for future surveys, pre-listing conservation plans, and infrastructure planning.

Table 3-2 lists species with a possible or known occurrence in Bexar County that may be considered for ESA-listing in the near future. Based on the current status of regulatory review and the habitat requirements of the species, four species are presented as the most imminent for elevation to the list of threatened and endangered plants and animals. These species are highlighted in Table 3-2, and are described below.

- The **bracted twistflower (*Streptanthus bracteatus*)** was determined by the U.S. Fish and Wildlife Service in October 2011 to be "warranted" for listing. It is now considered a candidate for ESA listing. The 12 Month Finding has not been released yet, but will contain additional information on the status and distribution of this plant. This plant has not been observed on CSSA, but populations of this wildflower have been noted in northwestern Bexar County (Leonard and Van Auken 2010).
- The **big red sage (*Salvia penstemonoides*)** is known to occur on Cibalo Creek and Leon Creek drainages. Drainages on CSSA are tributary to these creek systems. The big red sage is currently under petition review, the next expected action is for the U.S. Fish and Wildlife Service to release a 12 Month Finding.
- The **spot-tailed earless lizard (*Holbrookia lacerate*)** may also occur on CSSA, although no known recent occurrences have been recorded in Bexar County (Texas Parks and Wildlife 2005). On May 24, 2011, the U.S. Fish and Wildlife Service announced a 90 Day Finding on a petition to list the spot-tailed lizard. The 12 Month Finding has not been released yet, which will contain more information on distribution and species status.
- The **Sprague's pipit (*Anthus spragueii*)** winters in Texas, particularly the Edward's Plateau, and breeds in the northern Great Plains. Biennial breeding bird surveys that occur at CSSA do not coincide with when this species may occur on the installation. On September 14, 2010, the U.S. Fish and Wildlife Service released a 12-month finding on a petition to list the Sprague's pipit with a finding of "warranted, but precluded."

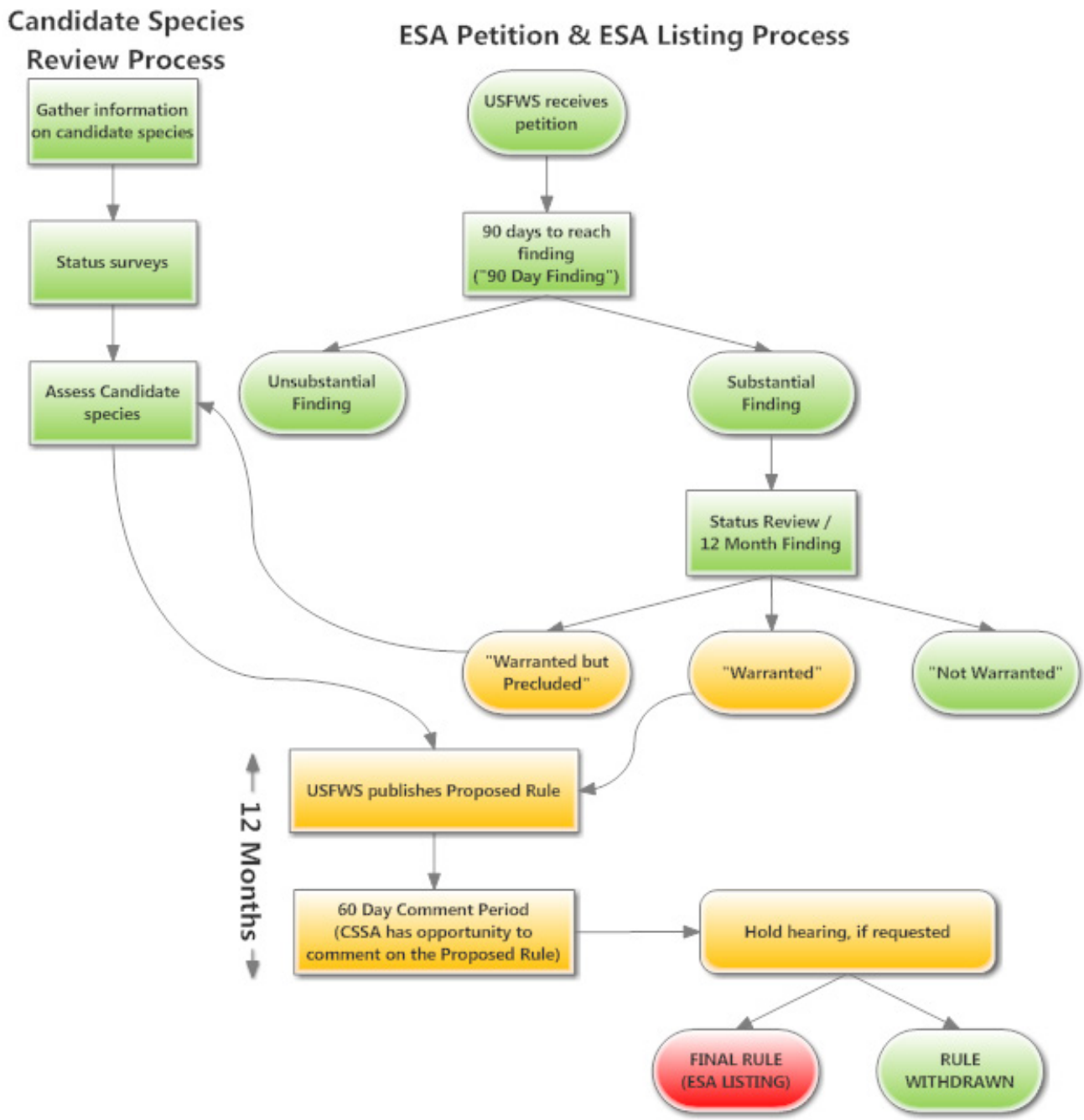


Figure 3-5: Candidate Species Reviews, ESA Petitions, and Listing Processes

Table 3-2: Species Considered to be Potentially Reviewed for ESA Listing Occurring in Bexar County

Major Species Group			Habitat	Likely Occurrence at CSSA
Major Species Group	**Common Name**	**Scientific Name**		
Plant	Bracted Twistflower	*Streptanthus bracteatus*	Endemic wildflower occurring on rocky slopes, usually under shrubs or full sun where ungulate pressure is absent.	***POSSIBLE***[1] Two populations in north western Bexar County. Source: Leonard and Van Auken (2010)
	Big Red Sage	*Salvia penstemonoides*	Endemic; moist to seasonally wet clay or silt soils in creek beds.	***POSSIBLE***[2] Found along Cibalo Creek drainages, first collection on JBSA-CB Source: Goyne (1991)
	Correll's False Dragon-head	*Physostegia correllii*	Found in wet, silty clay loams on sides of streams and other wet areas.	***POSSIBLE*** Observed flowering in northern Bexar County. Source: Boerne Chapter, Native Plant Society of Texas (2009)
Mollusks	False Spike	*Quincuncina mitchelli*	Substrates of cobble and mud with water lilies present. Rio Grande, Brazos, Colorado and Guadalupe river basins.	***NOT LIKELY***
	Golden Orb	*Quadrula aurea*	Sand and gravel, Guadalupe, San Antonio, and Nueces River basins	***NOT LIKELY***
	Texas Fatmucket	*Lampsilis bracteata*	Streams and rivers on sand, mud and gravel, Colorado and Guadalupe River basins.	***NOT LIKELY***
	Texas Pimpleback	*Quadrula petrina*	Mud, gravel and sand substrates, Colorado and Guadalupe river basins	***NOT LIKELY***
	Mimic Cavesnail	*Phreatodrobia imitata*	Subaquatic; only known from two wells penetrating the Edwards Aquifer	***NOT LIKELY***
Fish	Toothless Blindcat	*Trogloglanis pattersoni*	Troglobitic, blind catfish endemic to the San Antonio Pool of the Edwards Aquifer	***NOT LIKELY***
	Widemouth Blindcat	*Satan eurystomus*		***NOT LIKELY***

Table 3-2: Species Considered to be Potentially Reviewed for ESA Listing Occurring in Bexar County (Continued)

Major Species Group			Habitat	Likely Occurrence at CSSA
Major Species Group	**Common Name**	**Scientific Name**		
Amphibian	Cascade Caverns Salamander	*Eurycea latitans complex*	Endemic, subaquatic in Edwards Aquifer Area	***NOT LIKELY***
	Comal Blind Salamander	*Eurycea tridentifera*	Endemic; springs and waters of caves in Bexar County	***NOT LIKELY***
	Texas Salamander	*Eurycea neotenes*	Endemic; springs, seeps, cave streams, Helotes and Leon Creek drainages in Bexar County	***NOT LIKELY***
Reptile	Spot Tailed Earless Lizard	*Holbrookia lacerata*	Moderately open prairie-brushland.	***POSSIBLE***[3] No recent known occurrences in Bexar County
Bird	Mountain Plover	*Charadrius montanus*	Shortgrass prairies and fields with a mix of bare ground. Breeding thought not to occur in Bexar County.	***POSSIBLE***[4] Not observed in breeding bird surveys on CSSA.
	Sprague's Pipit	*Anthus spragueii*	Mixed grass prairies. Breeds in northern portion of Great Plains	***POSSIBLE***[4] Possible wintering grounds, no breeding. Source: Jones (2010)

NOTES: Species highlighted in orange meet the following criteria: (1) may occur at CSSA, and (2) the species is under review for listing, either from candidate species reviews, new petition evaluations, or review of petitions.

[1] On October 26, 2011, the U.S. Fish and Wildlife Service released a Candidate Notice of Review of certain high priority candidate species, including the bracted twistflower.The review was accompanied by a determination that listing this species is "warranted."
[2] The big red sage is currently under petition review, the next expected action is for the U.S. Fish and Wildlife Service to release a 12 Month Finding.
[3] On May 24, 2011, the U.S. Fish and Wildlife Service announced a 90 Day Finding on a petition to list the spot-tailed lizard. The 12 Month Finding has not been released yet, which will also contain more information on distribution and species status.
[4] The final rule to list the mountain plover as "threatened" was withdrawn with a finding of "not warranted" on May 11, 2011.
[5] On September 14, 2010, the U.S. Fish and Wildlife Service released a 12-month fining on a petition to list the Sprague's pipit with a finding of "warranted, but precluded."

3.1.2 MIGRATORY BIRD TREATY ACT OBLIGATIONS

CSSA's requirement to confer with the U.S. Fish and Wildlife Service for MBTA issues is triggered by a determination that the military readiness or other facility mission activity in question will have a significant adverse effect on a population of migratory bird species. An activity has a significant adverse effect if, over a reasonable period of time, it diminishes the capacity of a population of migratory bird species to maintain genetic diversity, to reproduce, and to function effectively in its native ecosystem. Although CSSA facilities support breeding and wintering habitat for several bird species protected under the MBTA, it is highly unlikely that CSSA mission activities would result in any take that would affect species on a population level. Further, CSSA implements conservation measures defined in this INRMP that are designed to benefit a wide variety of migratory waterfowl, raptors, and neo-tropical passerines.

3.1.3 WETLANDS AND WATERS OF THE U.S. / CLEAN WATER ACT REQUIREMENTS

3.1.3.1 Section 404 Clean Water Act Requirements

Activities in wetlands areas at CSSA are regulated under Section 404 of the Clean Water Act (CWA). The U.S. Army Corps of Engineers (USACE) is responsible for protecting the integrity of the nation's waterways through Section 404 of the CWA, a program established to regulate the discharge of dredged and fill material into waters of the U.S. Regulated activities in wetlands and waters of the U.S. are controlled by a permit review process administered by USACE, and the objective of the program is to ensure that no discharge of dredged or fill material be permitted if the nation's waters would be significantly degraded or if a practicable alternative exists that is less damaging to the aquatic environment.

When applying for a permit from USACE for the discharge of dredged or fill material into wetlands and waters of the U.S., CSSA must consider (1) designing projects that avoid impacts to wetlands, (2) minimizing potential direct and indirect impacts to wetlands, and (3) compensation in the form of wetlands mitigation for unavoidable impacts to wetlands. Future construction projects at CSSA will follow USACE permitting procedures for possible future impacts to wetlands.

Mitigative actions may include the following:

- ***Onsite mitigation*** Because of the size and characterization of CSSA, onsite mitigation may be the most prudent of all mitigation options when impacts to wetlands cannot be avoided. Mitigative actions may include stream bank stabilization, enhancements to existing wetlands, or wetlands creation, and be subject to USACE approval.
- ***Mitigation banking*** Mitigation banking is the restoration, enhancement, creation, and, in exceptional circumstances, preservation undertaken to compensate in advance for adverse impacts to the aquatic ecosystem. Mitigation banking may be appropriate when on-site mitigation cannot be practicably achieved or would not be as environmentally beneficial at the impact site or a nearby site. A mitigation bank receives payments for wetlands losses, and must be in the geographical context of CSSA. Currently, there are no USACE-approved mitigation banks that would be acceptable to USACE for CSSA potential wetlands mitigation needs.
- ***In-lieu fee program*** An in-lieu fee program would allow CSSA to pay a fee to an established trust fund in lieu of implementing specific on-site or off-site compensatory mitigation. The amount of the in lieu fee paid will normally represent the fair market cost of replacing those aquatic ecosystem resources that would be lost or impaired as a result of the authorized activity. The trust fund, in turn, finances mitigation projects that are designed to restore, enhance, create, or preserve aquatic ecosystem functions. Organizations that receive payments may include the Texas chapter of The Nature Conservancy or the Hill Country Conservancy.

Two wetlands delineations were performed in December 1995 and April 1996 (SAIC 1997a). Based on the survey results, four jurisdictional wetlands totaling 1.1 acres and seven non-jurisdictional wetlands totaling 3.2 acres occur on CSSA (Figure 2-11). The non-jurisdictional wetlands are all man-made impoundments. However, two impoundments are classified as jurisdictional because they intercept flows from defined channels, springs, or seeps. The other jurisdictional wetlands appear to be associated with either springs or seeps. In addition, approximately 32,250 linear feet of stream drainages on CSSA have defined channels and can be classified as jurisdictional waters of the U.S. (CSSA 1997). In

November 1996, a wetlands specialist from USACE visited the site to verify the findings of the delineation (CSSA 1997). Definitions for wetlands types are from Cowardin, *et al.* 1979, and include:

- ***Palustrine Unconsolidated Bottom Wetlands:*** Stock ponds essentially lacking in woody species, persistent emergents, or emergent mosses or lichens.
- ***Palustrine Emergent Wetlands:*** Dominated by hydrophytic vegetation including woody species and macrophytes.
- ***Lacustrine Littoral Unconsolidated Bottom:*** Depressional wetlands that lack vascular vegetation, and exceed 2 meters in depth at low water.

Additional wetlands work is required to meet compliance needs at CSSA. Wetlands delineations are considered valid by USACE for a period of 5 years after the survey. Therefore, new construction projects in drainage areas would require additional wetlands surveys.

3.1.3.2 Section 401 Clean Water Act Certification

Activities associated with the military mission at CSSA result in minimal ground disturbance, and no training related soil erosion problems currently exist. Consequently, potential erosion and sediment control issues would primarily be related to future construction activities.

Recently, several construction projects have been undertaken in the inner cantonment and East Pasture area. Stormwater Pollution Prevention Plans (SWPPPs) have been developed and implemented for these projects. Future construction projects that disturb 1 to 5 acres require the development and implementation and posting of a SWPPP. In areas that exceed 5 acres, a Notice of Intent (NOI) will be submitted to the TCEQ along with a SWPPP. In addition, because construction projects occur within the contributing zone of the Edwards Aquifer, construction activities may also be subject to Chapter 213 of TCEQ Regulations, made effective in September 2005.

Most stormwater runoff is currently discharged into Salado Creek and a tributary of Salado Creek in the southwest portion of the inner cantonment. Wastewater generated at CSSA is collected in a sanitary sewer system operating on a gravity feed from the inner cantonment area; CSSA's wastewater is discharged to the San Antonio Water System (SAWS) for treatment.

3.1.4 NATIONAL ENVIRONMENTAL POLICY ACT COMPLIANCE

CSSA is required by NEPA to (1) Identify and analyze environmental consequences of actions proposed by CSSA in comparable detail to economic and operational analyses, (2) Assess reasonable alternatives to agency proposed actions, (3) Document the environmental analysis and findings, and (4) Make environmental information available to public officials and citizens before agency decisions are made. As stated in **Section 1,** the CSSA INRMP serves as a source document for various NEPA documents, such as EAs, EISs, and RECs. The NEPA process as practiced by the CSSA is shown in Figure 3-6.

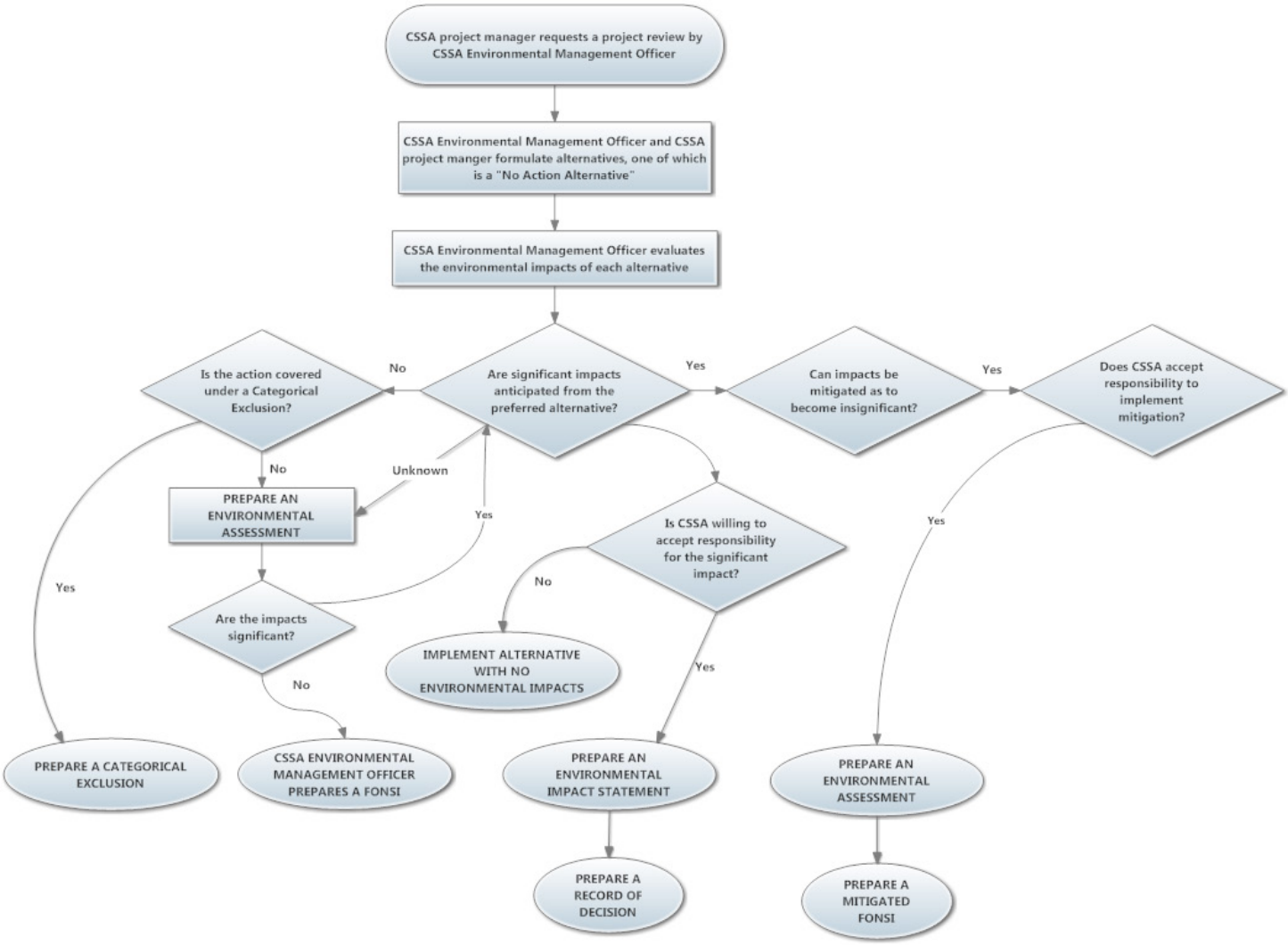


Figure 3-6: NEPA Process Flowchart for Camp Stanley Storage Activity

3.2 MILITARY MISSION SUSTAINMENT AND "BEYOND THE FENCE"

CSSA is committed to maintain training and testing areas that meet existing and planned components a diverse military mission. Accordingly, CSSA is committed to sustainable land use principles. The CSSA accomplishes these two goals and minimizes or avoids conflicts between achieving military mission goals and sustainable land use through the INRMP implementation. Through the INRMP planning process, natural resource management projects are designed to not adversely affect the military mission, achieve no net loss of military mission functionality, and leverage constrained areas as natural resource management opportunities.

3.2.1 PUBLIC OUTREACH

Public review of NEPA-related documents occurs during designated public comment periods, as required by NEPA. CSSA is responsible for identifying and resolving problems between military mission requirements and natural resource management activities.

Public outreach for CSSA and natural resource activities will be accomplished through traditional methods (e.g. publishing notices in local newspapers for document comment opportunities, upcoming notification for management practices, informal meetings with interested stakeholders, and formal notifications [letters] to public agencies). The CSSA environmental encyclopedia is available at http://www.stanley.army.mil/.

The environmental encyclopedia for CSSA was created to serve as the administrative record and to compile all of the documentation for the environmental restoration activities at CSSA into one comprehensive document. This electronic version of the encyclopedia includes the text, tables, and figures from the hard copy of the encyclopedia, but also provides convenient links to keywords, definitions, and sites and areas of concern at CSSA.

3.2.2 ENCROACHMENT PARTNERING

3.2.2.1 U.S. Army Compatible Use Buffer Program

Responding to encroachment pressures such as sprawl, environmental regulations and competition for land, airspace, and water, the DoD asked Congress for authorization to address the challenges it faced to readiness and training. Potential encroachment issues surrounding CSSA are addressed through the Army Compatible Use Buffer program (ACUB). Compatible Land Use Partnerships are authorized through 10 U.S.C. 2648a.

A project is eligible for funding consideration if:

- It is an agreement with an "eligible entity" or entities ("a state or political subdivision of a state, or a private entity that has as its stated principal organizational purpose or goal the conservation, restoration, or preservation of land and natural resources").
- Addresses the use or development of real property in the vicinity of, or ecologically related to, a military installation or military airspace for the purposes of: (1) limiting any development or use of the property that would be incompatible with the mission of the installation; or (2) preserving habitat on the property in a manner that is compatible with environmental requirements; and may eliminate or relieve current or anticipated environmental restrictions that would or might otherwise restrict, impede, or otherwise interfere, whether directly or indirectly, with current or anticipated military training, testing, or operations on the installation.

3.2.2.2 Types of Agreements

Agreements must provide for the acquisition of all rights, title and interest, or any lesser interest, in real property, by the eligible entity. The agreement must also provide for the sharing of acquisition costs. The contribution provided by the eligible entity towards acquisition costs may include funds (including those received by the entity in connection with a state or federal conservation program), services in kind, exchanges, properties, or interests therein, or a combination. Generally, any agreement where the contribution of the service is equal to or less than the fair market value of the real property interest it receives, or has a right to demand, is legally acceptable.

A cooperative agreement or real property interest transfer agreement (e.g., fee title, easement, or contingent enforcement right) between the eligible entity and CSSA is necessary to acquire or accept the property interest. The agreements should establish, as applicable, the acquisition procedures, cost sharing, property interest terms, long-term management responsibilities, and all real estate transaction

responsibilities. Agreements that result in the rights, title, and interest of the property to be held solely by the eligible entity with which DoD partners may also be acceptable.

3.2.2.3 Non-Governmental Eligible Entities for Compatible Land Use Partnerships

The following non-governmental entities are eligible for Compatible Land Use Partnerships:

- The Trust for Public Land,
- The Nature Conservancy,
- Hill Country Conservancy,
- National Audubon Society, and,
- Bexar County Audubon Society.

3.2.2.4 Off-Site Mitigation: Conservation Bank Credit Acquisition

CSSA has authority under a military mitigation banking statute (Section 311 of the FY2009 National Defense Authorization Act [now codified 10 United States Code [USC] § 2694c. "Participation in conservation banking programs"]) to obtain mitigation credits directly from a mitigation bank to conduct mitigation off-post where it will revolve adverse impacts to species. The mitigation credit must be from a bank that the U.S. Fish and Wildlife Service has reviewed and approved in accordance with the following authorities:

- The Federal Guidance for the Establishment, Use and Operation of Mitigation Banks (60 Fed. Reg. 58605; November 28, 1995)
- The Guidance for the Establishment, Use, and Operation of Conservation Banks (68 Fed. Reg. 24753; May 2, 2003); or,
- Any successor or related administrative guidance or regulation. Military organizations also have authorities to enter into cooperative partnerships for off-post mitigation projects, including to help set up mitigation banks, and this method could also be used to obtain mitigation credits from an approved bank.

These authorities are under the Sikes Act (Section 313 of the FY2009 National Defense Authorization Act [now codified at 16 USC 670c-1(a)] titled "Expand Cooperative Agreement Authority for Management of Natural Resources to Include Off-Installation Mitigation"); and/or the Army Compatibility Use Buffer Program (Title 10 USC Section 2684a authorizes the Secretary of the Army to enter into agreements with State or local Governments or private conservation organizations to address the use or development of real property in the vicinity of a military installation).

3.2.3 TEXAS CONSERVATION ACTION PLAN

The Texas Conservation Action Plan (TCAP) was updated in September 2012, and was formerly referred to as the Texas Comprehensive Wildlife Conservation Strategy (Texas Parks and Wildlife Department 2012). The purpose of the plan is to (1) develop a strategy that will assist the Texas Parks and Wildlife Department and conservation partners with the development of nongame initiatives and goals that will address the needs of animal species and habitats, and (2) meet the required elements of the State Wildlife Grant Program outlined by the U.S. Fish and Wildlife Service.

The eight elements include the following:

(1) Information on the distribution and abundance of species of wildlife, including low and declining populations as the Texas Parks and Wildlife Department deems appropriate, that are indicative of the diversity and health of the Texas' wildlife.
(2) Descriptions of locations and relative condition of key habitats and community types essential to conservation of species identified in the first element.
(3) Descriptions of problems which may adversely affect species identified in the first element or their habitats, and priority research and survey efforts needed to identify factors which may assist in restoration and improved conservation of these species and habitats.
(4) Descriptions of conservation actions determined to be necessary to conserve the identified species and habitats and priorities for implementing such actions.
(5) Descriptions of the proposed plans for monitoring species identified in the first element and their habitats, for monitoring the effectiveness of the conservation actions proposed in the fourth element, and for adapting these conservation actions to respond appropriately to new information or changing conditions.
(6) Descriptions of procedures to review the TCAP at intervals not to exceed ten years.
(7) Descriptions of the plans for coordinating, to the extent feasible, the development, implementation, review, and revision of the TCAP with federal, state, and local agencies and Indian tribes that manage significant land and water areas within Texas or administer programs that significantly affect the conservation of identified species and habitats.
(8) Descriptions of the necessary public participation in the development, revision, and implementation of the TCAP.

The Texas Conservation Action Plan is available online at: www.tpwd.state.tx.us/landwater/land/tcap/

The CSSA INRMP complements the Texas TCAP by incorporating many of the goals and objectives of the TCAP into the INRMP project planning process. Further, by providing natural resource surveys results to the Texas Parks and Wildlife Department, information may be incorporated into the TCAP implementation as needed. Further, the military mission activities that occur, or are expected to occur, do not conflict with goals and objectives outlined in the TCAP.

This page left intentionally blank

4 NATURAL RESOURCE PROGRAM ELEMENTS AND INRMP PROJECTS FOR 2013 - 2018

This section provides the descriptions of the major program elements in the CSSA natural resources management program, which form the framework for INRMP project design and programming. Section 4.1 describes the natural resources program elements, Section 4.2 describes the INRMP project design process, and Section 4.3 provides a list of INRMP projects for planning the natural resource strategy from 2013 through 2018.

4.1 CSSA NATURAL RESOURCE PROGRAM ELEMENTS

The CSSA natural resource program has four basic elements: (1) land and watershed management, (2) special status species management, (3) fish and wildlife management (including recreation), and (4) information management. These natural resource program elements are described in detail below and provide a framework for INRMP projects discussed in Section 4.2 and Section 4.3.

4.1.1 LAND AND WATERSHED MANAGEMENT

The Land and Watershed Management Program provides a foundation for all other natural resources program components, and serves as a basic land use and conservation management guide. Sound practices of land and water resource management that conserve soil and water are paramount to the overall natural resources conservation program. Soil and water resources form the basis for supporting the remaining components of the system.

This program is integrated with other missions, land use, and environmental planning processes at the installation, as well as all other natural resources management programs. Issues addressed under the Land and Watershed Management Program include:

- Vegetation management practices that include mechanical treatments, prescribed burn operations, invasive species control, and seeding and outplanting of native species;
- Wetlands and riparian corridor management;
- Oak wilt control;
- Stormwater management; and,
- Erosion and sediment control.

Overall management goals for the Land and Watershed Management Program include the following:

- Conserve, develop, manage, and maintain all land and water resources in accordance with proven scientific methods, procedures, and techniques to facilitate the military mission;
- Integrate a safe and effective prescribed burn program into vegetation management practices to facilitate the military mission;
- Avoid, reduce, or eliminate any contribution of pollution due to erosion and sedimentation;
- Maintain no net loss of installation wetlands and protect the biodiversity, functions, and values of wetlands communities;
- Prevent the introduction of invasive species and control populations of such species in a cost-effective and timely manner;
- Comply with all applicable federal and state laws and regulations, as well as DoD policies that mandate land and water conservation; and
- Implement ecosystem and multiple use management practices to achieve program goals.

Historically, vegetation of the Edwards Plateau was originally savanna composed of scattered oak mottes in a matrix of herbaceous vegetation and the now ubiquitous Ashe juniper was restricted only to steep slopes (Nadkarni *et al.* 1985). The demise of roaming bison herds and their subsequent replacement by year-round grazing of livestock, along with a change in fire regime have led to a widespread increase in woody species and loss of grasslands across the Edwards Plateau (Smeins 1980). Removing fire from the landscape coupled with overgrazing has allowed woody species to proliferate across the Edwards Plateau. At CSSA, Ashe juniper is the primary manifestation of woody species encroachment, and is the focus of brush management activities.

Management of Ashe juniper infestations are of concern to both the ecological management of CSSA, as well as the military mission. At CSSA, Ashe juniper encroachment has reduced visibility along fence lines, increased fuel loading for potential wildland fires, and overgrown existing fuel breaks, roads, and trails necessary to meet installation security requirements. As a secure and closed facility, CSSA security personnel require access and visibility along the installation perimeter. Since munitions storage is a primary component of the military mission, brush management to reduce fuel loading (and potential subsequent catastrophic wildfires) and maintenance of fuel breaks is necessary.

Ashe juniper encroachments are of ecological concern because they can reduce grazable area for livestock and wildlife, reduce production and diversity of plant species, restrict access to desirable forage plants, and reduce rainfall effectiveness (Lyons *et al.* 1998). Interfering with grass and forb production by intercepting rainfall before it reaches the surface, Ashe junipers may out-compete other plants. Further, Ashe junipers appear to be heavy consumers of soil nitrates, therefore, soil under and adjacent to Ashe juniper stands may be less favorable to other grasses, forbs, and woody species. Ashe juniper infestation that progresses to a closed canopy can reduce forage production from 1,900 pounds per acre to approximately 280 pounds per acre (Rollins 2001).

Interception of rainfall by Ashe junipers is of further ecological concern to water availability within watersheds. A mature live oak canopy can intercept approximately 25 percent of annual precipitation, while Ashe juniper canopy intercepts approximately 37 percent (Lyons, *et al.* 1998). Beneath the canopy, the litter layer of an Ashe juniper can intercept an additional 40 percent of the annual rainfall, while the litter layer of a live oak will remove an additional 21 percent. Ashe junipers, therefore, may remove 77 percent of the annual precipitation that reaches the mineral soil, compared to 10.8 percent for shortgrass prairies, 19.1 percent for tallgrass prairies, and 46.1 percent for live oak stands (Thurow and Hester 1997).

Brush-dominated rangelands occur over vast areas of Central Texas that were once dominated by grasses, with only scattered trees present. Coping with excessive tree and shrub cover has been costly and often a futile effort for land managers for several decades. Brush eradication was the prevailing strategy throughout the 1950s which attempted to maximize grazing area for cattle. Large-scale, broadcast mechanical or chemical methods were applied over entire pastures (Hamilton *et. al.* 2004).

Range scientists, resource managers, and landowners now recognize the tangible and intrinsic value of woody plants to game and non-game wildlife habitat, erosion control, watershed management, recreation, as well as traditional livestock grazing (Wiedemann *et al.* 1999). “Brush sculpting” is a concept of sculpting brush-infested rangeland for these multiple uses. As land managers addressed resource management practices simultaneously, the practice of an integrated brush management system (IBMS) developed (Hamilton 2000).

Management of Ashe juniper at CSSA as an IBMS would be focused on existing grasslands, emerging Ashe juniper shrublands, areas identified as black-capped vireo habitat, and along fuel breaks and roads that have been determined as necessary to the military mission. The golden-cheeked warbler is the only endangered species that requires Ashe juniper as a habitat component; therefore, brush clearing in golden-cheeked warbler habitat areas will be limited to selective thinning along necessary fuel breaks and roads to support the military mission or selective thinning of Ashe junipers to enhance growth of other tree species important to golden-cheeked warblers. Management methods of Ashe juniper at CSSA will include mechanical treatments with hand tools (chainsaws), hydraulic shearing machines (cedar eaters), and periodic mowing, as well as a prescribed fire program.

CSSA pesticide applications have been conducted by facility personnel authorized to apply pesticides. In the past, CSSA has stored chlordane, malathion, diazinon, and weed killers. The only known application areas are along portions of existing railroad track segments for weed control and along perimeter security fencing. Some application equipment is stored adjacent to the locomotive building. Additional application equipment and locations of equipment cleaning and disposal are unknown. Current practice is to employ contract pesticide applicators to perform large-scale applications. CSSA personnel store only small quantities of nonrestricted-use pesticides in building 66 near the headquarters building. During a site visit in November 1992, only Kocide 101 (copper hydroxide), copper sulfate, and rat traps and bait were observed (Parsons 1993). CSSA has a valid Integrated Pest Management Plan, signed in 2010 (McAlester Army Ammunition Plant and CSSA 2010).

Assets of current operations associated with land and watershed management activities at CSSA include a knowledgeable and motivated work crew familiar with regional land management concerns and ownership of mechanical brush control equipment.

4.1.2 FISH AND WILDLIFE MANAGEMENT

The fish and wildlife management program at CSSA addresses a variety of topics, including the following:

- Habitat management;
- Wildlife management;
- Nuisance wildlife management;
- Fisheries management; and
- Natural resources law enforcement.

In accordance with the overall natural resources management approach of CSSA, fish and wildlife management focuses on protecting and enhancing biodiversity through ecosystem management. Virtually all natural resources management activities at CSSA affect fish and wildlife resources. Accordingly, fish and wildlife management issues and concepts have been integrated into all of the other management programs and there is significant interaction among programs.

The overall goal of the fish and wildlife management program is to manage fish and wildlife resources to maintain and enhance ecosystem functions and values in a manner that supports and is consistent with the military mission. Additional overall program goals include the following:

- Maintain healthy fish and wildlife populations;
- Maintain and enhance biodiversity;

- Use ecosystem management practices to achieve program goals; and,
- Ensure that wildlife populations do not conflict with the military mission at CSSA.

Habitat Management

Vegetation management, discussed in Section 4.1.1, will be a strong component of terrestrial wildlife habitat management. Specific targets of vegetation management will be the enhancement of terrestrial game and non-game habitat. Habitat management for non-game species, such as the black-capped vireo and golden-cheeked warbler, are discussed in Section 4.1.3.

Nuisance Wildlife Management

Nuisance wildlife at CSSA includes five mammals, one insect, and three birds. The mammals that may become a nuisance include: coyotes, domestic and semi-domestic house cats, wild pigs, and potential occurrences of wild dogs. Within facilities, mice are trapped and baited with chemical toxicants, and bats may also inhabit some buildings. The insect of concern is the red imported fire ants and possibly Africanized bees ("killer bees"), and the birds include brown-headed cowbirds, European starlings, and grackles.

Natural Resources Law Enforcement

CSSA does not have in-house staffing assigned to or specifically trained for natural resources law enforcement. The entire property is surrounded by a high perimeter security fence (including common boundaries with JBSA-CB), and the perimeter fence is posted against trespass. Security personnel also routinely patrol much of the facility. CSSA is a restricted access facility; therefore, natural resource law violations are a minimal concern. The Wildlife Management Committee supervises the installation hunting program and makes recommendations to the Installation Manager on violations of internal regulations and policy. Any trespassers or others suspected of natural resources law violations are reported to local law enforcement. Texas Parks and Wildlife Department has the authority to enforce natural resource law violations at CSSA.

Injured Wildlife

Incidents of injured wildlife are referred to Wildlife Rescue and Rehabilitation, Inc., a wildlife rescue facility located in Kendalia, Texas, which maintains a 24-hour hotline (210-698-1709) for incident advice.

Fisheries and Game Management

Hunting is an effective tool available to land managers to help maintain deer numbers at or below carrying capacity of the habitat, regulate sex ratios, and achieve long term goals and management objectives. A hunting plan (provided by the CSSA Wildlife Management Committee) along with supplemental hunting information is included in Appendix D).

Outdoor Recreation

The outdoor recreation program at CSSA addresses consumptive (hunting) and non-consumptive (fishing) natural resource-based recreational activities. The program emphasizes natural resources-based activities, and does not address outdoor activities associated with physical fitness. Recreational opportunities at the installation include fishing, hunting, and wildlife viewing. The overall goal of the outdoor recreation program is to allow maximum use of CSSA for natural resources-based activities in a manner that does not interfere with mission activities or impact other program areas, such as rare species management. Providing recreational opportunities provides quality of life benefits to military personnel and their families, which may indirectly enhance military recruitment objectives. In addition,

participation in these activities tends to increase natural resources awareness and fosters good stewardship of the land.

Access for Outdoor Recreation

In accordance to the Sikes Act, public access to the installation for natural resources-associated outdoor recreation is allowed to the extent that:

- The use is not inconsistent with the needs of fish and wildlife resources; and
- The use is subject to requirements necessary to ensure safety and military security.

CSSA is a closed facility, therefore, access to outdoor recreation areas are extremely restricted. Access to CSSA for outdoor recreation is limited due to safety issues associated with the East Pasture range and issues associated with former ranges and historical military activities, as well as to ensure that recreational activities do not interfere with the military mission.

Outdoor Recreation Areas

Designated outdoor recreation areas at the installation include picnic grounds, hunting and fishing areas, and outdoor-use areas adjacent to on-base residential housing. Currently, fishing and mountain biking are the only non-consumptive outdoor recreation program at CSSA. Additional future activities may include birding or enhancement of family use areas.

Hunting Program

Hunting is the primary outdoor recreational activity at CSSA. The installation maintains a hunting plan, which defines the following goals for the program:

- Maintenance of deer population numbers;
- Improvement of the overall health of the deer herd while allowing for more vegetation diversity;
- Improvement of recreational opportunities for installation employees; and
- To provide excess meat to charitable institutions.

The Wildlife Management Committee establishes hunting and management guidelines at CSSA, and also supports:

- Stocking of fish and crawfish ponds (currently not practiced);
- Purchase of feed for turkey and quail;
- Maintenance of deer stands;
- Gathering volunteer work crews;
- Supplemental pasture feeding of deer during summer and winter stress periods; and,
- Maintaining water levels in the inner cantonment ponds (“D” & “W” tanks) and wildlife water stations at various inner and outer cantonment locations.

Hunting at CSSA is primarily for native white-tailed deer and exotic axis deer, turkey, dove, and quail. Regulations for hunting white-tailed deer and other game animals at CSSA are consistent with regulations of the State of Texas. Axis deer are not regulated by the State of Texas, but CSSA restricts axis deer hunting to the white-tailed deer season. The entire deer population is confined by 8- to 10-foot security perimeter fence. There are 45 deer stands at the installation. The deer stands can be moved to different areas, if necessary.

With the exception of creating a hunting database, all projects associated with the hunting program will be addressed by projects listed in Section 5, Fish and Wildlife Management. Data gathered will be obtained directly from hunters, and will include target game species, size, sex, antler metrics, and age (if possible). The database will track progress throughout the hunting season to meet harvest and carrying capacity goals established from spotlight counts and other census surveys.

4.1.3 SPECIAL STATUS SPECIES MANAGEMENT

For the purposes of this INRMP, the term "special status species" is used to refer to various plants and animals that warrant special management concern and are protected by law in some cases. Special status species include the following:

- Species listed or proposed as endangered or threatened, or designated as candidates for listing, by the U.S. Fish and Wildlife Service under the ESA of 1973 (Public Law 93-205);
- Animals listed as endangered or threatened species in Chapters 67 and 68 of the Texas Parks and Wildlife Code and Sections 65.171 - 65.184 of Title 31 of the Texas Administrative Code (TAC); and
- Plants listed as endangered and threatened in Chapter 88 of the Texas Parks and Wildlife Code, and Sections 69.01 - 69.14 of the TAC.

The overall rare species management goal for CSSA is to conserve listed species in accordance with the ESA, Endangered Species Recovery Plans, U.S. Army regulations and guidance, and approved site-specific management plans, including Endangered Species Management Plans (ESMP). Section 3.2 (Endangered Species Act Requirements) provides the framework for conducting Section 7 ESA consultation with the U.S. Fish and Wildlife Service Austin Ecological Services Field Office.

AR 200-3 requires installations to prepare ESMPs for each listed and proposed species and critical habitat present at an installation, including areas used by tenant organizations. AR 200-3 does not require ESMPs for candidate species, but installations are encouraged to develop ESMPs for candidate species and to participate in conservation agreements with the U.S. Fish and Wildlife Service. Installations requiring more than one ESMP (*i.e.,* more than one listed or proposed species is present) are permitted to prepare a combined ESMP provided the combined plans satisfy the substantive requirements detailed in AR 200-3, Chapter 11-5(b)(3 and 4). ESMPs must prescribe area-specific measures to meet conservation goals for the subject species and critical habitats. This INRMP serves as the ESMP for the black-capped vireo and golden-cheeked warbler at CSSA, both of which are federally listed as endangered. A checklist of INRMP projects is listed in Section 5 of this plan, and INRMP project factsheets comprise Appendix A.

In accordance with AR 200-3, CSSA will engage in informal Section 7 consultations at the earliest opportunity with the U.S. Fish and Wildlife Service to ensure that proposed actions that may affect listed species or critical habitat are consistent with the requirements of the ESA. The CSSA Environmental Office is responsible for identifying actions at CSSA that require ESA consultation and initiating the consultation process, in cooperation with the proponent of the action. The informal Section 7 consultation process is typically initiated by sending a written description of the proposed action and a map showing the location of the proposed action to the U.S. Fish and Wildlife Service Austin Ecological Services Field Office. Contact information for the U.S. Fish and Wildlife Service is provided in Appendix G and a more detailed description of the ESA coordination/consultation process is provided in Chapter 11

of AR 200-3, which can be accessed on the Internet at the U.S. Army Publishing Agency Home Page (http://www.usapa.army.mil/index.html).

CSSA has determined that habitat manipulation is not required to enhance endangered species habitats; rather, identifying habitat areas and protection of these areas through seasonal access restrictions, fuel break maintenance, and continued monitoring are the most prudent actions for ESA-listed species management at the facility. Two programmatic Biological Opinions are in place to allow for the limited take of species habitat and for an off-site mitigation program discussed in Section 3.1.1.2, Programmatic Biological Opinion for Large Habitat Removal.

In support of CSSA's five-year update of the CSSA INRMP and recent Section 7 ESA consultations with the U.S. Fish and Wildlife Service Austin Ecological Services Field Office, CSSA has updated the habitat coverage on the installation for ESA-listed species. Specifically, this document focuses on habitat designations for the golden-cheeked warbler. Black-capped vireo habitat is expected to increase over the next few years within the North Pasture, an expected trend attributed to the wildfire originating off base in September 2011.

"Potential Habitat" is defined as areas within CSSA that include tall, closed canopy, dense and mature stands of Ashe juniper, mixed with various oak species and other native hardwood trees. Definitions of habitats are based on recently updated information provided by the U.S. Fish and Wildlife Service (www.fws.gov/southwest/es/AustinTexas), Texas Parks and Wildlife guidelines, and results and observations from biennial systematic golden-cheeked warbler surveys conducted at CSSA since 2005 (shown on Figure 2-5). This type of woodland generally grows in relatively moist areas such as steep-sided canyons, slopes, and adjacent uplands; however, warblers may also be found in drier, upland juniper-oak woodlands over flat topography.

Potential habitat extent locations are important to CSSA's Installation Manager and natural resource personnel for a number of reasons. The size and location of habitat patches compared to the location, intensity, and duration of projects that contribute to CSSA's military mission factor into mitigation costs associated with projects that impact ESA-listed species habitats. Also, a map-able extent of habitat can assist installation planners to avoid or minimize potential impacts to habitats while achieving the military mission. Most of the increased Potential Habitat areas are within currently-constrained portions of the installation (e.g., within range fans, explosive safety arcs) and do not conflict with the day-to-day operation of the installation.

To assess golden-cheeked warbler habitat, vegetation descriptions were taken within each discrete habitat unit, bounded by identifiable features (e.g. roads, fencelines, stark vegetation community boundaries). The percent canopy cover and ratio of canopy species (hardwood-Ashe juniper-pine) was determined. Additionally, dominant deciduous species, the presence of mature Ashe juniper (5 inch+ diameter at breast height [DBH]) and deciduous species recruitment were assessed at each point. Incidental observations of obvious ungulate damage were also noted.

Golden-cheeked warbler habitats located at CSSA are consistent with habitat descriptions of other, extensively-studied large patch size habitats in the eastern portion of the breeding range. The Potential Habitat coverage has been updated to include a total area of 1,167 acres of woodlands (see Figure 2-13). This represents an approximate 30 percent increase in the amount of Potential Habitat for the golden-cheeked warbler. The previous habitat assessments in 2005 recorded 873 acres of golden-cheeked

warbler habitat. Most of this increase occurs within the range fan and explosive safety arcs. Seven years of vegetation growth has apparently resulted in the presence of much more warbler habitat at CSSA.

4.1.4 INFORMATION MANAGEMENT

The information management program at CSSA addresses geographic information system (GIS) administration and data gathering, natural resource document management, and field data integration projects. The program emphasizes activities associated with natural resources-based information gathering and archiving. Information management at CSSA provides easy access for land managers to make sound natural resource planning decisions using the best available technology.

4.2 INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN PROJECT DEVELOPMENT

4.2.1 PROJECT DESIGN

The CSSA natural resources management strategy and philosophy is interdisciplinary, adaptive, and considers multiple uses for facility lands. INRMP Projects listed in Table 4-1 and described in Section 4.3 of this INRMP were designed to supplement prior CSSA INRMP projects. Revisions and new projects were designed in consultation with personnel from the U.S. Fish and Wildlife Service Austin Ecological Services Field Office and Texas Parks and Wildlife Department field biologists. In addition to the consultation between the CSSA and federal and state resource and regulatory agencies, the INRMP projects followed a project planning framework built on principles of ecological restoration while maintaining compliance with natural resource regulatory frameworks and achieving no net loss of the military mission.

Ecological restoration is an intentional activity that initiates or accelerates the recovery of an ecosystem with respect to its health, ecological integrity, and sustainability (Society of Ecological Restoration 2004). The project descriptions are designed in adherence to the Society of Ecological Restoration guidance for planning ecological restoration (Society of Ecological Restoration 2004) and The Nature Conservancy general guidelines for conservation planning (The Nature Conservancy 2007). Both sets of planning guidelines follow an adaptive management framework (Williams et al. 2007, Holling 1978, Salafsky and Margoluis 1999), a management practice that allows for the involvement of stakeholders to modify management activities in response to changing conditions or new information. Adaptive management strategies are an integral part of the INRMP project designs. Therefore, this INRMP contains revisions to projects based on the best science available, realistic expectations of success, and monitoring of success in cooperation with the technical expertise from the U.S. Fish and Wildlife Service and Texas Parks and Wildlife Department.

4.2.2 PROJECT PRIORITIZATION

INRMP projects are classified as type and priority. C = Compliance, M = Maintenance, S = Stewardship. Compliance projects are those that must be conducted to ensure the continuance of military mission activities. For example, compliance with U.S. Fish and Wildlife Service Biological Opinions is a requirement for CSSA to continue activities that may adversely affect ESA-listed species. Maintenance projects are routine and continuing activities that support military mission activities. Stewardship activities are activities that are above and beyond compliance with natural resource regulatory frameworks. Priority codes are provided below:

- C / I Compliance Class I - Current compliance obligations
- M / II Maintenance Class II - Maintenance requirements
- S / III Stewardship Class III - Stewardship actions / beyond compliance

Priority levels are helpful for the installation manager and Environmental Program Manager to program projects as to focus on compliance issues and military mission sustainability first, and then proceed with stewardship projects as funding becomes available.

4.3 INRMP PROJECTS

Table 4-1 lists each natural resource management project proposed for implementation under this INRMP. Each project is grouped by natural resource element and a priority level (explained in Section 4.2.2).

Table 4-1: CSSA INRMP Projects, 2013 - 2018

Natural Resource Program Element	INRMP Project Name	Priority Level	
Land and Water Shed Management (Section 4.1.1)	Brush Management Needs Assessment	M / II	Section 4.3.2.1
	Mechanical Treatment of New Fuel Breaks. Roads, Security Setbacks	M / II	Section 4.3.2.2
	Prescribed Fire Operations for Fuels Management	M / II	Section 4.3.2.3
	Mechanical Brush and Grasslands Treatment for Fuels Management	M / II	Section 4.3.2.4
	Oak Wilt Awareness Program	S / III	Section 4.3.3.1
Special Status Species Management (Section 4.1.2)	ESA-listed Bird Surveys	C / I	Section 4.3.1.1
	Section 7 ESA Annual Reporting Requirements	C / I	Section 4.3.1.2
	Section 7 ESA Programmatic Biological Opinion Renewal	C / I	Section 4.3.1.3
	Red Imported Fire Ant Assessment	S / III	Section 4.3.3.2
Fish and Wildlife Management (Section 4.1.3)	Food Plot Installation	S / III	Section 4.3.3.3
	Deer Census	S / III	Section 4.3.3.4
	Upland Game Bird Estimates	S / III	Section 4.3.3.5
	Determination of Harvest Numbers	S / III	Section 4.3.3.6
	Mammal Predator Control	S / III	Section 4.3.3.7
	Brown-headed Cowbird Control	S / III	Section 4.3.3.8
	Fish Population Analysis	S / III	Section 4.3.3.9
	Pond Stocking	S / III	Section 4.3.3.10
Information Management (Section 4.1.4)	INRMP Training and Implementation	C / I	Section 4.3.1.4
	Update CSSA Enterprise GIS	M / II	Section 4.3.2.5

NOTES:

C / I Compliance Class I - Current compliance obligations
M / II Maintenance Class II - Maintenance requirements
S / III Stewardship Class III - Stewardship actions / beyond compliance

4.3.1 COMPLIANCE CLASS I PROJECTS

Four INRMP projects are assigned the highest implementation priority level. These compliance-level projects include ESA-listed bird surveys (biennial golden-cheeked warbler and black-capped vireo surveys), Section 7 ESA Annual Reporting Requirements, Section 7 ESA Programmatic Biological Opinion Renewal, and INRMP training modules. These projects are described in more detail below:

4.3.1.1 ESA-listed Species Surveys

Currently, monitoring and surveys of black-capped Vireos and golden-cheeked warblers are conducted biannually on CSSA. Installation wide monitoring of the black-capped vireo and for the golden-cheeked warbler began in 2005. These monitoring efforts consist of point count surveys for the warbler and presence/absence surveys for the black-capped vireo. Additional presence/absence surveys for the warbler are conducted in all other known habitat areas on CSSA. Figure 2-5 shows the potential habitat coverage for ESA-listed bird species on CSSA.

During the implementation period for this INRMP, bird surveys will be conducted in 2013, 2015, and 2017. CSSA utilizes contractors to accomplish the survey and complete survey reports. The CSSA Environmental Program Manager reviews the report and the results of the report are included in annual reporting transmittals to the U.S. Fish and Wildlife Service Austin Ecological Services Field Office in compliance with current programmatic Biological Opinions.

4.3.1.2 Section 7 ESA Annual Reporting Requirements

Section 3.1.1.4, Reporting Requirements, discusses the reporting obligations CSSA is required to fulfill in accordance with current Biological Opinions. By October 31 of each year, an annual report summarizing the natural resource management activities, particularly those activities requiring effects to ESA-listed species and habitats, must be transmitted to the U.S. Fish and Wildlife Service Austin Ecological Services Field Office (addressed to the Field Office Supervisor). As a template and example, the 2012 annual report is included in Appendix B-3.

CSSA tasks natural resource contractors to complete the annual report, however, it is the responsibility of the CSSA Environmental Program Manager to transmit the report with the Installation Manager signature on a cover letter.

4.3.1.3 Section 7 ESA Programmatic Biological Opinion Renewal

As described in Section 3.1.1, Section 7 Endangered Species Act Consultation Requirements, CSSA is required to confer with the U.S. Fish and Wildlife Service Austin Ecological Services Field Office if range activities, operations and maintenance activities, natural resource management activities, or other activities would potentially affect ESA listed species, species considered for ESA listing, or recently delisted recovered species where proposed actions would necessitate relisting.

CSSA and the U.S. Fish and Wildlife Service have worked through the Section 7 consultation process to apply two programmatic Biological Opinions to provide a framework for most of the activities that require golden-cheeked warbler and black-capped vireo habitat removal. Figure 3-1 shows the decision process to determine the appropriate Section 7 ESA consultation framework. Section 3.1.1.1, Programmatic Biological Opinion for Small Habitat Removal, describes a programmatic Biological Opinion that will expire on 13 January 2018. Section 3.1.1.2, Programmatic Biological Opinion for Large Habitat Removal, describes a programmatic Biological Opinion that will expire on 7 August 2017 (see Figure 3-4 for the overlapping timeframes for each programmatic Biological Opinion). The expiration of the programmatic consultations and the renewal of the next INRMP will roughly be proximate; therefore, a coordinated Sikes Act and ESA consultation will benefit the natural resource program.

CSSA may use contractors to prepare documentation for renewing the Section 7 ESA consultation packages. Although contractors may be used to prepare technical reports, draft correspondence, and responding to comments, the U.S. Fish and Wildlife Service generally regards contractors as “third

parties." The Environmental Program Manager is responsible for transmitting documents with proper installation signature authorities.

4.3.1.4 INRMP Training Module

Internal stakeholder briefings are necessary for natural resource awareness and INRMP implementation. CSSA may use contractors to prepare presentations, white papers, or conduct meetings with CSSA internal stakeholders. One annual training module should be sufficient to properly brief internal stakeholders on the installation compliance obligations, as well as general natural resource issues.

4.3.2 MAINTENANCE CLASS II PROJECTS

Five INRMP projects are assigned the maintenance class II priority level. These maintenance projects include brush management needs assessment; mechanical treatment of new fuel breaks, roads, and security setbacks; prescribed fire operations for fuels management; and mechanical brush and grasslands treatment for fuels management. These projects are described in more detail below:

4.3.2.1 Brush Management Needs Assessment

Needs assessment will identify road, trail, fence line, and fuel break segments necessary to the military mission and ecological management at CSSA. The assessment will include a mapping inventory of existing segments, documentation of the current segment condition, management recommendations for each segment, scheduling of segment treatments based on condition and priority, and management recommendations will include either (1) decommission of the segment with rehabilitating the segment to wildlife habitat, (2) continued maintenance of the segment, and (3) new segment establishment to meet military mission and ecological management goals.

In addition, vegetation management treatment areas to meet ecological management goals will be identified. In areas with environmental constraints, such as unexploded ordinance or unsurveyed areas, mechanical treatments will be applied to brush areas to simulate burn effects on live oak and shin oak mottes. CSSA currently operates a "Cedar Eater," a type of mechanical treatment that shreds targeted woody species. Since Ashe juniper is an important component of golden-cheeked warbler habitat, control for Ashe juniper will follow golden-cheeked warbler management guidelines.

4.3.2.2 Mechanical Treatment of New Fuel Breaks, Roads, Security Setbacks

Based on the brush management needs assessment, CSSA will engage with the Public Works department to initiate a brush management program to maintain strategic fuel breaks, road corridors, and security setbacks. The CSSA Environmental Program Manager will ensure that brush clearance activities comply with existing programmatic Biological Opinions.

CSSA may use contractor personnel to map specific target for brush management activities; however, the CSSA Public Works department has the equipment and technical expertise to conduct the actual brush clearance.

4.3.2.3 Prescribed Fire Operations for Fuels Management

Burning treatments will be applied to maintain or enhance grasslands, reduce fuel loading, enhance wildlife habitat, and to eliminate existing brush piles. Initially, prescribed burn operations will coincide with brush pile burnings. Each prescription fire will have a Prescribed Burn Plan, as a part of the larger installation prescribed fire management program, which stipulates prior notification with county fire departments, cooperating agencies, and adjacent schools and neighborhoods. Appendix G contains a

copy of the Draft CSSA Wildland Fire Management Policy. Some burns may occur in summer months, if conditions fall within adequate prescriptions for burn operations. These possible summer burn units would not occur in habitat areas; however, effects of burn operations (namely smoke) may adversely affect the golden-cheeked warbler and black-capped vireo. The effects are considered in the estimation of potential take, described in Section 2.11.

CSSA is currently coordinating with the U.S. Fish and Wildlife Service Fire Management Office at Balcones Canyonlands National Wildlife Refuge since 2009. U.S. Fish and Wildlife Service wildland fire personnel will conduct prescribed burn operations and have submitted draft burn plan (included in Appendix G). CSSA may elect to contract with a certified burn boss to conduct prescribed burns. Burn boss certification is required at CSSA to ensure that fire as a management tool is applied appropriately in line with safe practices and within burn prescriptions. In addition, certification limits CSSA liability for property damage, injury, or death resulting from prescribed burn operations. Prescribed burns are regulated in the State of Texas by Texas Natural Resources Code §§153.001-153.081 (2002).

4.3.2.4 Mechanical Brush and Grasslands Treatment for Fuels Management

Mowing frequencies and blade heights over certain areas will be modified to meet multiple use criteria. Normal mowing schedules will be applied to designated areas around buildings, security fence line corridors, and around igloo structures. Periodic mowings with frequencies varying between 6 and 12 months will be applied to areas where prescribed burning is prohibited or not practical. These areas include much of the savanna and grassland areas in the inner cantonment.

There are 120 munitions igloos, or earth-covered magazines at CSSA. Maintaining and managing brush and other vegetation cover is a high mission priority. As described in *Guidelines for Managing Vegetation on Earth Covered Magazines* (Palazzo, *et al.* 1994), the establishment and maintenance of vegetation cover reduces erosion potential. According to Army Material Command Regulation 385-100, a minimum of 2 feet of earth cover is required for safety purposes. Maintaining woody species around igloos will also increase shading (Palazzo *et al.* 1994). Only trees that grow quickly and have shallow root systems should be considered, however, and low-lying and dead branches must be removed to reduce fire danger.

4.3.2.5 Updating the CSSA Enterprise GIS

CSSA maintains an active installation-wide GIS program. All data and data management conforms to National Geospatial Data Standards, including data collection procedures, metadata compilation and naming conventions. All geospatial data associated with the CSSA INRMP will be integrated into the CSSA enterprise GIS program.

All GIS data at CSSA (including global positioning system field collection) is compliant with the Spatial Data Standards for Facilities, Infrastructure, and Environment (SDSFIE). SDSFIE are graphic and non-graphic standards for GIS implementations within the DoD. The SDSFIE provide a standardized grouping of geographically referenced features depicted graphically on a map at their real-world location.

Two high value datasets, which included a high resolution digital aerial photograph dataset for CSSA and the surrounding areas, and a matching coverage of a LiDAR (Light Distance and Ranging) dataset, were acquired for CSSA in May 2003. Both datasets have been valuable to supporting the environmental program at CSSA.

4.3.3 STEWARDSHIP CLASS III PROJECTS

4.3.3.1 Oak Wilt Awareness Training and Awareness

Oak wilt, one of the most destructive tree diseases in the United States, is killing oak trees in central Texas in epidemic proportions. Oak wilt is an infectious disease of the vascular system of susceptible trees, caused by the fungus *Ceratocystis fagacearum*. All oaks vary in their susceptibility to oak wilt. Red oaks, particularly Spanish oak, are extremely susceptible and may play a unique role in the establishment of new oak wilt infections. Spanish oaks are present at CSSA. CSSA also contains several white oak species, such as chinkapin (*Quercus muehlenbergii*) and bur oaks (*Quercus macrocarpa*), which are resistant to the disease and rarely die from oak wilt. Live oaks, present in large numbers at CSSA, are intermediate in susceptibility to oak wilt, but are most seriously affected due to their tendency to grow from root sprouts and form vast interconnected root systems that allow movement (or spread) of the fungus between adjacent trees (U.S. Department of Agriculture 1991). Successful management of oak wilt depends on correct diagnoses and an understanding of how the pathogen spreads between different oak species. Appendix C contains oak wilt identification and management information.

The foliar symptoms, patterns of tree mortality, and the presence of fungal mats can be used as indicators of oak wilt.

The Texas Forest Service Project Forester, based in San Antonio, will be consulted when there is any suspected presence of oak wilt at CSSA. Below is the contact information for the Project Forester:

Mark Peterson
Texas Forest Service Project Forester
600 Hemisphere Plaza, Bldg. #277
San Antonio, TX 78204
(210) 208-9306
mpeterson@tfs.tamu.edu

Publications will be compiled from existing sources on oak wilt identification and be distributed to CSSA staff by the Environmental Program Manager. Presentations to the Wildlife Management Committee, as well as to other section groups at CSSA, on how to identify oak wilt will be conducted. All instances of suspected oak wilt will be reported to and investigated by the Environmental Program Manager. Field pocket guides will be developed, including oak identification keys relevant to CSSA and oak wilt diagnosis information.

Oak wilt management will follow an eight-step program devised by the Texas Agricultural Extension Service (Johnson and Appel 2001) and is included in Appendix C with other oak wilt information. The process outlined in the program begins with identification of oak wilt symptoms in the field, including leaf manifestations and tree defoliation. Further, red oaks will typically die within a few weeks of infection, while other species (including live oak) will live much longer after infection. Therefore, these characteristics will be used to identify the presence of oak wilt and the probable rate of spread to determine the most appropriate management options. If oak wilt is positively identified, the process proceeds with buffer zone creation, sanitization of buffer zone interior, pruning, tree wound protection, fungicide treatments, and replanting of resistant native tree species.

4.3.3.2 Red Imported Fire Ant Assessment

Fire ants are documented at CSSA (Parsons 2005a), and have been associated with direct impacts to bird hatchlings, young fawns, and other ground nesting animals. Fire ants also attack and destroy seeds, fruit, shoots, and seedlings of numerous native plants. Further, fire ants have been documented to "tend" other invertebrate pests such as scales, mealy bugs, and aphids (Virginia Cooperative Extension 2003). Chemical treatment in areas where game wildlife is not consumed involves application of products, such as hyramethylon (Amdro), fenoxycarb (Award), acephate (Orthene), and chlorophyriphos (Dursban). Areas that are hunted and the game consumed should be considered agricultural areas (Drees 2002) and only pesticides certified for agricultural areas will be used. Chemical treatment in wildlife habitat will only be considered in areas that have an excess of 20 mounds per acre, as recommended by the University of Arkansas Red Imported Fire Ant Working Group (2005). Treatment near facility buildings will be part of the routine grounds maintenance schedule. Fire ant mound densities were not recorded in previous surveys, and such density calculations will precede any chemical applications.

4.3.3.3 Food Plot Installation

Food plots are typically used to bait and hold deer in an area. These food plots will be located near hunting blinds. Half of all food plots will be planted in early fall (with forage available during winter stress periods) and half will be planted in spring (with forage available during summer stress periods). All species planted will be native annuals and perennials. It is the responsibility of the CSSA Wildlife Management Committee to implement (and fund) food plot installation.

4.3.3.4 Deer Census

A crucial aspect of deer management is estimating the number of animals available for harvest. At CSSA, the Spotlight Census method will be used to estimate the number of deer available for harvest, supplemented by a daylight line survey to obtain herd composition variables (buck:doe ratio and doe:fawn ratio). Census techniques are taken from Jester and Dillard (1998) and Texas Parks and Wildlife Department (2005). Spotlight census methods are not intended to observe a total deer population, but rather to sample a representative portion of habitat and the number of deer found by sampling a given area of land and the density of deer found there.

Spotlight counts will be conducted during September. Deer are generally well-distributed in their home ranges during this period of the year, and more easily identified by sex and age class (e.g., fawns). Each route will be counted three to four times to improve reliability of the data, and surveys will not be conducted in unfavorable weather (e.g., rain, high wind) or following significant disturbance along the route (e.g., mission-associated training activities, construction, or geophysical surveys involving seismograph work).

4.3.3.5 Upland Game Bird Estimates

Numbers of bobwhite quail, turkey, and dove populations will be estimated through daytime flush surveys. Numbers and species of birds flushed will be recorded. Surveys will not be conducted in unfavorable weather (rain, high wind) or following significant disturbance along the route (e.g., mission-associated training activities, construction, or geophysical surveys involving seismograph work).

4.3.3.6 Determination of Harvest Numbers

Deer harvest numbers will be calculated by the Texas Parks and Wildlife Department, and evaluated by the CSSA Wildlife Management Committee. Bobwhite quail, dove, and turkey harvest numbers will be determined by the CSSA Wildlife Management Committee.

4.3.3.7 Mammal Predator Control

Coyotes are documented at CSSA (SAIC 1997b; Parsons 2005). Coyote control is primarily conducted for health and safety purposes (e.g. protection of installation residents and workers, disease control). Coyote control will be closely coordinated with harvest projections of game wildlife. Coyote control will be achieved through contracting with a wildlife predator control specialist, and funded by the CSSA Wildlife Management Committee. Methods for control include trapping, poisoning, and shooting. Domestic and semi-domestic house cats are documented at CSSA (SAIC 1997b; Parsons 2005). House cats are known predators of game birds, such as bobwhite quail and dove, as well as on non-game birds including, but not limited to, the black-capped vireo and the golden-cheeked warbler. Feeding of outdoor cats at CSSA is forbidden. Mountain lions may also occur on the installation, however, no confirmed sightings have been documented.

Pigs are also an increasingly important wildlife management issue in Central Texas. Pigs have been killed on the facility, but populations are currently low. Active depredation of pigs on the facility is highly encouraged. Pigs are known to trample and consume eggs of ground nesting birds, as well as cause significant habitat damage.

4.3.3.8 Brown-headed Cowbird Control / Assessment

Brown-headed cowbirds *(Molothrus* ater) are documented at CSSA (Parsons 2005). The brown-headed cowbird is a brood parasite that lays its eggs in the nests of more than 225 other species of bird, including black-capped vireos and golden-cheeked warblers. A host that has its nest parasitized will usually raise cowbird young at the expense of its own eggs or young fledglings (Barber and Martin 1997). Prior to cattle introductions and enclosure fencing, brown-headed cowbirds followed migratory bison herds. Because of the herd mobility, impacts to adjacent song bird nests were reduced. After cattle were introduced by Europeans, removal of bison, and subsequent pasture enclosure, brown-headed cowbirds quickly became associated with sedentary cattle herds, and impacts increased to adjacent songbird populations.

4.3.3.9 Fish Population Analysis

There is no cohesive fishing program in operation at CSSA, yet there is strong interest in recreational fishing at CSSA ponds. A general policy of catch and release is followed at CSSA. With the exception of creating a fisheries database, all projects associated with improving the fishing program will be addressed by projects listed in Section 5, Fish and Wildlife Management. Data gathered will be obtained from recreational fishing, and include species, size, weight, and sex (if possible). If practiced, dates and amounts of stocking activities will be incorporated in the database. The database will help quantify sources and effects of future fish die-offs, and may be linked to hydrological and climate data. Poor quality fishing in most small ponds is caused by unbalanced or undesirable fish populations (Texas AFS 2005). Electroshocking is a method for analyzing fish populations and involves sending an electronic current through the water which stuns fish, causing them to float to the surface. Fish species and characteristics are then assessed. Beneficial fish species in Texas ponds include channel and blue catfish, large mouth bass, bluegill, redear sunfish, hybrid striped bass, fathead minnow, and threadfin shad. Undesirable species include gizzard shad, golden shiners, crappie, and flathead catfish.

Electroshocking uses specialized equipment. CSSA would use a contractor with suitable technical expertise and fisheries knowledge to conduct population analyses on ponds at CSSA.

4.3.3.10 Pond Stocking

While currently not practiced at CSSA, stocking may include the introduction of sterile carp for algae and aquatic weed control, as well as sport fish. Stocking rates would be determined by results of the fish population analysis, as well as management objectives defined by the Wildlife Management Committee. Pond stocking activities would follow recommendations from the fish population analysis report. CSSA would coordinate with local fisheries services to add to existing stocks within existing ponds. It is the responsibility of the CSSA Wildlife Management Committee to implement (and fund) fish stocking at CSSA ponds if and when it is practiced.

5 INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN IMPLEMENTATION STRATEGY

Section 5 describes the implementation strategy for the INRMP. Section 5.1 identifies internal and external personnel that are projected to implement the INRMP along with interagency partnering agreements, Section 5.2 provides a rough order of magnitude for implementation costs (for planning purposes), Section 5.3 describes potential funding pathways to fund individual projects or program elements, and Section 5.4 provides a notional schedule for project implementation.

5.6 STAFFING

Planning natural resource projects requires the cooperation of CSSA staff, contractors, subcontractors, and cooperative agencies. In addition, schedule changes may be necessary due to weather. Scheduling of project performance periods must be coordinated with CSSA mission associated training schedules, and the CSSA Installation Manager, the Environmental Program Manager, and security personnel.

5.6.1 CSSA STAFF

The Environmental Program Manager is responsible for administration of natural resource management programs. Since the Environmental Program Manager administers environmental programs not associated with the CSSA INRMP, only a small percentage (5-10%) of the Environmental Program Manager's time is allocated to natural resources management at CSSA. CSSA grounds d staff will be required to provide logistical and on-site support of project components.

In addition to the Environmental Program Manager, the Wildlife Management Committee is also a labor source for INRMP-associated projects. Committee members have been the most active participants in past CSSA natural resource related projects.

5.6.2 CONTRACTORS

A CSSA contractor will be the primary labor source for coordination of INRMP associated projects. The contractor will work independently or direct field crews on natural resource projects.

In addition to the contractor coordinator position, subcontracts will be issued in accordance with DoD criteria for support of natural resource projects. The subcontracts may include pond treatments and seed supply through standard procurement procedures.

5.6.3 COOPERATIVE AGENCIES AND AGREEMENTS

The U.S. Fish and Wildlife Service will be a primary source of support for natural resource projects. Support may be in the form of providing information and consultation on specific natural resource management practices, as well as providing expertise and labor for prescribed burn operations.

In addition to the U.S. Fish and Wildlife Service, the Texas Parks and Wildlife Department has provided expertise on deer harvest calculations and fish stocking permits in the past. This support will continue, and enhancements to data collection methods will be reviewed by the Texas Parks and Wildlife Department.

5.7 IMPLEMENTATION COSTS AND FUNDING PATHWAYS

Management of natural resources at CSSA relies on a variety of funding mechanisms, some of which are self-generating and all of which have different application rules. The following subsections contain general discussions about different sources of funding to implement the CSSA INRMP.

5.7.1 IMPLEMENTATION COSTS

During the project design phase, costs were formulated as rough orders of magnitude, or general estimates on project costs. The total project costs amount to $482,000 for full implantation of the INRMP projects from 2013 to 2018. As shown in Figure 5-1, $125,000 are for projects rated as a Compliance Level I project, $176,000 for Maintenance Level II projects, and $181,000 for Stewardship Level III projects.

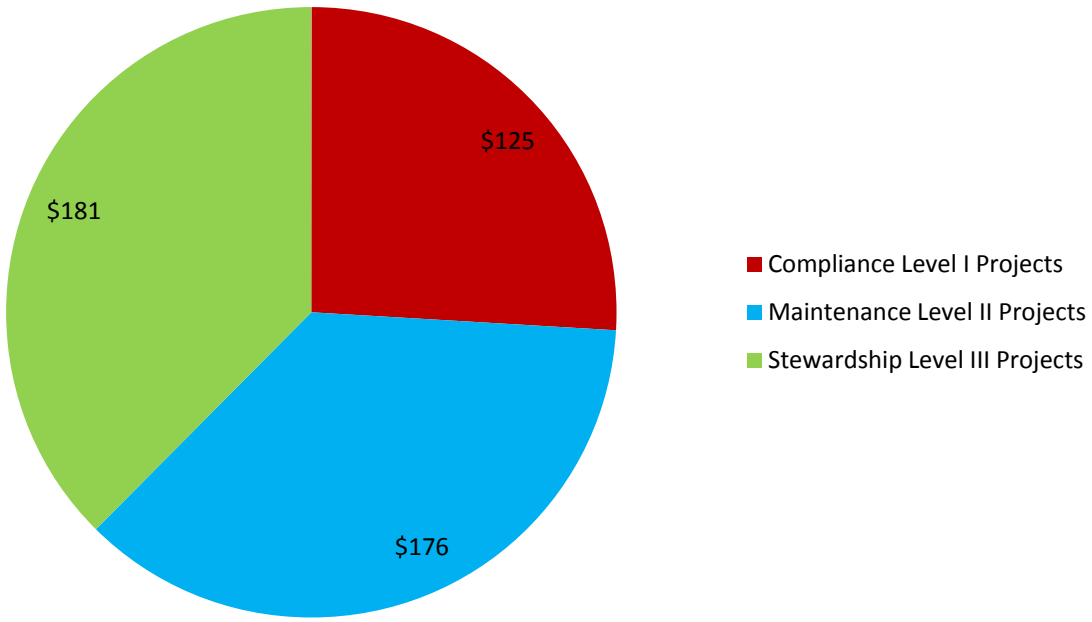
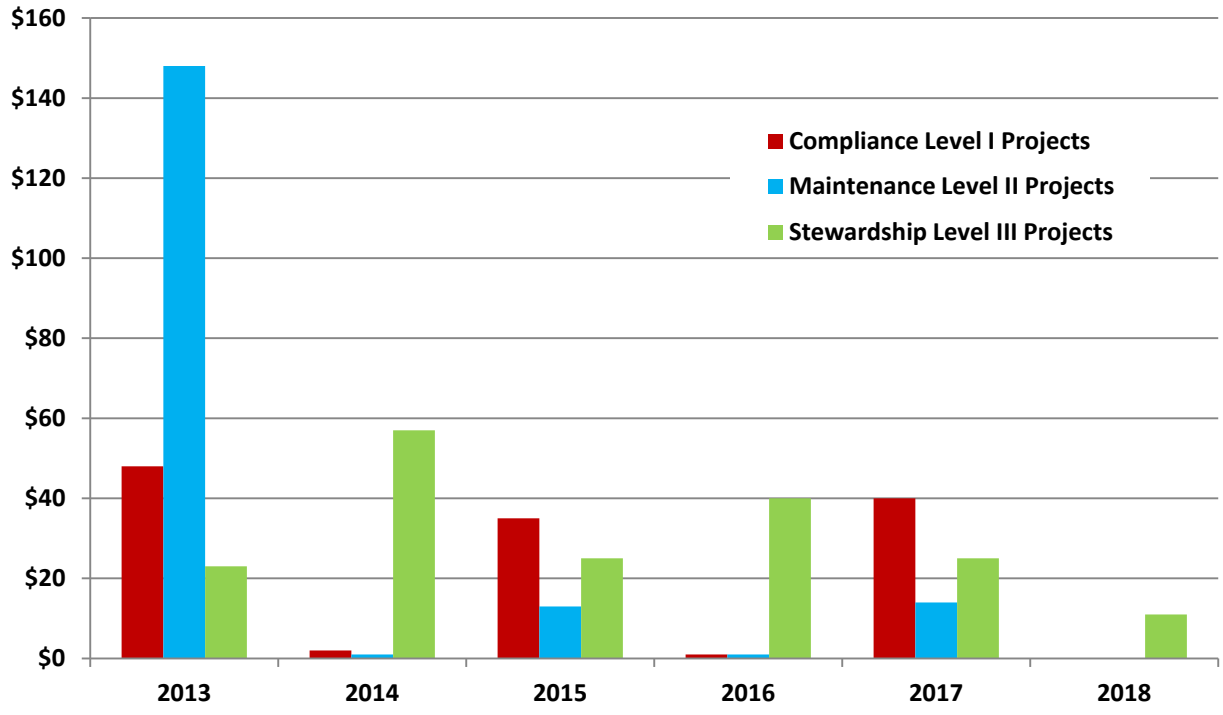


Figure 5-1: Overall INRMP Cost Estimates, 2013 – 2018

Some years are projected to have varying expenditures, depending on seasonal activities and compliance schedule obligations. For instance, brush work is estimated to be relatively expensive, but does not occur every year. Similarity, ESA-listed bird surveys occur every other year, and represent a significant amount of the expenditures in years when the surveys occur. Figure 5-2 shows the estimated yearly expenditures for planning purposes from 2013 through 2018.



Note: Costs are provided as x1000 dollars.

Figure 5-2: Estimated Yearly Expenditures of INRMP Projects by Priority Level

5.7.2 AGRICULTURAL FUNDS

Agricultural funds are derived from agricultural leases on DoD installations. On Army lands, the funds are centrally controlled at Department of Army and Major Command levels with no requirements for spending where they are generated. AR 200-3 outlines procedures or the collection and spending of these funds. They are intended to offset costs of maintaining agricultural leases, but they are also available for preparing and implementing INRMPs. Agricultural funds are the broadest use of funds available exclusively to natural resource managers.

CSSA is authorized to request agricultural funds from the Installation Management Agency, Army Reserve Command; however, these funds would likely only be available to CSSA if an agricultural lease was in place on the facility. There are no active agricultural leases in effect on CSSA.

5.7.3 ENVIRONMENTAL PROGRAM REQUIREMENTS

The Environmental Program Requirements (EPR) report provides the primary means for identifying current and projected environmental requirements and resources needed to execute CSSA natural resource projects described in this INRMP. The EPR report satisfies Army requirements, as specified in Executive Order 12088, Office of Management and Budget Circular A-11, and other federal directives. The report is used for many purposes: planning, programming, budgeting, and forecasting costs; documenting past accomplishments and expenditures; tracking project execution and monitoring

performance; refining and validating requirements for the budget year; and supporting the Program Objective Memorandum for outyear requirements.

5.7.4 OPERATION AND MAINTENANCE FUNDS

Certain projects within this INRMP and past INRMP projects may receive (or have received) assistance from Operations and Maintenance (O&M) Funds. General pest management is in this category.

5.7.5 CSSA WILDLIFE MANAGEMENT COMMITTEE FUNDS

Funds from the CSSA Environmental Program may not be used for certain natural resource activities, particularly for consumptive recreation. Activities described in this INRMP that cannot be funded with CSSA Environmental Program funds include food plot installation for deer, fish stocking in CSSA ponds (not currently practiced), and predator control (e.g. coyote control) for enhancing installation consumptive wildlife resources. The CSSA Wildlife Management Committee, however, may fund these activities with the approval and oversight by the CSSA Environmental Program to ensure that these activities do not conflict with other natural resource program elements.

5.8 INRMP IMPLEMENTATION SCHEDULE

Figure 5-3 provides a checklist and schedule for each INRMP project from 2013 through 2018. Each project has rough order of magnitude costs for each implementation year.

Figure 5-3: CSSA Integrated Natural Resources Management Plan Project Checklist, 2013 – 2019

Project Name (Note 1)	INRMP Reference	Estimated Project Cost (Note 2)	Preliminary Schedule (Note 3)
			2013 (April - Dec): A M J J A S O N D
			2014: J F M A M J J A S O N D
			2015: J F M A M J J A S O N D
			2016: J F M A M J J A S O N D
			2017: J F M A M J J A S O N D
			2018: J F M
Compliance Level I Priority Projects			
ESA-listed Bird Surveys	Section 4.3.1.1	$112	$33 (2013); $34 (2015); $35 (2017)
Section 7 ESA Annual Reporting Requirements	Section 4.3.1.2	$4	$4 (2013)
Section 7 ESA Programmatic Biological Opinion Renewal	Section 4.3.1.3	$4	$4 (2018)
INRMP Training and Implementation	Section 4.3.1.4	$5	$1 (2013); $1 (2014); $1 (2015); $1 (2016); $1 (2017); $1 (2018)
Maintenance Level II Projects			
Brush Management Needs Assessment	Section 4.3.2.1	$51	$12 (2013); $12 (2015); $12 (2017)
Mechanical Treatment of New Fuel Breaks. Roads, Security Setback	Section 4.3.2.2	$40	$40 (2014)
Prescribed Fire Operations for Fuels Management	Section 4.3.2.3	$40	$40 (2014)
Mechanical Brush and Grasslands Treatment for Fuels Management	Section 4.3.2.4	$40	$40 (2014)
Update CSSA Environmental Encyclopedia and GIS	Section 4.3.2.5	$5	$1 (2014); $1 (2014); $1 (2015); $1 (2016); $1 (2017); $1 (2018)
Stewardship Level III Projects			
Oak Wilt Awareness Program	Section 4.3.3.1	$8	$4 (2014); $4 (2016)
Red Imported Fire Ant Assessment	Section 4.3.3.2	$16	$8 (2014); $8 (2016)
Food Plot Installation	Section 4.3.3.3	$9	$3 (2014); $3 (2016); $3 (2018)
Deer Census	Section 4.3.3.4	$25	$5 (2013); $5 (2014); $5 (2015); $5 (2016); $5 (2017); $5 (2018)
Upland Gamebird Estimates	Section 4.3.3.5	$20	$4 (2013); $4 (2014); $4 (2015); $4 (2016); $4 (2017); $4 (2018)
Determination of Harvest Numbers	Section 4.3.3.6	$10	$2 (2014); $2 (2015); $2 (2016); $2 (2017); $2 (2018)
Mammal Predator Control	Section 4.3.3.7	$32	$8 (2014); $6 (2015); $6 (2016); $6 (2017); $6 (2018)
Brown-headed Cowbird Control and Assessment	Section 4.3.3.8	$40	$8 (2013); $8 (2014); $8 (2015); $8 (2016); $8 (2017)
Fish Population Analysis	Section 4.3.3.9	$6	$6 (2013)
Pond Stocking	Section 4.3.3.10	$15	$15 (2014)
TOTAL INRMP ESTIMATED IMPLEMENTATION CO		**$482**	**2013 (April - Dec) $219**; **2014 $59**; **2015 $73**; **2016 $42**; **2017 $78**; **2018 $11**

Notes:

1 INRMP projects are classified as type and priority. C = Compliance, M = Maintenance, S = Stewardship. Compliance are projects that must be conducted to ensure the continuance of military mission activities. For example, compliance with U.S. Fish and Wildlife Service Biological Opinions is a requirement for CSSA to continue activities that may adversely affect ESA-listed species. Maintenance projects are routine and continuing activities that support military mission activities. Stewardship activities are activities that are above and beyond compliance with natural resource regulatory frameworks. Priority codes are provided below:

C / I Compliance Class I - Current compliance obligations
M / II Maintenance Class II - Maintenance requirements
S / III Stewardship Class III - Stewardship actions / beyond compliance

2 Individual project component costs are estimated in white within the schedule bars.
Estimated costs should be considered rough orders of magnitude for general planning purposes, provided as x1000 dollars

3 The schedule covers the valid period for the INRMP (April 2013 through March 2018).

This Page Intentionally Left Blank

6 REFERENCES

Section 6 provides a list of references used in the INRMP. EndNote (Thomas and Reuters, version 5) was used to provide standardized citations and store digital copies of the references. Therefore, the preparation of this INRMP also includes a compiled library of references used to support future INRMP updates, reporting requirements, and Section 7 ESA consultations. Information regarding the EndNote software program is available at www.endnote.com.

Alamo Area Council of Governments. (1995). Final Report, Camp Bullis Joint Land Use Survey. San Antonio, Texas.

Andersen, M. C., B. Thompson, & K. Boykin. (2004). Spatial risk assessment across large landscapes with varied land use: lessons from a conservation assessment of military lands. *Risk Analysis*, 24(5), 1231-1242.

Ashworth, J.B. (1983). Groundwater Availability of the Lower Cretaceous Formations in the Hill Country of South-Central Texas. Texas Water Development Board, report 273.

Barber, D.R. & D.H. Martin 1997. Influence of Alternate Host Densities on Brown-headed Cowbird Parasitism Rates in Black-capped Vireos. *The Condor. 99*:595-604.

Cowardin, L. M., V. Carter, F. C. Golet, & E. T. LaRoe. (1979). Classification of Wetlands and Deepwater Habitats of the United States. Prepared for the U. S. Fish and Wildlife Service, Office of Biological Services. Washington, D. C.

Diamond, D.D., D.H. Riskind, & S.L.Orzell. (1988). A framework for plant community classification and conservation in Texas. *Texas Journal of Science 39*(3):203-221.

Drees 2002. Managing Red Important Fire Ants in Wildlife Areas, Texas Red Imported Fire Ant Research and Management Project, Publication Number 006. May 2002.

Eckrich, G.H., T.E. Kolozar, & M.D. Goering. (1999). Effective landscape management of brown-headed cowbirds at Fort Hood, Texas. *Studies in Avian Biology 18*: 267–274.

Engineering Science. (1993). Final Environmental Assessment, Camp Stanley Storage Activity. Prepared for CSSA, Boerne, Texas, and Armstrong Laboratory/OEB, Brooks AFB, Texas. Austin, Texas.

Hamilton, W.T. (2000). An Ecosystem Perspective for Brush Management Planning. In *Brush, Water, and Wildlife—A Compendium of Our Knowledge*.

Hamilton, W.T., A. McGinty, D. N. Ueckert, C. W. Hanselka, & M. R. Lee. (2004). *Brush Management: Past, Present, Future.* Texas A&M University Press, College Station, Texas.

Hammond, W.W. (1984). Hydrogeology of the Lower Glen Rose aquifer, south-central Texas. The University of Texas at Austin, Ph.D. dissertation, 1984.

Holling, C.S. (1978). *Adaptive environmental assessment and management.* New York: John Wiley & Sons.

Jester S., & J. Dillard. (1998). Conducting White-Tailed Deer Spotlight Surveys in the Cross-Timbers and Prairies Region of North and Central Texas. Publication Number W7000-1126. Texas Parks and Wildlife 1998.

Johnson, J., & D. Appel. (2001). Eight step program to oak wilt management. Department of Plant Pathology & Microbiology, Texas A&M University, College Station, Texas. <http://cygnus.tamu.edu/Texlab/oakwilt.html> Accessed September 2012.

Kibler and Gardner. (1998). Archeological Survey and National Register Testing at Camp Stanley Storage Activity, Bexar County, Texas.

Lee Jenni, D. Grace, M. Nils Peterson, F.W. Cubbage, & J. K. Jameson. (2012). Assessing biodiversity conservation conflict on military installations. *Biological Conservation*, 153 (127-133).

McAlester Army Ammunition Plant and CSSA. 2010. Integrated Pest Management Plan for McAlester Army Ammunition Plant and Camp Stanley Storage Activity. Prepared by: Directorate of Engineering and Public Works Operations and Maintenance Division Grounds and Structures Team McAlester, Oklahoma.

Nadkarni, N.M, P.J. Fonteyn, & J.T. Baccus. (1985). Putting the Breaks on Cedar. Texas Parks and Wildlife Publication Number 43: 36-38.

National Oceanic and Atmospheric Administration (2002). Climate Normals 1970 – 2000. National Climate Data Center, National Oceanic and Atmospheric Administration. Washington, D.C.

Palazzo, A.J., L. Gatto, & W. Woodson. (1994). Guidelines for Managing Vegetation on Earth-covered magazines within the U.S. Army Materiel Command, Cold Regions Research and Engineering Laboratory, Hanover, New Hampshire, CRREL Report 94-6.

Parsons (2005a). Draft Integrated Cultural Resources Management Plan. Prepared for CSSA by Parsons.

Parsons (2005b). Presence/Absence Survey for Black-capped Vireos and Golden-cheeked Warblers, Camp Stanley Storage Activity, Boerne, Texas. Prepared for CSSA by Parsons. Austin, Texas.

Parsons. (1996). Groundwater investigation and associated source characterization. In Camp Stanley Storage Activity environmental encyclopedia, Parson Engineering Science, ed., compact disk, December 2001 edition, Parsons Engineering Science, Austin, Texas.

Rollins (2001). Brush, water and wildlife: a compendium of our knowledge. SP-106. Texas Cooperative Extension, Texas A&M University, College Station, TX.

SAIC (1997a). Wetlands and Waters of the U.S. Delineation Report. Camp Stanley Storage Activity ICNRMP, Bexar County, Texas. Prepared by Science Applications International Corporation. Submitted to the U.S. Army Corps of Engineers, Fort Worth District.

SAIC (1997b). Science Applications International Corporation, Camp Stanley Storage Activity Integrated Cultural and Natural Resources Management Plan. Prepared by Science Applications International Corporation for the U.S. Army Corps of Engineers, Fort Worth District, Fort Worth, Texas, 1997.

Salafsky, N. & R. Margoluis. (1999). *Greater than the sum of their parts: Designing conservation and development programs to maximize results and learning.* Washington D.C.: Biodiversity Support Program.

Sanchez, G. (2006). CSSA Environmental Management Officer, personal communication, April 2006.

Schwope C. (2005). personal communication, September 2005.

Scott. (1997). Archeological Survey and Testing at Camp Stanley Storage Activity, Bexar County, Texas. Prepared by Prewitt and Associates, Inc. for CSSA.

Smeins. (1980), Natural role of fire on the Edwards Plateau. in White, L. D., Prescribed range burning in the Edwards Plateau, Texas Agricultural Experiment Station Proceedings, College Station, TX. pp. 4-16

Stewardship Services. (1993). Camp Stanley Storage Activity Habitat Evaluation. In: Final Environmental Assessment, Camp Stanley Storage Activity. Prepared for CSSA by Armstrong Laboratory/ OEB Brooks AFB, Texas, 1993.

Texas Parks and Wildlife Department. (1996). Endangered and Threatened Animals of Texas: Their Life History and Management. Texas Parks and Wildlife Press. Austin, Texas.

Texas Parks and Wildlife Department. (1999). Brown-headed Cowbird Control. Texas Parks and Wildlife Department Publication Number 99-388. Austin, Texas.

Texas Parks and Wildlife Department. (2013). Federal and State Listed Threatened and Endangered Species for Bexar County, Texas. List.

Texas Parks and Wildlife Department. (2012). Texas Conservation Action Plan 2012-2016. Editor, Wendy Connally, Texas Conservation Action Plan Coordinator. Austin, Texas.

Thurow and Hester (1997). How an increase or reduction in juniper cover alter rangeland hydrology. (pages 4-9 to 4-22) In: C.A. Taylor (editor). Proceedings of 1997 Juniper Symposium. Texas Agricultural Experiment Station Technical Report 97-1, Sonora, Texas, 228 pages.

U.S. Army. (1995). Integrated Natural Resource Management Plan. Preparation Guidelines. Interim Final. Conservation Division, Army Environmental Center.

U.S. Department of Agriculture. (1991). Soil Survey, Bexar County, Texas. U.S. Department of Agriculture, Soil Conservation Service, Washington, D.C., Series 1962, No. 12, June 1966, reissued June 1991.

U.S. Fish and Wildlife Service. (1992). Golden-cheeked Warbler (Dendroica chrysoparia) Recovery Plan. Southwest Region. USFWS Ecological Field Office. Albuquerque, New Mexico.

U.S. Fish and Wildlife Service. (2003). Delineation of Hydrogeologic Areas and Zones for the Management and Recovery of Endangered Karst Invertebrate Species in Bexar County, Texas. USFWS Ecological Field Office. Albuquerque, New Mexico.

U.S. Fish and Wildlife Service. (2004). Federally Listed Threatened and Endangered Species for Bexar County, Texas. List.

Underwood (2005). Southwest Region 2 Ecological Services Field Office, Austin, Texas. U.S. Fish and Wildlife Service. Personal communication, September 2005.

University of Arkansas Red Imported Fire Ant Working Group. (2005). Online access, last accessed August 2005. http://www.uaex.edu/natural/fireant/board.htm.

Veni, G. & Reddell. (1999). Management Plan for the Conservation of Rare Karst Species and Karst Species Proposed for Endangered Listing. Camp Bullis, Bexar and Comal Counties, Texas. Report for Garrison Public Works, Environmental Division, Fort Sam Houston, Texas,

Veni, G. (2002). Draft Phase One Karst Hydrogeologic Investigation, Camp Stanley Storage Activity, Bexar County, Texas. Prepared by George Veni and Associates for Parsons. San Antonio, Texas.

Veni, G. (1994). Geologic controls on cave development and the distribution of endemic cave fauna in the San Antonio, Texas, region. Report for Texas Parks and Wildlife Department and U.S. Fish and Wildlife Service, Austin, Texas, George Veni and Associates, San Antonio, Texas.

Virginia Cooperative Extension. (2003). Red Imported Fire Ant (RIFA). Publication Number 444-284. January 2003.

Virginia Cooperative Extension. (2003). Red Imported Fire Ant (RIFA). Publication Number 444-284. January 2003.

Wellman, W. Jr. (2006). *The Man And His Wings: William A. Wellman and the Making of the First Best Picture*. Westport, Connecticut: Praeger Publishers.

Whitney, M.I. (1952). Some Zone Marker Fossils of the Glen Rose Formation of Central Texas. Journal of Paleontology, vol. 26, no. 1, pp 65-73. January 1952.

Wiedemann, H.T. ,D. Rollins, D.N. Ueckert, and A. McGinty 1999. Sculpting Brush-dominated Rangeland for Multiple Use. Pages 223 – 234 in D. Eldridge and D. Freudenberger, editors. Proceedings 6th International Rangeland Congress. Townsville, Queensland, Australia.

Williams, B.K., R. C. Szaro, & C.D. Shapiro. (2007). Adaptive Management: The U.S. Department of the Interior Technical Guide. Adaptive Management Working Group, U.S. Department of the Interior, Washington, DC.

APPENDIX A:
CURRENT U.S. FISH AND WILDLIFE SERVICE PROGRAMMATIC BIOLOGICAL OPINIONS AND CONSULTATION DOCUMENTS

This page left intentionally blank

A.1: U.S. FISH AND WILDLIFE SERVICE PROGRAMMATIC BIOLOGICAL OPINION, 2008 - 2017

This page left intentionally blank

United States Department of the Interior

FISH AND WILDLIFE SERVICE
10711 Burnet Road, Suite 200
Austin, Texas 78758
512 490-0057
FAX 490-0974

JAN 14 2008

Jason Shirley, Installation Manager
Camp Stanley Storage Activity
25800 Ralph Fair Road
Boerne, Texas 78015

Consultation # 21450-2007-F-0128

Dear Mr. Shirley:

This transmits our programmatic biological opinion pursuant to section 7 of the Endangered Species Act of 1973, as amended (Act)(16 U.S.C. 1531 *et seq.)* for projects with effects to the Federally-endangered golden-cheeked warbler (*Dendroica chrysoparia*) and black-capped vireo (*Vireo atricapilla).* "Projects" are those described in the *Integrated Natural Resource Management Plan (INRMP), Boerne, Bexar County, Texas* (proposed action) Camp Stanley Storage Activity (CSSA or installation) submitted to the Service for review for this consultation. CSSA projects that meet the conditions specified below, or that the U.S. Fish and Wildlife Service (Service) determines will have similar effects, may be appended to this programmatic biological opinion. The geographic scope of this programmatic biological opinion includes lands within the jurisdictional boundaries of CSSA. Although CSSA will implement conservation measures beneficial to areas containing karst features, no listed karst species are known to occur on the installation (Veni 1994, Veni and Reddell 1999, and Veni 2002), therefore, listed karst species will not be addressed in this programmatic biological opinion.

The purpose of this programmatic biological opinion is to expedite CSSA projects with relatively minor effects on the federally listed species. Projects that exceed the programmatic threshold will require individual biological opinions. The Service will re-evaluate this programmatic biological opinion annually to ensure that its continued application will not result in unacceptable effects on federally listed species. Restrictions based on incidental take for avian species are as follows:

Table 1 Extent of take authorized for listed species.

Species	Permanent Effects	Temporary Effects
Golden-cheeked warbler	No more than 0.8 acres (0.32 hectares) per year	No more than 3.00 acres (1.2 hectares) per year
Black-capped vireo	No more than 0.4 acre (0.16 hectares) per year	No more than 1.0 acre (0.40 hectares) per year and one territory per ten years

Restricting this programmatic biological opinion to projects with temporary and permanent effects as prescribed above will limit the effects of the programmatic actions on Federally-listed species that occur on the installation. Tracking and restricting project effects over time will serve to minimize cumulative effects at local and regional levels.

The findings and recommendations in this consultation are based on: (1) various emails, meetings, and telephone conversations between CSSA staff and their consultant (Parsons) and the Service from 2006 through March 2007; (2) a letter from CSSA dated April 6, 2007, to the Service requesting formal consultation; (3) the *Draft-Final Integrated Natural Resource Management Plan, Camp Stanley, Boerne, Texas* dated March 2007; and, (4) other sources of information available to the Service. A complete administrative record of this consultation is on file at this office.

Consultation History

June 3, 2005:	A site visit at CSSA attended by the Service (A. Arnold, M. Underwood, and T. Schuuman), Texas Parks and Wildlife Department (TPWD)(D. Allen), CSSA (J. Shirley, B. Murphy, J. Aston, and, C. Beal), and Parsons (M. Collins, J.Burdey, and, T. Houston) to discuss natural resource and military mission issues at CSSA in preparation for the INRMP.
August 4, 2006:	A letter from Parsons to the Service relaying a draft of the INRMP.
August 11, 2006:	A meeting attended by the Service (A. Arnold) and Parsons (T. Houston) to discuss Service comments on the INRMP and the possibility of issuance of a programmatic biological opinion to cover CSSA natural resource programs, range activities, and operations and maintenance projects.
October 6, 2006:	A request from Parsons (H. Taylor) to the Service (C. Sexton) regarding research on shaded fuel breaks at the Balcones National Wildlife Refuge (BCNWR). The Service responded with that information on October 16, 2006.
October 12, 2006:	A meeting attended by the Service (A. Arnold), CSSA (G. Sanchez, C. Beal, and, T. Tijerina), and Parsons (J. Burdey, T. Houston, and, J. Kirk) to discuss the estimation of potential incidental take for consideration of a programmatic biological opinion and planned projects at CSSA.
March 21, 2007:	A letter from Parsons (representing Camp Stanley) requesting concurrence for two proposed projects: (1) concurrence that the 2007 INRMP will not jeopardize the continued existence of the golden-cheeked warbler or black-capped vireo and (2) concurrence that the proposed perimeter road work may affect, but will not likely adversely affect, the golden-cheeked warbler or black-capped vireo.

April 3, 2007: Two emails and two telephone conversations between the Service and Parsons requesting clarification of some statements in the INRMP and to request that formal initiation of consultation come directly from CSSA. Parsons responded the same day with those clarifications and indicated that CSSA would be sending a formal request to initiate consultation.

April 11, 2007: An electronic transmittal of an April 6, 2007, letter from CSSA to the Service requesting formal consultation.

July 24, 2007: The Service issued a draft programmatic biological opinion to CSSA for review and comment.

October 25, 2007: The Service received comments from CSSA on the draft programmatic biological opinion issued July 24, 2007.

December 13, 2007: The Service, Parsons, and CSSA met to discuss CSSA's comments for finalization of the programmatic biological opinion.

Definitions

Disturbance Area. Primary disturbance acreage will be determined by project area; however, disturbance area may exceed project boundaries because a 300 ft (100 m) buffer from the edge of habitat is incorporated to include essential habitat components and determine potential take. Disturbance may be temporary and/or permanent and should consider: (1) opportunities to avoid habitat within the project area; (2) area, timing, and duration of the disturbance; and, (3) temporary haul roads and equipment staging areas.

Habitat. For the purposes of this programmatic biological opinion, habitat for each species will be defined as all habitat for golden-cheeked warblers and black-capped vireos that occurs within the jurisdictional boundaries of CSSA. Core habitat is defined by a 656 foot (ft)(200 meter(m)) radius circle around bird detections recorded during the 2005 survey and is intended to represent habitat that was occupied during the 2005 nesting season. Non-core habitat is defined by vegetation community type and abiotic factors such as slope and canopy structure. Non-core habitat is intended to represent all potentially suitable habitat for these species at the installation.

Monitoring. The following level of monitoring is required when specified: (1) photo documentation included in a report notifying the Service when the habitat restoration was completed and what materials were used; (2) photo documentation and progress report submitted one year from restoration implementation; (3) justification from release of any further monitoring, if requested; and, (4) recommendations for remedial actions and request for approval from the Service, if necessary.

Permanent Effects. Permanent effects are those project activities that result in loss of habitat and/or permanently remove essential habitat components. Temporary projects that exceed two seasons to complete will be considered permanent effects.

Season. A season is defined as the period between September 1st and February 28th, when golden-cheeked warblers and black-capped vireos are typically absent from Texas. Project effects and restoration of habitat that can be completed within this period or, if necessary, within the same calendar year with an approved extension, will be considered occurring within one season.

Temporary Effects. Temporary effects are project activities that temporarily remove essential habitat components, but can be restored to pre-project conditions of equal or greater habitat value. Projects that are to be considered temporary effects must be able to implement the project and restore the affected habitat within two seasons.

Programmatic Biological Opinion Guidelines

Initial project authorization under this programmatic biological opinion is dependent upon the following criteria:

1. Effects will not exceed permanent or temporary losses of habitat prescribed in Table 1 of this programmatic biological opinion; and,

2. The Scope of Work is one or more of the types listed on pages 4-8 of this programmatic biological opinion and routinely authorized by CSSA, as appropriate.

Implementing Procedure

The following process will be used when implementing future proposed projects under this programmatic biological opinion:

1. CSSA will submit a letter requesting that the proposed project be appended to this programmatic biological opinion and a brief environmental assessment;

2. The Service will review the proposed project to determine if the project is: (1) not likely to adversely affect listed species; (2) is appropriate to append to this programmatic biological opinion; or (3) requires a separate biological opinion; and,

3. Upon appending a proposed project to this programmatic biological opinion, the Service will, in consultation with CSSA biological staff, determine whether one or a combination of the following is required: (1) restoration of the project site and, (2) monitoring to ensure success of restoration implemented.

BIOLOGICAL OPINION

Description of the Proposed Action

Detailed information about the installation may be found in the 2007 Draft-Final INRMP.

CSSA, formerly known as Leon Springs Military Reservation, is located in Bexar County, northwest of downtown San Antonio, Texas (Figure 2.1 of the INRMP). The post is located immediately east of State Highway 3351, approximately one-half mile east of Interstate Highway 10. Camp Bullis borders CSSA on the east and south. CSSA comprises 4,004 acres(ac)(1,620 hectares(ha)), divided into an inner and an outer cantonment areas. CSSA is a subinstallation of McAlester Army Ammunition Plant, United States (U.S.) Army Field Support Command, Army Materiel Command, U.S. Army. The primary mission of the installation is receipt, storage, and issuance of ordnance as well as quality assurance testing and maintenance of military weapons and ammunition. In addition, a restricted hunting program is conducted by military and installation personnel, and until recently, the U.S. Department of Agriculture (USDA) leased CSSA land for grazing of experimental cattle.

Since the l940's, various portions of the north pasture in the outer cantonment at CSSA have been used for demilitarization activities (*i.e.*, munitions burning) and for munitions testing. Currently, the only munitions testing carried out at CSSA is for munitions stored at the installation, and usually only for small ammunition (*e.g.,* grenades and land mines). There is currently no on-site disposal of munitions at CSSA. Explosive ordnance disposal previously took place at CSSA; however, these activities were discontinued in 1987 (Engineering Science 1993). Because of increasing urbanization, especially west of CSSA, future demilitarization of large munitions is not planned at the installation. CSSA currently transports unusable munitions to appropriate Department of Defense (DoD)/Army disposal facilities for evaluation and potential reuse.

The primary mission of the installation is receipt, storage, and issuance of ordnance materiel as well as quality assurance testing and maintenance of military weapons and ammunition. The management, administration, and functional operations of CSSA must comply with Army Regulation (AR) 740-1 and other applicable regulations, in support of the DoD Military Assistance Program and other missions as directed by military headquarters.

Operations conducted at CSSA require the use of both hazardous and nonhazardous materials which result in solid waste that is either hazardous or nonhazardous. CSSA is a conditionally exempt small quantity generator (CESQG – 100 kg or less of hazardous waste generated monthly) and the waste generated is largely dependent on workload. Depending on variables, CSSA could temporarily become a small quantity generator (SQG – between 100 kg and 1000 kg of hazardous waste generated monthly). These operations are of a batch type and are highly variable in duration and intensity. No changes to the CSSA mission and military activities that may result in take that would be in addition to what is provided by this programmatic biological opinion are expected in the future.

The primary purpose of the CSSA INRMP is to ensure that natural resource management activities and military activities are integrated, consistent, and compliant with Federal stewardship requirements. Therefore, the CSSA INRMP serves as the Installation Manager's comprehensive plan for natural resource management to attain and sustain stewardship requirements while enhancing the facility mission. The scope of the INRMP covers all CSSA mission lands, which encompass both the inner and outer cantonments.

The Sikes Act (Title 16, United States Code 670a *et seq.*), as amended through 1997, provides the primary legal basis for the Secretary of Defense to carry out a program that provides for the conservation and rehabilitation of natural resources on military lands. To facilitate such a program, the Sikes Act requires each military department to prepare and implement INRMP documents at appropriate installations. Further, such plans shall be prepared with, and reflect the mutual agreement of, the Secretary of Interior (acting through the Service Director) and the head of each appropriate state resource agency.

AR 200-3 (*Environmental Quality - Natural Resources - Land, Forest, and Wildlife Management*, February 28, 1995)(AR 200-3) is the appropriate implementing regulation, and identifies general requirements for the contents of installation INRMPs, as well as criteria for achieving integration with the installation mission. The cooperative agreements with Federal and State resource agencies referred to in AR 200-3 are superseded by the resource agencies' approval of the installation INRMP. AR 200-3 requires installations to develop an Endangered Species Management Plan (ESMP), which assesses potential effects of military training and land management activities on Federally-listed species, and to determine whether those effects are likely to be adverse. The proposed action is the implementation of the INRMP which will serve as the ESMP for CSSA.

Proposed activities include: (1) Operations and Maintenance, (2) Range Management, and, (3) Natural Resource Management. Activities are anticipated to continue for the next ten years and are necessary to accomplish routine mission requirements. Annually, this programmatic biological opinion will be re-evaluated to determine effects of this consultation on Federally-listed species. Each group of activity is described below.

Operations and Maintenance

These activities include maintenance and construction of new and existing infrastructure at CSSA and grounds maintenance, as well as security patrols and other activities that support the military mission. Maintenance of facilities and roads may require the removal of selected vegetation and could adversely affect golden-cheeked warblers and black-capped vireos. CSSA anticipates road paving activities to occur on paved road segments once over the next ten years. Most of these road segments are within the inner cantonment and will not subject golden-cheeked warblers or black-capped vireos to adverse effects; however, CSSA does anticipate the construction of a paved road for security purposes around the outer cantonment sometime in the next ten years. Most of the road construction will occur in previously cleared areas and cleared areas adjacent to habitat. Timing of construction activities can be planned around nesting season

periods for golden-cheeked warblers, and indirect effects from increased traffic along the road is expected to be insignificant. If roadwork is conducted during the breeding season a minimum 300-ft. buffer will be set-up around any occupied habitat. The road will be primarily utilized for vehicle security patrols. Beneficial effects from the road may include the creation of an impervious surface which would also function as a permanent fuel break for golden-cheeked warbler habitat protection.

Over the next ten years, CSSA, as a munitions storage and testing facility, will engage in active fuels reduction and fire containment activities with the dual intention of reducing fire risk and providing ecological benefit. Figure 4.1 of the INRMP illustrates burn units and associated fuel breaks. Maintenance activities will be required to keep fuel breaks clear of fine fuel loading and to remove "ladder fuels." In areas where golden-cheeked warbler habitat exists, CSSA will schedule activities associated with fuel breaks to occur outside of the nesting season for golden-cheeked warblers.

Facility construction at CSSA is primarily limited to the inner cantonment; however, CSSA is planning the construction of a warehouse facility in the North Pasture adjacent to a single golden-cheeked warbler territory. Adverse effects are not anticipated from construction activities, as CSSA is scheduling construction outside of the nesting season and the project is located outside designated habitat area. CSSA anticipates completion of the project before the golden-cheeked warbler nesting season, however, since project planning is ongoing as of the date of this text, the potential take of this territory is considered in the estimation of potential temporary adverse effects. Facility construction is not anticipated to occur in black-capped vireo habitat areas; therefore, this activity type is expected to not affect black-capped vireo, at CSSA.

Other maintenance and operations activities anticipated over the next ten years include limited brush clearing, with a primary focus on Ashe juniper (*Juniperus ashei*). The brush management activities at CSSA are conducted to reduce fuel loading in grassland areas, maintain existing fuel breaks, and maintain fencelines. Subsection 4.2.1 of the INRMP provides a detailed description of brush management activities at CSSA. Brush management at CSSA typically involves the removal of shrubby Ashe juniper that are not of intrinsic value to golden-cheeked warblers; therefore, this removal should not adversely affect golden-cheeked warblers. Periodic brush removal may affect black-capped vireos areas by removing shrubby oaks, sumac, and other shrub species from fencelines and woodland edges, which may be utilized by black-capped vireos.

Range Management

CSSA maintains an active live-fire range in its East Pasture. Primary range activity impacts are associated with fire and noise. In addition, there is a very slight possibility of a golden-cheeked warbler or black-capped vireo to be struck by a live round. Most live fire activities are confined either to an indoor practice range or an outdoor range with a protective earthen berm. In the very unlikely event that a live round shoots over the berm and causes a fire, six golden-cheeked

warbler territories and one black-capped vireo territory fall within the trajectory safety cone. Should an event such as this occur, CSSA anticipates the loss of one golden-cheeked warbler territory over the next ten years, with the increased potential of creating black-capped vireo habitat. Fires from the range in CSSA's recent past apparently has created suitable black-capped vireo habitat. The only detection during 2005 surveys of black-capped vireo occurred in the East Pasture adjacent to the range area. Pulse noise events (associated with explosives and small arms fire) are not generally viewed as a permanent adverse effect to black-capped vireos or golden-cheeked warblers (Tazik et al. 1992).

Natural Resource Management

Activities associated with the natural resource program are described in detail in Sections 3 through 9 of the INRMP, and are generally designed to benefit listed species. The prescribed burn program (Section 4.2.1.2 and Section 6.2.2 of the INRMP) involves cool and warm season burns, which may harass golden-cheeked warblers and black-capped vireos in adjacent habitat through smoke inundation, displacing predators into occupied habitat areas, and directly removing woody species important for species. Temporary adverse effects of prescribed burn operations are estimated by considering the timing of burn operations relative to habitat locations. CSSA estimates five summer burns to potentially temporarily adversely affect black-capped vireos and golden-cheeked warblers, primarily through smoke disturbance.

Regarding loss of habitat, CSSA estimates that no more than one black-capped vireo territory within a ten year period will be temporarily lost due to prescribed burns. Further, the prescribed burn program will benefit black-capped vireos by maintaining and creating shrubby dense vegetation on a multi-year rotational burn regime, as described in Section 6.2.2, increasing available habitat for black-capped vireos through regeneration in 1-2 years post-burn. CSSA anticipates that available habitat for black-capped vireos will increase from one viable territory to over three viable territories post-burn due to regeneration of shrubby habitat desirable to black-capped vireos. Recreational activities, including but not limited to hunting, (Section 7.2.3 of the INRMP) will benefit golden-cheeked warblers by encouraging hardwood regeneration by managing deer populations.

Proposed Conservation Measures

Areas of the INRMP, specifically Chapter 6, detail: (1) specific objectives for listed species; (2) justification of objectives based on the best scientific and commercial data available; and, (3) specific actions necessary to achieve those objectives. CSSA proposes to implement specific objectives in order to conserve and protect listed species and their associated habitat within their jurisdictional boundaries.

Implementing the INRMP likely will subject limited areas of golden-cheeked warbler and black-capped vireo habitat to greater disturbance from installation activities likely resulting in incidental take. However, the INRMP provides provisions to offset these likely effects. Effects are limited to within parameters currently believed necessary to maintain populations of both

golden-cheeked warblers and black-capped vireos on CSSA and are consistent with Service recovery goals for these species.

Fully implemented, the INRMP is anticipated to meet conservation objectives for listed species, assist in species recovery, fulfill section 7(a)(1) and or 7(a)(2) Act requirements, and be compatible with the accomplishment of military mission-essential tasks.

The principal objectives of actions prescribed in the INRMP for listed species will be implemented to:

- maintain sufficient habitat and sustain populations to advance current Service recovery goals for these species for the black-capped vireo and golden-cheeked warbler;
- minimize incidental take of the black-capped vireo and golden-cheeked warbler by minimizing habitat destruction and disturbance;
- conserve and protect karst habitat, within the limits possible through the caves, land, and authority of CSSA and its operational and mission requirements;
- coordinate with the Service's Balcones Canyonlands National Wildlife Refuge (BCNWR) Fire Management Office in review of CSSA burn plans, with the possibility of providing training and assistance on prescribed burn operations; and,
- provide necessary flexibility to achieve mission essential objectives.

As part of the INRMP implementation, CSSA will adhere to certain activity restrictions, outlined in Table 2 below, in order to minimize and avoid adverse effects to listed species. The INRMP projects, described in Sections 3 through 8 of the INRMP, were designed to have the smallest footprint possible on the military mission at CSSA. Indeed, many projects in the INRMP serve the military mission goals and provide ancillary ecological, and in some cases, recreational benefits. Restrictions on activities at CSSA are associated with endangered species habitat. Each documented species occurrence is delineated with a 250 meter buffer radius from the location of the occurrence. To the greatest extent practicable, that buffer will be in place for activities that may affect black-capped vireos or golden-cheeked warblers while those species are occupying the installation. Activity restrictions are adapted from current natural resource planning policies at Camp Bullis (Camp Bullis ESMP 2005).

Table 2 Activity Restriction Associated with Habitat and Ecologically Sensitive Areas (INRMP Table 2.3 with revisions for the purposes of this consultation)
*** GCWA = golden-cheeked warbler; BCVI = black-capped vireo**

Area Type	Species*		Season	Activity Restriction	Effects on Current Mission Activity
	GCWA	BCVI			
Core Habitat (Detection Buffer Area)	463.1 acres	31.1 acres	**Level 1: Non- Breeding Season** 15 August to 28 February	(1) Use of only existing roads and trails, equipment will be parked in open areas only. (2) No vegetation removal including brush/juniper removal, except when deemed vital to military mission	Current activity at CSSA within core habitat areas do not suggest a significant change in current operations. Range areas will not be affected. Tree removal will be compensated through conversion of demobilized fuel breaks, fencelines, roads.
			Level 2: Breeding Season 1 March to 14 August	(1) Use of only existing roads and trails, equipment will be parked in open areas only. (2) No vegetation removal including brush/juniper removal. (3) No off-road vehicle use for military maneuver. (4) No prescribed burn operations	
Non-Core Habitat (Primary Habitat based on vegetation)	778.1 acres	109.9 acres	**Level 1: Non- Breeding Season** 15 August to 28 February	(1) Consideration of activity relocation to grassland or other non-habitat areas	Current activity at CSSA within non-core habitat areas does not suggest a significant change in current operations. Range areas will not be affected. Tree removal will be compensated through conversion of demobilized fuel breaks, fencelines, roads (INRMP Project 4A and 4B)
			Level 2: Breeding Season 1 March to 14 August	(1) Use of only existing roads and trails, equipment will be parked in open areas only. (2) No vegetation removal including brush/juniper removal. (3) No off-road vehicle use for military maneuver. (4) No prescribed burn operations	
Karst Buffer Zones	For Karst Invertebrates 1 acre		**Year Round**	(1) Pesticide application prohibited within karst buffer zones (INRMP Project 6E).	Current activity at CSSA within karst areas does not suggest a significant change in current operations, with the exception of a minor change to pesticide applications Range areas will not be affected.

Additionally, CSSA will implement specific management activities, outlined in Table 3, anticipated to be beneficial to both golden-cheeked warblers and black-capped vireos. These activities are described in greater detail in Section 6 of the INRMP.

Table 3 Rare Species Management Projects (INRMP Table 6.2)

Project ID	Project Name	Description and Goals	Duration and Schedule	Priority Classification
6A	BCVI *population survey and core/non-core habitat mapping	Point counts of BCVI in suitable habitat to assess population trends and habitat utilization	2007 Breeding/nesting season	Compliance / Class 0
6B	GCWA* population survey and core/non-core habitat mapping	Point counts of GCWA in suitable habitat to assess population trends and habitat utilization	2007 Breeding/nesting season	Compliance / Class 0
6C	BCVI habitat enhancements	Shrubby, low-stature Ashe junipers will be subject to selective removal, maintaining a relatively open shrub canopy and encouraging growth of beneficial broad-leaf shrub species, such as flame leaf sumac. Habitat areas will be subject to small scale prescribed burn treatments.	Corresponding to brush management activities	Stewardship / Class III
6D	GCWA habitat enhancements	Selective thinning of low stature Ashe juniper shrub vegetation on slopes will occur in selected treatment areas in the North Pasture. Thinning would be accomplished with hand tools and be focused on enabling native hardwood growth and regeneration.	Corresponding to brush management activities	Stewardship / Class III
6E	Karst Area Management	Coordinate Best Management Practice implementation with construction activities.	Corresponding to construction and renovation areas.	Compliance / Class 0

Status of the species

For more information regarding the biology of the golden-cheeked warbler, please see the *1992 Golden-cheeked Warbler Recovery Plan* (Recovery Plan).

Species Description and Life-History

The golden-cheeked warbler was emergency listed as endangered on May 4, 1990 (55 FR 18844). The final rule listing the species was published on December 27, 1990 (55 FR 53160). No critical habitat is designated for this species.

The golden-cheeked warbler is a small, insectivorous songbird, 4.5 to 5 inches (11.4 to 12.6 centimeters) long with a wingspan of approximately eight inches. Average breeding weight is 0.36 ounces (10.2 grams) for adult males and 0.33 ounces (9.4 grams) for adult females. Wings are black with two distinct white wing-bars. Males have a black back, throat, and cap, and yellow cheeks with a black eye strip. Females are similar, but duller overall in color (Service 1992).

Golden-cheeked warblers breed exclusively in the mixed Ashe juniper/deciduous woodlands of the central Texas Hill Country west and north of the Balcones Fault and require, for nest material, the shredding bark produced by mature Ashe junipers. Kroll (1980) estimates Ashe junipers begin producing this shedding bark at about 20 years of age. Typical deciduous woody species include Texas oak (*Quercus buckleyi*), Lacey oak (*Quercus glaucoides*), live oak (*Quercus fusiformis*), Texas ash (*Fraxinus texensis*), cedar elm (*Ulmus crassifolia),* hackberry (*Celtis occidentalis*), bigtooth maple (*Acer grandidentatum*), sycamore (*Platanus occidentalis*), Arizona walnut (*Juglans major*), and pecan (*Carya illinoinensis*).

Breeding and nesting golden-cheeked warblers feed primarily on insects, spiders, and other arthropods found in Ashe junipers and associated deciduous tree species (Pulich 1976).

Male golden-cheeked warblers arrive in central Texas beginning on March 1st and begin to establish breeding territories, which they defend against other males by singing from visible perches within their territories. Females arrive a few days later, but are more difficult to detect in the dense woodland habitat. Three to five eggs are generally incubated in April, and unless there is a second nesting attempt, nestlings fledge in May to early June. By early August, golden-cheeked warblers begin their migration south. Golden-cheeked warblers winter in the highland pine-oak woodlands of southern Mexico and northern Central America.

Historic and Current Distribution

The golden-cheeked warbler's entire breeding range occurs on the Edwards Plateau and Lampasas Cut Plain of central Texas. Golden-cheeked warblers are confirmed in 26 counties and may occur in another 12 counties. However, many of the counties where it is known to occur, now or in the past, have only small amounts of suitable habitat (Pulich 1976, USFWS

1995b). For estimates of golden-cheeked warbler habitat availability rangewide, see McKinney and Sansom (1995) and Diamond and True (2002).

Travis County contains the greatest amount of golden-cheeked warbler habitat in large, contiguous blocks and lies at the center of the species' range (USFWS 1992). However, Bexar County also contains golden-cheeked warbler habitat, with the only remaining large blocks associated with Government Canyon SNA and Camp Bullis. Other smaller areas in Bexar County that provide habitat include land owned and managed by the City of San Antonio Parks and Recreation Department, including Friedrich Wilderness Park, Crownridge, and Ironhorse.

Currently, there are only four significant known golden-cheeked warbler populations receiving some degree of protection: (1) those at the Balcones Canyonlands Preserve (BCP) in Travis County; (2) the nearby Balcones Canyonlands National Wildlife Refuge in Travis, Burnet, and Williamson counties; (3) the Fort Hood Military Reservation (Weinberg 1995) in Coryell and Bell counties; and, (4) Camp Bullis in Bexar County.

Before 1990, the primary reason for golden-cheeked warbler habitat loss was juniper clearing to improve conditions for livestock grazing. Since then, habitat loss has occurred as suburban developments spread into prime golden-cheeked warbler habitat along the Balcones Escarpment. Golden-cheeked warbler populations are limited primarily by the amount and configuration of available habitat. Pulich (1976) estimates that approximately 130,000 ac (52,608 ha) of potential habitat, or 35 percent, were lost from 1962-1990 and nesting territories have declined approximately 25 percent during that same period.

Activities that continue to threaten golden-cheeked warblers include the clearing of deciduous oaks upon which the warblers forage, oak wilt, nest parasitism by brown headed cowbirds (*Molothrus ater*) (Engels and Sexton 1994), drought, fire, stress associated with migration, and competition with other avian species (Ladd and Gass 1999).

Specifically, golden-cheeked warblers are threatened by loss of habitat from urbanization. Human activities have eliminated habitat within the central and northern parts of their respective ranges, particularly areas associated with the Austin and San Antonio metropolitan areas. Populations of golden-cheeked warbler and other neotropical migrants are less stable in small habitat patches surrounded by urbanization (Coldren 1998, Engels 1995, Arnold et al. 1996, Bolger et al. 1997). Some studies indicate that the abundance of several bird species, including golden-cheeked warblers, is reduced within 656-1640 feet (200-500 meters) of an urban edge (Engels 1995, Arnold et al. 1996, Bolger et al. 1997, Coldren 1998). Coldren (1998) reported that golden-cheeked warbler occupancy declined with increasing residential development and roadway width.

Range-wide Survival and Recovery Needs

The recovery strategy outlined in the Recovery Plan divides the breeding range of the golden-cheeked warbler into eight regions, or units, and calls for the protection of sufficient habitat to support at least one self-sustaining population in each unit. These recovery units were delineated based primarily on watershed, vegetational, and geologic boundaries (USFWS 1992). The proposed action is located within Recovery Unit 6, which includes Bexar, Kendall, Comal, and portions of Bandera, Kerr, Gillespie, and Blanco counties.

Based on the Recovery Plan, protection and management of occupied habitat and minimization of further degradation, development, or environmental modification of unoccupied habitat are necessary to provide for the survival of the species. Habitat protection must include elements of both breeding and non-breeding habitat (i.e., associated uplands and migration corridors). Efforts to create new and protect existing habitat will enhance the golden-cheeked warbler's ability to expand in distribution and numbers. Efforts to increase numbers of existing viable populations is critical to the survival and recovery of this species, particularly when rapidly expanding urbanization continues to result in the loss of prime breeding habitat.

Catastrophic fires within occupied habitats could result in the loss of significant portions of habitat and/or entire existing populations within each recovery unit. Efforts to control accidental fires should continue to be a priority to minimize the chance of significant loss of breeding golden-cheeked warblers and the habitat necessary to allow for expansion of distribution and numbers of golden-cheeked warblers.

In order to accurately assess the status of the golden-cheeked warbler, formal surveys need to be conducted across its range in Central Texas. However, access to private lands to conduct formal surveys continues to be difficult to obtain. The *Golden-cheeked Warbler Population and Habitat Assessment Report* (Service 1995b) indicates that only a few counties (e.g., Bexar, Travis, Bell, Coryell) have been intensively surveyed in an appropriate manner. Other counties within the species' range also require surveys.

Population viability assessments on golden-cheeked warblers have indicated the most sensitive factors affecting their continued existence are population size per patch, fecundity (productivity or number of young per adult), and fledgling survival. It is estimated that a minimum of 32,500 acres (13,152 hectares) of prime unfragmented habitat must be preserved to reduce the possibility of extinction in the next 100 years to less than five percent (Service 1995b). This acreage is estimated to provide the carrying capacity for 3,000 breeding pairs. Further, this minimum carrying capacity threshold estimate increases with poorer quality habitat (i.e., patchy habitat resulting from urbanization).

Black-capped vireo

For more specific information regarding the black-capped vireo, please refer to the *Black-capped Vireo Recovery Plan* (USFWS 1991).

Species Description and Life History

The black-capped vireo was federally listed as endangered in 1987 (52 FR 37420-37423). No critical habitat is designated for this species.

The black-capped vireo is a 4.5 inch (11.4 centimeter) long, insectivorous songbird. Mature males are olive green above and white below with faint greenish-yellow flanks. The crown and upper half of the head are black with a conspicuous white eye-ring. The iris is brownish-red and the beak is black. The mature females are generally duller in color than the males, and have a dark slate gray head (USFWS 1991).

Although black-capped vireo habitat throughout Texas is quite variable with respect to plant species, soils, and rainfall, habitat types generally have a similar overall appearance. Black-capped vireos typically inhabit patchy shrublands and open woodlands with a distinctive patchy structure. The shrub vegetation generally extends from the ground to about six ft (1.8 m) above ground and covers about 30 to 60 percent of the total area. In the Edwards Plateau, common plants in vireo habitat include Texas oak, shin oak (*Quercus sinuata*), live oak, mountain laurel (*Sophora secundiflora*), sumac (*Rhus* sp), redbud (*Cercis canadensis* var. *texana*), Texas persimmon (*Diospyros texana*), mesquite (*Prosopis glandulosa*), and agarita (*Mahonia trifoliata*). Densities of Ashe juniper are usually low. In the Edwards Plateau, suitable habitat for the black-capped vireo is early successional scrub/shrub created by fire or woodland clearing. Black-capped vireos are opportunistic foragers, however, they prefer insect larvae and seeds (Grzybowski 1995).

Male black-capped vireos arrive in central Texas in late March and begin to establish breeding territories, which they defend against other males by singing within their territories. The females arrive a few days later, but are more difficult to detect in the dense brushy habitat. Three to four eggs are generally incubated in April, and unless there is a second nesting attempt, nestlings fledge in May to early June. In mid-July, black-capped vireos begin their migration south, beginning with females and young and followed by adult males (TPWD 2002, Graber 1957, Oberholser 1974). Typically, black-capped vireos are gone from Texas by mid-September.

Historic and Current Distribution

Black-capped vireos breed from Oklahoma south through central Texas to the Edwards Plateau, then south and west to central Coahuila, Nuevo Leon, and southwestern Tamaulipas, Mexico and winter on the Pacific slope of Mexico. Populations have been extirpated in Kansas, and have been reduced in Oklahoma, suggesting habitat loss and parasitism may be particularly prevalent in this part of the species' range (Grzybowski 1995, Wilkins et al. 2006).

Wilkins et al. 2006, estimate that in 2005, the known U.S. population of black-capped vireos is approximately 6,000 males, a marked increase since survey efforts for black-capped vireos have intensified since listing. It is unknown as to whether population numbers have increased due to

increased survey efforts or increased habitat due to habitat management efforts since listing, or some combination of both.

Current efforts to monitor black-capped vireo populations in Texas occur on properties owned and/or managed by the Department of the Defense's Camp Bullis and Fort Hood, the City of Austin's Balcones Canyonlands Preserve (BCP) in Travis County, the Service's Balcones Canyonlands National Wildlife Refuge (BCNWR), Texas Parks and Wildlife Department's Kerr Wildlife Management Area (Kerr WMA), and properties owned and/or managed by The Nature Conservancy Texas and Mexico. Approximately 75 percent of the known population is located on the Kerr WMA and Fort Hood (both in Texas), and on the Wichita Mountains NWR and Ft. Sill (both in Oklahoma) (Wilkins et al. 2006). Many efforts are underway to assist landowners in determining black-capped vireo status on their property and to educate landowners on the implementation of management strategies beneficial to the black-capped vireo. Fully understanding the current distribution of the black-capped vireo in Texas largely depends on the data collected through these various efforts.

Reasons for Decline and Threats to Survival

Threats to the black-capped vireo include habitat loss, fragmentation, and degradation due to development, vegetational succession, poor grazing practices, and brown-headed cowbird (*Molothrus ater*) parasitism. A complete summary of the threats to the species can be found in Federal Register 52: 37420-37423.

Range-wide Survival and Recovery Needs

The Black-capped Vireo Recovery Plan includes the criteria that there is a viable vireo population in four of the six Texas regions delineated therein, and one each in Oklahoma and Mexico (USFWS 1991). The recovery strategy divides the breeding range of the black-capped vireo into six regions for Texas delineated based primarily on physiographic boundaries.

Based on the Black-capped Vireo Recovery Plan, protection and management of occupied habitat and minimization of further degradation, development, or environmental modification of unoccupied habitat are necessary to provide for the survival of the species. Habitat protection must include elements of both breeding and non-breeding habitat, i.e., associated uplands and migration corridors. Efforts to create new, and protect existing, habitat will enhance the black-capped vireo's ability to expand in distribution and numbers. Efforts to increase numbers of existing viable populations are critical to the survival and recovery of this species, particularly when rapidly expanding urbanization continues to result in the loss of prime breeding habitat. Due to the nature of early successional shrub growth preferred by black-capped vireos, fire should be used to manage, enhance, and create black-capped vireo breeding habitat, as appropriate.

Environmental Baseline

Golden-cheeked warbler

Status within the Action Area

The Service considers the action area to include all habitat located within the jurisdictional boundaries of CSSA. General information on the golden-cheeked warbler and its distribution, life history, and habitat are provided in Subsection 2.8.4 and in the 2005 survey report (Appendix B) both in the INRMP.

CSSA provides over 1,241 ac (502 ha) of golden-cheeked warbler habitat. Of this, 463.10 ac (187.41 ha) are core habitat, 778.10 ac (314.89 ha) are non-core habitat. The core and non core habitat areas are found mostly on various forested hillocks in the North Pasture, East Pasture and the southern portion of the inner cantonment.

Golden-cheeked warblers were first documented at CSSA in 1993. One male golden-cheeked warbler was detected during the 1993 survey in the northeastern portion of the installation (Stewardship Services 1993). More intensive presence-absence surveys and habitat mapping were conducted during the 2005 spring and summer survey season. Nineteen golden-cheeked warblers were detected during 2005 (Parsons 2005b). No surveys for these birds were conducted at CSSA from 1994 through 2004.

Factors affecting golden-cheeked warblers within the Action Area

Surrounding pressures include developments near CSSA that result in destruction of habitat and a reduction in the amount of available habitat. Possible factors on CSSA include an increase in available habitat as younger vegetation matures and improved management actions. Adverse effects may include habitat disturbance or destruction from routine operations.

Three previous Service golden-cheeked warbler consultations have involved lands near the action area: (1) Government Canyon - Housing and Urban Development land disposal of San Antonio Ranch in Bexar County resulting in take of 45.1 ac (18 ha) of golden-cheeked warbler habitat (Service File 21450-1993-F-0170); (2) Canyon Springs Ranch – Mayberry Tract in Bexar County just north of the intersection of Hwy 281 and Stone Oak Pkwy resulting in two territories and 11.25 ac of habitat modified (surveys prior to construction identified 15 ac (6 ha) of suitable habitat and two pairs were detected) (Service File 21450-1997-F-0386), and, (3) a consultation involving golden-cheeked warblers was conducted for the construction of a City Public Services transmission line near Government Canyon State Natural Area resulting in direct and indirect take of golden-cheeked warblers potentially occurring within 10.59 ac of golden-cheeked warbler habitat (Consultation Number 21450-2003-F-0344).

Black-capped vireo

Status within the Action Area

The Service considers the action area to include all habitat located within the jurisdictional boundaries of CSSA. General information on the black-capped vireo and its distribution, life history, and habitat are provided in Subsection 2.8.4 and in the 2005 survey report (Appendix B) both in the INRMP.

CSSA provides over 140 ac (56 ha) of black-capped vireo habitat. Of this, 31.10 ac (12.59 ha) are core habitat, 109.9 ac (44.48 ha) are non-core habitat. The core and non core habitat areas are found mostly in the East Pasture, the North Pasture, and in the inner cantonment.

A pair of black-capped vireos was first documented at CSSA in 1993 in the northeastern portion of the installation (Stewardship Services 1993). More intensive presence-absence surveys and habitat mapping were conducted during the 2005 spring and summer survey season. A single black-capped vireo was detected during 2005 (Parsons 2005). The low black-capped vireo population on CSSA is likely due to the installation's location at the extreme southeastern extent of the black-capped vireo's range and lack of suitable habitat (approximately 2.7 percent of the total installation). No surveys for these birds were conducted at CSSA from 1994 through 2004.

Factors affecting black-capped vireos within the Action Area

Fires, whether prescribed or accidental, within black-capped vireo habitat appear to improve conditions for black-capped vireos because they reverse vegetative succession. Adverse effects may include habitat disturbance or destruction from routine operations, including but not limited to prescribed fire acitivities.

One previous black-capped vireo consultation involved lands near the action area: Government Canyon – Housing and Urban Development land disposal of San Antonio Ranch in Bexar County resulting in loss of 37 ac (15 ha) of black-capped vireo habitat (Consultation Number 21450-1993-F-0170).

Effects of the Proposed Action

Beneficial effects – The programmatic process will expedite projects resulting in minor adverse effects to listed species habitat and may encourage CSSA to avoid greater effects that would require a lengthy permit process. Project planning efforts that stay within the programmatic biological opinion guidelines may facilitate listed species recovery by resulting in significantly less habitat loss, and possibly the creation of more habitat over time. Occupied habitat currently protected will provide population components that are not threatened by the factors that contributed to listing the species. Conservation measures implemented now will likely secure protected habitat areas distributed across CSSA.

Direct effects – Projects that may remove vegetation or create erosive conditions could result in direct effects to listed species. Any given disturbance near occupied habitat areas could cause golden-cheeked warblers and black-capped vireos to move into areas of unsuitable habitat where they will experience greater risk of predation or other sources of mortality. Activities that create noise such as live fire from large rounds could also indirectly effect golden-cheeked warblers and black-capped vireos.

Distribution – CSSA project authorizations are issued for projects that occur within the jurisdictional boundaries of CSSA that occurs within the known range of golden-cheeked warblers and black-capped vireos.

Disturbance duration and frequency – Projects that would qualify for this programmatic biological opinion may have both temporary and permanent effects. Projects may be completed within one season, or may require two or more seasons to complete. Some projects may result in permanent loss of habitat and an increased disturbance frequency associated with maintenance and recreation activities. Temporary loss of habitat and temporary disturbance may result from repairs, modifications, or maintenance (e.g., temporary fill for a construction access, maneuver training, etc.). Increased disturbance frequency from recreation, traffic, or human intrusion may be an indirect effect of some projects. Completed projects that require routine maintenance activities in proximity to habitat have future potential to cause harm, harassment, or injury.

Disturbance intensity and severity – Projects that would qualify for this programmatic biological opinion are anticipated to have small permanent or temporary effects, as described in Table 1, some of which can be restored at completion of the project.

Indirect effects – Utility lines, road improvements, drainage facility improvements, and recreational structures, may all potentially increase use of areas not previously used and may have indirect effects to listed species, specifically from human intrusion during routine maintenance operations.

Monitoring. The following level of monitoring is required, as appropriate, when specified: (1) photo documentation included in a report notifying the Service when the habitat restoration was completed and what materials were used; (2) photo documentation and progress report submitted one year from restoration implementation; (3) justification from release of any further monitoring, if requested; and, (4) recommendations for remedial actions and request for approval from the Service, if necessary.

Proximity of the action – Projects that meet the criteria for inclusion in this consultation will be permitted under CSSA project authorizations, as appropriate. Projects may involve direct work in habitat, such as maneuver training, live fire training, recreation, brush management, prescribed burning, grazing, surveying, monitoring, and operation and maintenance of the Installation. Other activities associated with the permitted project may occur adjacent to habitat and thus may affect upland golden-cheeked warbler habitat that provides post-fledge foraging habitat. These activities may include grading, clearing, mowing, and equipment staging and access.

Timing – Projects occurring outside of the nesting and post-fledging periods for golden-cheeked warblers and black-capped vireos minimize and avoid most adverse effects to golden-cheeked warblers and black-capped vireos. However, mission critical activities that are authorized by CSSA occur year round and there is very little flexibility to alter timing of activities due to the urgency of the overall mission of CSSA. To the greatest extent practicable, those projects that occur in golden-cheeked warbler or black-capped vireo habitat will be implemented outside of the nesting and post-fledging season.

Establishment of nesting territories by, and post-fledging activity of, golden-cheeked warblers and black-capped vireos generally occurs March to September. Golden-cheeked warblers and black-capped vireos generally fledge in late April to mid-May and spend the rest of the summer foraging in upland and/or riparian habitats. Initial nesting success and successful foraging through the nesting and post-fledging period is critical to reproductive success for both species. Disturbance during this time may lessen reproductive success.

Cumulative Effects

Cumulative effects include the effects of future State, local, or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

An undetermined number of future land use conversions and routine agricultural practices are not subject to Federal authorization or funding and may alter the habitat or increase incidental take of golden-cheeked warblers and black-capped vireos, and are, therefore, cumulative to the proposed project. These additional cumulative effects include: (1) unpredictable fluctuations in habitat due to urbanization; (2) increase in impervious cover due to urbanization and the installation of appurtenant facilities, i.e., roads, etc.; (3) use of pesticides on listed species habitat; (4) contaminated runoff from agriculture and urbanization; (5) nest parasitism; and, (6) predation by feral animals and pets.

CSSA is an island of green within an ever more urbanized landscape. The area around Camp Bullis and CSSA is quickly being developed and habitat for listed species continues to be converted to other uses. It is theorized that much of the increase in densities of golden-cheeked warblers on Camp Bullis has been attributed, in part, to habitat loss immediately surrounding the installation over the past five years (Jackie Schlatter, Camp Bullis, pers. comm. 2005). The same has been theorized regarding populations located on CSSA.

Other than three Parks (Government Canyon State Natural Area, Guadalupe River State Park and Friedrich Wilderness Park) there is continued conversion of golden-cheeked warbler habitat to urban uses around Camp Bullis and CSSA. Both the Camp Bullis ESMP and CSSA INRMP may have some short-term detrimental effects from surveys, but the overall effect will be positive. In addition, the plans will serve to minimize or avoid those detrimental effects from Army training and land management activities. To date, the upward trend of the population

indicates success. Barring large-scale habitat destruction from accidental fires, Camp Bullis and CSSA will continue as valuable space for the golden-cheeked warbler in this part of the range.

Although a relatively small amount of black-capped vireo habitat exists on both Camp Bullis and CSSA, the Camp Bullis ESMP and CSSA INRMP will provide for long term protection of black-capped vireos by sustaining existing populations and encouraging population growth on both installations.

Though it is not possible to determine changes in Army training loads in the near future because of uncertainties in current overseas operations, the Army is committed to conserving and protecting all five species occurring on Camp Bullis and CSSA. There is no change in training anticipated that would require the conversion of golden-cheeked warbler habitat to grassland. There are no changes in training anticipated that would require fewer protections to karst ecosystems or that will require the conversion of black-capped vireo habitat to other uses.

Conclusion

After reviewing the current status of the golden-cheeked warbler and black-capped vireo, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the Service's biological opinion that the projects that meet the qualifications for this programmatic biological opinion, and will be evaluated for cumulative take and habitat losses annually, are not likely to jeopardize the continued existence of the golden-cheeked warbler or black-capped vireo. No critical habitat occurs within the project area for these species, therefore, none will be affected.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined by the Service as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harass is defined by the Service as an intentional or negligent act or omission which creates the likelihood of injury to a listed species by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding and sheltering. Harm is defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by impairing behavioral patterns including breeding, feeding, and sheltering. Incidental take is defined by the Service as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act, provided that such taking is in compliance with this Incidental Take Statement.

The measures described below are nondiscretionary and must be implemented by CSSA so that they become binding conditions of any authorization issued to implement a project covered by

this programmatic biological opinion, as appropriate, in order for the exemption in section 7(o)(2) to apply. CSSA has a continuing duty to regulate the activity covered by this Incidental Take Statement. If CSSA (1) fails to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the authorizations, and/or (2) fails to retain oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse.

Amount or Extent of Take

The Service anticipates incidental take of golden-cheeked warblers and black-capped vireos will occur as a result of the proposed action. Individual golden-cheeked warblers and black-capped vireos are difficult to detect unless they are observed, undisturbed, in their environment. Most close-range observations of golden-cheeked warblers and black-capped vireos represent chance encounters that are difficult to predict. The project sizes and effects authorized under this programmatic biological opinion will vary, but are expected to have small indirect and direct effects. Further, the Service believes that beneficial effects to both species will result from long-term management actions that will be implemented through the INRMP and ESMP and will likely off-set adverse actions that result from the proposed action. The Service anticipates the following amount of incidental take from the proposed action:

1. No more than 0.80 ac (0.32 ha) per year of golden-cheeked warbler habitat may be permanently lost and no more than three (3) ac (1.2 ha) per year of golden-cheeked warbler habitat may be temporarily adversely affected;

2. No more than 0.4 ac (0.16 ha) per year of black-capped vireo habitat may be permanently lost, no more than one territory per ten years may be adversely affected due to prescribed fire activities, and no more than one (1.0) ac (0.40 ha) per year of black-capped vireo habitat per year may be temporarily adversely affected;

3. The number of golden-cheeked warblers that may be found within 3.8 ac (1.5 ha) of habitat per year may be disturbed, harassed, harmed, or killed as a result of actions permitted under this opinion; and,

4. The number of black-capped vireos that may be found within one territory (one pair of black-capped vireos) may be disturbed, harassed, harmed, or killed per ten year period as a result of prescribed fire activities permitted under this opinion. The number of black-capped vireos found within 1.4 ac (0.57 ha) of habitat per year may be disturbed, harassed, harmed, or killed as a result of actions permitted under this opinion.

The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the effects of incidental take that might otherwise result from the proposed action. With implementation of these measures, the Service believes that no more than 30 ac (12.1 ha) of golden-cheeked warbler habitat will be temporarily affected and no more than eight

ac (3.2 ha) of golden-cheeked warbler habitat will be permanently lost for the duration authorized under this opinion, or a total of ten years.

With implementation of this measure, the Service believes that no more than ten ac (4.0 ha) of black-capped vireo habitat will be temporarily affected, no more than four acres (1.6 ha) of black-capped vireo habitat will be permanently lost, and no more than one black-capped vireo territory will be lost for the duration authorized under this opinion, or a total of ten years.

In addition, (1) the number of golden-cheeked warblers that may be found within 3.8 ac (1.5 ha) of habitat per year may be disturbed, harassed, harmed, or killed as a result of actions permitted under this opinion and, (2) the number of black-capped vireos that may be found within 1.40 ac (0.57 ha) of habitat per year and one territory per ten years may be disturbed, harassed, harmed, or killed as a result of actions permitted under this programmatic biological opinion.

Take associated with scientific collection and monitoring purposes for listed species will be authorized by individual section 10(a)1(A) permits.

Effect of the Take

In the accompanying programmatic biological opinion, the Service has determined that this level of anticipated take is not likely to result in jeopardy to the golden-cheeked warbler or black-capped vireo. No critical habitat occurs within the jurisdictional boundaries of CSSA, therefore, none will be affected.

Reasonable and Prudent Measures

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize incidental take of golden-cheeked warblers and black-capped vireos.

CSSA shall:

1. Minimize harassment and harm of golden-cheeked warblers or black-capped vireos during activities associated with implementing the projects authorized by this programmatic biological opinion; and,

2. Minimize effects of temporary and/or permanent losses and degradation of habitat of golden-cheeked warblers and black-capped vireos and, to the greatest extent practicable, minimization shall include habitat restoration to pre-project conditions.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, CSSA must comply with the following terms and conditions that implement the reasonable and prudent measures described

above and outline required reporting/monitoring requirement. These terms and conditions are non-discretionary.

1. The following terms and conditions implement reasonable and prudent measure number one:

   A. To the greatest extent practicable, authorized activities within or near (within 300 feet of) golden-cheeked warbler or black-capped vireo habitat should be conducted between September 1st and February 28th. This is the non-nesting period for golden-cheeked warblers and black-capped vireos and potential adverse effects are minimized and avoided;

   B. To the greatest extent practicable, authorized activities within or near (within 300 feet of) core golden-cheeked warbler habitat and adjacent riparian areas or within known nesting territories of black-capped vireos should be minimized during the nesting and post-fledging season (March 1st to September 1st);

   C. All personnel involved in any authorized activity covered by this programmatic biological opinion shall be informed of the terms and conditions of this biological opinion prior to the implementation of the authorized activity;

   D. Golden-cheeked warblers or black-capped vireos encountered during authorized activities should be allowed to move away from activities on their own. Capture and relocation of trapped or injured individuals can only be attempted by personnel or individuals with current Service recovery permits pursuant to section 10(a)1(A) of the Act;

   E. To the greatest extent practicable, movement of heavy equipment to and from a project site shall be restricted to established roadways to minimize habitat disturbance; and,

   F. Golden-cheeked warbler and black-capped vireo surveys shall be conducted, as appropriate, to facilitate routine operation planning efforts to avoid and minimize adverse effects caused by routine operations.

2. The following terms and conditions implement reasonable and prudent measure number two:

   A. Known occupied habitat of Federally-listed species shall be designated as Environmentally Sensitive Areas and personnel shall, to the greatest extent practicable, avoid such areas;

   B. After completion of activities covered by this programmatic biological opinion that result in habitat alteration, any temporary fill, construction, or other debris

shall be removed and, wherever feasible, disturbed areas shall be restored to pre-project conditions; and,

C. CSSA shall ensure compliance with the Reporting Requirements below to assist in management decisions to avoid and minimize effects on golden-cheeked warblers, black-capped vireos, and their associated habitats.

Reporting Requirements

Appropriate CSSA personnel shall notify the Service immediately if golden-cheeked warblers or black-capped vireos are found on site as detailed in term and condition 1D, and will submit a report including date(s), location(s), habitat description, and any voluntary corrective measures taken to protect each bird found. Appropriate personnel shall submit locality information to the TPWD no more than 90 calendar days after completing the last field visit of the project site. Each form shall have an accompanying scale map of the site such as a photocopy of a portion of the appropriate 7.5 minute U.S. Geological Survey map and shall provide at least the following information: name of the quadrangle; dates (day, month, year) of field work; number of individuals and life stage (where appropriate) encountered; and a description of the habitat by community-vegetation type.

Where temporary or permanent adverse effects occur, a post-activity report shall be forwarded to the Field Supervisor, Austin Ecological Services Field Office, within 60 calendar days of the completion of such activities. This report shall detail (1) dates that activity occurred; (2) pertinent information concerning the success in implementing restoration measures; (3) an explanation of failure to meet such measures, if any; (4) known project effects on Federally-listed species, if any; (5) occurrences of incidental take of federally listed species, if any; and (6) other pertinent information.

The Austin Ecological Services Field Office is to be notified within three working days of the finding of any dead listed species or any unanticipated harm to the species addressed in this programmatic biological opinion. The Service contact person for this is the Field Supervisor at (512) 490-0057.

Review Requirements

The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the effects of incidental take that might otherwise result from the proposed action. If, during the course of the authorized activities, the level of incidental take authorized by this programmatic biological opinion is exceeded prior to the annual review, such incidental take represents new information requiring review of the reasonable and prudent measures provided. CSSA must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures. This programmatic biological opinion will expire ten years from the date of issuance

of this programmatic biological opinion. Issuance of a new programmatic biological opinion will be subject to evaluation of the recovery of the species.

Conservation Recommendations

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

The recommendations provided here relate only to the proposed action and do not necessarily represent complete fulfillment of the agency's section 7(a)(1) responsibilities for these species.

1. CSSA should assist the Service in the development and implementation of recovery plans for each listed species;

2. CSSA should incorporate into bidding documents the terms and conditions of this programmatic biological opinion, when appropriate; and,

3. CSSA, in partnership with the Service, should develop maintenance guidelines for CSSA projects that will reduce adverse effects of routine maintenance on listed species and their habitat. Such actions may contribute to the delisting and recovery of listed species by preventing degradation of existing habitat and increasing the amount and stability of suitable habitat.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

Reinitiation Notice

This concludes formal consultation on the implementation of the 2007 Integrated Natural Resource Management Plan (INRMP) for the U.S. Army's CSSA in Bexar County, Texas. As provided in 50 CFR Sec. 402.16, reinitiation of formal consultation is required where discretionary federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this consultation; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this biological opinion; or, (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

If you have any questions regarding this biological opinion, please contact Allison Arnold at (512) 490-0057, extension 242.

Sincerely,

Adam Zerrenner
Field Supervisor

cc: Glare Sanchez, CSSA, Boerne, Texas
Taylor Houston, Parsons, Austin, Texas

Literature Cited

Arnold, K., C. Coldren, and M. Fink. 1996. The interaction between avian predators and golden-cheeked warblers in Travis County, Texas. Sponsored by the Texas Department of Transportation. Research report 1983-2, study number 7-1983, Texas Transportation Institute, Texas A&M University. College Station, Texas.

Bolger, D.T., T.A. Scott, and J.T. Rotenberry. 1997. Breeding bird abundance in an urbanizing landscape in coastal southern California. Conservation Biology 11(2):406-421.

Coldren, C.L., 1998. The effect of habitat fragmentation on the golden-cheeked warbler. PhD Dissertation. Texas A&M University, College Station, Texas.

Diamond, D.D., and C.D. True. 2002. Golden-cheeked warbler nesting habitat area, habitat distribution, and change and landcover within Edwards Aquifer Recharge Zone. Final Report. Submitted to U.S. Fish and Wildlife Service for Grant #1448-20181-98-G941, Austin, Texas.

Engels, T.M. 1995. Conservation biology of the golden-cheeked warbler. PhD dissertation, University of Texas, Austin, Texas.

Engels, T.M., and C.W. Sexton. 1994. Negative correlation of blue jays and golden-cheeked warblers near an urbanizing area. Conservation Biology, Vol. 8 No. 1 (1994).

Engineering Science 1993. Final Environmental Assessment, Camp Stanley Storage Activity. Prepared for CSSA, Boerne, Texas, and Armstrong Laboratory/OEB, Brooks AFB, Texas. Austin, Texas.

Graber, J.W. 1957. A bioecological study of the black-capped vireo (*Vireo atricapilla*). Ph.D. Dissertation, University of Oklahoma, Norman.

Grzybowski, J.A. 1995. The Birds of North America: Black-capped vireo (*Vireo atricapillus*). No. 181.

Kroll, J. C. 1980. Habitat requirements of the Golden-cheeked warbler: management implications. J. Range. Manage. 33: 60-65.

Ladd, C. and L. Gass. 1999. The Birds of North America: Golden-cheeked warbler (*Dendroica chrysoparia*). No. 420.

Lasley, G.W., C. Sexton, W. Sekula, M. Rockwood, and C. Shackelford. 1997. Texas region, spring migration, Mar. 1 - May 31, 1997. National Audubon Society Field Notes 51:892-897.

McKinney, L.D. and A. Sansom. 1995. Draft Final Report: Remote Sensing and GIS of Golden-cheeked warbler Breeding Habitat and Vegetation Types on the Edwards Plateau. Texas

Parks and Wildlife Department Project 39. Submitted to U.S. Fish and Wildlife Service in fulfillment of Grant No. E-1-7, Austin, Texas.

Moses, E. 1996. Golden-cheeked warbler (*Dendroica chrysoparia*) habitat fragmentation in Travis County, Texas: a remote sensing and geographical information system analysis of habitat extent, pattern and condition. Master's thesis, Texas A&M University. College Station, Texas.

Oberholser, H.C. 1974. The bird life of Texas (Edgar Kincaid, editor). Austin: The University of Texas Press.

Parsons. 2005b. Presence/Absence Survey for Black-capped vireos and Golden-cheeked warblers, Camp Stanley Storage Activity, Boerne, Texas. Prepared for CSSA by Parsons. Austin, Texas.

Pulich, W.M. 1976. The golden-cheeked warbler: a bioecological study. Texas Parks and Wildlife Dept., Austin.

Stewardship Services, 1993. Camp Stanley Storage Activity Habitat Evaluation. In: Final Environmental Assessment, Camp Stanley Storage Activity. Prepared for CSSA by Armstrong Laboratory/ OEB Brooks AFB, Texas, 1993.

Tazik, D. J., and J. D. Cornelius. 1990. The Black-capped Vireo on the lands of Fort Hood, Texas. Part III: Population and Nesting Ecology (Draft Technical Report). U. S. Army Construction Research Laboratory, Champaign, Illinois.

TPWD. 2002. The Black-capped Vireo in Texas.
http://www.tpwd.state.tx.us/publications/pwdpubs/media/pwd_br_w7000_0002.pdf

U. S. Army. 2005. Endangered Species Management Plan. Fort Sam Houston, Camp Bullis, Boerne, Texas.

USFWS. 1991. Black-capped vireo (*Vireo atricapillus*) Recovery Plan. Austin, Texas.

USFWS. 1992. Golden-cheeked warbler (*Dendroica chrysoparia*) Recovery Plan. Albuquerque, New Mexico.

USFWS. 1995a. Black-capped vireo population and habitat viability assessment report. Austin, Texas.

USFWS. 1995b. Golden-cheeked warbler population and habitat viability assessment report. Austin, Texas.

Veni, G. 1994. Geologic controls on cave development and the distribution of endemic cave fauna in the San Antonio, Texas, region. Report for Texas Parks and Wildlife Department and U.S. Fish and Wildlife Service, Austin, Texas, George Veni and Associates, San Antonio, Texas.

Veni, G. 2002. Draft Phase One Karst Hydrogeologic Investigation, Camp Stanley Storage Activity, Bexar County, Texas. Prepared by George Veni and Associates for Parsons. San Antonio, Texas.

Veni, G. and J. Reddell. 1999. Management Plan for the Conservation of Rare Karst Species and Karst Species Proposed for Endangered Listing. Camp Bullis, Bexar and Comal Counties, Texas. Report for Garrison Public Works, Environmental Division, Fort Sam Houston, Texas,

Weinberg, H. J. 1995. Project status report: 1994 field studies of two endangered species (the black-capped vireo and the golden-cheeked warbler) and the cowbird control program on Fort Hood, Texas. Submitted to: HQ III Corps and Fort Hood, Fort Hood, Texas.

Wilkins, N., R. A. Powell, A. A. T. Conkey, A. G. Snelgrove. 2006. Population Status and Threat Analysis for the Black-capped Vireo. Texas A&M University.

A.2: U.S. FISH AND WILDLIFE SERVICE PROGRAMMATIC BIOLOGICAL OPINION, 2012 – 2017

This page left intentionally blank

United States Department of the Interior

FISH AND WILDLIFE SERVICE
10711 Burnet Road, Suite 200
Austin, Texas 78758
512 490-0057
FAX 490-0974

AUG 0 8 2012

Jason D. Shirley
Installation Manager
Camp Stanley Storage Activity
25800 Ralph Fair Road
Boerne, Texas 78015

Consultation No. 02ETAU00-2012-F-0151

Dear Mr. Shirley:

This transmits our final programmatic biological opinion for activities affecting up to 204 acres of golden-cheeked warbler (GCWA) habitat on the Camp Stanley and your GCWA mitigation program. It is anticipated that the individual projects will occur over the next five years that may adversely affect the golden-cheeked warbler (*Setophaga* (=*Dendroica*) *chrysoparia*), which is listed as endangered pursuant to the Endangered Species Act of 1973, as amended (Act)(16 U.S.C. 1531 et seq.) and its habitat.

The geographic scope of this consultation includes lands within the boundaries of Camp Stanley Storage Activity (Camp Stanley), Bexar County, Texas. Although other species listed as endangered pursuant to the Act (black-capped vireo and potentially Bexar County karst invertebrates) may occur on Camp Stanley, the projects in this programmatic opinion are not anticipated to cause any adverse effects to those species. Therefore, they will not be discussed further in this programmatic opinion.

The structure of this programmatic opinion is designed to provide an overall section 7 consultation framework pursuant to the Act within which Camp Stanley may seek regulatory approval for projects over a five year period. A project with adverse effects to listed species that do not meet the criteria set forth in this programmatic opinion will not be covered by this programmatic opinion and would require separate formal consultation. The Service will evaluate projects pursuant to this programmatic opinion as needed to ensure that its continued application will not result in adverse effects on listed species or their habitat in excess of those effects authorized under this programmatic opinion.

Projects covered by this programmatic opinion for incidental take of the golden-cheeked warbler will adhere to the following criteria: No more than 204 acres of golden-cheeked warbler habitat may be adversely affected by the proposed project during a five-year period. Restricting this programmatic opinion to relatively small projects will limit the effects of the programmatic actions on the golden-cheeked warbler and its habitat.

The findings and recommendations in this consultation are based on: (1) various electronic mail correspondence (e-mails), meetings, site visits, and telephone conversations between Camp Stanley staff, U.S. Army's consultant, Parsons Corp., and the Service; (2) the May 1, 2012, letter to the Service requesting consultation; (3) the Biological Assessment of the Programmatic Golden-cheeked Warbler (*Setophaga chrysoparia*) Habitat Mitigation Process for Camp Stanley Storage Activity dated May 2012; and (4) other sources of information available to the Service.

Consultation History

January 14, 2008	Service provides the U.S. Army final programmatic biological opinion for Camp Stanley Storage Activity pursuant to the Integrated Natural Resource Management Plan (INRMP).
April 21, 2011	U.S. Army provides description of proposed road paving project at Camp Stanley to Service.
May 6, 2011	Service provides the U.S. Army with letter affirming the road paving project and mitigation is consistent with terms and conditions of January 14, 2008 biological opinion.
October 26, 2011	Camp Stanley provides its annual report to the Service.
May 1, 2012	Service receives the U.S. Army's biological assessment and request for formal consultation.
May 14, 2012	U.S. Army provides tour of Camp Stanley to the Service.
July 17, 2012	Service provides a draft programmatic biological opinion to the U.S. Army.
July 19, 2012	U.S. Army provides comments on the draft biological opinion to the Service.

Programmatic Opinion Guidelines

Implementing Procedure
The following process will be used when implementing future proposed projects under this programmatic opinion:

1. Camp Stanley will submit a letter to the Service requesting that a proposed action be covered by this programmatic opinion. The letter will be accompanied by a brief biological assessment of the specific action;

2. The Service will review the proposed action (project) to determine if the activity: (a) is not likely to adversely affect golden-cheeked warblers; (b) is appropriate to cover under to this programmatic opinion; or (c) requires a separate biological opinion;

3. When considering a proposed activity under this programmatic opinion, the Service will, in consultation with Camp Stanley staff: (a) review the proposed action with best available information; (b) determine the extent of habitat affected; (c) verify the number of golden-cheeked warbler habitat credits needed; and, (d) document Camp Stanley's off-site conservation measures (use of credits in an approved golden-cheeked warbler conservation bank or its equivalent).

BIOLOGICAL OPINION

Proposed Action

Over a five year period, Camp Stanley intends to design and build several facilities. These include, but are not limited to, buildings for training and water supply infrastructure. The actions covered by this programmatic opinion are necessary to support the varied missions of Camp Stanley Storage Activity. Section 7 (a)(1) of the Act directs Federal agencies to use their authorities to further the purposes of the Act by carrying out conservation programs for the recovery of listed species. Camp Stanley's conservation planning and golden-cheeked warbler mitigation measures are commendable examples of section 7(a)(1) efforts. For more detailed information on Camp Stanley missions, facilities, and conservation measures, please see the BA.

Project location is a key environmental planning opportunity. Selection of project location (siting) will consider a number of factors at Camp Stanley including but not limited to: (1) munitions storage quantity distance arcs; (2) buffer of the range fan; (3) flooding; (4) topography; (5) roads; (6) water and sewage infrastructure; (7) heritage tree preservation; and (8) habitat for the GCWA.

Camp Stanley proposes to establish an account with an adequate number of credits in a GCWA conservation bank. The first project to be covered is estimated to directly degrade about 19 acres of GCWA habitat. The initial number of credits acquired (2012) will be 23, which is expected to be adequate mitigation for the first project to be covered by this programmatic opinion. Camp Stanley estimates a maximum of 204 credits will serve its mitigation needs over the next five years and actual credits needed may be about 50 to 60. Camp Stanley will develop a project description for actions to be reviewed and covered by this programmatic biological opinion. The project description and evaluation of impacts to GCWA habitat will be submitted to the Service. The Service will respond to Camp Stanley with its determination for the project and proposed mitigation units. Camp Stanley will debit a commensurate number of GCWA credits in a GCWA conservation bank prior to ground disturbance for the subject action.

As stated in the BA, as much as 204 acres of GCWA habitat could be degraded by proposed actions. These effects would be mitigated by permanently conserving habitat in an accredited conservation bank. The BA describes the measures to avoid and minimize adverse effects to

GCWA habitat on Camp Stanley and the mitigation strategy for conserving GCWA off-post. The Service recognizes the need for flexibility in identifying and conserving GCWA habitat off-post and offers two options: (1) secure credits from any accredited GCWA conservation bank that includes Camp Stanley in its service area or (2) in coordination with the Service, establish a permanent conservation easement that meets all of the requirements of an accredited conservation bank. The following table (Table 1) summarizes the off-post measures proposed for GCWA habitat affected on Camp Stanley under this consultation. The BA provides descriptions for unoccupied habitat, buffer habitat, and occupied habitat.

Table 1. Proposed Off-Post Mitigation by Category of Habitat Affected.

Category of GCWA Habitat Per Biological Assessment	Ratio of Off-Post Acres in Conservation Stewardship to On-Post Acres Affected
1. Unoccupied (Potential)	1 : 1
2. Buffer Habitat	2 : 1
3. Occupied Habitat	3 : 1

To improve consistency in GCWA habitat determinations, the Service has provided detailed descriptions on our website, **http://www.fws.gov/southwest/es/AustinTexas**. One of the first steps in assessing a proposed project effects on GCWA habitat, is to follow the Texas Parks and Wildlife Department (2003) guidelines and identify/delineate GCWA habitat. It is noteworthy that GCWA have been found in habitat patches smaller than 12 acres and Butcher et al (2010) estimated that the minimum patch size for GCWA reproductive success is between 37 and 50 acres. While larger habitat patches are expected to support larger and more persistent GCWA populations, smaller patches may be important in a landscape where habitat is increasingly fragmented (TPWD 2003).

If GCWA have been detected in a given woodland patch, we consider the patch itself to be occupied. We are unaware of any appropriate means to identify a subset of a patch as occupied (with the balance of the patch designated unoccupied) based on a GCWA observation made during a presence/absence survey. Similarly, a circular buffer around one point (GCWA observation) should not be used to estimate the subset of a patch that is occupied because GCWA typically move freely within and sometimes among habitat patches. Studies of the territories, reproduction, feeding, and movement by all life stages indicate GCWA use a variety of areas within a patch.

Action Area

The Action Area is Camp Stanley Storage Activity, Bexar County, Texas. Figure 1 shows Camp Stanley and an adjacent part of Camp Bullis. Due to safety restrictions, future permanent facilities need to be located outside the range fan. Projects covered by this programmatic consultation are likely to be located in the western part of the North Pasture and the Inner

Cantonment (in the southwest part of Camp Stanley). Figure 2 shows the potential GCWA habitat from Model C developed by Missouri Resource Assessment Partnership (MoRAP) at the University of Missouri, Columbia. Camp Stanley is updating their 2005 vegetation surveys of potential habitat and will provide the report to the Service as part of the five-year review of the Camp's Integrated Natural Resource Management Plan (INRMP) no later than October 2012. These vegetation surveys were accomplished by field work in May and June 2012 following Service protocols and may refine the areas of potential habitat depicted in Figure 2.

Status of the Golden-cheeked Warbler

Species Description and Life History
The golden-cheeked warbler was emergency listed as endangered on May 4, 1990 (55 FR 18844). The final rule listing the species was published on December 27, 1990 (55 FR 53160). No critical habitat is designated for this species. For more information regarding the biology of the golden-cheeked warbler, please see the 1992 Golden-cheeked Warbler Recovery Plan.

The GCWA is a small, insectivorous songbird, 4.5 to 5 inches long with a wingspan of about 8 inches (Pulich 1976, Oberholser 1974). Golden-cheeked warblers breed exclusively in the mixed Ashe juniper/deciduous woodlands of the central Texas Hill Country west and north of the Balcones Fault (Pulich 1976). Golden-cheeked warblers require the shredding bark produced by mature Ashe junipers for nest material. Typical deciduous woody species include Texas oak (*Quercus buckleyi*), Lacey's oak (*Q. laceyi*), escarpment live oak (*Q. fusiformis*), Texas ash (*Fraxinus texensis*), cedar elm (*Ulmus crassifolia*), hackberry (*Celtis occidentalis*), bigtooth maple (*Acer grandidentatum*), sycamore (*Platanus occidentalis*), Arizona walnut (*Juglans major*), and pecan (*Carya illinoinensis*) (Pulich 1976, Ladd and Gass 1999). Breeding and nesting GCWA feed primarily on insects, spiders, and other arthropods found in Ashe junipers and associated deciduous tree species (Pulich 1976).

Male GCWA arrive in central Texas around March 1st and begin to establish breeding territories, which they defend against other males by singing from visible perches within their territories. Females arrive a few days later, but are more difficult to detect in the dense woodland habitat (Pulich 1976). Three to five eggs are generally incubated in April, and unless there is a second nesting attempt, nestlings fledge in May to early June (Pulich 1976). If there is a second nesting attempt, it is typically in mid-May with nestlings fledging in late June to early July (Pulich 1976). By late July, GCWA begin their migration south (Chapman 1907, Rappole et al. 2000). Golden-cheeked warblers winter in the highland pine-oak woodlands of southern Mexico and northern Central America (Kroll 1980).

Historic and Current Distribution
The GCWA's entire breeding range occurs on the Edwards Plateau and Lampasas Cut Plain of central Texas. Golden-cheeked warblers have been confirmed in 39 counties: Bandera, Bell, Bexar, Blanco, Bosque, Burnet, Comal, Coryell, Dallas, Eastland, Edwards, Erath, Gillespie, Hamilton, Hays, Hill, Hood, Jack, Johnson, Kendall, Kerr, Kimble, Kinney, Lampasas, Llano, Mason, McLennan, Medina, Menard, Palo Pinto, Real, San Saba, Somervell, Stephens, Tom Green, Travis, Uvalde, Williamson, and Young. However, many of the counties where it is

known to occur, now or in the past, have only small amounts of suitable habitat (Pulich 1976, Service 1996, Lasley et al. 1997). Diamond (2007) estimated that the amount of suitable GCWA habitat across the species' range was about 4.2 million acres, much of this habitat occurring on private lands. As a result, the population status for the GCWA on private lands remains mostly undocumented throughout major portions of the breeding range.

Reasons for Decline and Threats to Survival

Before 1990, the primary reason for GCWA habitat loss was juniper clearing to improve conditions for livestock grazing. Since then, habitat loss has occurred as suburban developments spread into prime GCWA habitat. Groce et al. (2010) summarized the rates of expected human population growth within the range of the GCWA and found by 2030 the growth rate ranges from 17 percent around the Dallas-Fort Worth area to over 164 percent around San Antonio. As the human population continues to increase, so do associated roads, single and multi-family residences, and infrastructure, resulting in continued habitat destruction, fragmentation, and increased edge effects (Groce et al. 2010).

Fragmentation is the reduction of large blocks of a species' habitat into smaller patches. While GCWA have been found to be reproductively successful in small patches of habitat (less than 50 acres), there is an increased likelihood of occupancy and abundance as patch size increases (Coldren 1998, Butcher et al. 2010, DeBoer and Diamond 2006). Increases in pairing and territory success are also correlated with increasing patch size (Arnold et al. 1996, Coldren 1998, Butcher et al. 2010). In addition, while some studies have suggested that small patches that occur close to larger patches are likely to be occupied by GCWA, the long-term survival and recovery of the GCWA is dependent on maintaining the larger patches (Coldren 1998, Peterson 2001, Texas Nature Conservancy (TNC) 2002).

As GCWA habitat fragmentation increases it creates edges where two or more different vegetation types meet. For the GCWA edge is where woodland becomes shrubland, grassland, a subdivision, etc., and depending on the type of edge, it can act as a barrier for dispersal; act as a territory boundary; favor certain predators; increase nest predation; and/or reduce reproductive output (Arnold et al. 1996, Johnston 2006, Sperry et al. 2008, Sperry et al. 2009). Canopy breaks (the distance between tree top foliage) of as little as 36 feet have been shown to be barriers to GCWA movement (Coldren 1998). Territory boundaries have not only been shown to stop at edges, but GCWA will often avoid nesting near habitat edges (Beardmore 1994, DeBoer and Diamond 2006, Sperry 2007).

Other threats to GCWA include the clearing of deciduous oaks upon which the GCWA forage, oak wilt infection in trees, nest parasitism by brown headed cowbirds (Engels and Sexton 1994), drought, fire, stress associated with migration, competition with other avian species, and particularly, loss of habitat from urbanization (Ladd and Gass 1999). Human activities have reduced GCWA habitat throughout the species' range, particularly areas associated with the I-35 corridor between the Austin and San Antonio metropolitan areas.

Range-wide Survival and Recovery Needs
The recovery strategy outlined in the Golden-cheeked Warbler Recovery Plan (Service 1992), which is currently being revised, divides the breeding range of the GCWA into eight regions, or units, and calls for the protection of sufficient habitat to support at least one self-sustaining viable population in each unit. These recovery units were delineated based primarily on watershed, vegetation, and geologic boundaries (Service 1992).

According to the Golden-cheeked Warbler Population and Habitat Viability Assessment Report (Service 1996 (Golden-cheeked warbler PHVA) and Alldredge et al. (2002), a viable GCWA population needs to consist of more than 3,000 breeding pairs. This and other population viability assessments on GCWA have indicated the most sensitive factors affecting their continued existence are population size per patch, fecundity (productivity or number of young per adult), and fledgling survival (Service 1996, Alldredge et al. 2002). These assessments estimated one viable population will need a minimum of 32,500 acres of prime unfragmented habitat to reduce the possibility of extinction of that population to less than five percent over 100 years (Service 1996). Further, this minimum carrying capacity threshold estimate increases with poorer quality habitat (e.g., patchy habitat resulting from fragmentation).

Mathewson et al. (2012) recently estimated the range-wide GCWA male population at 263,339 (95 percent confidence interval: 223,927 – 302,620). Morrison et al. (2012) concluded that the GCWA exists as a single population across its breeding range. Waples and Gaggiotti (2006) reviewed the varied use of the term population and described the difficulties and paradigms associated with defining a 'population'.

Based on the Golden-cheeked Warbler Recovery Plan (Service 1992), protection and management of occupied habitat and minimization of degradation, development, or environmental modification of unoccupied habitat necessary for buffering nesting habitat are necessary to provide for the survival of the species. Habitat protection must include elements of both breeding and non-breeding habitat (i.e., associated uplands and migration corridors). Current and future efforts to create new and protect existing habitat will enhance the GCWA's ability to expand in distribution and numbers. Efforts, such as land acquisition for GCWA habitat conservation and conservation easements, to protect existing viable populations is critical to the survival and recovery of this species, particularly when rapidly expanding urbanization continues to result in the loss of prime breeding habitat.

Several State and federally owned lands occur within the breeding range of the GCWA, but the overriding majority of the species' breeding range occurs on private lands that have been either occasionally or never surveyed (Service 1992). Currently, there are four large GCWA populations receiving some degree of protection: those at the Balcones Canyonlands Preserve in Travis County; the nearby Balcones Canyonlands National Wildlife Refuge (NWR) in Travis, Burnet, and Williamson counties; Camp Bullis Military Installation in Bexar County; and the Fort Hood Military Reservation in Coryell and Bell counties. There are also several conservation banks (CB) whose goal is to protect GCWA habitat (acres presented are the total if all bank credits are sold): Hickory Pass CB (3,003 acres) in Burnet County, Majestic Ranch CB (495 acres) in Kendall County, and Bandera Corridor CB (4,363 acres) in Bandera and Real

counties. The first phase (also called *tranche*) of the Bandera Corridor CB (about 2,400 acres) is in Bandera County about 48 miles from Camp Stanley.

Environmental Baseline

As described in the Golden-cheeked Warbler Recovery Plan (Service 1992), the breeding range of the GCWA in Texas is divided into eight recovery units and Camp Stanley is located in recovery unit 6. Camp Stanley is comprised of 4,004 acres. The Service estimates that about 30 percent (1,200 acres) of Camp Stanley is medium to high quality GCWA habitat based on models built on remotely sensed forest canopy cover data (Missouri Resource Assessment Partnership (MoRAP) 2008 and Loomis Partners 2008). The majority of Camp Stanley's oak – juniper woodlands are inside the boundaries of the range fan. GCWA surveys at Camp Stanley indicate that all large blocks of oak – juniper woodlands are occupied by GCWA.
The action area, Camp Stanley, constitutes a very small fraction of recovery unit 6. In determining the amount of GCWA habitat affected by a project, the Service uses (and directs others to use) the habitat descriptions in Texas Parks and Wildlife Department's 2003 management guidelines for the GCWA. Woodlands with tree canopy cover exceeding 35 percent containing a mix of Ashe juniper, oaks, and other hardwoods are considered potential GCWA habitat. The Service considers contiguous woodland habitat patches (having the hallmarks of TPWD's GCWA habitat guidance) as occupied if any portion of the woodland patch has been found to be occupied by GCWA during a current or relevant previous survey.

Relatively large blocks of GCWA habitat in Bexar and Comal counties, outside Camp Stanley, are located at Camp Bullis, Government Canyon State Natural Area (SNA) and Honey Creek SNA. Threats within the action area include a lack of oak recruitment due to herbivory from native and non-native animals, death of mature oaks from oak wilt, and wildfires (Pulich 1976, Armstrong et al. 1991, Texas Forest Service 2008, USDA and DOI 2001). Further, as large blocks of good quality habitat become developed, opportunities to meet recovery goals become more limited due to increased development pressure, increased land prices, and fragmentation.

According to our consultations tracking database, there have been 48 formal section 7 consultations on the GCWA range-wide. The action area these consultations covered was over 70.8 million acres. Four of these consultations were on Fort Hood; therefore, we've only counted that action area once in the total area covered by formal consultations. One consultation covered almost half of Texas at 60 million acres. Over 60,290 acres of GCWA habitat were authorized to be affected by these consultations. Several large consultations make up the majority (over 52,000) of this acreage: (1) over 33,000 acres were associated with Fort Hood activities; (2) over 14,000 acres were associated with brush control projects throughout the GCWA's 35 county range; and (3) 5,000 acres were for activities on Camp Bullis, less than 15 percent of which was considered occupied. The result of these consultations is over 63,000 acres of GCWA habitat maintained on DOD land and over 68,000 acres of private land preserved and/or maintained for the benefit of the GCWA.

Additionally, we have issued 129 individual 10(a)(1)(B) incidental take permits covering more than 885,819 acres (note: this is the permit area, not the actual acres of affected habitat). The

majority of this acreage comes from two Regional HCPs: Balcones Canyonlands Conservation Plan (BCCP) at 561,000 acres (Balcones Canyonlands Preserve or BCP) and Williamson County at 316,883 acres. In total all permits authorized effects to over 29,900 acres of GCWA habitat. Mitigation for these effects resulted in preservation of over 15,000 acres of GCWA habitat and almost $1.3 million dollars towards GCWA conservation either to the BCP to buy additional lands or to TPWD to manage the 4,500 acre Parrie Haynes Ranch in perpetuity. Additionally, the BCP has another 20,000 acres of land as part of their preserve, some of which supports GCWA; and if Williamson County exercises their entire take authorized, an additional 4,000 acres will be preserved in perpetuity for the GCWA.

Since 2008, there has been one section 7 formal consultation on the GCWA in the action area. This consultation was on Camp Stanley's Integrated Natural Resources Management Plan (INRMP), which authorized no more than 0.8 acre of GCWA habitat per year to be permanently lost and no more than 3 acres of GCWA habitat per year to be temporarily adversely affected. There have been no 10(a)(1)(B) incidental take permits issued within the action area, as Camp Stanley is a Federal facility.

Distribution on Camp Stanley
Figure 3 shows the distribution of GCWA detections on Camp Stanley and nearby parts of Camp Bullis. The results of surveys and population monitoring of GCWA on Camp Stanley are provided in the BA. Figure 4 shows GCWA detection on Camp Stanley relative to areas characterized by their GCWA occupancy probability as estimated by Morrison et al. (2010). Golden-cheeked warblers have been documented in the majority of the areas of Camp Stanley with suitable habitat in surveys from 2005, 2007, 2009, and 2011. However, these surveys are not adequate for trend analyses. It is noteworthy that certain moderate size habitat patches (e.g., patches in orange in Figure 4, which is the site of the proposed warehouse expansion) appear to be continuously occupied. Golden-cheeked warblers have also been observed in areas surrounding Camp Stanley, including Camp Bullis, Eisenhower Park to the south, and Friedrich Wilderness Park to the west, as well as some adjacent private lands.

Effects of the Proposed Action

It is anticipated that up to 204 acres of golden-cheeked warbler habitat will be destroyed or degraded over a five year period due to the proposed activities. Incidental take of the golden-cheeked warbler under this programmatic opinion will be measured in terms of the direct and indirect effects to habitat resulting from the proposed activities.

The range fan part of the action area (outlined in Figures 1, 2, and 3) has maintained value as a large block of GCWA habitat due in part to restrictions from munitions storage and firearm testing.

Using habitat as an alternative for take of individual golden-cheeked warblers is consistent with the previous consultations and incidental take permits. Estimation of take of individual golden-cheeked warblers is difficult and this programmatic opinion substitutes the acres of habitat for the golden-cheeked warbler that will be affected, directly or indirectly, by proposed activities.

As stated in the proposed conservation measures of the BA, habitat impacts will be mitigated at various ratios depending on GCWA occupancy, commensurate with the estimated level of adverse effect to golden-cheeked warblers and their habitats. The greater the adverse effect to GCWA, the higher the mitigation ratio will be applied. Due to the mitigation ratio reflecting acquisition for amounts higher than a 1:1 ratio, it is anticipated that more suitable habitat for the golden-cheeked warbler will be preserved in perpetuity than that which is destroyed by the proposed clearing activity resulting in a net benefit to the golden-cheeked warbler in the long-term.

Cumulative Effects

Cumulative effects include the effects of future State, local, or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

An undetermined number of future land use conversions and routine agricultural practices are not subject to Federal authorization or funding and may alter the habitat or increase incidental take of warblers and are, therefore, cumulative to the proposed project. These additional cumulative effects include: (1) unpredictable fluctuations in habitat due to urbanization; (2) increase in impervious cover due to urbanization and the Installation of appurtenant facilities, i.e., roads, etc.; (3) use of pesticides on and near GCWA habitat; (4) contaminated runoff from agriculture and urbanization; (5) nest parasitism; and, (6) predation by feral animals and pets.

Camp Stanley and Camp Bullis provide relatively large patches of GCWA habitat in an urban and suburban landscape. The area around Camp Stanley is quickly being developed and GCWA habitat continues to be converted to other uses.

Conclusion

After reviewing the current status of the golden-cheeked warbler, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the Service's biological opinion that individual projects that meet the qualifications for this programmatic opinion, and will be evaluated for cumulative take and habitat losses annually, are not likely to jeopardize the continued existence of the golden-cheeked warbler. This is based primarily on the limited areal extent of the proposed projects. Woodland clearing associated with projects will not occur between March 1 and August 15, which will likely avoid direct take of individual birds. Further, the proposed mitigation strategy will render more protected habitat than that which is currently protected in proposed Recovery Unit 6 and the amount of habitat protected through the proposed mitigation strategy will exceed the amount lost from the proposed clearing on the Installation. The Service anticipates that the habitat protected in conservation banks off-post will be of better quality that that which is cleared.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined by the Service as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harass is defined by the Service as an intentional or negligent act or omission which creates the likelihood of injury to a listed species by annoying it to such an extent as to significantly disrupt normal behavioral patterns, which include, but are not limited to, breeding, feeding and sheltering (50 CFR §17.3). Harm is defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by impairing behavioral patterns, including breeding, feeding, and sheltering. Incidental take is defined by the Service as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act, provided that such taking is in compliance with this Incidental Take Statement.

The measures described below are nondiscretionary and must be implemented by Camp Stanley so that they become binding conditions of any authorization issued to implement a project covered by this programmatic opinion, as appropriate, in order for the exemption in section 7(o)(2) to apply. Camp Stanley has a continuing duty to regulate the activity covered by this incidental take statement. If Camp Stanley (1) fails to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the authorizations, and/or (2) fails to retain oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the Installation must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement [50 CFR 402.14(i)(3)].

Amount or Extent of Take

The Service anticipates incidental take of golden-cheeked warblers will occur as a result of the proposed project. Project sizes and effects authorized under this programmatic opinion are expected to have both beneficial and adverse effects. The Service anticipates the following amount of incidental take from vegetation clearing on the Installation:

1. No more than 204 acres of golden-cheeked warbler habitat may be permanently destroyed over a five year period beginning August 16, 2012; and,

2. The number of golden-cheeked warblers that may be found within 204 acres of habitat may be disturbed, harassed, harmed, or killed as a result of actions authorized under this opinion.

All field biologists working on GCWA on Camp Stanley need to have their own section 10(a)1(A) permit. Any work conducted pursuant to valid permits will be covered for incidental take as prescribed in the individual permit conditions.

Effect of the Take

In the accompanying programmatic opinion, the Service has determined that this level of anticipated take is not likely to result in jeopardy to the golden-cheeked warbler due to the long-term beneficial effects associated with the proposed mitigation strategy and the commitment to provide for protection of GCWA habitat in perpetuity. Off-site mitigation will be secured prior to the initiation of clearing activities. No critical habitat has been designated for the golden-cheeked warbler, therefore, none will be affected.

Reasonable and Prudent Measures

The Service believes the following reasonable and prudent measure is necessary and appropriate to minimize incidental take of golden-cheeked warblers:

1. Minimize harassment and harm of golden-cheeked warblers during activities associated with project actions (e.g., clearing of woody vegetation); and,

2. Mitigation in the form of credits in GCWA conservation banks will occur prior to project-related adverse effects to GCWA habitat. The ratio of conservation bank credits acquired to the area affected by a given project will follow the description in Section 2 of the BA.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, Camp Stanley must comply with the following terms and conditions that implement the reasonable and prudent measures described above and outline required reporting/monitoring requirements. These terms and conditions are non-discretionary.

1. The following terms and conditions implement reasonable and prudent measure number one:

A. To the greatest extent practicable, authorized activities within golden-cheeked warbler habitat should be conducted between August 16th and February 28th. This is the non-nesting period for golden-cheeked warblers. Activities outside the breeding season that impact GCWA habitat may still result in indirect take of GCWA (in the form of harassment). Planning for projects should avoid GCWA habitat, when possible and minimize impacts when habitat cannot be avoided;

B. All personnel involved in any authorized activity covered by this programmatic opinion shall be informed of these terms and conditions prior to the implementation of the authorized activity;

C. Golden-cheeked warblers encountered during authorized activities should be allowed to move away from activities on their own;

D. To the greatest extent practicable, movement of heavy equipment to and from a project site shall be restricted to established roadways to minimize habitat disturbance;

E. Golden-cheeked warbler surveys shall be conducted biannually and in coordination with the Austin Ecological Services Field Office;

F. Occupied golden-cheeked warbler habitat, as described by the Service on page 3 of this programmatic opinion, is considered sensitive and valuable areas and personnel and planning efforts shall, to the greatest extent practicable, avoid such areas;

G. After completion of activities covered by this programmatic opinion that result in habitat alteration, any temporary fill, construction, or other debris shall be removed; and,

H. Camp Stanley shall ensure compliance with the reporting requirements below to assist in management decisions to avoid and minimize effects on golden-cheeked warblers and their associated habitats.

2. The following terms and conditions implement reasonable and prudent measure number two:

A. Prior to clearing activities, Camp Stanley shall ensure that mitigation for the affected area has been secured in an accredited conservation bank in perpetuity.

Reporting Requirements

Appropriate Camp Stanley personnel shall notify the Service immediately if golden-cheeked warblers are found on site as detailed in term and condition 1C, and will submit a report including date(s), location(s), habitat description, and any voluntary corrective measures taken to protect each bird found. Appropriate personnel shall submit locality information to the TPWD no more than 90 calendar days after completing the last field visit of the project site. Each form shall have an accompanying scale map of the site, such as a photocopy of a portion of the appropriate 7.5 minute U.S. Geological Survey map, and shall provide at least the following information: name of the quadrangle; dates (day, month, year) of field work; number of individuals and life stage (where appropriate) encountered; and a description of the habitat by community-vegetation type.

After a given project is submitted and the Service has provided its review of mitigation required, a brief summary should be provided within one month to the Service documenting when the project will be started, and where mitigation credits have been secured.

Where temporary or permanent adverse effects occur, a post-activity report shall be forwarded to the Field Supervisor, Austin Ecological Services Field Office, within 60 calendar days of the completion of such activities. This report shall detail (1) dates that activity occurred; (2) pertinent information concerning the success in implementing restoration measures, as appropriate; (3) an explanation of failure to meet such measures, if any; (4) known project effects

on species listed pursuant to the Act, if any; (5) occurrences of incidental take of species listed pursuant to the Act, if any; and (6) other pertinent information.

Camp Stanley shall provide an annual report to the Service recording each action, the effects of that action to golden-cheeked warblers, and the mitigation efforts to off-set adverse effects of the action to golden-cheeked warblers. This report may be included as a section in the report provided annually (due October 31) pursuant to the biological opinion for the INRMP.

The Austin Ecological Services Field Office is to be notified within three working days of the finding of any dead listed species or any unanticipated harm to the species addressed in this programmatic opinion. The Service contact person for this is the Field Supervisor at (512) 490-0057.

Review Requirements

The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the effects of incidental take that might otherwise result from the proposed action. With implementation of these measures, the Service believes that no more than 204 acres of golden-cheeked warbler habitat will be permanently lost in Proposed Recovery Unit 6 for the duration authorized under this programmatic opinion, or a total of five years. Due to the proposed mitigation strategy, it is anticipated that there will be no net loss of habitat on the Installation within Proposed Recovery Unit 6.

If, during the course of the authorized activities, this level of incidental take is exceeded prior to the annual review, such incidental take represents new information requiring review of the reasonable and prudent measures provided. Camp Stanley must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures. This programmatic opinion will expire five years from the date of issuance. Issuance of a new programmatic opinion will be subject to evaluation of the recovery of the species.

Conservation Recommendations

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on GCWA, to help implement recovery plans, or to develop information.

The recommendations provided here relate only to the proposed action and do not necessarily represent complete fulfillment of the agency's section 7(a)(1) responsibilities for these species.

1. Camp Stanley should prepare and implement a fire protection plan in coordination with Austin Ecological Services and the Fire Management team at Balcones Canyonlands National Wildlife Refuge;

2. Camp Stanley should assist the Service in the re-development and implementation of the recovery plan for the golden-cheeked warbler;

3. Camp Stanley, in partnership with the Service, should develop maintenance guidelines for Camp Stanley projects that will reduce adverse effects of routine maintenance on GCWA and their habitat. Such actions may contribute to the conservation and recovery of GCWA by preventing degradation of existing habitat and increasing the amount and stability of suitable habitat; and,

4. Camp Stanley should work cooperatively with partners to develop the Southern Edwards Plateau Regional Habitat Conservation Plan.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefiting GCWA or other listed species, the Service requests notification of the implementation of any conservation recommendations.

Reinitiation Notice

This concludes formal consultation on the implementation of the Habitat Mitigation Process for Camp Stanley Storage Activity, Bexar County, Texas. As provided in 50 CFR Sec. 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this consultation; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this biological opinion; or, (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

If you have any questions regarding this programmatic biological opinion, please contact Patrick Connor at (512) 334-8419.

Sincerely,

Adam Zerrenner
Field Supervisor

cc: James V. Cannizzo, U.S. Army, Camp Stanley, Boerne, TX

Literature Cited

Abbruzzese, Carlo. 2000. 2000 golden-cheeked warbler and black-capped vireo monitoring program. Balcones Canyonlands Preserve. October 2000.

Alldredge, M.W., J.S. Hatfield, D.D. Diamond, and C.D. True. 2002. Population viability analysis of the golden-cheeked warbler. Final Report to U.S. Fish and Wildlife Service, Region 2, Albuquerque, New Mexico.

Arnold, K., C. Coldren, and M. Fink. 1996. The interaction between avian predators and golden-cheeked warblers in Travis County, Texas. Sponsored by the Texas Department of Transportation. Research report 1983-2, Study Number 7-1983, Texas Transportation Institute, Texas A&M University. College Station, Texas.

Beardmore, C.J. 1994. Habitat use of the golden-cheeked warbler in Travis County, Texas. Thesis, Texas A&M University, College Station.

Blair, R. B. 1996. Land use and avian species diversity along an urban gradient. Ecological Applications 6(2):506-519.

Bolger, D.T., T.A. Scott, and J.T. Rotenberry. 1997. Breeding bird abundance in an urbanizing landscape in coastal southern California. Conservation Biology 11(2):406-421.

Butcher, J.A., M.L. Morrison, D. Ransom, Jr., R.D. Slack, and R.N. Wilkins. 2010. Evidence of a minimum patch size threshold of reproductive success in an endangered songbird. Journal of Wildlife Management 74(1):133-139.

Chapman, F.M. 1907. The warblers of North America. D. Appleton & Co., New York, New York.

Coldren, C.L., 1998. The effect of habitat fragmentation on the golden-cheeked warbler. PhD Dissertation. Texas A&M University, College Station, Texas.

DeBoer, T.S. and D.D. Diamond. 2006. Predicting presence-absence of the endangered golden-cheeked warbler (*Dendroica chrysoparia*). Southwestern Naturalist 51:181–190.

Diamond, D. 2007. Range-wide modeling of GCWA habitat. Project Final Report to Texas Parks and Wildlife Department. Missiouri Resource Assessment Partnership, University of Missouri, Columbia.

Engels, T.M. 1995. Conservation biology of the golden-cheeked warbler. PhD dissertation, University of Texas, Austin, Texas.

Engels, T.M., and C.W. Sexton. 1994. Negative correlation of blue jays and golden-cheeked warblers near an urbanizing area. Conservation Biology 8(1):286-290.

Friesen, L.E., P.F.J. Eagles, and R.J. Mackay. 1995. Effects of residential development on forest-dwelling neotropical migrant songbirds. Conservation Biology 9(6):1408-1414.

Groce, J.E., H.A. Mathewson, M.L. Morrison, and R.N. Wilkins. 2010. Scientific evaluation for the 5-year status review of the golden-cheeked warbler. Texas A&M University – Institute of Renewable Natural Resources, College Station, Texas. Report to U.S. Fish and Wildlife Service.

Gutzwiller, K.J., H.A. Marcum, H.B. Harvey, J.D. Roth, and S.H. Anderson. 1998. Bird tolerance to human intrusion in Wyoming montane forests. The Condor 100: 519-527.

Johnston, M.M. 2006. A survey for potential predators of the golden-cheeked warbler (*Dendroica chrysoparia*) in relation to different edges at the Balcones Canyonlands Preserve. Masters of Science thesis, Texas State University- San Marcos.

Kroll, J.C. 1980. Habitat requirements of the golden-cheeked warbler: management implications. Journal of Range Management 33:60-65.

Ladd, C.G. 1985. Nesting habitat requirements of the GCWA. M.S. thesis. Southwest Texas St. Univ., San Marcos, Texas. 65 pp.

Ladd, C.G. and L. Gass. 1999. The birds of North America: golden-cheeked warbler (*Dendroica chrysoparia*). No. 420.

Lasley, G.W., C.W. Sexton, W. Sekula, M. Lockwood, and C. Shackleford. 1997. Texas region, spring migration, Mar 1 – May 31, 1997. National Audubon Society Field Notes 51:892-897.

Lockwood, M.W. and D. Hernandez. 2000. Surveys of golden-cheeked warblers at Government Canyon, Hill Country, and Honey Creek State Natural Areas, Spring 2000. Texas Parks & Wildlife Dept., Austin, Texas.

Loomis Austin. 2008. Mapping potential golden-cheeked warbler breeding habitat using remotely sensed forest canopy cover data. Prepared for County of Hays, Texas.

Mathewson, H.A., J.E. Groce, T.M. McFarland, M.L. Morrison, J.C. Newnam, R.T. Snelgrove, B.A. Collier, and R.N. Wilkins. 2012. Estimating breeding season abundance of golden-cheeked warblers in Texas, USA. Journal of Wildlife Management 76(6)1117-1128.

Missouri Resource Assessment Partnership. 2008. Golden-cheeked warbler modeling. Prepared for U.S. Fish and Wildlife Service, Austin Ecological Services Field Office.

Morrison, M.L., R.N. Wilkins, B.A. Collier, J.E. Groce, H.A. Mathewson, T.M. McFarland, A.G. Snelgrove, R.T. Snelgrove, and K.L. Skow. 2010. Golden-cheeked warbler population distribution and abundance. Texas AgriLife Research, Texas A&M University, College Station, Texas.

Morrison, M.L. B.A. Collier, H.A. Mathewson, J.E. Groce, and R.N. Wilkins. 2012. The prevailing paradigm as a hindrance to conservation. Wildlife Society Bull. Special Section 1-7.

Moses, E. 1996. Golden-cheeked warbler (Dendroica chrysoparia) habitat fragmentation in Travis County, Texas: a remote sensing and geographical information system analysis of habitat extent, pattern and condition. Masters thesis, Texas A&M University. College Station, Texas.

Oberholser, H.C. 1974. The bird life of Texas (Edgar Kincaid, editor). Austin: The University of Texas Press.

Peterson, C.E. 2001. Golden-cheeked warbler (*Dendroica chrysoparia*: Parulidae) territory and non-territory habitat choice in fragmented ashe-juniper patches on the Kerr Wildlife Management Area. Masters of Science thesis, Southwest Texas State University, San Marcos, Texas.

Pulich, W.M. 1976. The golden-cheeked warbler: a bioecological study. Texas Parks and Wildlife Dept., Austin.

Rappole, J.H., D.I. King., and P. Leimgruber. 2000. Winter habitat and distribution of the endangered golden-cheeked warbler (*Dendroica chrysoparia*). Animal Conservation 2:45-59.

Riffell, S.K., K.J. Gutzwiller, and S.H. Anderson. 1996. Does repeated human intrusion cause cumulative declines in avian richness and abundance? Ecological Applications 6(2):492-505.

Sperry, C.M.H. 2007. Influences of borders on golden-cheeked warbler habitat in the Balcones Canyonlands Perserve, Travis County, Texas. Masters of Science thesis. Texas State University - San Marcos.

Sperry, J.H., R.G. Peak, D.A. Cimprich, and P.J. Weatherhead. 2008. Snake activity affects seasonal variation in nest predation risk for birds. Journal of Avian Biology 39:379-383.

Sperry, J.H., D.A. Cimprich, R.G. Peak, and P.J. Weatherhead. 2009. Is nest predation on two endangered bird species higher in habitats preferred by snakes? Ecoscience 16:111-118.

Wilcove, D.S. 1988. Changes in the avifauna of the Great Smoky Mountains: 1947-1983. Wilson Bulletin 100:256-271.

Texas Department of Transportation. 2006. Biological Evaluation for U.S. Highway 83, Real County, Texas.

Texas Nature Conservancy. 2002. A range-wide assessment of potential breeding habitat for the golden-cheeked warbler. Final report submitted to Natural Resources Management Branch, Fort Hood, Texas.

Texas Parks and Wildlife Department. 2003. Golden-cheeked wabler. Available online. **http://www.tpwd.state.tx.us/huntwild/wild/species/**

Texas Parks and Wildlife Department. 2004. Biological conservation data system. Austin, Texas.

USFWS. 1996. Golden-cheeked warbler population and habitat viability assessment report. Austin, Texas. U.S. National Biological Service Grant No. 80333-1423.

USFWS. 1992. Golden-cheeked warbler (*Dendroica chrysoparia*) Recovery Plan. Albuquerque, New Mexico.

Waples, R.S. and O.E. Gaggiotti. 2006. What is a population? An empirical evaluation of some genetic methods for identifying the number of gene pools and their degree of connectivity. Molecular Ecology 15:1419-1439.

Watson, C.A., F.W. Weckerly, J.S. Hatfield, C.C. Farquhar, and P.S. Williamson. 2008. Presence-nonpresence surveys of golden-cheeked warblers: detection, occupancy, and survey effort. Animal Conservation 11:484-492.

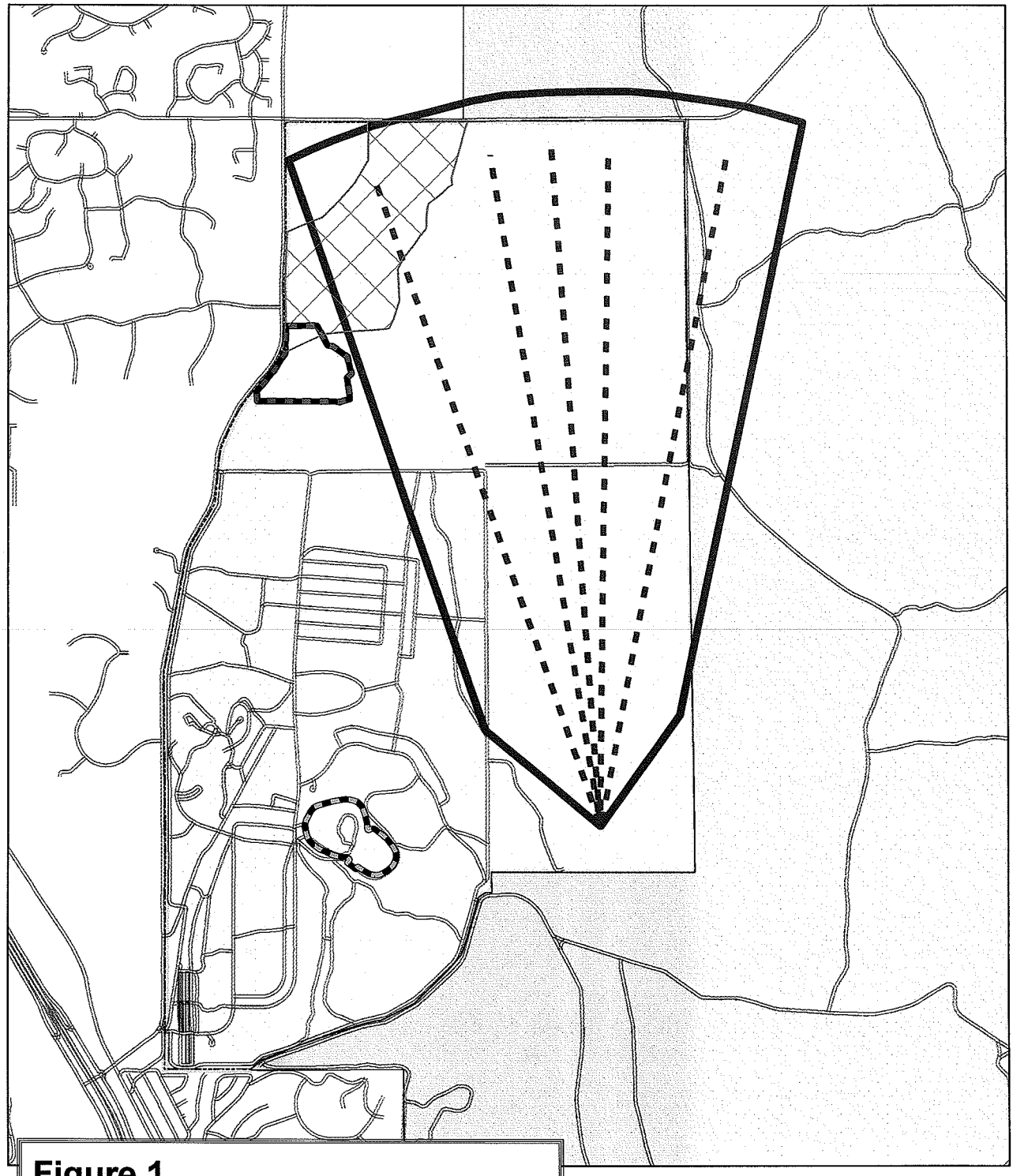


Figure 1.
Camp Stanley Storage Activity Overview and Action Area

- Camp Stanley & Action Area
- Camp Bullis
- Area Burned Sept. 2011
- Range Fan Outline
- General Area for Potential Project 2012
- General Area for Potential Water Tower

0 0.4 0.8 1.6 Kilometers

N

Figure 2.
Camp Stanley
Potential GCWA Habitat
After September, 2011 Burn
GCWA Habitat Model C
With Live Oak as Evergreen

Model C Live Oak as Evergreen

- Potential GCWA Habitat - All Classes - Low to High
- SEPT2011BURNAREACSSA
- 50ft_wide_FIRE_BREAKS_SEPT_2011
- WarehouseTraningArea2012
- Hilltop_for_Water_Tower

0 0.4 0.8 1.6 Kilometers

N

Figure 3. Camp Stanley Potential GCWA Habitat Loomis Partners Model 2008

GCWA Potential Habitat

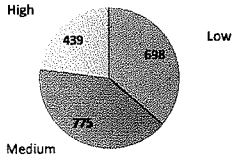
- Low
- Medium
- High
- Range Fan Outline
- Area Burned Sept. 2011
- WarehouseTraningArea2012
- Firebreaks
- Hilltop_for_Water_Tower
- Camp Stanley GCWA Detected 2005 - 2011
- Camp Bullis GCWA Detections 2010 - 2011

N

Row Labels	Sum of Acres	GCWA Potential
1	698.4	Low
2	774.9	Medium
3	439.3	High
Grand Total	**1,912.6**	

Sum of Acres

Potential GCWA Habitat Camp Stanley Total Area, in Acres with September 2011 Burn Removed



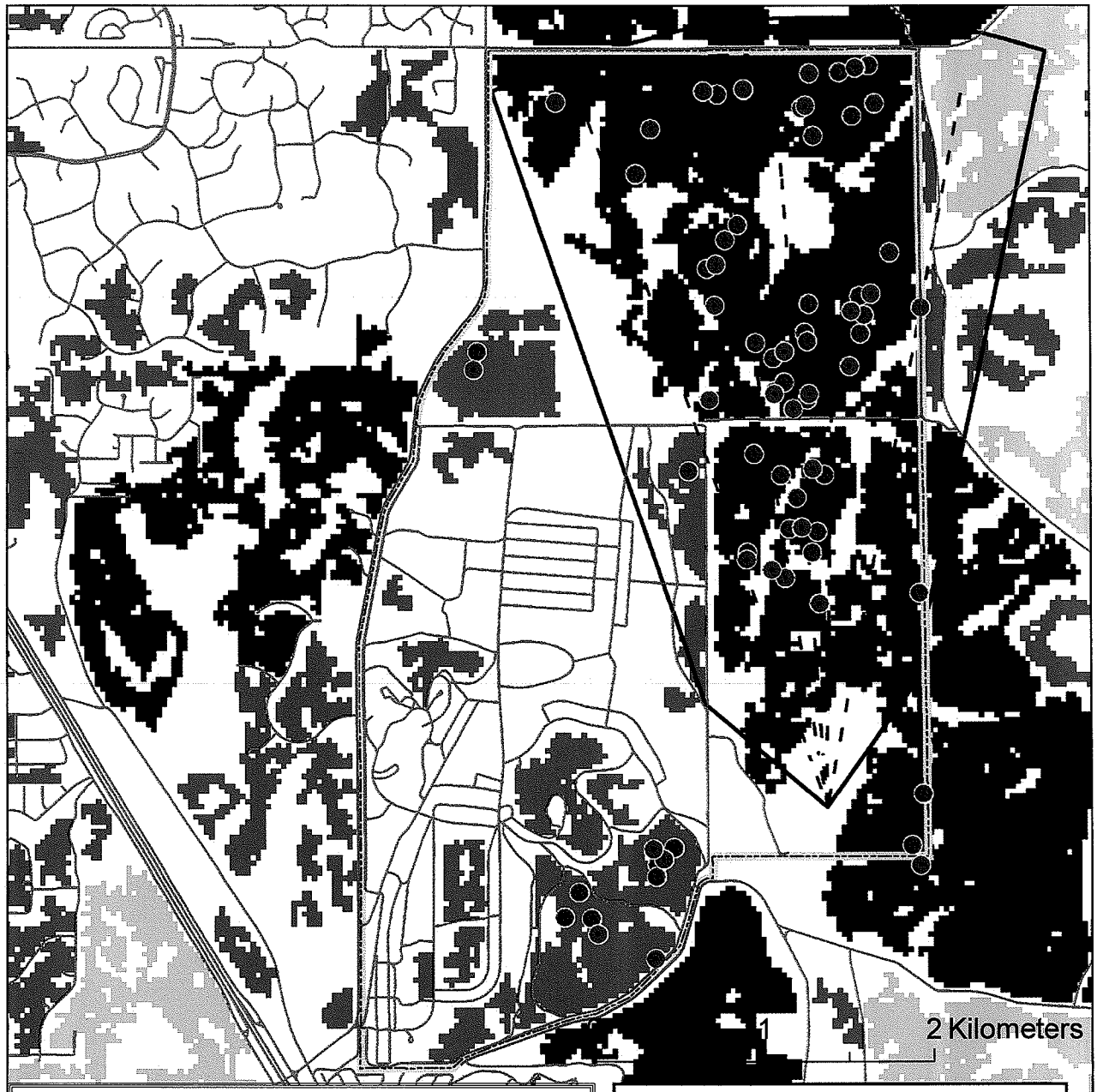


Figure 4. Camp Stanley with Texas A&M University 2010 IRNR GCWA Habitat Model

Camp Stanley

Range Outline

Golden-Cheeked Warbler Model Habitat - Texas A&M 2010

0.01 - 0.30 Occupancy Probability

0.31 - 0.50

0.51 - 0.70

0.71 - 1.00

2011-GCWA-detections

2009-GCWA-detections

2007-GCWA-detections

2005-GCWA-detections

N

W E

S

Occupancy Probability Bin	Camp Stanley Total Acres GCWA in Bin
0.01 to 0.1	157.1
0.1 to 0.2	36.3
0.2 to 0.3	103.0
0.3 to 0.4	83.6
0.4 to 0.5	93.7
0.5 to 0.6	0.0
0.6 to 0.7	0.0
0.7 to 0.8	0.0
0.8 to 0.9	1343.3
0.9 to 1.0	0.0
Texas A&M GCWA Model (Statewide 2010) Total Acres	1817.0

A.3: GOLDEN-CHEEKED WARBLER HABITAT ASSESSMENT AT CAMP STANLEY (2011)

This page left intentionally blank

Golden-cheeked Warbler (*Setophaga chrysoparia*) Habitat Assessments at Camp Stanley Storage Activity, Boerne County, Texas

Prepared for:
Department of the Army
Camp Stanley Storage Activity

Prepared by:
Parsons Corporation
September 2012

Golden-cheeked Warbler (*Setophaga chrysoparia*) Habitat Assessments at Camp Stanley Storage Activity, Boerne County, Texas

Document Notes:

(1) Document title: Golden-cheeked Warbler (*Setophaga chrysoparia*) Habitat Assessments at Camp Stanley Storage Activity, Boerne County, Texas
(2) Scientific names are used at first mention, with common names used thereafter.
(3) Unit measurements are provided in the English system, with metric system equivalents in parentheses.
(4) Golden-cheeked warblers have recently undergone a taxonomic revision. The genus for this species has been renamed from *Dendroica* to *Setophaga,* consistent with the American Ornithologists' Union 7th edition (incl. 52th suppl.).
(5) Cover photo: Golden-cheeked warbler in cedar elm, North Pasture, CSSA. March 2011.

Golden-cheeked Warbler (*Setophaga chrysoparia*) Habitat Assessments at Camp Stanley Storage Activity, Boerne County, Texas

Executive Summary

In support of Camp Stanley Storage Activity's (CSSA) five-year update of the CSSA Integrated Natural Resources management Plan (INRMP) and recent Endangered Species Act (ESA) Section 7(a)(2) consultations with the U.S. Fish and Wildlife Service, CSSA has updated the habitat coverage on the installation for ESA-listed species. Specifically, this document focuses on habitat designations for the golden-cheeked warbler (*Setophaga chrysoparia*). Black-capped vireo (*Vireo atricapilla)* habitat is expected to increase over the next few years within the North Pasture, an expected trend attributed to a wildfire originating off base in September 2011. The cause of the fire is unknown at this time. The fire began in the vicinity of a municipal electric substation just north of Camp Canley and just west of Camp Bullis in the corner between the two installations. Approximately 219 aces on Camp Stanley were affected, of which 29 acres had been Golden-cheeked Warbler habitat.

This document describes the methods and results of field surveys to determine if woodland areas within the installation boundary meet criteria for Potential Habitat. Potential Habitat is defined as areas within CSSA that includes tall, closed canopy, dense and mature stands of Ashe juniper (*Juniperus ashei*), mixed with various oak species and other native hardwood trees. This type of woodland generally grows in relatively moist areas such as steep-sided canyons, slopes, and adjacent uplands; however, warblers may also be found in drier, upland juniper-oak woodlands over flat topography.

Potential Habitat was previously mapped on the facility in 2005, in support of the first systematic surveys adhering to U.S. Fish and Wildlife Service survey protocols. These surveys occur on a biennial basis since 2005, the latest survey in 2011. In 2005, 872 acres of potential habitat were mapped. This update adds an additional 295 acres, for a revised total of 1,167 acres.

The revised acreage is important to installation managers and natural resource personnel for a number of reasons. The size and location of habitat patches compared to the location, intensity, and duration of projects that contribute to CSSA's military mission factor into mitigation costs associated with projects that impact ESA-listed species habitats. Also, a map-able extent of habitat can assist installation planners to avoid or minimize potential impacts to habitats while achieving the military mission. Most of the increased Potential Habitat areas are within currently-constrained portions of the installation (e.g., within range fans, explosive safety arcs) and do not conflict with the day-to-day operation of the installation.

Table of Contents

List of Figures

List of Tables

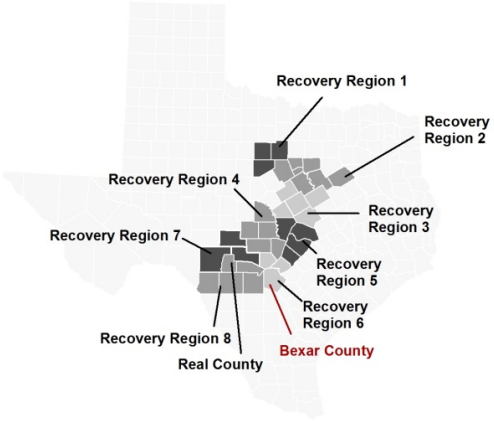
Golden-cheeked Warbler (*Setophaga chrysoparia*) Habitat Assessment at Camp Stanley Storage Activity, Boerne County, Texas

Overview

Habitat assessments for the golden-cheeked warbler (*Setophaga chrysoparia*) were completed throughout the spring and summer of 2012 on certain portions of the Camp Stanley Storage Activity (CSSA), located in Boerne County, Texas (see Figure 1). The Study Area was defined as forested areas in both the Inner cantonment and the outer cantonment that were not included in previous iterations of habitat mapping efforts, which first began with the first systematic bird survey at CSSA in 2005. Since that time, some of these areas have achieved habitat quality suitable to support the golden-cheeked warbler. The U.S. Fish and Wildlife Service (USFWS) also requested a review of potential habitat areas during a recent Endangered Species Act (ESA) Section 7(a)(2) consultation. Incidental observations of golden-cheeked warblers were also noted during the 2012 survey.

Regulatory Status an

The golden-cheeked warbler
(U.S. Fish and Wildlife Service
cheeked warblers breed in w
contain a mix of mature Ashe
(*Quercus* spp.) and provide n
Across the breeding range, th
of confirmed individuals or te
effort. In order to plan and tr
and recovery efforts, USFWS
eight recovery units (U.S.
Fish and Wildlife Service
2010), as shown in Figure
1. Thus far, survey effort
has focused on a relatively
small fraction of the
species' range. For
example, Recovery Region
3 encompasses Fort Hood
and contains about five
percent of the species'
potential habitat.



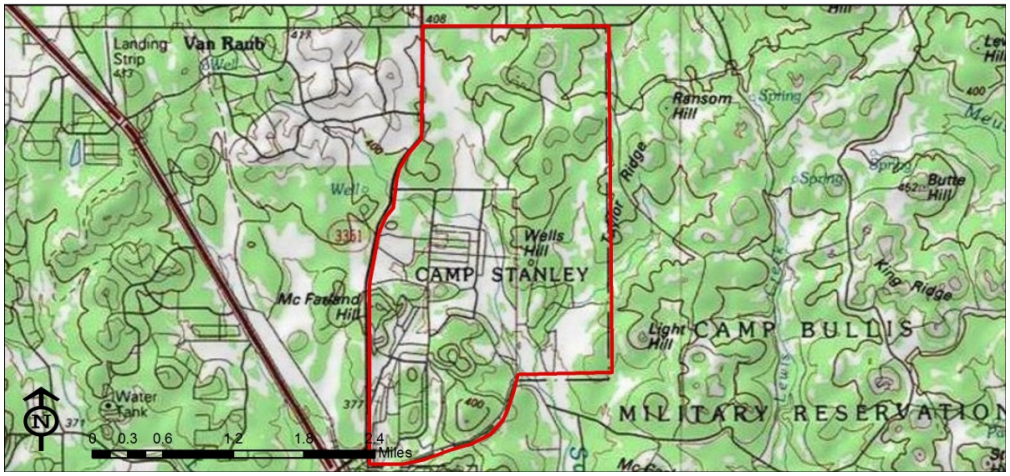


Figure 1: Location of CSSA and Recovery Regions

The Southern Edwards

Plateau Habitat Conservation Plan (within Recovery Unit Five) provides appropriate long term golden-cheeked warbler habitat preservation and management. USFWS assesses threats to ESA-listed species based on five broad factors: (1) Threatened destruction, modification, or curtailment of habitat or range; (2) over-utilization for commercial, recreational, scientific, or educational purposes; (3) disease or predation; (4) inadequacy of existing regulatory mechanisms; and (5) other natural or human-made factors affecting the continued existence of golden-cheeked warblers (U.S. Fish and Wildlife Service 2010). Within the southern portion of the golden-cheeked warbler range, the most significant threat factors appear to be the threatened destruction, modification, fragmentation, or curtailment of habitat or range attributed to planned transmission line corridors, road construction, and division of large land tracts into smaller parcels (U.S. Fish and Wildlife Service 2010).

Golden-cheeked warblers typically occur in mature stands of Ashe juniper (*Juniperus ashei*) mixed with a variety of oaks (*Quercus* spp.) and other deciduous tree and shrub species (Kroll 1980; Pulich 1976; U.S. Fish and Wildlife Service 2010). Ashe juniper and Texas oak (*Quercus buckleyi)* are the most commonly detected woody vegetation species throughout the breeding range relative to golden-cheeked warbler occurrence. Additional species include plateau live oak (*Q. fusiformis*), shin oak (*Q. sinuata* var. *beviloba*), Texas ash (*Fraxinus texensis*), cedar elm (*Ulmus crassifolia*), Arizona walnut (*Juglans major*), and lacey oak (*Q. laceyi*) (Pulich 1976; Rowell et al. 1995; U.S. Fish and Wildlife Service 2010).

Although the species composition of the trees and shrubs varies throughout the breeding range, mature Ashe juniper is always present and often the dominant canopy species (Reemts and Hansen 2008; Rowell et al. 1995).

Status at Camp Stanley Storage Activity

Warblers on CSSA appear to occupy habitat typical of other known occupied habitats within the eastern portion of the breeding range. However, some areas that appear to be acceptable habitat are not occupied, while other areas that do not seem to have the vegetation make-up to provide good habitat are occupied. CSSA provides moderate to high quality warbler habitat. Warblers have previously been documented in the majority of the areas on the installation with suitable habitat. Based on surveys conducted over the past seven years, four sub-populations have been designated within the installation due to the relatively high concentrations of warblers. These areas are:

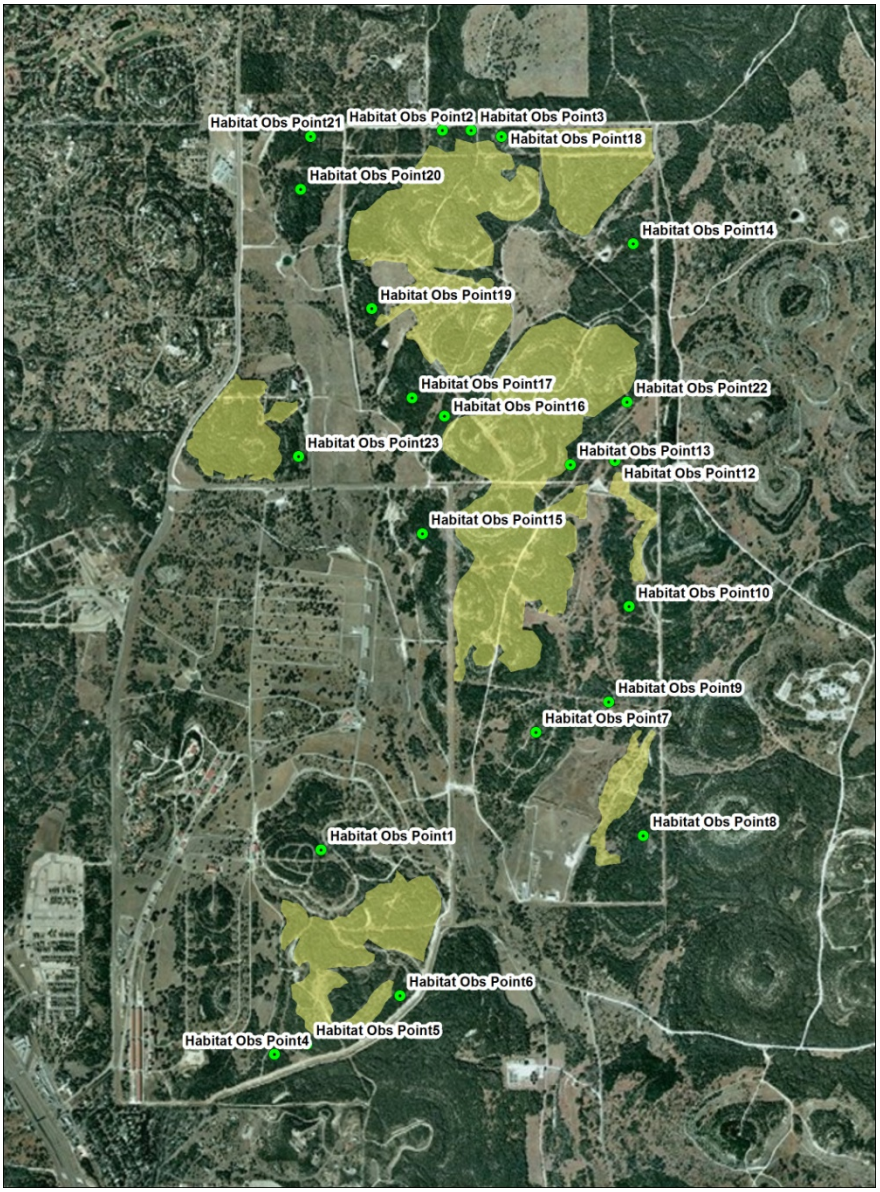
- the main population lives within range buffer areas in the outer cantonment;
- one isolated golden-cheeked warbler territory associated with approximately 65 acres of potential habitat is in the southwestern portion of the north pasture along Ralph Fair Road;
- two territories associated with about 132 acres of potential habitat in the south central portion of the inner cantonment; and,
- a 65-acre area of potential habitat in the southeast corner of the outer cantonment (Parsons 2011).

Warblers have also been observed in areas surrounding CSSA, including Camp Bullis, Eisenhower Park to the south, Friedrich Wilderness Park to the southwest, and some private lands over a mile to the west.

Methods

Field Methods

To assess golden-cheeked warbler habitat, vegetation descriptions were taken within each discrete habitat unit, bounded by identifiable features (e.g. roads, fencelines, stark vegetation community boundaries). The percent canopy cover and ratio of canopy species (hardwood-Ashe juniper-pine) was determined. Additionally, dominant deciduous species, the presence of mature Ashe juniper (5 inch+ diameter at breast height [DBH]) and deciduous species recruitment were assessed at each point. Incidental observations of obvious ungulate damage were also noted. Habitat methods conform to methods described by the U.S. Fish and Wildlife Service (2010). Habitat observation points are shown in Figure 2.



Areas previously mapped as potential habitat for the golden-cheeked warbler are shaded in yellow.

Post-Field Analysis Methods

Habitats within forested areas of the Inner and Outer Cantonments exhibit a strong correlation to soils and topography. Therefore, geographic information system (GIS) data layers were obtained from U.S. Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS) soil surveys for Bexar County (Natural Resources Conservation Service 2009), as well as slope and aspect (direction of slope) from a high resolution topographic dataset (derived from a LiDAR [light distance

and ranging] acquisition in 2003). Habitat information in the field, along with golden-cheeked warbler locations were qualitatively analyzed for correlations.

Results

Revised Golden-cheeked Warbler Habitat Coverage

Measurements taken at 23 locations in areas previously not mapped as Potential Habitat at CSSA are summarized in Table 1. Based on the information shown in Table 1, the existing potential habitat areas (shown in Figure 2) have been updated with additional areas (shown in Figure 3).

Table 1: Habitat Observation Point Habitat Parameters

Habitat Observation Point	Dominant Hardwoods	Hardwood composition	Canopy Closure	Slope	Soil Unit	Habitat
1	Live oak, Texas oak	30	60	30	BrE	Not included: patch size highly fragmented
2	Live oak, Texas oak, cedar elm	40	70	5	Cb	Yes
3	Live oak, Texas oak, cedar elm	60	60	10	TaC	Yes
4	Live oak	40	60	10	TaB	Yes
5	Live oak, Texas oak	50	70	40	BrE	Yes
6	Live oak, Texas oak, shin oak	50	80	35	BrE	Yes
7	Live oak, Texas oak, cedar elm	25	70	35	BrE	Yes
8	Live oak, Texas oak, cedar elm	40	80	10	TaC	Yes
9	Live oak	50	80	5	Kr	Yes
10	Live oak	50	70	10	BrD	Yes
11	Live oak, Texas oak, cedar elm	50	70	10	BrD	Yes
12	Live oak, Texas oak, cedar elm	25	90	5	Kr	Yes
13	Live oak, cedar elm	40	70	10	TaB	Yes
14	Live oak, cedar elm	25	80	5	Kr	Yes
15	Live oak, Texas oak, cedar elm	40	70	10	TaB	Yes
16	Live oak, Texas oak, cedar elm	30	60	5	Kr	Yes
17	Live oak, Texas oak	30	60	10	TaB	Yes
18	Live oak, cedar elm	25	60	10	TaB	Yes
19	Live oak, Texas oak, cedar elm	40	70	10	TaB	Yes
20	Live oak, Texas oak	60	80	10	TaB	Yes
21	Live oak, walnut, cedar elm	80	70	0	LvB	Yes
22	Live oak, Texas oak	80	80	0	TaB	Yes
23	Live oak	50	20	15	BtE	Not included: transitioning out of oak parkland to low-stature cedar break

Notes: Hardwood composition, canopy closure, and slope reported as percents. BrE = Brackett gravelly clay loam, 12 to 20 percent, Cb = Crawford and Bexar stony soils, TaC = Eckrant cobbly clay, 5 to 15 percent, TaB = Eckrant cobbly clay, 1 to 5 percent, Kr = Krum clay, 1 to 5 percent, BrD = Brackett gravelly clay loam, 5 to 12 percent, LvB = Lewisville silty clay, 1 to 5 percent, BtE = Brackett-Eckrant association, 20 to 60 percent.

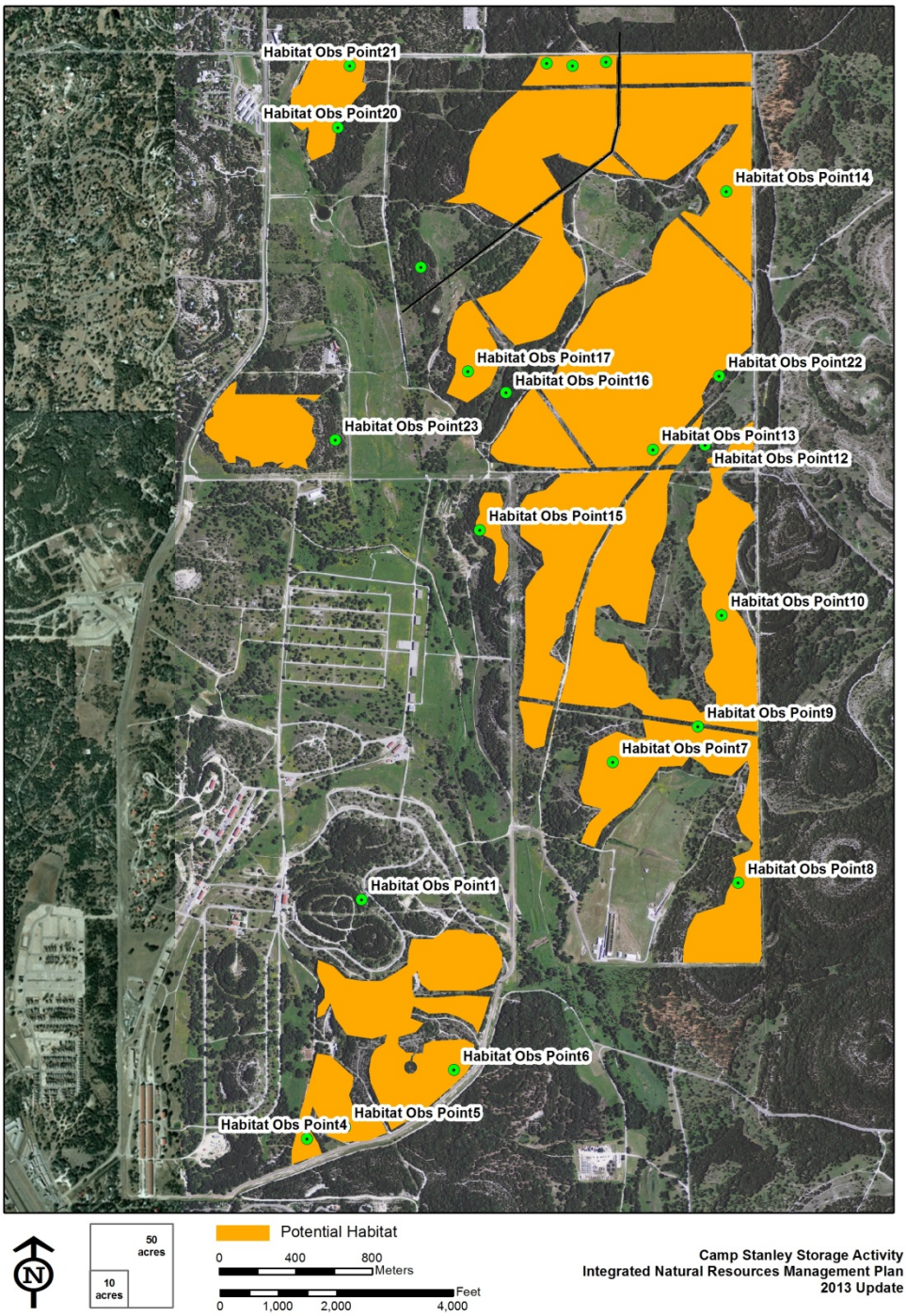


Figure 3: Revised Habitat Coverage

The following subsections describe the vegetation community types, canopy trees and understory shrub and trees observed at each bird location, browse pressure observations, and characteristics of soil, topography, and hydrology that either contribute or limit habitat quality.

Vegetation Community Types

Surveyors identified three major woodland communities that support golden-cheeked warblers. Initial habitat information (tree species composition and structure) suggests that the East and Northeast pasture woodlands are typical of Edwards Plateau golden-cheeked warbler habitats, with apparent Chihuahuan Desert influences.

- ***Juniper woodlands***: These woodlands contain a relatively high percentage of junipers, at least 80 percent. Understory vegetation includes Texas mountain laurels, Texas persimmons, and various smaller stature oaks, such as shin and live oaks. Occasional observations of catclaw acacia and black cherry in more mesic areas.

- ***Mixed oak-juniper woodlands*:** These woodlands have a higher representation of oaks in the upper canopy than juniper woodlands. Variation in oak species was observed, based on position along a xeric-mesic gradient. For instance, lacey oaks and Texas oaks were more readily observed along ephemeral draws, with a higher relative concentration of vasey oaks on the slopes above the drainages. Understory vegetation includes Texas mountain laurels, Texas persimmons, and various smaller stature oaks, as well as Texas (or little) walnuts and black cherries in more mesic areas.

Tree and Shrub Species List at Habitat Observation Points

As part of the golden-cheeked warbler habitat assessment, canopy tree species and understory species were noted at each observation point. This is typical of other parts of the eastern portion of the golden-cheeked warbler's breeding range.

Table 2 lists each tree and shrub species observed.1 In addition to noting tree and shrub species, the dominant hardwood species were noted at each observation location. As shown in Figure 4, live oaks, Texas oaks, and cedar elms were the most common dominant hardwood species observed within habitats. This is typical of other parts of the eastern portion of the golden-cheeked warbler's breeding range.

Table 2: Tree and Shrub Species at Habitat Observation Points

Scientific name	Common name	Observed habit	
		Tree	Shrub
Acacia farnesiana	Sweet acacia (aka Huisache)	X	X
Acacia greggii	Catclaw acacia		X
Diospyros texana	Texas persimmon	X	
Eysenhardtia texana	Texas kidneywood	X	X
Forestiera reticulate	Netleaf swampprivet (aka Net-leaf forestiera)		X
Juglans microcarpa	Little walnut	X	
Juniperus ashei	Ashe juniper	X	
Mahonia trifoliolata	Agarita (aka Algerita)		X
Platanus occidentalis	Sycamore	X	
Prunus serotina var. eximia	Escarpment black cherry	X	
Quercus buckleyi	Spanish oak (aka Texas red oak)	X	
Quercus fusiformis	Plateau live oak (aka Texas live oak)	X	
Quercus sinuata var. breviloba	Shin oak	X	
Rhus virens	Evergreen sumac		X
Sophora secundiflora	Texas mountain laurel	X	X
Ulmus crassifolia	Cedar elm		
Yucca rupicola	Twistleaf yucca		X

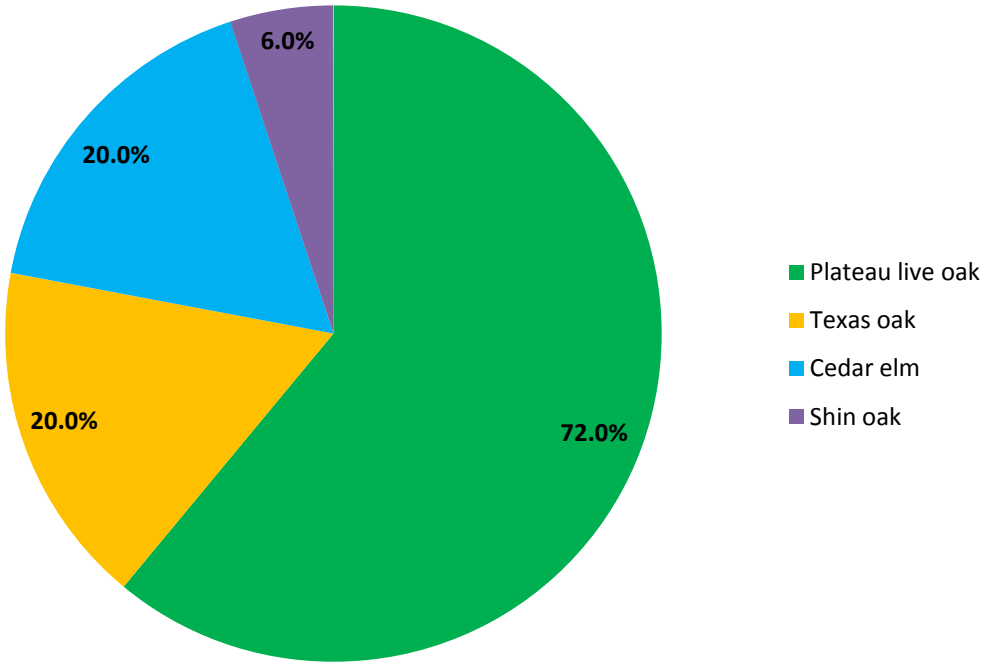


Figure 4: Dominant Hardwood Species at Observed Bird Locations

Browse Observation

Overbrowse by native and exotic ungulates can be detrimental to the regeneration of hardwood species and thus a direct impact to the long-term stability of golden-cheeked warbler habitat. At each vegetation/habitat assessment location, a cursory determination of browse was made. Although some points did show moderate browse by ungulates, overall there was little to no browse observed on woody species. This is in stark contrast to the commonly observed, moderate to heavy browse pressure noted in golden-cheeked warbler habitat in other parts of the eastern portion of the breeding range, particularly in habitats around Austin and San Antonio areas where deer populations often greatly exceed the capacity of the habitat.

At many observation locations, forb species were often found to be nipped indicating the presence of deer. The overall lack or minimal recruitment of woody species at most points could indicate overpopulation of ungulates. However, it should be noted that the recent, historic drought must be having a negative effect on the vegetation community of the ranch. Deer were observed infrequently as were any field signs (rubs, pellets, tracks) indicating possibly an ecologically healthy population. Feral hog (*Sus scrofa*) damage was not observed at any location, however, the presence of hogs on the installation cannot be discounted.

Soils Units

Habitat for golden-cheeked warblers occur on a diverse set of soils at CSSA. Soils at CSSA and the surrounding areas are derived from the Edwards Limestone Formation, as well as limestone bedrock of the Upper Glen Rose Formation. These soils are shallow, especially in uplands, with deeper soils overlying cemented stream bed material in ephemeral drainage bottoms. As shown in Figure 5, over half of the soil unit composition in habitat areas are attributed to Eckrant cobbly clay (1 to 5 percent slopes) and Bracett-Eckrant association on steeper slopes. The other soil units are typically found in flats and baseslopes found in ephemeral draws. Woodland composition and structure appears to be more influenced by historical land use instead of soil composition.

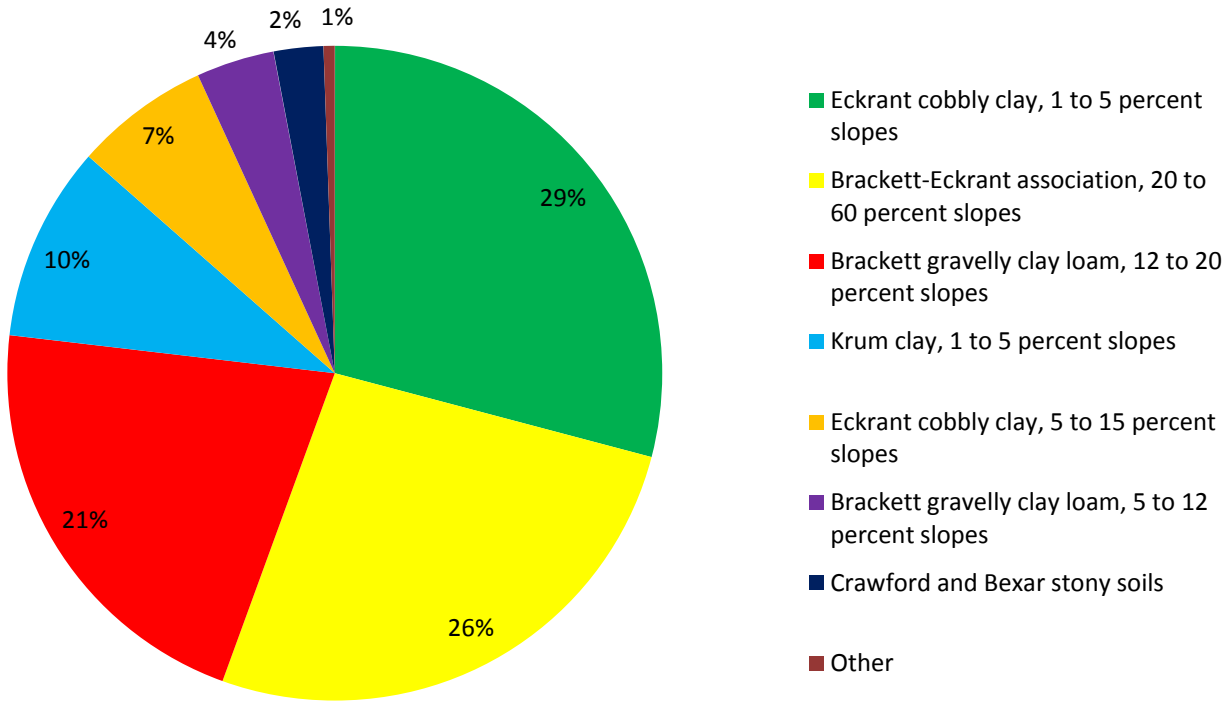


Figure 5: Soil Units within Potential Habitat Area

Summary and Discussion

Golden-cheeked warbler habitats located at CSSA are consistent with habitat descriptions of other, more well-studied large patch size habitats in the eastern portion of the breeding range. The Potential Habitat coverage has been updated to include a total area of 1,167 acres of woodlands. This represents a 29 percent increase in the amount of Potential Habitat for the golden-cheeked warbler. The previous habitat assessments in 2005 recorded 873 acres of golden-cheeked warbler habitat. Most of this increase occurs within the range fan and explosive safety arcs. Seven years of vegetation growth has apparently resulted in much more GCWA habitat now being in existence at Camp Stanley. Because of the revised habitat coverage, CSSA may request a modification to the programmatic Biological Opinion that permits CSSA for the removal of habitat on an annual basis to achieve military mission objectives.

References

Kroll, J. C. (1980). Habitat requirements of the golden-cheeked warbler: Management implications. *Journal of Range Management, 33*, 60-65.

Lower Colorado River Authority (2012). LCRA CREZ homepage. Retrieved from http://www.lcra.org/energy/trans/crez/index.html 6 April 2012.

Natural Resources Conservation Service. (2009). Soil Survey of Bexar County, Texas. Prepared by U.S. Department of Agriculture, Natural Resources Conservation Service and Texas Agricultural Extension Program.

Pulich, W. M. (1976). The golden-cheeked warbler: A bioecological study. Prepared for Texas Parks and Wildlife Department. Austin, Texas.

Reemts, C. M. & Hansen, L. L. (2008). Slow recolonization of burned oak-juniper woodlands by the Ashe juniper (*Juniperus ashei*): Ten years of succession after crown fire. *Forest Ecology and Management 255*, 1057–1066.

Rowell, G. A., Keddy-Hector, D. P., Diamond, D. D., Lloyd, J., McKinney, B., Maggio, R. C. & Cook, T. L. (1995). Remote sensing and GIS of golden-cheeked warbler breeding habitat and vegetation types on the Edwards Plateau. Texas Parks and Wildlife Department Grant No.l E-1-7, Project No. 39. Austin, Texas.

U.S. Fish and Wildlife Service. (1990). FInal Rule to List the Golden-cheeked Warbler as Endangered. 55 FR 53153 53160.

U.S. Fish and Wildlife Service. (2010). Scientific Evaluation for the 5-Year Status Review of the Golden-cheeked Warbler. College Station,Texas: Institute of Renewable Natural Resources and the Department of Wildlife & Fisheries Sciences Texas A&M University. Prepared by J. E. Groce, H. A. Mathewson, M. L. Morrison and N. Wilkins.

Wrede, J. 2010. *Trees, Shrubs, and Vines of the Texas Hill Country*, 2nd ed. Texas A&M University Press, TX, pp. 168.

A.4: 2012 ANNUAL REPORT TO U.S. FISH AND WILDLIFE SERVICE AUSTIN ECOLOGICAL SERVICES FIELD OFFICE

This page left intentionally blank

2012 Annual Report
Natural Resources Management Activities at Camp Stanley Storage Activity, Bexar County, Texas

Prepared by:
U.S. Army / Camp Stanley Storage Activity

Prepared for:
U.S. Fish and Wildlife Service Ecological Services
Austin Ecological Services Field Office

2012 Annual Report
Natural Resources Management Activities at
Camp Stanley Storage Activity, Bexar County, Texas

Document Notes:

- Document title: 2012 Annual Report Natural Resources Management Activities at Camp Stanley Storage Activity, Bexar County, Texas.
- Scientific names are used at first mention, with common names used thereafter.
- Unit measurements are provided in the English system, with metric system equivalents in parentheses.
- Golden-cheeked warblers have recently undergone a taxonomic revision. The genus for this species has been renamed from *Dendroica* to *Setophaga,* consistent with the American Ornithologists' Union 7th edition (incl. 52th suppl.).

Executive Summary

The U.S. Army / Camp Stanley Storage Activity (CSSA) is submitting this annual report to the U.S. Fish and Wildlife Service (USFWS) Austin Ecological Services Field Office. This report summarizes the natural resource work conducted in 2012 that is relevant to Endangered Species Act (ESA) listed species and habitats on the installation, and is prepared in accordance with CSSA's obligations under Section 7(a)(2) of the ESA, as well as Sikes Act Improvement Act (Sikes Act) obligations to follow and implement an installation Integrated Natural Resources Management Plan (INRMP). As specified in the 2008 Programmatic Biological Opinion, the annual reporting period is from October to October of each year.

In summary, activities at CSSA have included the following elements:

- Completion of Section 7 ESA consultation between CSSA and USFWS regarding the construction and operation of an expanded warehouse facility in the North Pasture.
- Closing of the mitigation requirements associated with the Section 7 ESA consultation, resulting in CSSA acquisition of 23 credits from an accredited conservation bank (Bandera Canyon Conservation Bank).
- Completion of habitat clearance activities required for the construction phase of the warehouse expansion project.
- Completion of field surveys to revise the potential habitat coverage for golden-cheeked warbler (*Setophaga chrysoparia*), in response to comments received from the USFWS Austin Ecological Services Field Office.
- Habitat clearance activities under the 2008 Programmatic Biological Opinion.
- Update of the installation INRMP (in process). The original INRMP was finalized in April 2008, the finalization of the updated INRMP is anticipated to occur in April 2013.

The elements listed above are discussed in more detail in this document. Actual golden-cheeked warbler and black-capped vireo (*Vireo atricapilla*) surveys are conducted on a biennial basis, and have been accomplished in 2005, 2007, 2009, and 2011, with the next survey to be conducted in 2013.

Table of Contents

List of Tables

List of Figures

Introduction

Camp Stanley Storage Activity (CSSA), formerly known as Leon Springs Military Reservation, is located in Bexar County, northwest of downtown San Antonio, Texas. The post is located immediately east of State Highway 3351, approximately one-half mile east of Interstate Highway 10. CSSA comprises 4,004 acres (1,620 hectares), divided into an inner and an outer cantonment. CSSA is a subinstallation of McAlester Army Ammunition Plant, United States (U.S.) Army Field Support Command, Army Materiel Command, U.S. Army. The primary mission of the installation is receipt, storage, and issuance of ordnance as well as quality assurance testing and maintenance of military weapons and ammunition. In addition, a restricted hunting program is conducted by military and installation personnel. Figure 1 shows a summary diagram of installation activities.

Figure 1: Camp Stanley Storage Activity Military Mission

This annual report summarizes the natural resource work conducted in 2012 that is relevant to Endangered Species Act (ESA) listed species and habitats on the installation, and is prepared in accordance with CSSA's obligations under Section 7(a)(2) of the ESA, as well as Sikes Act Improvement Act (Sikes Act) obligations to follow and implement an installation Integrated Natural Resources Management Plan (INRMP). As specified in the 2009 Programmatic Biological Opinion, the annual reporting period is from October to October of each year.

This report includes detailed activity descriptions relevant to the CSSA natural resource program for the 2012 reporting year. These activities include: (1) completion of Section 7 ESA consultations resulting in a programmatic Biological Opinion for military mission activities (2012-2017), (2) completion of mitigation requirements for the North Pasture warehouse expansion, (3) completion of habitat clearance activities associated with the North Pasture warehouse expansion, (4) revision of the 2005 potential habitat coverage for golden-cheeked warblers, (5) removal of 0.80 acre of habitat in the southern portion of the Inner Cantonment, and (6) update and revision of installation INRMP.

Section 7 ESA Consultation: 2012 Programmatic Biological Opinion for Military Mission Improvements (Consultation 02ETAU00-2012-F-0151)

On 8 August, 2012, the USFWS Austin Ecological Services Field Office finalized a programmatic Biological Opinion for activities affecting up to 204 acres of golden-cheeked warbler habitat (USFWS consultation number 02ETAU00-2012-F-0151). The 2012 programmatic Biological Opinion allows for CSSA to implement several military mission improvements (e.g. infrastructure for training, water supply infrastructure) that may impact the golden-cheeked warbler. Location of these proposed and notional projects are constrained by munitions storage quantity distance arcs, range fan buffers and safety zones, existing infrastructure (e.g. roads, buildings, fences, water and sewage facilities), and various natural resource constraints (e.g. topographic constraints, floodplain locations, heritage tree locations, ESA-listed species habitats).

The 2012 programmatic Biological Opinion approves CSSA's proposal to obtain an adequate number of credits from a USFWS-approved conservation bank. CSSA estimated that the maximum number of credits would be 204 credits, although between 50 and 60 credits may meet CSSA requirements. The effects of habitat removal would be mitigated by permanently preserving habitat in an accredited conservation bank.

The USFWS also approved a framework for establishing mitigation credit requirements. The framework calls for habitat to be classified as (1) unoccupied, but potential habitat, (2) buffer habitat, and (3) occupied habitat.

Table 1 shows the mitigation requirements for each of these classifications.

Table 1: Mitigation Ratio Requirements Specified under the 2012 Programmatic Biological Opinion

Category of Golden-cheeked Warbler Habitat	Ratio of Off-Installation Acres in Conservation Stewardship to On-Installation Acres Affected
Category 1: Unoccupied / Potential Habitat	1:1
Category 2: Buffer Habitat	2:1
Category 3: Occupied Habitat	3:1

The 2012 programmatic Biological Opinion also specified additional conservation measures. The measures will serve as non-discretionary guidelines and should provide appropriate golden-cheeked warbler habitat protection so that CSSA can maintain compliance with the Terms and Conditions of the 2008 Biological Opinion and management goals, while meeting the military mission requirements. These measures are described below:

- Habitat alteration associated with a project shall occur when golden-cheeked warbler are not present in the Action Area.

- Black-capped vireo habitat will be specifically avoided. Any take of black-capped vireo habitat will be addressed under the 2008 Biological Opinion.
- Federally listed karst invertebrate preserves will be specifically avoided.
- All brush/slash piles shall be burned or mulched in place, or moved to another area and burned or mulched in place. Burning of slash material will be considered as the preferred method, and only with prior concurrence from the CSSA Environmental Manager, who is responsible for prescribed burning. Mulching and/or disposing of brush and slash will reduce the danger of ladder fuels in the event of wildfire, and will reduce habitat opportunities for Texas rat snakes (*Elaphe obsoleta lindheimeri*), a major predator of golden-cheeked warblers. Timely removal of brush/slash piles is imperative before the onset of the next breeding season.
- All construction trails, equipment storage areas, and equipment staging areas associated with habitat alteration will be located outside remaining golden-cheeked warbler habitat, and in non-endangered species habitat areas.
- To prevent the spread of oak wilt disease (*Ceratocystis fagacearum*), damage to Texas oak (*Q. buckleyi*) and live-oak trees will be minimized. Immediately sealing oak injuries with pruning paint and performing modification during the winter months should reduce disease infection and spread.

Figure 2 shows the steps to implement the guidelines of the 2012 programmatic Biological Opinion.

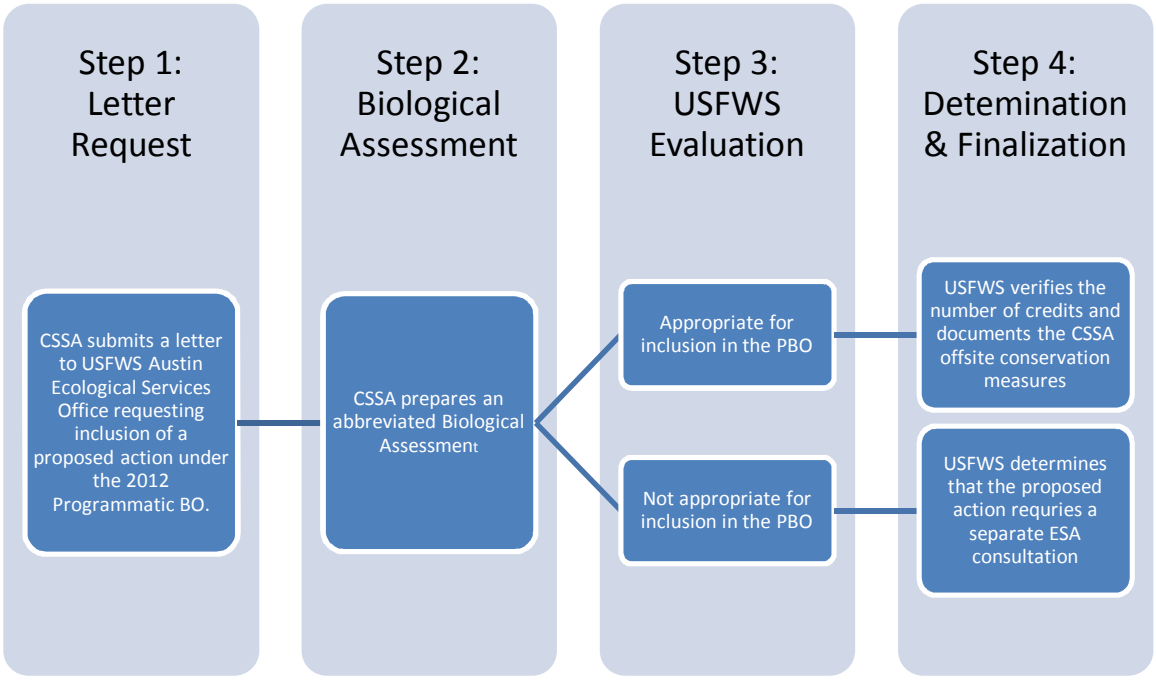


Figure 2: 2012 Programmatic Biological Opinion Implementation Steps

Completion of Mitigation Requirements for the North Pasture Warehouse Expansion

Following the procedures shown in Figure 2, CSSA submitted a letter to USFWS Austin Ecological Services Field Office and a Biological Assessment on 1 May 2012. The proposed action was to clear 14.0 acres of unoccupied / potential habitat and 4.5 acres of buffer habitat. Following the mitigation ratio requirements specified in Table 1, CSSA proposed to acquire 23 credits from Bandera Canyon Conservation Bank. The USFWS Austin Ecological Services Field Office determined that this request was appropriate for inclusion under the 2012 programmatic Biological Opinion, and approved the mitigation action on 21 August 2012. Figure 3 shows the extent of habitat clearance activities associated with the North Pasture warehouse facility.

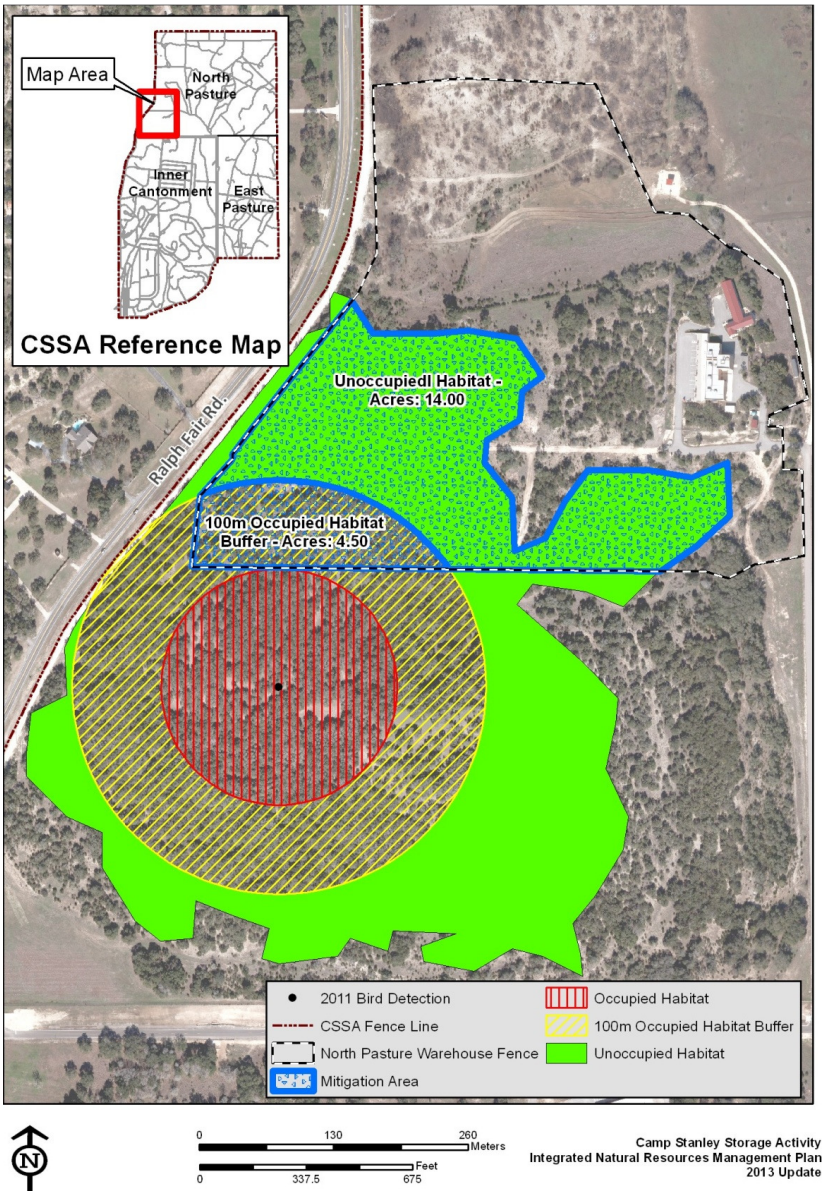


Figure 3: North Pasture Warehouse Habitat Clearance Requirements

Completion of Habitat Clearance Activities in the North Pasture

In accordance with the 2012 programmatic Biological Opinion, habitat clearance activities did not occur during the golden-cheeked warbler nesting period (the nesting / breeding season generally spans the period between late February to mid-August). Required clearance activities were completed between the end of August and October 2012.

Revision of Potential Habitat Coverage Map at CSSA

In support of CSSA's five-year update of the CSSA INRMP and recent Section 7 ESA consultations with between CSSA and the USFWS Austin Ecological Services Field Office, CSSA has updated the habitat coverage on the installation for ESA-listed species. Specifically, this document focuses on habitat designations for the golden-cheeked warbler. Black-capped vireo habitat is expected to increase over the next few years within the North Pasture, an expected trend attributed to the wildfire originating off base in September 2011.

"Potential Habitat" is defined as areas within CSSA that include tall, closed canopy, dense and mature stands of Ashe juniper (*Juniperus ashei*), mixed with various oak species and other native hardwood trees. Definitions of habitats are based on recently updated information provided by USFWS (www.fws.gov/southwest/es/AustinTexas), Texas Parks and Wildlife guidelines, and results and observations from biennial systematic golden-cheeked warbler surveys conducted at CSSA since 2005 (shown on Figure 4). This type of woodland generally grows in relatively moist areas such as steep-sided canyons, slopes, and adjacent uplands; however, warblers may also be found in drier, upland juniper-oak woodlands over flat topography.

The revised acreage is important to installation managers and natural

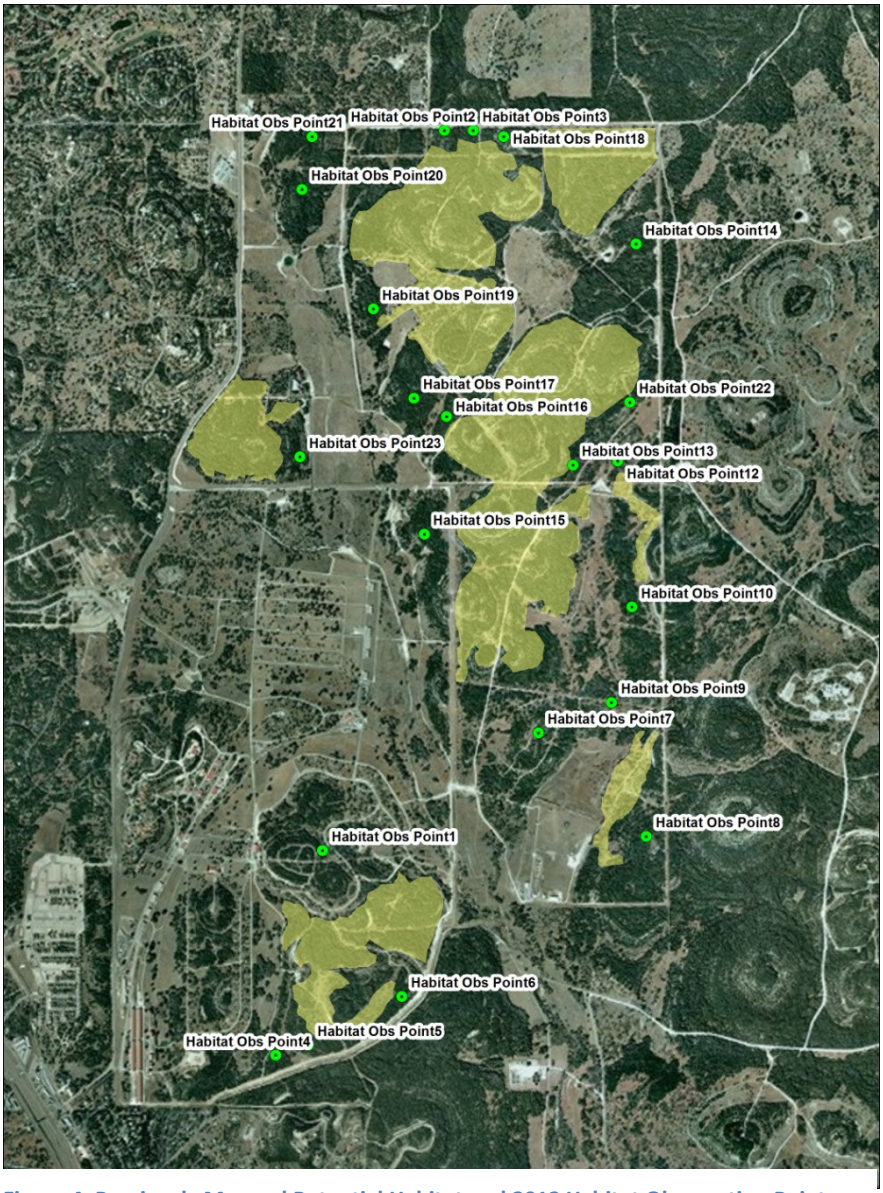


Figure 4: Previously Mapped Potential Habitat and 2012 Habitat Observation Points

resource personnel for a number of reasons. The size and location of habitat patches compared to the location, intensity, and duration of projects that contribute to CSSA's military mission factor into mitigation costs associated with projects that impact ESA-listed species habitats. Also, a map-able extent of habitat can assist installation planners to avoid or minimize potential impacts to habitats while achieving the military mission. Most of the increased Potential Habitat areas are within currently-constrained portions of the installation (e.g., within range fans, explosive safety arcs) and do not conflict with the day-to-day operation of the installation.

To assess golden-cheeked warbler habitat, vegetation descriptions were taken within each discrete habitat unit, bounded by identifiable features (e.g. roads, fencelines, stark vegetation community boundaries). The percent canopy cover and ratio of canopy species (hardwood-Ashe juniper-pine) was determined. Additionally, dominant deciduous species, the presence of mature Ashe juniper (5 inch+ diameter at breast height [DBH]) and deciduous species recruitment were assessed at each point. Incidental observations of obvious ungulate damage were also noted.

Golden-cheeked warbler habitats located at CSSA are consistent with habitat descriptions of other, more well-studied large patch size habitats in the eastern portion of the breeding range. The Potential Habitat coverage has been updated to include a total area of 1,167 acres of woodlands (see Figure 5). This represents an approximate 30 percent increase in the amount of Potential Habitat for the golden-cheeked warbler. The previous habitat assessments in 2005 recorded 873 acres of golden-cheeked warbler habitat. Most of this increase occurs within the range fan and explosive safety arcs. Seven years of vegetation growth has apparently resulted in much more warbler habitat now being in existence at Camp Stanley.

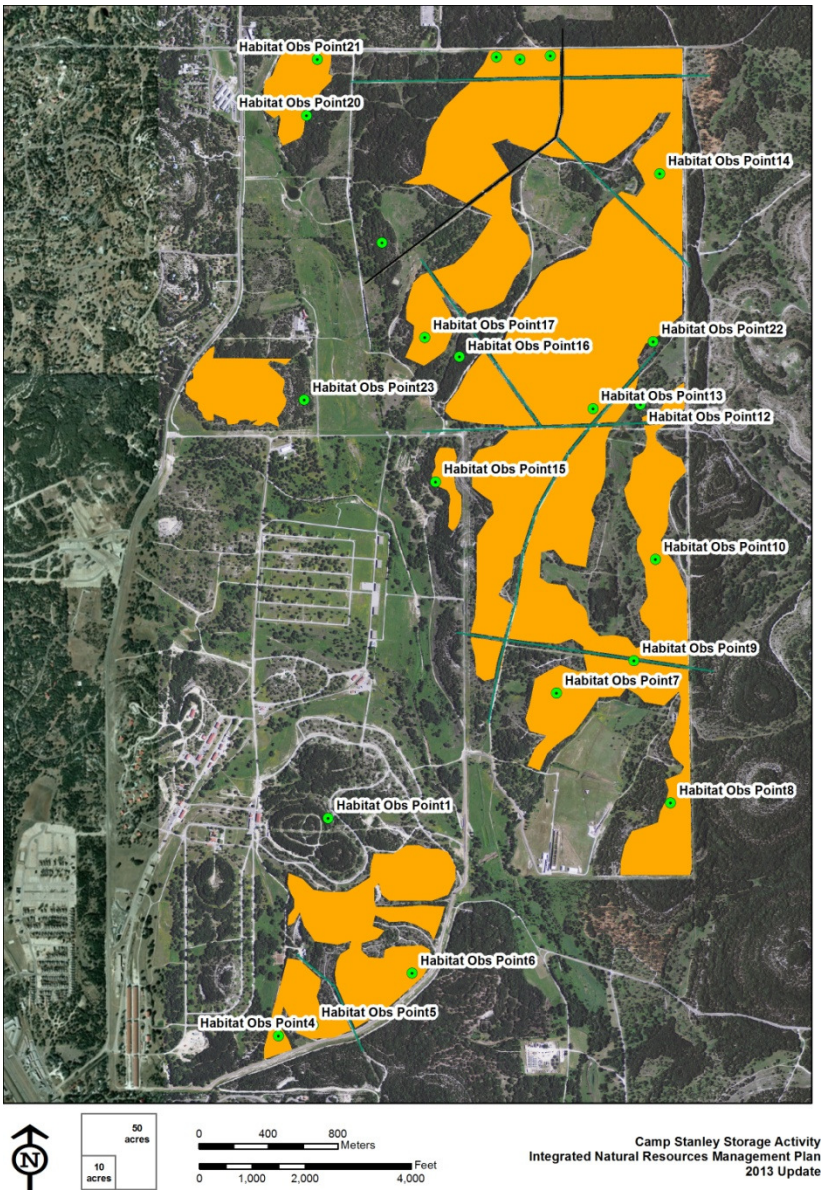


Figure 5: 2012 Potential Habitat Revisions at CSSA

Habitat Clearance under 2008 Programmatic Biological Opinion (Consultation Number: 2-1450-2007-F-0128)

CSSA cleared 0.80 acre in October 2012 for site access in the southern portion of the Inner Cantonment. The access is to a high point location, which also is co-located with mapped potential habitat for the golden-cheeked warbler. In 2009, surveyors detected a singing male near this location. The site is characterized by a mix of Texas oaks, live oaks, mature ashe junipers, and various shrub species (e.g. sumac, Texas redbud) especially along edges of small patch clearings. The cleared area is shown on Figure 6.

This vegetation removal activity is within specifications of the 2008 Programmatic Biological Opinion (Consultation Number 2-1450-2007-F-0128), which allows an annual removal of 0.80 acre of golden-cheeked warbler habitat. Clearing activity occurred outside of the breeding and nesting season (departures from central Texas territories are generally complete by August 2012). There has been no other clearance activity in habitat areas for the golden-cheeked warbler.

Notes: Potential habitat for golden-cheeked warbler is shown in orange, centerpoint (red triangle) is within the cleared area (yellow outline).

Figure 6: 2008 Clearance Activity under the 2008 Programmatic Biological Opinion

Integrated Natural Resources Management Plan Revision Status

The primary purpose of the CSSA INRMP is to ensure that natural resource management activities and military activities are integrated, consistent, and compliant with federal stewardship requirements. Therefore, the CSSA INRMP serves as the Installation Manager's comprehensive plan for natural resource management to attain and sustain stewardship requirements while enhancing the facility mission. The scope of the INRMP covers all CSSA mission lands, which encompass both the inner and outer cantonments.

The first INRMP for CSSA was finalized in 1993. The INRMP was substantially revised over a period from 2007 and 2008, which coincided with systematic ESA-listed bird species surveys and engagement with USFWS on natural resource issues and challenges. The 2008 INRMP is currently under revision, and is expected to be finalized in 2013. Figure 7 outlines a notional schedule for the INRMP revision and Sikes Act coordination requirements.

CSSA is committed to maintain training areas that meet existing and planned components of a diverse military mission. Accordingly, CSSA is committed to sustainable land use principles. The CSSA INRMP accomplishes these two goals and minimizes or avoids conflicts between achieving military mission goals and sustainable land use. Through the INRMP planning process, natural resource management projects are designed to not adversely affect the military mission, achieve no net loss of military mission functionality, and leverage constrained areas as natural resource management opportunities.

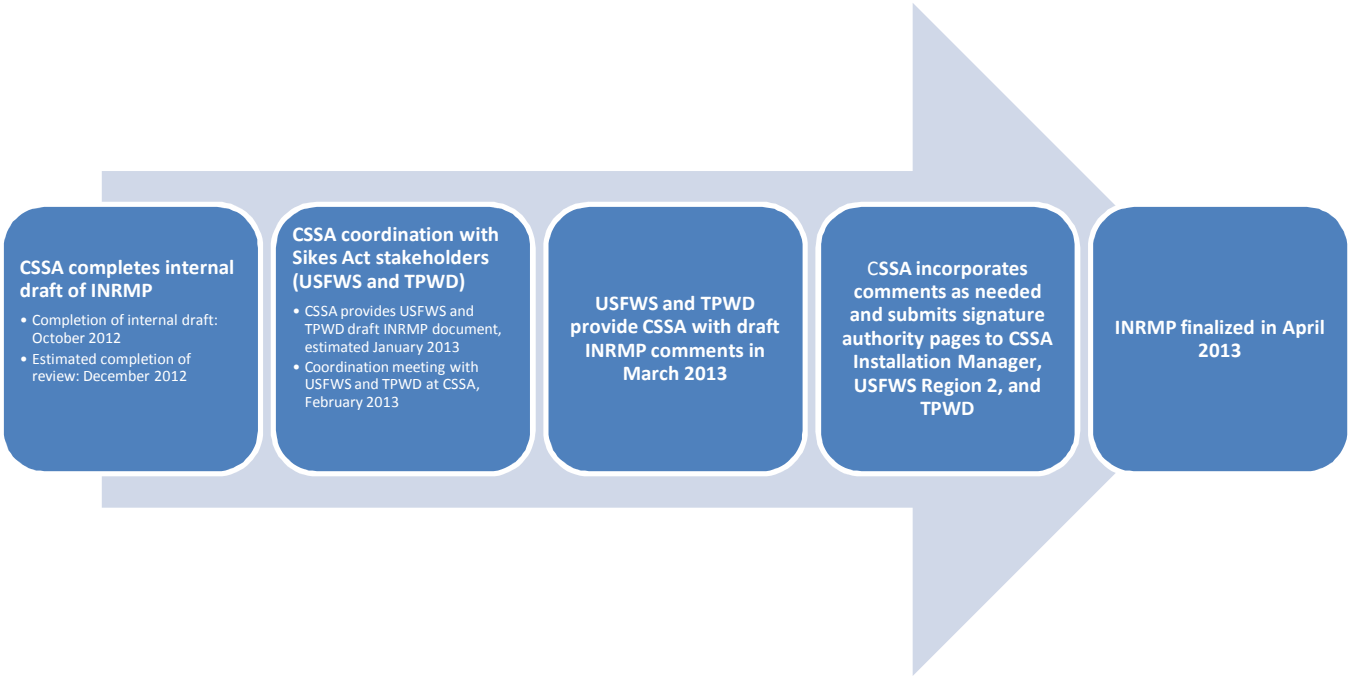


Figure 7: Notional Schedule for INRMP Update and Sikes Act Coordination

APPENDIX B: INRMP PROJECTS CONSISTENT WITH MIGRATORY BIRD TREATY ACT

Appendix B describes how CSSA manages for migratory birds that utilize the Sinstallation for breeding or wintering habitat.

B.1 MIGRATORY BIRD TREATY ACT OVERVIEW

The Migratory Bird Treaty Act (MBTA) of 1918 implemented the 1916 convention between the U.S. and Great Britain for the protection of birds migrating between the U.S. and Canada. Similar conventions between the U.S. and Mexico (1936), Japan (1972) and the former U.S.S.R (1976) further expanded the scope of international protection of migratory birds. Each new treaty has been incorporated into the MBTA as an amendment and the provisions of the new treaty are implemented domestically. These four treaties and their enabling legislation, the MBTA, established Federal responsibilities for the protection of nearly all species of migratory birds, their eggs, and nests.

The MBTA prohibits the taking, killing, or possessing of migratory birds unless permitted by regulation. The species of birds protected by the MBTA is codified in 50 CFR 10.13. In total, 836 species of birds are protected by the MBTA, 58 of which are currently hunted legally as game birds.

B.2 2003 NATIONAL DEFENSE AUTHORIZATION ACT AND THE PROVISIONS FOR THE INCIDENTAL TAKE OF MIGRATORY BIRDS BY THE DEPARTMENT OF DEFENSE.

On December 2, 2003, President George W. Bush signed the 2003 National Defense Authorization Act (NDAA), which ammended the MBTA to allow the Secretary of the Interior prescribe regulations to exempt the Armed Forces from the incidental taking of migratory birds during military readiness activities authorized by the Secretary of Defense.

Congress defined military readiness activities as all training and operations of the Armed Forces that relate to combat and the adequate and realistic testing of military equipment, vehicles, weapons, and sensors for the proper operation and suitability for combat use. Congress further provided that military readiness activities do not include: (a) the routine installation of operating support functions, such as administrative offices, military exchanges, commissaries, water treatment facilities, storage facilities, schools, housing, motor pools, laundries, morale, welfare, and recreational activities, shops, and mess halls; (b) the operation of industrial activities; or (c) the construction or demolition of facilities used for a purpose described in (a) or (b).

The final rule authorizing the DoD to take migratory birds during military readiness activities was published in the Federal Register on February 28, 2007. The regulation can be found in 50 CFR Part 21. The regulation provides that the Armed Forces must confer and cooperate with the U.S. Fish and Wildlife Service on the development and implementation of conservation measures to minimize or mitigate adverse effects of a military readiness activity if it determines that such activity may have a significant adverse effect on a population of a migratory bird species.

The requirement to confer with the U.S. Fish and Wildlife Service is triggered by a determination that the military readiness activity in question will have a significant adverse effect on a population of migratory bird species. An activity has a significant adverse effect if, over a reasonable period of time, it diminishes the capacity of a population of migratory bird species to maintain genetic diversity, to reproduce, and to function effectively in its native ecosystem. A population is defined as “a group of

distinct, coexisting, same species, whose breeding site fidelity, migration routes, and wintering areas are temporally and spatially stable, sufficiently distinct geographically (at some point of the year), and adequately described so that the population can be effectively monitored to discern changes in its status." Assessment of impacts should take into account yearly variations and migratory movements of the impacted species.

Migratory bird conservation relative to non-military readiness activities is addressed separately in a Memorandum of Understanding developed in accordance with EO 13186, signed January 10, 2001, "Responsibilities of Federal Agencies to Protect Migratory Birds." The Memorandum of Understanding between DoD and the U.S. Fish and Wildlife Service was signed on July 31, 2006. DoD responsibilities discussed in the Memorandum of Understanding include, but are not limited to:

(1) Obtaining permits for import and export, banding, scientific collection, taxidermy, special purposes, falconry, raptor propagation, and depredation activities;
(2) Encouraging incorporation of comprehensive migratory bird management objectives in the planning of DoD planning documents;
(3) Incorporating conservation measures addressed in Regional or State Bird Conservation Plans in Integrated Natural Resource Management Plans;
(4) Managing military lands and activities other than military readiness in a manner that supports migratory bird conservation;
(5) Avoiding or minimizing impacts to migratory birds, including incidental take and the pollution or detrimental alteration of the environments used by migratory birds; and,
(6) Developing, striving to implement, and periodically evaluating conservation measures for management actions to avoid or minimize incidental take of migratory birds, and, if necessary, conferring with the Service on revisions to these conservation measures.

B.3 CSSA INRMP PROJECTS THAT SUPPORT THE MBTA AND NDAA 2003 PROVISIONS

Table B.1 lists projects included in the CSSA INRMP that are associated with migratory bird management, the intended benefit of the project, and the reference to the project description with Chapter 4 (which contains the project descriptions). Of the 19 projects lincluded in this INRMP, 12 projects have direct and indirect benefits to migratory birds found on the installation.

Table B-1: INRMP Projects that Support MBTA and NDAA 2003 Provisions

INRMP Project Name	Benefit to Migratory Birds	IRNMP Reference Section
ESA-listed Bird Surveys	Monitoring of golden-cheeked warbler and black-capped vireo populations, as well as species diversity found on the installation.	Section 4.3.1.1
Section 7 ESA Annual Reporting Requirements	Ensures habitat protections for ESA-listed species, and other birds that utilize the same habitat.	Section 4.3.1.2
Section 7 ESA Programmatic Biological Opinion Renewal	Ensures habitat protections for ESA-listed species, and other birds that utilize the same habitat.	Section 4.3.1.3
INRMP Training and Implementation	Increases awareness of natural resource compliance and stewardship activities on the installation.	Section 4.3.1.4
Prescribed Fire Operations for Fuels Management	Prescribed burning will encourage forb production and grassland maintenance for grassland passerines and raptors.	Section 4.3.2.3
Mechanical Brush and Grasslands Treatment for Fuels Management	Maintaining grasslands will preserve habitats for grassland passerines and raptors.	Section 4.3.2.4
Oak Wilt Awareness Program	Reduce the spread of oak wilt to maintain oak dominant woodlands and mixed woodlands.	Section 4.3.3.1
Red Imported Fire Ant Assessment	Reduce potential predation by fire ants on passerine nests.	Section 4.3.3.2
Upland Gamebird Estimates	Monitoring of gamebird populations on the installation.	Section 4.3.3.5
Determination of Harvest Numbers	Promotes healthy populations of gamebirds using hunters	Section 4.3.3.6
Mammal Predator Control	Reduces potential predation by mammals on passerine nests.	Section 4.3.3.7
Brown-headed Cowbird Control and Assessment	Reduces a known parasite on passerine nests.	Section 4.3.3.8

This page left intentionally blank

APPENDIX C: FIRE MANAGEMENT POLICY AT CSSA

This page left intentionally blank

Fire Damage Memo: 2011 Camp Bullis Fire

Prepared for Installation Commander, Camp Stanley Storage Activity
Prepared by T. Houston (Parsons Corporation), Taylor.Houston@parsons.com / 512-299-0609

Bottomline Upfront

- On 7 September 2011, a fire of unknown origin began offsite north of the Camp Stanley Storage Activity (Camp Stanley) installation boundary and burned an area approximately 219 acres on Camp Stanley's North Pasture. The burn area was uneven-- most areas were burned completely, but some small areas were left intact or burned in various degrees of severity.
- High winds from the north drove the fire onto the installation. Once on the installation, the fire was carried primarily by fine fuels of grassland portions of the North Pasture, as well as mixed shrublands and low-stature cedar breaks. The fire was uneven in coverage throughout the 219 acre coverage.
- The effects of the fire include potential increases in black-capped vireo habitats (between 100 to 219 acres) depending on how the grasslands respond and how the grasslands are maintained. This recovery and habitat expansion would occur over the next two to 10 years.
- Golden-cheeked warbler habitat is expected to decrease by 29 acres, none of which were occupied during the 2011 bird survey season. The fire avoided consistent concentrations of nesting activity to the east of the fire.
- Wildland fires in the grassland areas may increase forb production (benefit game and non-game wildlife), but regional fire effects during extended drought periods are under investigation throughout burned areas in Central Texas.

2011 Texas Wildfire Season Overview

The current Texas wildfire season began on November 15, 2010. A La Niña weather pattern that began in the summer of 2010 brought widespread drought to Texas. In 2011, 47.1 percent of all acreage burned in the United States was burned in Texas. The fires have been particularly severe due to the ongoing drought covering the state, and exacerbating the problem is rapid desertification, the unusual convergence of strong winds, unseasonably warm temperatures, and low humidity. The percentage of exceptional drought in the state was the highest since the U.S. Drought Monitor began tracking the data in 2000. A pattern of high pressure troughs from the Pacific Northwest brought strong winds over the plains. These weather conditions coupled with an above normal grass fuel loading created conditions for an active fire season in Texas and other drought affected areas in the southeastern U.S.

2011 Camp Bullis Fire Overview

On 7 September 2011, a fire of unknown origin began near a CPS substation to the north of the Camp Stanley boundary. Smoke was spotted around 15:30 near Ralph Fair Road and Dietz Elkhorn Road. Strong winds from the north carried the fire quickly over the installation boundary and a fuelbreak road along the northern boundary onto Camp Stanley. The fire also spread eastward onto Camp Bullis and burned approximately 24 acres (See Figure 2). Approximately 219 acres were burned on Camp Stanley. The fire primarily was carried on the installation through fine fuels (grasslands) in the North Pasture. Most areas were completely burned, although there were locations within the 219 acre burn area left intact (no visible damage) or damaged in various degrees of severity. The fire was contained by a new fuel break constructed by fire response personnel and by leveraging Ralph Fair Road as a fuel break.

Response Activities

Several fire departments, including the San Antonio Fire Department, helped fight the fire. Five planes and two Black Hawk helicopters dropped water and fire retardant chemicals onto the flames and structures they were protecting. Structural protection was concentrated on the Fair Oaks subdivision to the west of Ralph Fair Road, while incidental attack operations were concentrated on the grassland and woodland areas of Camp Stanley and Camp Bullis (See Figure 1). Response activities included (1) new fuelbreak construction to contain the fire using manual tools and bulldozers, (2) use of aerial operations for wetline fuel construction (helicopter drops to wet vegetation), (3) use of aerial support to extinguish fires (helicopter water drops directly on fires and use of fixed wing planes to drop fire retardant), (4) vehicular support for wetlines and direct attack (brush rigs use to spray water on vegetation for wetline containment and directly on flames), and (5) “mop up” efforts.

Figure 1: Photographs of Fire Response Activities at Camp Stanley. Source: Jerry Lara, San Antonio Express-News, 7 September 2011.

Ecological Impacts from Fires and Response Activities

The North Pasture area contains closed canopy forests suitable for the golden-cheeked warbler, as well as mixed shrublands suitable for the black-capped vireo. The golden-cheeked warbler occupies extensive areas of the North Pasture to the east of burned areas. Prior to the 2011 Camp Bullis fire, the areas burned were characterized by grasslands, low stature juniper (cedar) trees / cedar breaks, and mixed shrublands located in areas subject to ground

disturbance or along closed canopy mixed oak forests. The fires quickly moved through the fine fuel areas, but the map shows that there was limited encroachment into more intact close canopy forests. This is likely due to the increased mesic conditions (increased fuel moisture content) in the intact forests sufficient to not carry fire into the forests.

ESA-listed Species and Habitats

Camp Stanley habitats may be affected in a number of ways. Namely, black-capped vireo habitats are likely to expand in the North Pasture by creating new shrublands. Live oak, persimmon, cedar elm, sumac, and other species that comprise black-capped vireo habitats respond to fires often by radial growth from damaged limbs, which increases structural density within the shrub vegetation. The newly available habitat would take two to ten years to develop with a maximum potential area corresponding to the burned area (approximately 219 acres). If grasslands are maintained, then the size of the new habitat areas will be lower.

Golden-cheeked warbler habitat has been decreased directly by the fire (removal of trees). Indirect effects will include increasing xeric margins along closed canopy areas which will create lower stature shrub vegetation. Suitable habitat removed is approximately 29 acres.

Other Natural Resource Issues

Camp Stanley supports various game and nongame wildlife species. In general, fire effects on grasslands have a “maintenance effect” that promote forb production. Increased shrub cover at Camp Stanley will also improve screening for deer, dove, and turkey. Whether beneficial effects of this fire occur at Camp Stanley are a subject of similar discussions in other burned areas in Central Texas by regional ecologists.

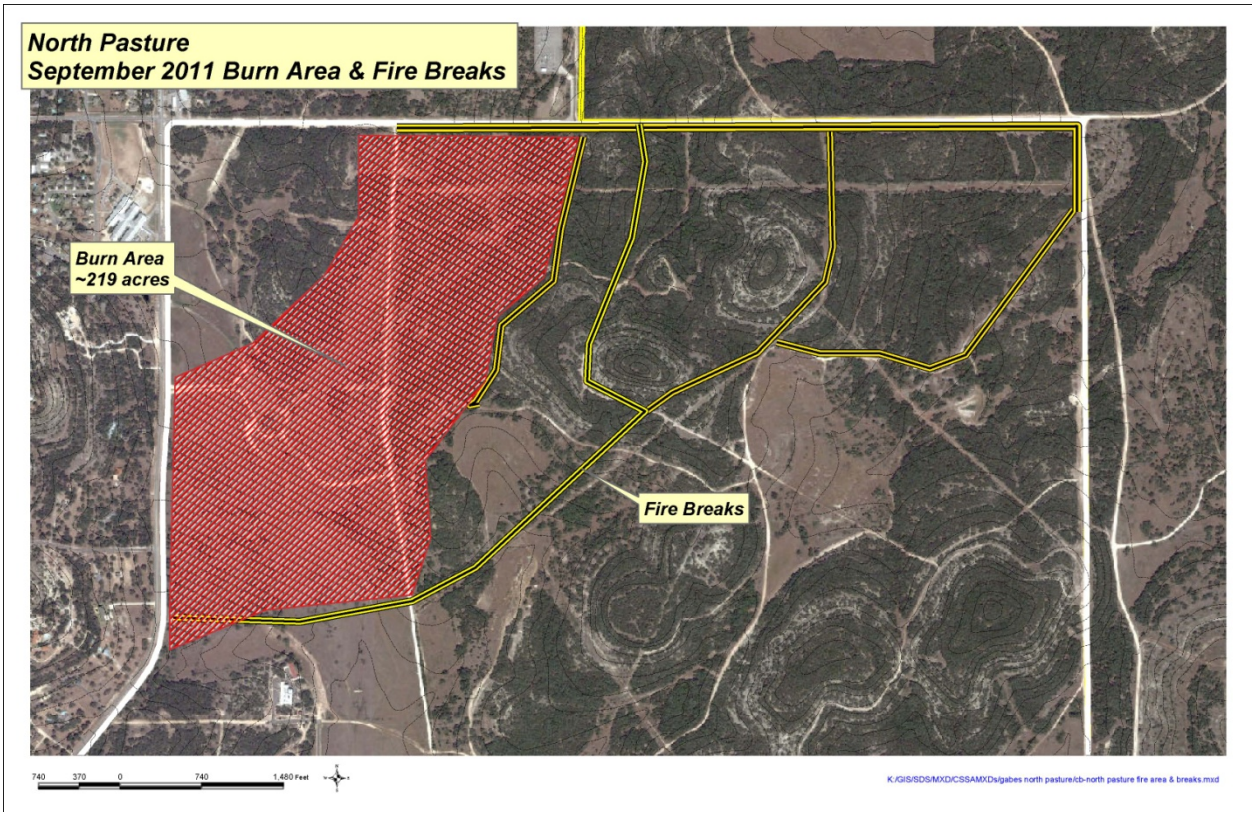


Figure 2: Map of 2011 Camp Bullis Fire and Response
Source: Camp Stanley Storage Activity, Environmental

APPENDIX D: HUNTING AND FISHING MANAGEMENT ACTIVITIES

This page left intentionally blank

*CSSA-R 215-1

Department of the Army
Camp Stanley Storage Activity, MCAAP
Boerne, TX 78015-4800

29 August 2008

Morale, Welfare, and Recreation

WILDLIFE MANAGEMENT HUNTING AND FISHING PROGRAM

Applicability: This regulation is applicable to all individuals participating in the Camp Stanley Storage Activity (CSSA) Wildlife Management Hunting and Fishing Program.

Supplementation: Supplementation of this regulation requires prior approval from the CSSA Installation Manager.

Suggested Improvements: The proponent of this regulation is the CSSA Installation Manager. Users may send comments and/or suggested improvements to the Installation Manager, ATTN: AMSTA-MCAAP-K

Distribution: Distribution of this regulation is in accordance with requirements submitted by organizations on CSSA and to each person issued a valid hunting or fishing permit.

FOR THE INSTALLATION MANAGER:

OFFICIAL:

JASON D. SHIRLEY
Installation Manager
Camp Stanley Storage Activity

Page

PURPOSE

Establish policies and procedures for the Camp Stanley Storage Activity (CSSA) Wildlife Management Hunting and Fishing Program (WMP).

REGULATORY GUIDELINES

(1) Title 16 United States Code (U.S.C.) Section 670: Conservation on Military Installations (Sikes Act) as amended

(2) Title 16 U.S.C. 1531: Endangered Species Act of 1973 as amended (October 88)

(3) Army Regulation (AR) 200-1: Environmental Protection and Enhancement

(4) AR 200-3: Natural Resources – Land, Forest, and Wildlife Management

(5) AR 215-1: Non-Appropriated Fund Instrumentalities and Morale, Welfare, and Recreation Activities

(6) Army Materiel Command (AMC)-R 385-100: Safety Manual

Related Forms

(1) CSSA Form 132: CSSA Hunting and/or Fishing Permit Application

EXPLANATION OF ABBREVIATIONS AND TERMS

AR	Army Regulation
AMC	Army Materiel Command
Buck	Male deer, either Whitetail or Axis
CSSA	Camp Stanley Storage Activity
DA	Department of the Army
Doe	Female deer, either Whitetail or Axis
FPS	feet per second
Hunt	A period of time specified within the regulation for hunting each wildlife species
IAW	in accordance with
TPWD	Texas Parks and Wildlife Department
WMC	Wildlife Management Committee
WMP	Wildlife Management Hunting and Fishing Program

POLICY

The Wildlife Management Hunting and Fishing Program (WMP) will be conducted in accordance with (IAW) regulatory guidelines and requirements established by Federal Laws, Department of Army (DA), Texas Parks and Wildlife Department (TPWD), and CSSA.

Hunting activities will be conducted under the supervision of the Wildlife Management Committee (WMC) IAW guidance provided by the Installation Manager, Environmental Program Manager, and Safety Officer.

Hunting activities will be authorized based on dates specified for Bexar County by the TPWD and will be published in a CSSA memorandum IAW the Installation Manager.

Installation Manager may restrict or cancel hunting activities without advanced notice due to mission essential requirements.

RESPONSIBILITIES

Installation Manager

The Installation Manager is responsible for:

- Establishing game quotas;
- Hunting certification frequency;
- Approving changes to CSSA regulations and the WMP; and
- Appointing members to the WMC.

Environmental Program Manager/Environmental Office

The Environmental Program Manager is responsible for:

- Provide technical expertise to the WMP;
- As funding levels permit, fund necessary projects for habitat enhancement, supplemental animal feeding, and other applicable projects IAW the Sikes Act (16 U.S.C. 670a et seq.);
- Coordinate with the TPWDfor the annual harvest quotas for the CSSA hunting program.
- Coordinate with the WMC for habitat improvement actions;
- Publish current maps depicting hunting areas deer stands prior to each season;
- Issuing of CSSA hunting/fishing permits; and
- Ensure that decisions made for the program are IAW CSSA's Integrated Natural Resources and Management Plan (INRMP).

Safety Officer

The Safety Officer is responsible for:

- Provide guidance to the WMC concerning hunting activities;
- Inspection of stands;
- Oversight of the WMP with regard to safety concerns and issues.

Wildlife Management Committee

The WMC is responsible for:

- Purchase, construction, and maintenance of hunting blinds/stands, feeders, and hunting areas;
- Supplemental wildlife feeding and related conservation programs;

- Recommending annual hunting activities, as approved by the Installation Manager and the TPWD, to properly manage the wildlife herds;
- Recommend changes to this regulations and the WMP; and
- Ensure expenditures remain within funds collected from permit fees.

Chairperson, Wildlife Management Committee

The Chairperson, WMC is responsible for:

- The approval of hunting/fishing applications;
- Ensure that all personnel, requesting the purchase of a hunting or fishing permit, are eligible IAW the provisions designated under Eligible Personnel of this regulation, and
- Ensure that all personnel attend the mandatory requirements: The Hunter's Safety briefing, weapons qualification, and habitat work hours.

Security

The Security Branch is responsible for:

- The enforcement of this regulation to include verifying state and CSSA permits prior to activities;
- Ensuring only qualified weapons listed on the permit enter CSSA;
- Reporting violations of this regulation or recognized violations of state game laws to the Installation Manager. Such violations may result in permanent withdrawal of CSSA hunting and fishing privileges, and
- Inspecting vehicles.

ELIGIBLE PERSONNEL

Hunting and fishing privileges are extended to the following:

- Permanently assigned Civil Service employees of CSSA;
- Civil Service Employees retired from CSSA;
- Immediate family members of eligible personnel listed above.
  - Immediate family members include: spouse, mother/step-mother, father/step-father, brother/step-brother, sister/step-sister; child/step-child, son-in-law, daughter-in-law, or grandchild.

PERMITS

Eligible individuals submit completed CSSA hunting and/or fishing permit applications to Chairperson, WMC for approval. Each applicant must possess a valid Texas hunting and/or fishing license. A copy of the state license must accompany the CSSA permit application. It is an individual responsibility to obtain a valid Texas hunting and/or fishing license prior to CSSA activities. Hunters born on or after September 2, 1971, are required by law to take the Texas Hunter Education Program and provide proof of certification with the CSSA permit application

Each approved applicant agrees to comply with Texas game laws and CSSA regulations. They also agree to relieve the United States of any liability for injury or damage incurred during authorized hunting or fishing activities.

Approved permits will contain the names of family members authorized to participate in hunting and fishing activities. Family members 18 years of age and older must have a valid Texas license and must sign a separate liability waiver. The waiver must accompany the sponsor's application. Sponsors must accompany family members participating in these activities.

Attendance at a hunting safety briefing is mandatory for all permit holders and strongly encouraged for "designated hunters" prior to engaging in any hunting activities. The CSSA Bulletin announces dates and times for hunting safety briefings. A memorandum is sent to retirees with dates and time for the hunting safety briefings.

FEES

Hunting and/or fishing permits fees will be recommended by the WMC and approved by the Installation Manager.

Hunting/Fishing Permit is $60.00

Fishing Permit Only is $15.00

HUNTING CERTIFICATION

Employees and their authorized family members desiring to hunt must demonstrate their proficiency with the weapon(s) they plan to use while hunting and must be certified by personnel approved by the Installation Manager. An authorized family member, who does not participate in the hunt and is not qualified on a weapon, may still accompany a hunter in the stand. However, a non-qualified family member will not handle a weapon at any time while on the installation.

- Archery
  - Archery Certification consists of placing three (3) arrows into an eight (8) inch bull's eye at a distance of 20 yards.
  - Each qualification attempt consists of no more than five (5) arrows.
- Rifle
  - Rifle certification consists of placing three (3) shots into a six (6) inch bull's eye at 75 yards.
  - Each qualification attempt consists of no more than five (5) shots.
- Shotgun/Muzzleloader Rifles
  - Shotgun and muzzleloader rifle certification consists of placing three (3) shots into a six (6) inch bull's eye at 50 yards.
  - Each qualification attempt consists of no more than five (5) shots.

A hunting flier will be distributed to the divisions announcing dates and times for weapon certification. Retirees receive notification via mail, e-mail, or by phone from a designated WMC personnel.

The Installation Manager will determine the hunting certification frequency.

HABITAT WORK DAYS

Each permit holder (employee and/or retiree) who wishes to hunt or fish on CSSA must perform work as indicated below to improve the hunting/fishing habitat on the installation. A hunting/fishing permit is contingent upon completion of the required work.

- Hunting/Fishing – 8 Hours
- Fishing Only – 4 Hours

RULES, LAWS, AND REGULATIONS

General Safety & Hunting Rules

CSSA hunters and family members will obey and strictly follow all safety requirements to include, but not limited to, gun safety, personal safety, sportsmanship, etc., at all times. Blaze orange is required for all hunting activities to assure maximum visibility in the field. Hunters must wear an outer garment colored fluorescent blaze orange, which must be exposed at all times. This outer garment may be a jacket or a vest.

Access to the installation for hunting and fishing activities is dependent upon employees possessing a valid Texas hunting/fishing license and a CSSA Hunting/Fishing permit upon arrival at the main gate. Family members must be accompanied by their CSSA sponsors and must hunt with their sponsor in a single designated blind or at a shotgun, archery, and muzzle-loader hunting area.

Hunters must use every precaution to avoid damage to government property, being especially careful of fire. Hunters may smoke on-post only at designated locations.

Hunters shall not possess alcoholic beverages of any kind while engaged in any hunting activity. Hunters displaying apparent symptoms of intoxication or incapacitation may not enter the installation or participate in hunting activities. Violations of this rule result in permanent revocation of all CSSA hunting privileges.

Hunters shall not load their guns except when in the assigned hunting blind. (Unloaded means no rounds in either the chamber or magazine). Weapons are subject to inspection by security personnel or WMC members at any time while on-post.

While in a deer stand, a hunter (regardless of the number of hunters in a blind) may have only one rifle for deer and another weapon (bow and arrow or shotgun) for either deer or turkey. When a hunter has more than one firearm in the stand, only one firearm may have a round in the chamber at any one time.

Hunters may not track wounded deer beyond a 100-yard radius from their assigned stand. Security must be notified prior to hunter's departure if a wounded deer cannot be found.

Deer may be harvested using the following methods:

- Archery Equipment
  - Must meet TPWD requirements (excluding crossbows).
  - Bow hunters may not move about with their hunting equipment "ready to shoot," but may hunt from approved ground or tree blinds.
- Rifles
  - Must use factory ammunition for their weapon certification and hunt;
  - Hunters must not use weapons that exceed a maximum velocity of 2300 fps;
  - Hunters are also restricted from the use of rim fire or non-expanding ammunition, such as military ball, for hunting deer; and
- Muzzle-Loader/Black Powder Rifles
- Shotguns
  - Accepted use of 12, 16, or 20 gauge rifled slug.

- Buckshot will not be used to hunt deer on CSSA.

- **Possession of any firearm or ammunition violating these rules will result in the immediate and permanent revocation of CSSA hunting/fishing privileges.**

Hunters require a full understanding of safe methods for use when climbing into and out of tree blinds.

All vehicles departing the installation during or immediately after hunting hours require inspection, except those of residents and guests not engaged in hunting activities.

Violation of this regulation results in the suspension of CSSA hunting and fishing privileges for a period determined by the Installation Manager for a first offense. A second violation of this regulation could result in the permanent withdrawal of CSSA hunting privileges. In all instances, the Installation Manager decides revocation or re-instatement of these privileges on a case-by-case basis.

UXO Safety

Unexploded ordnance (UXO) is defined as ammunition that was fired, but did not explode. Ammunition may include bullets, bombs, grenades, mortars, shells, projectiles, fuses, and blasting caps. UXO has explosive potential.

CSSA has a long history of military training and UXO has been found in both the east and the north pastures, however, other locations have also revealed UXO items. Identifying UXO can be difficult, since it can be found in many shapes, sizes, and types.

- Size Doesn't Matter! Larger or small items can kill or injure.
- Age Doesn't Matter! Old, rusty items can kill or injure.
- Type Doesn't Matter! Can look like metal pipes, soda cans, and old mufflers.

It is important to remember the "3Rs" of UXO: RECOGNIZE, RETREAT, and REPORT.

- Recognize – If you thing you found something that could be UXO…DON'T TOUCH!
- Retreat – Leave the area…go back the same way you came in!
- Report – Inform Security immediately at 295-7408 or –7455. Let them know where it can be found. Security will notify the appropriate personnel.

Weather Safety

The San Antonio/South Texas area weather is very unpredictable. Here are a few precautions to prevent a potentially hazardous situation:

- Lightning – When an electrical storm is observed, personnel will get away from metal objects such as tools, weapons, and tree stands. Seek shelter immediately.
- Flooding – Seasonal heavy rains create an extreme flash flood hazard on CSSA and the surrounding area. As potential flooding develops, personnel should move from low-lying areas and avoid crossing low-water crossings when water begins running through the crossing.
- Heat/Cold Related Injuries – Hunters and family members need to be prepared for all types of inclement weather. Always check the weather forecast and dress appropriately.

Wildlife Hazards

There are numerous forms of wildlife on CSSA, which can pose a safety threat to humans. Some animals may be infected with rabies or Lyme disease. Some common wildlife and plants are:

- Snakes – Rattlers, Copperheads, Coral, and Moccasins
- Insects – Black widows, brown recluses, scorpions, centipedes, fire ants, ticks, chiggers, bees, wasps, etc.
- Plants – Sumac, Poison Oak, and Poison Ivy.

Permit/Hunting limits

Deer quota will be determined and published by the Installation Manager on an annual basis based on the recommendation of TPWD. TPWD recommends an annual quota based on the number and condition of the wildlife.

A permit holder may harvest one (1) deer per hunt. There are two (2) hunts per day (am and pm).

CONDUCT OF THE HUNT

Archery Only Season

Absolutely No Firearms Allowed. Archers hunt within established hunting areas indicated on the map posted in the Conference Room, Building 98. Archers may use existing tree blinds or provide their own. Freelance stalking and/or walk hunting is not permitted on-post. Employees and family members are required to hunt in the same hunting area.

General Deer Hunting Season

Hunters are responsible for knowing the location of their assigned deer stand before departing Building 98 to hunt. Hunters go to their assigned hunting stand by the most direct route and return the same way.

Hunters must unload all weapons before leaving the stand, remove all trash from the stand, and close and secure all windows and doors. Report any stand discrepancies, such as broken windows or loose steps, using WMC complaint forms prior to departure from the installation.

Tag all whitetail deer kills immediately with the hunter's own tag. Axis deer do not require "tagging".

Hunters should use the designated area and facilities to gut and weigh deer. Those hunters preferring to gut their deer in the field must place the entrails in a container and transport them to the designated area for disposal. Gut and weigh all deer.

Prohibited activities includes hunting or shooting from a vehicle while en route to or from an assigned hunting stand or area or road hunting either while walking to or from a vehicle.

Rifle or shotgun hunters hunt from within an assigned deer stand. Unauthorized activity includes "freelancing" or moving about to get a better angle, use of archery blinds, and/or hiding near a food plot or water.

Deer Hunting Hours:

	Reporting Times	Hunting Hours
Monday, Wednesday, & Friday Afternoon	1615	1630 to ½ hour after sunset
Weekend and Holidays	0545	0600 to 1200 hours 1200 to ½ hour after sunset

Turkey Hunting Season

Turkey may be hunted during general deer hunting season from deer stands. Hunting is from established areas indicated on the current map posted in the Conference Room, Building. 98.

Spring hunting is from established areas, indicated on the current map posted in the Conference Room, Building 98, on scheduled turkey hunting days. Authorized weapons for the spring season include a shotgun or bow and arrow. Hours are as above.

Hunters making the kill must use his/her own turkey tag and have a state turkey stamp on license.

Turkey Hunting Hours:

	Reporting Times	Hunting Hours
Monday, Wednesday, and Friday Afternoon	1615	1630 to ½ hour after sunset
Weekend and Holidays	0545	0600 to 1200 hours 1200 to ½ hour after sunset

Dove, Duck, and Quail Hunting

Hunting Season for doves and quail is IAW designated TPWD hunting seasons. A shotgun is the only weapon authorized for use to hunt, Dove, Duck, or Quail.

The current map posted in the Conference Room, Building 98, contains dove, duck, and quail hunting areas.

During the “Archery Only” season, dove hunting is authorized since both activities involve the use of short-range weapons. Selection of areas is on a first come, first choice basis immediately before hunt.

Dove, Duck, and Quail Hunting Hours:

DOVE, DUCK, AND QUAIL SEASON		
	Reporting Times	Hunting Hours
Monday, Wednesday, and Friday Afternoon	1615	1630 to ½ hour after sunset
Weekend and Holidays	0545	0600 to 1200 hours 1200 to ½ hour after sunset

DOVE, DUCK, AND QUAIL HUNTING DURING DEER SEASON		
	Reporting Times	Hunting Hours
Monday, Wednesday, and Friday Afternoon	1615	1630 to ½ hour after sunset
Weekend and Holidays	0545	0600 to 1200 hours 1200 to ½ hour after sunset

Small Game and Varmint Hunting

The current map posted in the Conference Room, Building 98, lists areas for hunting rabbits, squirrels, raccoons, coyotes, etc.

Authorized weapons to hunt small game and varmints are bow and arrow or shotgun. Rifles may be used for varmint hunting from deer stand only.

Small Game and Varmint Hunting Hours:

	Reporting Times	Hunting Hours
Monday, Wednesday, and Friday Afternoon	1615	1630 to ½ hour after sunset
Weekends and Holidays	0545	0600 to 1200 hours 1200 to ½ hour after sunset

HUNTING AREA ASSIGNMENTS

Deer Stands

The current map posted in the Conference Room, Building 98, contains the location of authorized deer stands.

A special drawing determines stand assignments for “Opening Weekend” only.

Stand Assignment Determination:

- Except for opening weekend, stand assignment is by a draw immediately before each authorized hunt, using the CSSA Hunting Permit as the “draw instrument”.
- Hunters not present for the drawing of stands may select a stand from the remaining stands during authorized hunting hours.
- The hunter is responsible for posting any stand changes to the hunt status board and for notifying Security of the change. Failure to post the status board or to notify Security of a change in a hunter’s status may result in the loss of the hunter’s hunting privilege.

Muzzle-Loader/Shotgun Areas

A special drawing determines area assignments.

- Turkey Hunting
  - During general deer season.
  - Spring hunting is from established areas, indicated on the current map posted in the Conference Room, Building 98, on scheduled turkey hunting days. Areas are assigned on a first come – first serve basis.
-
- Dove, Duck and Quail Hunting
  - The current map posted in the Conference Room, Building 98, contains dove, duck and quail hunting areas. Areas are assigned on a first come – first serve basis.
-
- Small Game and Varmint Hunting
  - The current map posted in the Conference Room, Building 98, lists areas for hunting rabbits, squirrels, raccoons, coyotes, etc. Areas are assigned on a first come – first serve basis.

FISHING

CSSA has a catch and release policy in effect. CSSA permit holders may fish at "D" and "W" stock tanks for recreational use only.

APPENDIX E: SIKES ACT COOPERATOR AGENCY COMMENTS

This page left intentionally blank

E.1: AGENCY CORRESPONDENCE FROM U.S. FISH AND WILDLIFE SERVICE

The U.S. Fish and Wildlife Service Austin Ecological Services Field Office signed the Sikes Act signatory page on 14 March 2013, and did not submit comments on the CSSA INRMP.

This page left intentionally blank

E.2: AGENCY CORRESPONDENCE FROM TEXAS PARKS AND WILDLIFE DEPARTMENT

From: Russell Hooten [mailto:Russell.Hooten@tpwd.state.tx.us]
Sent: Friday, March 22, 2013 12:21 PM
To: Cannizzo, James V CIV USARMY USAMC (US)
Cc: Kathy Boydston
Subject: Comments on draft updated INRMP Camp Stanley

Jim,

I finally received the draft INRMP last week and completed a review of it this week. While TPWD does not have any comments or recommendations concerning the INRMP Compliance, Maintenance and Stewardship Projects described in Chapter 4, we do have minor comments regarding several references in the document and comments regarding very outdated information in Chapters 2 and 3 that should be revised in the FINAL copy of this 5-year INRMP update.

Typically, these issues would have been addressed and resolved through comment and response letters between TPWD and Camp Stanley. However, since there was some delay in my receiving the INRMP and the abbreviated review time necessary to meet the preferred April 1st deadline, comments are provided below.

As Kathy said in her email, it may take at least two weeks to get Carter Smith's signature.

Thanks,

Russell

Russell Hooten
Wildlife Habitat Assessment Program
TPWD-Wildlife Division
6300 Ocean Drive, NRC 2501
Unit 5846
Corpus Christi, TX 78412
361-825-3240 Office
russell.hooten@tpwd.state.tx.us

Camp Stanley *DRAFT* INRMP 2013-2018 update comments:

- **Page 1-1, line 19-21.** These lines should simply state that Texas Parks and Wildlife Department will review the INRMP. There is no "Wildlife Diversity Division." Wildlife Diversity is a program within Texas Parks and Wildlife Department.
- **Page 2-19, line 31.** The first sentence is missing a citation. The () are empty.
- **Page 2-24, Table 2-1.** This information in this table is outdated by over 8 years and does not reflect species that have recently been added or removed from the Bexar County list of rare species. Current lists area available online at: http://www.tpwd.state.tx.us/landwater/land/maps/gis/ris/endangered_species/
- **Page 2-29, line 17 through Page 2-30, line 1.** This sentence states that groundwater remediation activities are described in Section 2.7 of the INRMP. The copy of the draft INRMP provided to TPWD does not contain a Section 2.7.
- **Page 3-16, line 31 through Page 3-17, line 28.** This section discusses the 2005 Texas Comprehensive State Wildlife Management Plan and its eight elements that would be complimented by the INRMP. However, the Texas Comprehensive State Wildlife Management Plan was updated in 2012 and is now referred to as the Texas Conservation Action Plan (TCAP). The 2012 Plan update constitutes a "major revision" under the definition provided by the US Fish and Wildlife Service (USFWS) and the Association of Fish and Wildlife Agencies (AFWA). Section 3.2.3 if the draft INRMP references an outdated State Conservation Action Plan; it should be revised to incorporate elements of the new TCAP. The 2012 TCAP is available online at: http://www.tpwd.state.tx.us/landwater/land/tcap/
- **Page 4-4, line 5.** The first sentence states that Vegetation Management is discussed in Subsection 4.2.1. However, the heading for Subsection 4.2.1 is "Project Design." It appears this should be Subsection **4.1.1** which is titled "Land and Watershed Management" and discusses vegetation management.
- **Page 4-4, line 8.** Regarding habitat management for federally listed birds, this sentence references Subsection 6.2. There is no Subsection 6.2 in the draft INRMP.

Classification: UNCLASSIFIED
Caveats: FOUO

TEXAS PARKS & WILDLIFE

Life's better outside.®

Commissioners

T. Dan Friedkin
Chairman
Houston

Ralph H. Duggins
Vice-Chairman
Fort Worth

Antonio Falcon, M.D.
Rio Grande City

Karen J. Hixon
San Antonio

Dan Allen Hughes, Jr.
Beeville

Bill Jones
Austin

Margaret Martin
Boerne

S. Reed Morian
Houston

Dick Scott
Wimberley

Lee M. Bass
Chairman-Emeritus
Fort Worth

Carter P. Smith
Executive Director

April 15, 2013

Mr. James Cannizzo
U.S. Army, Camp Stanley
Environmental Department
25800 Ralph Fair Road
Boerne, TX 78015-4877

RE: Participation in Development and Review of Integrated Natural Resource Management Plan for Camp Stanley Storage Activity, Boerne, Texas

Dear Mr. Cannizzo:

This letter is in response to your request for Texas Parks and Wildlife Department (TPWD) to comment on the draft five-year update Integrated Natural Resource Management Plan (INRMP) as required by the Sikes Act Improvement Act of 1997. The INRMP will serve as Camp Stanley Storage Activity's (CSSA) comprehensive plan for natural resource management.

As a Sikes Act partner, TPWD participated in the scoping, design and preparation of the previous INRMP finalized in 2008. The 2013 draft update INRMP includes 19 projects that are focused on conserving important natural resources and providing military personnel with outdoor recreation opportunities.

TPWD appreciates and supports the efforts of CSSA's Compliance, Maintenance, and Stewardship Projects that preserve and enhance important wildlife habitat. We appreciate the opportunity to be involved in this process and look forward to continuing the partnership with CSSA in its natural resource management efforts. If we can be of further assistance, please do not hesitate to call Russell Hooten in Corpus Christi at (361) 825-3240. Thank you.

Sincerely,

Carter Smith
Executive Director

CS:RH.gg

Enclosure

4200 SMITH SCHOOL ROAD
AUSTIN, TEXAS 78744-3291
512.389.4800
www.tpwd.state.tx.us

This page left intentionally blank

E.3: CSSA Responses to Agency Comments

Comment Number	Page	Line Number	Comment	Response
Comments Received from Texas Parks and Wildlife Department, 22 March 2013				
TPWD-01	1-1	19-21	These lines should simply state that Texas Parks and Wildlife Department will review the INRMP. There is no "Wildlife Diversity Division." Wildlife Diversity is a program within Texas Parks and Wildlife Department.	The text has been revised as suggested.
TPWD-02	2-19	31	The first sentence is missing a citation. The () are empty.	The parentheses have been deleted.
TPWD-03	2-24	Table 2-1	This information in this table is outdated by over 8 years and does not reflect species that have recently been added or removed from the Bexar County list of rare species. Current lists area available online at: http://www.tpwd.state.tx.us/landwater/land/maps/gis/ris/endangered_species/	Table 2-1 has been updated. Note that this table is for species considered threatened or endangered by federal or state statute. Sprague's pipit and Mountain plover were added to the table, although these species (and others) included in the USFWS Candidate Notice or Review (November 2012) are discussed elsewhere in the document.
TPWD-04	2-29,30	17	This sentence states that groundwater remediation activities are described in Section 2.7 of the INRMP. The copy of the draft INRMP provided to TPWD does not contain a Section 2.7.	The section reference has been revised to Section 2.3.6 (Groundwater).
TPWD-05	3-16,17	31	This section discusses the 2005 Texas Comprehensive State Wildlife Management Plan and its eight elements that would be complimented by the INRMP. However, the Texas Comprehensive State Wildlife Management Plan was updated in 2012 and is now referred to as the Texas Conservation Action Plan (TCAP). The 2012 Plan update constitutes a "major revision" under the definition provided by the US Fish and Wildlife Service (USFWS) and the Association of Fish and Wildlife Agencies (AFWA). Section 3.2.3 if the draft INRMP references an outdated State Conservation Action Plan; it should be revised to incorporate elements of the new TCAP. The 2012 TCAP is available online at: http://www.tpwd.state.tx.us/landwater/land/tcap	Reference to the 2005 TCSWMP have been updated to refer to the 2012 TCAP. The 8 elements cited in the document are standards required for plan certification by USFWS, and have not changed since the 2005 plan. The 2012 citation has been added to the references list and "TCAP" has been added to the acronyms list.
TPWD-06	4-4	5	The first sentence states that Vegetation Management is discussed in Subsection 4.2.1. However, the heading for Subsection 4.2.1 is "Project Design." It appears this should be Subsection 4.1.1 which is titled "Land and Watershed Management" and discusses vegetation management.	The section reference has been updated.
TPWD-07	4-4	8	Regarding habitat management for federally listed birds, this sentence references Subsection 6.2. There is no Subsection 6.2 in the draft INRMP.	The section reference has been updated. The correct reference is Section 4.1.3.