



# **INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN**

## **VOLUNTEER TRAINING SITE – CATOOSA**



Tennessee Army National Guard  
Nashville, Tennessee  
August 2012





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March 2012

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**Volunteer Training Site – Catoosa  
Revised Integrated Natural Resources Management Plan**

**Signature Page**

This Integrated Natural Resources Management Plan (INRMP) meets the requirements for INRMPs listed in the Sikes Act Improvement Amendments (16 U.S.C. 670a et seq.), AR 200-3, and the “Executive Summary and Scope” within this plan. It has set appropriate and adequate guidelines for conserving and protecting the natural resources of the Volunteer Training Site at Catoosa.

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## ACRONYMS AND ABBREVIATIONS

AR	Army Regulations
ARNG	Army National Guard
BMP	Best Management Practice
CEQ	Council for Environmental Quality
CFMO	Construction and Facilities Management Office
CPX	Command Post Exercise
DA	Department of Army
DBH	Diameter at Breast Height
DOD	Department of Defense
DoDI	Department of Defense Instruction
EA	Environmental Analysis
EMS	Environmental Management System
ENV	Environmental Office (of the TNARNG)
EO	Executive Order
EPA	U.S. Environmental Protection Agency
EPD	Georgia Environmental Protection Division
FFT2	Firefighter Type 2 (wildland fire fighter NWCG standards)
FMO	Facilities Maintenance/Engineering Office (of the TNARNG)
FONSI	Finding of No Significant Impact
FTX	Field Training Exercise
GFC	Georgia Forestry Commission
GIS	Geographic Information System
GPS	Global Positioning System
ICRMP	Integrated Cultural Resources Management Plan
INRMP	Integrated Natural Resources Management Plan
IPMP	Integrated Pest Management Plan
IPP	Invasive Pest Plant
ISO	International Standard Organization
ITAM	Integrated Training Area Management
LCES	Lookouts, Communications, Escape Routes, and Safety Zones
LCTA	Land Condition Trend Analysis (now RTLA)
LRAM	Land Rehabilitation and Maintenance
METL	Mission Essential Task List
MOA	Memorandum of Agreement
MOSQ	Military Occupational Skill Qualification
MP	Military Police
MSL	Mean Sea Level
NAAQS	National Ambient Air Quality Standards
NCVS	North Carolina Vegetation Survey
NEPA	National Environmental Policy Act
NFDRS	National Fire Danger Rating System

NFPA	National Fire Protection Act
NGB	National Guard Bureau
NGB-ILE	National Guard Bureau - Director of Environmental Programs
NPS	Non-Point Source Pollution
NRM	Natural Resources Manager (of the TNARNG)
NWCG	National Wildfire Coordinating Group
NWS	National Weather Service
NWSG	Native Warm Season Grasses
O&M	Operations and Maintenance
POTO	Plans, Operations, and Training Officer (of the TNARNG)
PPE	Personal Protective Equipment
PPK	Projectile Point/Knives
REC	Record of Environmental Consideration
ROA	Report of (timber) Availability
RTE	Rare, Threatened, or Endangered Species
RTLA	Range and Training Land Assessment (previously LCTA)
RTLPL	Range and Training Land Program
SAIA	Sikes Act Improvement Act of 1997
SHPO	State Historic Preservation Office
SITE	Training Site personnel (of the TNARNG)
SJA	Staff Judge Advocate
SMZ	Streamside Management Zone
SOP	Standard Operating Procedure
SPCC	Spill Prevention, Control, and Countermeasure
SRA	Sustainable Range Awareness
SRP	Sustainable Range Program
STEP	Status Tool for Environmental Program
SWPPP	Storm Water Pollution Prevention Plan
TA	Training Area
TAG	The Adjutant General
TDEC	Tennessee Department of Environment and Conservation
TNANG	Tennessee Air National Guard
TNARNG	Tennessee Army National Guard
TNC	The Nature Conservancy
TN-EPPC	Tennessee Exotic Pest Plant Council
TRI	Training Resources Integration
TVA	Tennessee Valley Authority
TWRA	Tennessee Wildlife Resources Agency
USACE	United States Army Corps of Engineers
USAEC	United States Army Environmental Center
USDA	United States Department of Agriculture
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service



USGS	United States Geologic Service
VFD	Volunteer Fire Department
VOC	Volatile Organic Compounds
VTTS-C	Volunteer Training Site -- Catoosa
WFMP	Wildland Fire Management Plan

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## EXECUTIVE SUMMARY

This Revised Integrated Natural Resources Management Plan (INRMP), which is required by the Sikes Act, as amended (16 U.S.C. 670a et seq.), has been developed for use by the Tennessee Army National Guard (TNARNG) to provide guidance on the protection of natural resources at the Volunteer Training Site – Catoosa (VTS-C). The original VTS-C INRMP was implemented in 2002. As the natural resources management program developed, it was determined that the original INRMP format included information no longer applicable to the INRMP and the organization of project lists and guidelines was difficult to use and to update. Therefore, a revision of formatting and information was undertaken for this second iteration. In addition, the discovery of two federally listed Threatened species, *Scutellaria montana* and *Myotis grisescens*, on VTS-C and development of a forest management program for the training site required significant additions and alterations to the management plan. This revision was initiated in 2003, after discovery of the listed plant, but prior to the publication of the 2005 National Guard Bureau (NGB) Interim Guidance on the interagency coordination of INRMPs. Therefore, the official “five year review for operation and effect” was by-passed. However, the cooperating agencies were a part of the revision process from the start and have been particularly active in the development of the rare species management plan section, and thus the spirit of the interagency cooperative effort was met.

The primary purpose of natural resources management at VTS-C is to support the military training mission. The purpose of this INRMP is to ensure that natural resource conservation measures and military activities on mission lands are integrated and consistent with responsible stewardship and environmental compliance. This INRMP was prepared in accordance with the Sikes Act, as amended; Army Regulation (AR) 200-1 – Environmental Protection and Enhancement; and Department of Defense Instruction (DoDI) 4715.3 – Environmental Conservation Program.

The National Environmental Policy Act (NEPA) of 1969 dictates that planners of public actions using federal monies, such as those on military installations, shall consider the environmental impacts and effects of “major federal actions.” Section 1508.18 in the Council for Environmental Quality (CEQ) regulations lists the adoption of a formal Integrated Natural Resource Management Plan as a major federal action. An Environmental Assessment (EA) has been prepared for this action (see Appendix A). In addition, in accordance with §670a(2) of the Sikes Act, approval of the INRMP has been noted in writing by the U.S. Fish and Wildlife Service and the Tennessee Wildlife Resources Agency (Appendix C).

The goals of this INRMP are:

- To describe the training site and its physical natural resources;
- To describe the military mission, potential effects of the mission on natural resources at the training site, and options for resolving conflicts between the military mission and natural resources management;
- To show the status of baseline inventories of natural and cultural resources and monitoring requirements for environmental compliance ;
- To present goals for the management of the site’s natural resources and tasks designed to achieve those goals;

- To recommend revegetation and erosion control techniques to maintain stable soils and ensure high-quality water resources and training opportunities; and,
- To provide management guidelines that will be effective in maintaining and improving the sustainability and biological diversity of terrestrial and aquatic ecosystems on the training site and that will support the military training mission through integrated, cooperative, and adaptive management.

Benefits to the military mission include improved maneuver lands and better distribution of military activities at VTS-C. This plan will increase training realism in the natural environment. It will also enhance long-range planning efforts at VTS-C. Benefits to the environment include reduced soil erosion and vegetation loss, improvement of water-quality in wetland and riparian ecosystems, and an increase in overall knowledge of the operation of the ecosystems on VTS-C through surveys and monitoring.

This document begins with a description of the subjects: mission and facility details are outlined in Chapter Two, while specifics of the physical environment at VTS-C are presented in Chapter Three. Chapter Four addresses the management goals for VTS-C according to the resource categories specified by the Sikes Act and the projects designed to meet those goals. Chapter Five presents guidelines intended for management and training activities as they relate to natural resources protection.

The nine Appendices of this document contain supplemental material, including NEPA documentation, additional biological data, and records of the annual review process. Five detailed management plans are included as annexes to this document: the Rare, Threatened, and Endangered Species plan, Forest Management Plan, Wildland Fire Management Plan, Invasive Pest Plant Control Plan, and the Herbicide Spray Plan for Grounds Maintenance. The Rare, Threatened, and Endangered Species Annex (Annex 1) also contains an assessment of the impacts of this plan on the federally listed species occurring in VTS-C and the U.S. Fish and Wildlife Service's concurring Biological Opinion.

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# CHAPTER 1

## GENERAL INFORMATION

### 1.1 PURPOSE

The Tennessee Army National Guard (TNARNG) maintains the federally owned Volunteer Training Site –Catoosa (VTS-C) in Catoosa County, Georgia, for the purpose of training members of the Tennessee National Guard. The TNARNG manages the land on this training site for the goal that no net loss of training land result from training or natural resources management activities. In addition, the TNARNG hopes to enhance training potential and environmental quality to the greatest extent possible through its management practices. This Integrated Natural Resources Management Plan (INRMP) for VTS-C is the principle guiding document for TNARNG land management activities taking place on the training site. It is a revision of the original VTS-C INRMP which covered the period 2002-2006 and will remain in effect until a revision is deemed necessary.

The Sikes Act, Public Law 105-85, “Sikes Act Improvement Act of 1997,” (SAIA) November 18, 1997, requires the preparation of an Integrated Natural Resources Management Plan (INRMP) for those military installations containing significant natural resources and specifies the key information to be included in the Plan. The U.S. Fish and Wildlife Service (USFWS) and the Georgia Wildlife Resources Division (GWRD) are required to be cooperators in the process of developing the INRMP.

The SAIA requires a review for operation and effect no less than every five years to keep the INRMP current. Major changes require a revision be conducted while minor changes can be incorporated with an update to the existing INRMP. A revision or update will be used based on the review for operation and effect conducted jointly with the USFWS and the GWRD. The original VTS-C INRMP was implemented in 2002. In this year, a federally listed threatened species, the large-flowered skullcap (*Scutellaria montana*) was found in large numbers on the training site. The need to develop management guidelines for this species and the unsatisfactory nature of the original INRMP drove an internal decision by TNARNG in 2003 to initiate a full revision in coordination with the cooperating agencies. In 2005, Interim Guidance was provided by NGB requiring a joint decision with the cooperating agencies to initiate a full revision. As this revision was begun prior to the publication of the Interim Guidance, the agencies were not party to the initial decision, though they were a part of the assessment of the need for a rare species management plan. They were contacted when the revision process was begun and have contributed to the development of the new INRMP. Therefore, while conducting the formal five-year review, as defined in the Interim Guidance, would not have been useful, the spirit of the interagency cooperative effort has been honored. Documentation of this cooperation is included in Appendix C.

This Revised INRMP for VTS-C will serve guide TNARNG activities on the training site until a review finds that significant revision is necessary. The overriding goals of this plan are to minimize impact on training lands, to effectively repair damage caused by training activities, to improve the mission-specific qualities of the training lands, and to protect and enhance the ecosystem value of the training site. This is a living document which will be reviewed annually and updated as needed during the five years. Barring earlier need for substantial revision, five years following the date of implementation of this document, the USFWS, GWRD, and TNARNG will coordinate a review for operation and effect to determine whether the INRMP is functioning effectively or whether another large-scale revision is necessary.

Natural resources management is an on-going, long-term process. This and subsequent INRMPs will serve to shape the direction of that process in order to support the military mission of the TNARNG,

encourage sustainable management of natural resources, and ensure compliance with all relevant federal, state, and local laws.

## **1.2 MANAGEMENT PHILOSOPHY**

As stated above, the primary goal of land management at VTS-C is to meet military training needs, now and in the future, while maintaining a healthy ecosystem. To ensure the ability to meet those future needs, there must be a healthy natural system in place across the training site. The goals of training and environmental protection should not be seen as opposing. Rather, the one – a healthy environment – supports and enhances the other – training potential.

Department of Defense (DOD) Instruction 4715.3 directs that DOD land management incorporate ecosystem management, biodiversity conservation, and multiple use management. The basic principle of ecosystem management is to focus on the health of the total environment – ecosystem composition, structure, and function – rather than individual species. It is management driven by goals and designed to be adaptable: monitoring of results should lead to changes in the process if desired outcomes are not achieved. Biodiversity is short for “biological diversity,” and it refers simply to the variety, distribution, and abundance of organisms in an ecosystem. Biodiversity is crucial to the stability and functioning of an ecosystem.

Multiple use management, a concept that originated in the forestry field, refers to the practice of integrating different purposes and end products into the management scheme for a single piece of property. Under multiple use management, the goal is to obtain such commodities as timber, wildlife, recreation, water quality, and in this case training opportunities from the same land through appropriate and integrated management.

The multiple uses for which the VTS-C is to be managed include: TNARNG training needs, maintenance of native communities and biodiversity, surface and ground water quality, conservation of soil resources, threatened and endangered species protection, and habitat quality. It is the role of this INRMP to integrate the management practices for each of these goals such that all needs can be met on a sustainable basis without compromising the health of the ecosystem or mission requirements.

## **1.3 RESPONSIBILITIES**

### **1.3.1 National Guard Bureau**

The National Guard Bureau is the federal component of DoD through which flow funds and guidance to the TNARNG. Three Directorates at NGB are involved in the management of natural resources: the Director of Environmental Programs (NGB-ILE), the Director of Engineering, and the Director of Operations, Training and Readiness. They work together to implement the Integrated Training Area Management (ITAM) Program.

The Sikes Act Coordinator at NGB-ILE is responsible for reviewing the INRMP and advising the Environmental Office before the state formally submits the plan for public review. The Environmental Directorate ensures operational readiness by sustaining environmental quality and promoting the environmental ethic and is also responsible for tracking projects, providing technical assistance, quality assurance and execution of funds.

Engineering provides policy guidance and resources to create, sustain, and operate facilities that support the Army National Guard. The Engineering Directorate coordinates proposed construction projects with Operations/Training and NGB-ILE and provides design and construction support, as well as environmental management that is directly related to property maintenance (e.g., grounds maintenance, pest control).

The Director of Operations, Training and Readiness is responsible for training and training site support to include sustainable range management. The Integrated Training Area Management (ITAM) program is run by Operations/Training, but must be coordinated with the Environmental and Engineering directorates to ensure methods and results are environmentally sound and meet military needs.

### **1.3.2 TNARNG**

The Adjutant General (TAG) of the TNARNG is directly responsible for the operation and maintenance of VTS-C, which includes implementation of this INRMP. TAG ensures that all installation land users are aware of and comply with procedures, requirements, or applicable laws and regulations that accomplish the objectives of the INRMP. TAG also ensures coordination of projects and construction among environmental, training, and engineering staffs.

TAG has an Environmental (ENV) office to provide professional expertise in the environmental arena for VTS-C and all other TNARNG properties. The conservation branch of ENV is responsible for natural and cultural resources. Natural resources, including flora, fauna, forest management, threatened and endangered species protection, riparian areas, wetlands, soils, and other features, are the focus of this plan. Cultural resources such as archaeology, historical buildings, curation, and American Indian consultation are covered by the Integrated Cultural Resources Management Plan (ICRMP). The compliance branch of ENV handles the legal requirements for managing hazardous materials and waste, drinking water quality, air quality, pollution prevention, and similar tasks. The NEPA process for TNARNG is also coordinated by a branch of the ENV office. Overall, ENV is responsible for characterizing the physical and biological features of TNARNG lands, recommending appropriate management for those features, identifying compliance needs, and advising TNARNG on the best ways to comply with federal and state environmental laws and regulations. The Environmental Office also provides technical assistance to the training site personnel including: developing projects, securing permits, conducting field studies, providing Environmental Awareness materials, locating and mapping natural and cultural resources, and developing and revising management plans, to include the INRMP.

The Plans, Operations and Training Officer (POTO) has the primary responsibility of scheduling military training and ensuring safety of all personnel while training exercises are being conducted. The POTO conducts contingency planning and preparation to provide timely and appropriate military support to meet required Federal, State, and community missions. The POTO is responsible for coordinating the ITAM program; by working with the environmental office to develop a baseline of current and projected training requirements and training lands/facilities for the training site; assisting the Environmental Office in determining carrying capacity for the training site by providing military usage and training data; planning for land use based on accomplishing training requirements while minimizing negative environmental effects; prioritizing and scheduling Land Rehabilitation and Maintenance (LRAM) projects with the Environmental Office and the Training Site Manager; and allocating funds and resources to accomplish ITAM requirements.

The Training Site Operations Staff (SITE) is made up of the Training Site Manager, Range Control, and civilian personnel, who work with the Environmental office to implement this plan and assure its success. The Training Site Operations Staff is familiar with all aspects of the training site, including training scheduling (and conflicts), locations of training facilities, impairments or problems with human-made Integrated Natural Resources Management Plan

structures or natural functions, and needs for improvement or maintenance of the training land. The Training Site Personnel and TNARNG Environmental staff will ensure that all ITAM, INRMP, and ICRMP projects are identified and executed in accordance with all laws and regulations.

The statewide Facilities Management/Engineering Office (FMO) provides a full range of financial and engineering disciplines for all facilities under the jurisdiction of the Military Department of Tennessee, including VTS-C. The FMO is responsible for master planning and ensuring that all construction projects comply with environmental regulations by consulting with the Environmental Office prior to any construction by TNARNG Engineers. The FMO also provides necessary assistance with design of erosion control projects.

The Staff Judge Advocate (SJA) advises the TAG, POTO, FMO, and ENV on laws and regulations that affect training land use and environmental compliance. The joint effort of TAG, Chief of Staff, POTO, Training Site, FMO, and Environmental Office make the INRMP a living document that is updated annually. The Conservation Branch will conduct yearly meetings with the training site manager and staff, the Training Site Commander, POTO, and FMO on proposed projects and plans for the training site. Coordination for the meeting will be the responsibility of the Conservation Branch of the Environmental Office.

#### **1.4 RELEVANT ENVIRONMENTAL REGULATIONS**

Natural resources management at VTS-C is subject to a variety of environmental regulations, as referenced in Appendix E. In addition to state and federal law, TNARNG must abide by DOD and Army policy in its handling of the training site. Copies of relevant laws and regulations are being compiled in the TNARNG Environmental library and are available for review by all personnel involved in natural resources management.

#### **1.5 ENVIRONMENTAL REVIEW (NEPA COMPLIANCE)**

The National Environmental Policy Act (NEPA) was created to identify environmental concerns with human activities and resolve them to the best degree possible at early stages of project development. The levels of NEPA are recognized:

1. If the proposed action meets a categorical exclusion as listed in 32 C.F.R. Part 651, Appendix B, a Record of Environmental Consideration (REC) document is prepared for the project, and the project may proceed as planned. These are the most commonly prepared documents.
2. An Environmental Assessment (EA) may be required when the conditions for a Categorical Exclusion are not met. This often happens when extensive new military exercises, major construction, or land acquisition is planned; when the planned action involves a large area; or when wetlands or endangered species may be involved. A Finding of No Significant Impact (FONSI) is required for the action to proceed as planned. Environmental Assessments are comprehensive documents that describe a proposed action and the alternatives to the action. A 30-day review period is provided for public comment.
3. If more study is needed or a Finding of No Significant Impact cannot be prepared, an Environmental Impact Statement (EIS) must be written. These can be lengthy documents that require significant time to prepare.

The TNARNG uses NEPA to ensure its activities are properly planned, coordinated and documented. The TNARNG provides NEPA documentation for proposed unit projects at VTS-C that are beyond the existing level of documentation developed by the TNARNG for the training site. This additional NEPA documentation can then be used for identification of potential problems or impacts on the natural resources of the VTS-C.

An Environmental Assessment (Appendix A) has been written to review the implementation of this plan. Topics addressed are related to the effects of the proposed plan on natural and cultural resources. The details are discussed in the following chapters and include but are not limited to: endangered species, wildlife, riparian zones, floodplains, wetlands, archaeological and historic sites, off-road vehicle use, sedimentation, erosion, timber harvesting and non-point source pollution.

## **1.6 IMPLEMENTATION AND REVISION**

The original VTS-C INRMP was implemented in 2002. During the first years of implementation, it became apparent that the format and content of the original INRMP were not conducive to applied management. In addition, the discovery of a federally listed threatened plant species required substantive changes in the VTS-C management plan. TNARNG decided in 2003 to initiate a full revision of the document to bring the structure and project lists more in line with actual management practices and provide for the protection of the listed species. The cooperating agencies were informed of this decision and requested to contribute to the revision process; there was no opposition to this proposal. Both the USFWS and the GDWR contributed substantially to the development of the rare species management guidelines. This occurred prior to the publication of the DoD Supplemental Guidance (2004) and NGB Interim Guidance (2005) which defined the process for a review for operation and effect. The cooperating agencies have reviewed and contributed to this new iteration (see documentation in Appendix C), thus satisfying the requirement for a joint review.

This INRMP is living document. It will be reviewed and updated annually and will remain in effect until a review finds that significant revision is necessary. It was developed in cooperation with the USFWS Athens, GA, Field Office, and the GWRD. Those agencies have approved the document, as has the Regional Office of the USFWS. It was subjected to public review to satisfy both the Sikes Act and the NEPA process. Public comments were reviewed by the cooperating agencies and incorporated into the final document where appropriate. Public comments are recorded in Appendix D. In addition, Annex 1, the Rare Species Management Plan contains a Biological Assessment of the impacts of this management plan on the federally threatened large-flowered skullcap. The determination was made that impacts were not expected to be detrimental to the protected plant. The USFWS has concurred with this determination in its Biological Opinion, also attached to Annex 1.

During the lifetime of this INRMP, it is the responsibility of the TNARNG Environmental Office to work with the cooperating agencies to review it annually and update it to stay in step with military mission requirements and to maintain compliance with all applicable laws. USFWS, GWRD, Training Site personnel, and the Environmental Office will review the accomplishments for the year and address any issues. Documentation of this review will be maintained in Appendix I. Minor changes will be incorporated when needed into the existing document with agreement of the primary cooperators. In the event of a significant change to management practices, military use, or law, a complete revision may be deemed necessary, requiring collaboration with USFWS and GWRD to produce a new, signed version of the INRMP. Otherwise, five years following the date of implementation of this revision, a full scale review for operation and effect will occur in accordance with the SAIA. A revision or update at that time will be initiated based on this review effort conducted jointly with the USFWS and the GWRD.

Implementation of the INRMP will be realized through the accomplishment of specific goals and objectives as measured by the completion of the projects identified in each section of this plan. Responsibility for implementation of goals and objectives has been identified and assigned to each project throughout this document. It should be noted that project implementation dates are estimated and are subject to change depending upon funding and staffing availability. The implementation schedule in Chapter 4, Table 4.2 will provide a basis for monitoring and evaluating accomplishments toward reaching the goals.

Projects identified in this Plan are reflected in the Status Tool for Environmental Program (STEP). Funding for these projects is programmed seven years out under this system.

### 1.6.1 Personnel

Essential to plan implementation is a balanced team of trained professionals and technical staff. Staffing sources for the natural resources program at VTS-C include:

- Permanent Staff
  - VTS-C Training Site Manager
  - VTS-C Range Control Officer
  - Two state-funded maintenance workers
  - Environmental Branch Personnel
    - TNARNG Environmental Program Manager
    - Natural Resources Manager
    - Pest Management Coordinator
    - Biologist
    - Cultural Resources Manager
- Part-time Staff
  - Training Site Detachment (8-10 people per weekend)
  - Summer Interns
- Troop Labor during Annual or Drill Training provides benefits to the training site as well as to the troops themselves. Examples of projects executed using troop labor in the past are road leveling and grading, spreading of gravel, development of a confidence course, and hardened bivouac site construction. A minimum of 100 man days per year are required to complete necessary LRAM projects and 95 man days for environmental projects using troop labor at VTS-C.

### 1.6.2 Outside Assistance

Because it is most probable that TNARNG will not be able to hire the specialized expertise needed to achieve some of the projects within this INRMP, considerable expertise from universities, agencies, and contractors will be required to accomplish the tasks. Specific needs from other organizations external to TNARNG are indicated throughout this plan.

Agencies and organizations which may provide substantial support to TNARNG in carrying out this INRMP include:

- Georgia Department of Natural Resources
  - Wildlife Resources Division
  - Historic Preservation Division
- Georgia Forestry Division
- U.S. Fish and Wildlife Service, Athens Field Office

- U.S. Forest Service
- Natural Resources Conservation Service, La Fayette (Walker County) Office

Universities are a key source of scientific expertise. TNARNG does not currently have any Memoranda of Understanding with local schools but is working to establish relationships with:

- University of Tennessee at Knoxville
- University of Tennessee at Chattanooga
- University of Georgia at Athens
- Tennessee Technological University

Many of the projects identified in this plan will require expertise and time beyond that available within the permanent TNARNG staff. Such projects will be contracted out to appropriate organizations or corporations and overseen by TNARNG Environmental Office staff.

### **1.6.3 Training**

Training received by TNARNG personnel and others participating in the management of natural resources at the training site should address practical job-oriented information, legal compliance requirements, applicable DoD/DA regulations, pertinent State and local laws, and current scientific and professional standards as related to the conservation of natural resources. The following annual workshops, professional conferences, and classes are excellent means of obtaining interdisciplinary training for natural resources managers:

- NGB National Environmental Workshop
- Sustainable Range Program Workshop
- Land Rehabilitation and Maintenance Conference
- Kansas State University GIS training
- Utah State University ARCVIEW training
- Colorado State University-Center for Ecological Management of Military Lands RTLA Training
- Pesticide Application and Licensing through Georgia Department of Agriculture
- National Military Fish and Wildlife Association Conference
- U.S. Army Corps of Engineers Wetlands Delineation Courses
- Prescribed Fire Management Course offered by The Nature Conservancy
- Locally available training through the Cooperative Extension Service, universities, professional and trade organizations, state government, and commercial businesses

### **1.6.4 Funding**

Implementation of the INRMP is subject to the availability of annual funding. The following discussion of funding options is not a complete listing of funding sources. Funding sources are continuously changing and the individual focus, restrictions, and requirements of funding sources are volatile.

In 2005, DA created the Sustainable Range/Installations Environmental Activities Matrix to realign and clarify funding responsibilities for environmental requirements on ranges and facilities to avoid redundancy and gaps. The matrix designates that Environmental is the primary funding source for cultural resources, wetlands, endangered species, and all environmental plans. Installations are the primary funding source for soils issues (erosion), pest management, and invasive species control. Prescribed burning is a shared responsibility: Environmental funds cover planning and burning for ecosystem management and endangered species protection/management. Installations are responsible for wildfire prevention, response, and control, including fire break maintenance.

### Operations and Maintenance Environmental Funds:

Environmental funds are a special category of Operations and Maintenance (O&M) funds and are controlled by the Status Tool for Environmental Program (STEP) budget process. They are special in that they are restricted by the DOD solely for environmental purposes, but they are still subject to restrictions of O&M funds. Compliance with appropriate laws and regulations is the key to securing environmental funding. The program heavily favors funding high priority projects with a goal of achieving compliance with federal or state laws, especially if non-compliances are backed by Notices of Violation or other enforcement agency action.

### Training Funds:

The VTS-C natural resources management program does not receive training funds except for projects administered through the ITAM program. ITAM funding requests are not submitted via the STEP process. Instead, a 5-year ITAM workplan is used to channel ITAM funding requests from TNARNG, through NGB, to the U.S. Army's Office of the Deputy Chief of Staff for Operations (ODCSOPS). ITAM funding is controlled by the POTO.

### Agriculture, Forestry, and Hunting Permit Funds:

The forestry program at VTS-C participates in the U.S. Army's Conservation Reimbursable and Fee Collection Program. Through this program income from the sale of forest products is used to support forestry activities on the site. At the end of each fiscal year, forestry work plan expenses are deducted from actual forestry proceeds to determine net proceeds. Forty percent of the installation's net proceeds in a given fiscal year is distributed to the county in which the sales took place in accordance with DoD Financial Management Regulation 7000.14-R, Volume 11A, Chapter 16 (August 2002). These state entitlements are to be used to build, maintain, and fund roads and schools. State entitlements are made by DFAS. Any remaining proceeds are transferred to the DoD Forestry Reserve Accounts. Funds from the account can be requested each year for projects directly related to forest management. Activities that can be funded through the forestry program include timber management, reforestation, timber stand improvement, inventories, fire protection, construction and maintenance of timber area access roads, purchase of forestry equipment, disease and insect control, planning (including compliance with laws), marking, inspections, sales preparations, personnel training, and sales.

There are no agricultural outleasements at VTS-C, so funding established for the Agricultural and Grazing Outlease program is not accessed for management at the training site. Likewise, there is no hunting program on the site and so there is no funding from hunting permit fees for wildlife management.

### Other Funding Sources:

The Legacy Resource Management Program provides assistance to DOD efforts to preserve natural and cultural resources on federal lands. Legacy projects could include regional ecosystem management initiatives, habitat preservation efforts, archaeological investigations, invasive species control, and/or flora or fauna surveys. Legacy funds are awarded on the basis of project proposals submitted to the program.

National Public Lands Day is an event that occurs once a year when volunteers come together to improve the country's largest natural resource – our public lands. These volunteers gather on a Saturday every September to help improve the public lands they use for recreation, education, and enjoyment. Consult the National Public Lands Day website for more information at <http://www.npld.com> and follow the link to the DoD contact listed on the Federal Agency Working Group page.

The Pulling Together Initiative (PTI) provides a means for federal agencies to partner with state and local agencies, private landowners, and other interested parties in developing long-term weed management



projects within the scope of an integrated pest management strategy. PTI's goals are: 1) to prevent, manage, or eradicate invasive and noxious plants through a coordinated program of public/private partnerships; and 2) to increase public awareness of the adverse impacts of invasive and noxious plants. Projects that benefit multiple species, achieve a variety of resource management objectives, and/or lead to revised management practices that reduce the causes of habitat degradation are sought. A special emphasis is placed on larger projects that demonstrate a landscape-level approach and produce lasting, broad-based results on the ground. Consult the PTI website link at <http://www.denix.osd.mil/Legacy-public> for information on current grant proposal criteria.

The Federal Domestic Assistance Program 15.608 (Fish and Wildlife Management Assistance) provides technical information, advice, and assistance to Federal and State agencies and Native Americans on the conservation and management of fish and wildlife resources. Projects for grant funding must be submitted to the Regional Director of the USFWS. Cooperative programs with the State conservation agencies and military installations have included joint studies of fishery and wildlife problems of major watersheds, large reservoirs, or streams. Through the Sikes Act, the Service has established a Memorandum of Understanding with the DoD whereby fish and wildlife values are considered on military installations.

The DoD administers the grant program "Streamside Forests: Lifelines to Clean Water," a competitive grant program designed to help children and others learn about protecting resources by working with installation staff to help restore a streamside ecosystem in their own community. The DoD provides funds up to \$5,000 to military installations working in partnership with local school and/or civic organizations to purchase locally native plant material for small streamside restoration projects.

### **1.6.5 Priorities and Scheduling**

The Environmental Quality Conservation Compliance Classes define funding priority with regard to O&M funds. All projects in classes 0, I, and II shall be funded consistent with timely execution to meet future deadlines (DODI 4715.3). The four project classes are:

Class 0: Recurring Natural and Cultural Resources Conservation Management Requirements – includes projects and activities needed to cover the recurring administrative, personnel, and other costs that are necessary to meet applicable compliance requirements (Federal and State laws, regulations, Presidential Executive Orders, and DOD policies) or which are in direct support of the military mission. Examples of recurring costs include:

- Manpower, training, and supplies
- Hazardous waste disposal
- Operating recycling activities
- Permits and fees
- Testing, monitoring, and/or sampling and analysis
- Reporting and record keeping
- Maintenance of environmental conservation equipment
- Compliance self-assessments

Class I: Current Compliance – includes projects and activities needed because an installation is currently or will be out of compliance if projects or activities are not implemented in the current program year.

Examples include:

- Environmental analyses, monitoring, and studies required to assess and mitigate potential effects of the military mission on conservation resources
- Planning documents

- Baseline inventories and surveys of natural and cultural resources
- Biological assessments, surveys, or habitat protection for a specific listed species
- Mitigation to meet existing regulatory permit conditions or written agreements
- Wetlands delineation
- Efforts to achieve compliance with requirements that have deadlines that have already passed
- Initial documenting and cataloging of archaeological materials

Class II: Maintenance Requirements – includes those projects and activities needed that are not currently out of compliance but shall be out of compliance if projects or activities are not implemented in time to meet an established deadline beyond the current program year. Examples include:

- Compliance with future requirements that have deadlines
- Conservation and Geographic Information System mapping to be in compliance
- Efforts undertaken in accordance with non-deadline specific compliance requirements of leadership initiatives
- Wetlands enhancement, in order to achieve the Executive Order for “no net loss” or to achieve enhancement of existing degraded wetlands
- Environmental awareness and education programs for troops and the public

Class III: Enhancement actions, beyond compliance – includes those projects and activities that enhance conservation resources or the integrity of the installation mission, or are needed to address overall environmental goals and objectives, but are not specifically required under regulation or Executive Order and are not of an immediate nature. Examples include:

- Participation in “National Public Lands Day”, an annual event where volunteers unite to improve resources on public lands
- Community outreach activities, such as “Earth Day” and “Historic Preservation Week”
- Educational and public awareness projects, such as interpretive displays, oral histories, “Watchable Wildlife” area, nature trails, wildlife checklists, and conservation teaching materials
- Restoration or enhancement of cultural or natural resources when no specific compliance requirement dictates a course or timing of action
- Management and execution of volunteer and partnership programs

## CHAPTER 2 TRAINING SITE OVERVIEW

### 2.1 LOCATION AND REGIONAL CHARACTER

#### 2.1.1 Location, size, general description

The Volunteer Training Site – Catoosa (VTS-C) is located in east-central Catoosa County in northwestern Georgia (Figure 2.1), approximately two miles east of Ringgold, the county seat, and 13 miles east of Fort Oglethorpe, Georgia. The 1,628-acre training site is approximately 90 miles northwest of Atlanta, the state capital, and approximately 20 miles southeast of Chattanooga, Tennessee. Georgia State Highway 2 borders the site on the south, and Salem Valley Road accesses the northern boundary (Figure 2.2). The site is approximately 16,000 feet at its maximum length by approximately 6,625 feet at its maximum width.

#### 2.1.2 Property Ownership

The VTS-C is owned by the U.S Army Corps of Engineers and has been licensed for use to the TNARNG since 1960. The Tennessee Military Department operates the VTS-C for the TNARNG through a license (DA Outgrant Number DACA21-3-72-0401) from the U.S. Army Corps of Engineers. The TNARNG is responsible for upkeep of the entire licensed area.

#### 2.1.3 Neighboring Land Ownership and Encroachment

The property surrounding VTS-C is primarily privately owned residential and agricultural land. The helicopter landing pad is approximately 100 feet north of the closest residence. Land to the north of the maneuver area and rifle range and west of VTS-C is composed of cultivated land, cattle pasture, and hardwood forest. A school (Tiger Creek Elementary) is located approximately 0.5 mile west of the training site on Highway 2.

#### 2.1.4 Demographics

The total resident population in 2005 for Catoosa County, Georgia, was 60,813 (Table 2.1). The unemployment rate for the county is less than the state average. Median household income is also slightly less than the median income for the state.

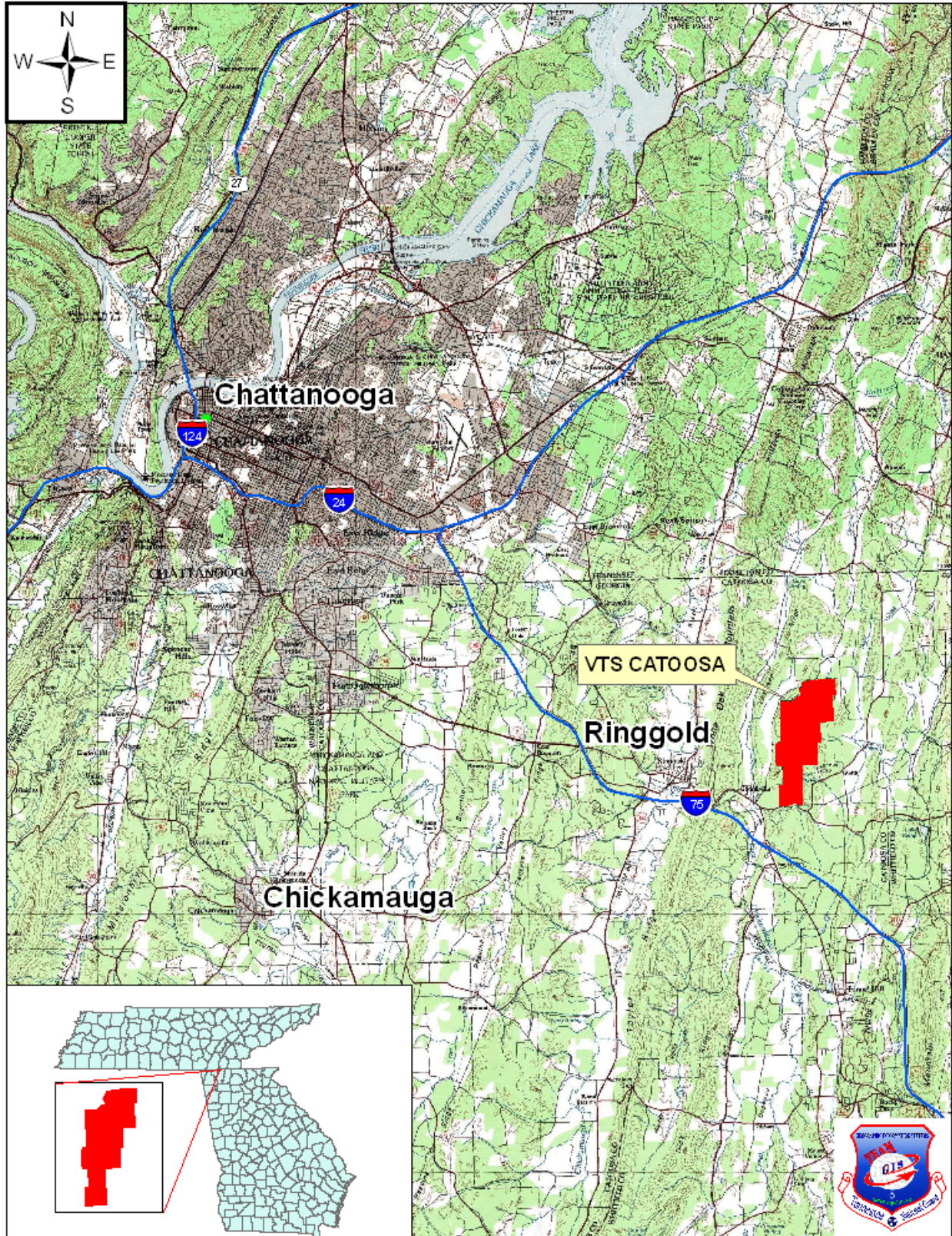
**Table 2.1: Selected demographic data for Catoosa County, Georgia.**

	Total Resident Population, 2011 *	Median Household Income, 2006-10 *	% Persons Below the Poverty Line, 2006-10 *	Unemployment Rate (%), 2010 **
Catoosa County	64,530	\$46,544	11.2 %	8.1 %
Georgia	9,815,210	\$49,347	15.7 %	10.2 %
U.S.	311,591,917	\$51,914	13.8 %	9.6 %

\* U.S. Census Bureau (2012)

\*\* U.S.D.A. Economic Research Service (2012)





**Figure 2.1: Location of the Volunteer Training Site – Catoosa.**



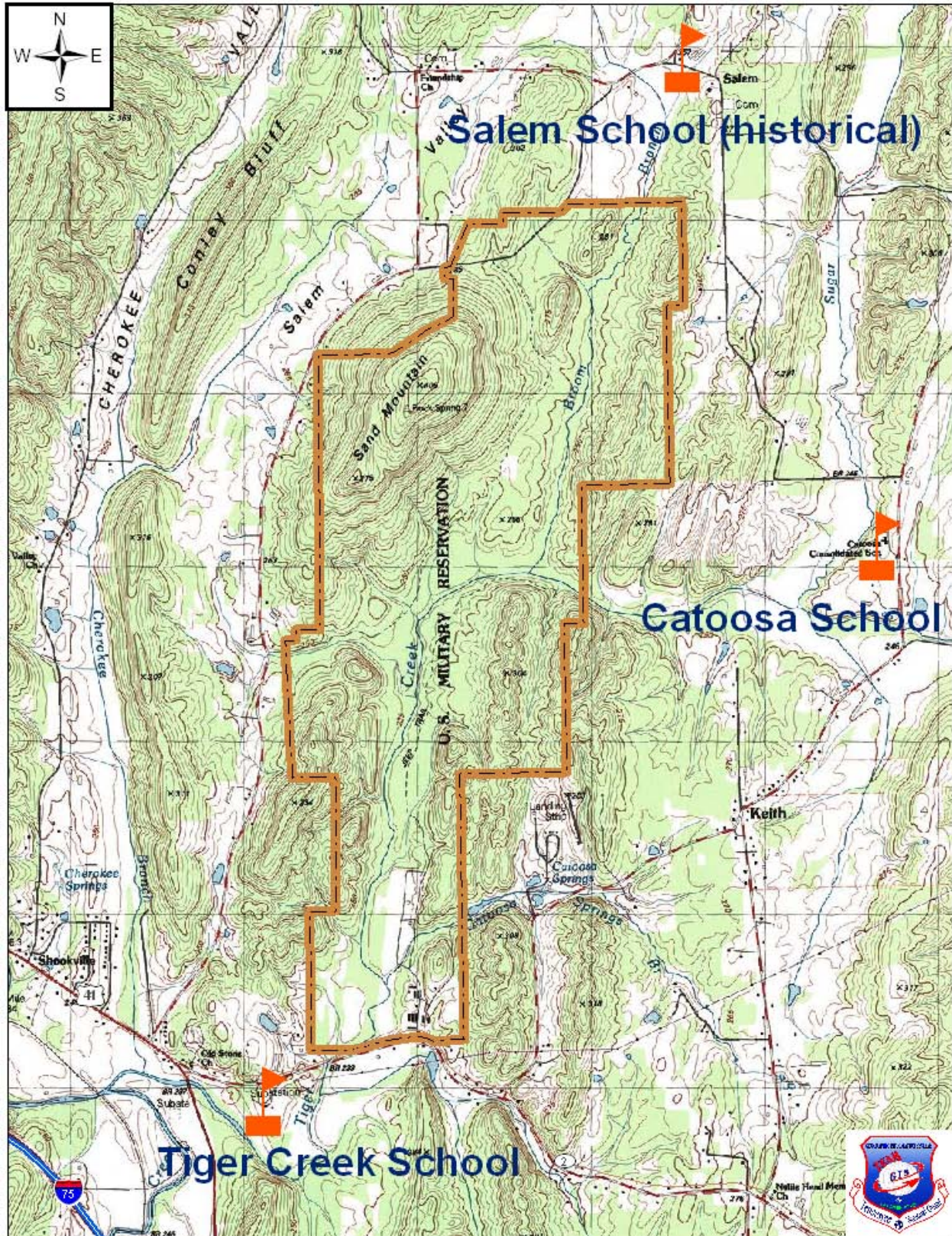


Figure 2.2: Local surroundings of VTS-Catoosa.



### 2.1.5 Nearby Natural Areas and Parks

A large portion of northwest Georgia is protected natural lands, the bulk of which falls within the Chattahoochee National Forest which covers parts of 18 counties in Georgia. The following list of natural areas within 30 miles of VTS-C was collected from multiple sources, including US Forest Service 2006, US National Park Service 2006, and Henry Chambers, GADNR, personal communication.

Chattahoochee National Forest – 750,502 acres in northwest Georgia – six acres of forest fall in Catoosa County and 11,719 acres are within Whitfield County, to the southeast of Catoosa. Both of these acreages are part of the Armuchee-Cohutta Ranger District, headquartered in Chatsworth, GA

Chickamauga and Chattanooga National Military Park – 9,059 acres south of Chattanooga in both Georgia and Tennessee

Cloudland Canyon State Park – 2300 acres in Dade and Walker Counties, straddling the deep gorge cut by Sitton Gulch Creek

Crockford-Pigeon Mountain Wildlife Management Area (WMA) – 16,400 acres in Walker County, west of Lafayette, GA

Elsie Holmes Nature Park (county park) – 66 acres in Catoosa County, approximately 5 miles from the training site, which has a protected population of large-flowered skullcap

Fort Mountain State Park – 3712 acres in Murray County within the Chattahoochee National Forest, including a 17 acre lake

JH (Sloppy) Floyd State Park – 500 acres in Chattooga County, including a 16 acre lake and a 34 acre lake

Johns Mountain WMA – 24,000 acres in Gordon and Walker Counties, located on the Chattahoochee National Forest

Otting Tract WMA – 700 acres in northwest Chattooga County.

Zahnd Tract Natural Area – 1400 acres in Dade and Walker Counties, including a 161 acre WMA.

## 2.2 INSTALLATION HISTORY

Catoosa County was established from Walker and Whitfield Counties by an act of the General Assembly of Georgia in 1853 (Lawrence 1993). The name is derived from the Cherokee word “Catoosa,” meaning “between two hills.” Cherokee Indians originally occupied Catoosa County, but a treaty signed in 1835 allowed the state to take control of lands formerly held by the Cherokee Nation. In 1838, the Cherokee people were forced from the area. In 1863, a fierce Civil War battle took place in and around Ringgold, the county seat (Lawrence 1993).

Military use of the lands that comprise VTS-C began in 1904 when the army utilized land adjacent to Catoosa Springs as a target range for training troops from Fort Oglethorpe. The land was originally leased by the Army and later purchased as two separate acquisitions in 1906-07 (876 acres) and 1910 (additional 751.41 acres).

The Catoosa property was referred to as the “Target Range” or “Rifle Range” during its years of association with Fort Oglethorpe, from 1910 until the end of World War II. The “Fighting” 6<sup>th</sup> Cavalry trained at Catoosa from 1919-1941, and members of the Woman’s Army Corps (WACs) were trained there during World War II. Soldiers were transported from the post to a 1,000 yard rifle range at the south end of the VTS-C property. Apparently the site held 13 buildings at that time, four located near Catoosa Springs Road and eight located along Tiger Creek at the base of Sand Mountain.

When Fort Oglethorpe closed in 1945, the associated property including the Catoosa Target Range was offered for public sale. In 1948, the rifle range was withdrawn from surplus and placed under the jurisdiction of the Army Corps of Engineers in an inactive status to be used by the Tennessee National Guard for training its Ground Force Unit. Since 1960, the TNARNG has had operational control through a license from the Corps of Engineers. The name of the facility was changed to the National Guard Catoosa Rifle Range in 1966, to Catoosa Area Training Center in 1976, and finally to the Volunteer Training Site – Catoosa in 2003.

### 2.3 MILITARY MISSION

The TNARNG serves both state and federal missions. Both state and federal funding are provided to ensure that the Tennessee Army National Guard is constantly ready to support any mission or need requiring military personnel and equipment. When called by the Governor, the state mission supports civil authorities in the protection of life and property and the preservation of peace, order, and public safety. When called by the President in times of war and national emergency, the federal mission provides trained and equipped personnel and units capable of rapid deployment.

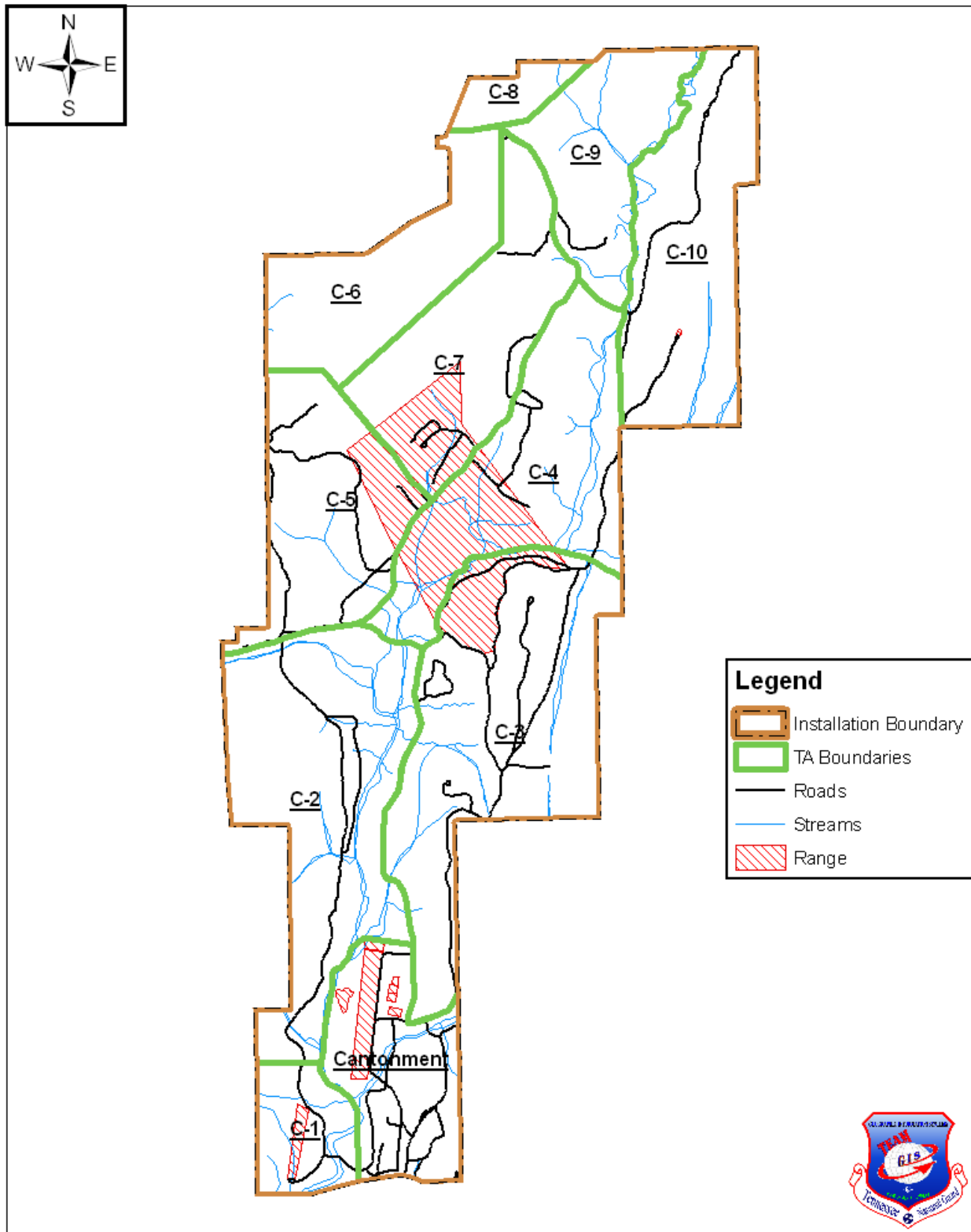
The VTS-Catoosa mission statement is to provide state of the art training facilities in support of total force training requirements to sustain operational readiness and exceed mission requirements. Training needs are subject to change in the near future as the TNARNG embraces the transformation of the military force structure.

### 2.4 FACILITIES

VTS-C has a 55.1-acre Cantonment Area, which is the improved portion of the training site. Developed facilities include an administrative building, three supply buildings, two mess halls each with kitchen shelter, seven barracks which house 400 soldiers (occupied by visiting TNARNG personnel only during training periods), a guardhouse, a 200 soldier latrine (with shower), one 50 soldier classroom, and paved parking.

The training site is divided into ten training areas and the cantonment area (Figure 2.3). Facilities in the small arms range area include two support buildings; one range tower; a weapon cleaning station; and a parking area. Available ranges on the site include:

25-meter Pistol Range	Tank Gunnery Range 1:60 scale
25-meter Rifle Range	Tank Table VII range 1:2 scale
10-meter M-60 Machine Gun range	M31 Artillery Range (inactive)
1200-meter Machine Gun Transition	M32 Mortar Range (inactive)
Known Distance Rifle Range (100-600 yards)	Demolition Range
M-203 Grenade Launcher Range	Gas Chamber
Hand Grenade Qualification Course	Urban Assault Course
MK-19 Range	



**Figure 2.3: VTS-Catoosa Training Areas and Facilities.**



Army aviation facilities include one lighted, non-controlled helipad. The nearest fuel point is the Chattanooga Metropolitan Airport. The existing facilities are considered sufficient to accommodate the current level of activities at VTS-C; however, to support the changing nature of the TNARNG mission, future plans include the addition of a Tactical Training Base (TA C-4), additional barracks and classrooms in the cantonment, and additional live fire ranges (TAs C-7, C-9, and C-4).

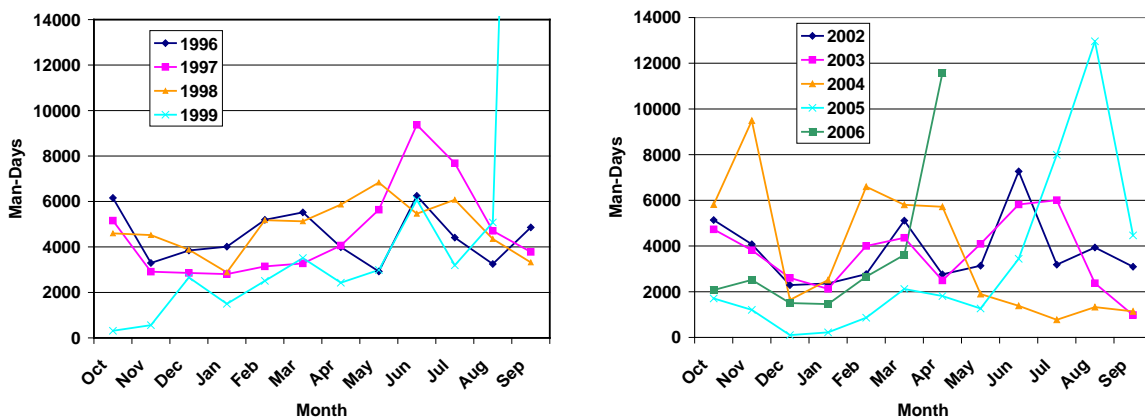
### 2.5 TRAINING SITE UTILIZATION

The VTS-C is the primary training facility for TNARNG units within 100 miles of the training site. The primary user units are:

1-181 <sup>st</sup> HIMARS BN	300 QM BN
TEC/AMS (Air Guard)	108 FA BN
489 CA BN	3397 <sup>th</sup>
4-14 <sup>th</sup> Marines (M Bttry)	212 Transportation BN
USARC History Group	844 <sup>th</sup> ENG BN
Co H, 121 INF (ABN)(LRS)	161 <sup>st</sup> ASB BN
265 <sup>th</sup> ENG BN	278 ACR
171 AVN BN	

Total training site utilization for the VTS-C for 1996-1999 and 2002-2005 is summarized in Figure 2.4 in man-days per month. The monthly data for three user groups (TNARNG/TNANG, Other Military, and Civilian) from fiscal years 1996-1999 and 2002-2005 are also presented in Table 2.2. Average training site usage over the past four years has been approximately 42,700 soldiers per year, a decrease from the average of 50,400 for the years 1996-1999 (not including the 55,000 civilians who took part in a Civil War Reenactment in September of 1999 – the off-the-chart spike on Figure 2.4).

Seasonal distribution of training activities can be seen in Figure 2.5. Training site use is generally well dispersed across the year; however, distinct peaks of National Guard usage occur in October-November, February-April, and June. The low level of use from May 2004 to May 2005 was due to unit deployments.



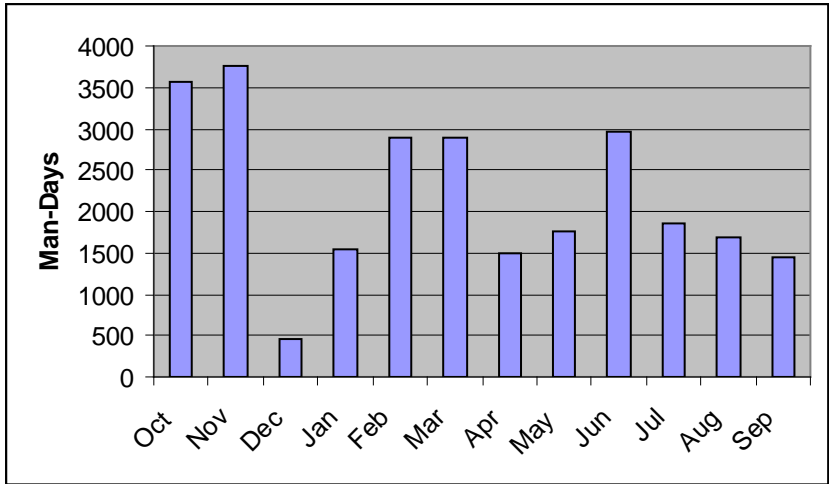
**Figure 2.4: Total training site use 1996-1999 and 2002-2006.**

**Table 2.2: Training site utilization by National Guard, other military, and civilian users, 1996-1999 and 2002-2006.**

<b>TY1996</b>	<b>OCT</b>	<b>NOV</b>	<b>DEC</b>	<b>JAN</b>	<b>FEB</b>	<b>MAR</b>	<b>APR</b>	<b>MAY</b>	<b>JUN</b>	<b>JUL</b>	<b>AUG</b>	<b>SEP</b>	<b>TOTAL</b>
<b>TNARNG/TNANG</b>	3463	1087	1640	2036	2126	2975	2357	1354	1543	4016	2740	2826	28163
<b>Other Military</b>	2134	1857	2028	1417	2694	2113	1340	1236	770	338	196	1829	17952
<b>Civilian</b>	558	351	177	558	375	434	296	332	3934	58	316	205	7594
<b>TOTALS</b>	6155	3295	3845	4011	5195	5522	3993	2922	6247	4412	3252	4860	53709
<b>TY1997</b>	<b>OCT</b>	<b>NOV</b>	<b>DEC</b>	<b>JAN</b>	<b>FEB</b>	<b>MAR</b>	<b>APR</b>	<b>MAY</b>	<b>JUN</b>	<b>JUL</b>	<b>AUG</b>	<b>SEP</b>	<b>TOTAL</b>
<b>TNARNG/TNANG</b>	3131	1340	606	72	2382	2155	2407	3511	8322	6260	3320	2365	38191
<b>Other Military</b>	1459	1061	1962	72	552	956	1001	1714	467	216	490	1245	11195
<b>Civilian</b>	570	512	287	343	209	166	654	412	582	1205	899	168	6007
<b>TOTALS</b>	5160	2913	2855	487	3143	3277	4062	5637	9371	7681	4709	3778	55393
<b>TY1998</b>	<b>OCT</b>	<b>NOV</b>	<b>DEC</b>	<b>JAN</b>	<b>FEB</b>	<b>MAR</b>	<b>APR</b>	<b>MAY</b>	<b>JUN</b>	<b>JUL</b>	<b>AUG</b>	<b>SEP</b>	<b>TOTAL</b>
<b>TNARNG/TNANG</b>	1700	2693	1115	2132	3798	2684	4296	4274	2674	2086	3572	1740	32764
<b>Other Military</b>	1542	1228	1875	392	1062	1757	921	2201	800	2350	314	1140	15582
<b>Civilian</b>	1358	600	890	360	319	687	649	356	1989	1639	465	440	9752
<b>TOTALS</b>	4600	4521	3880	2884	5179	5128	5866	6831	5463	6075	4351	3320	58098
<b>TY1999</b>	<b>OCT</b>	<b>NOV</b>	<b>DEC</b>	<b>JAN</b>	<b>FEB</b>	<b>MAR</b>	<b>APR</b>	<b>MAY</b>	<b>JUN</b>	<b>JUL</b>	<b>AUG</b>	<b>SEP</b>	<b>TOTAL</b>
<b>TNARNG/TNANG</b>	214	561	261	818	1938	2079	930	877	3883	2430	4350	3253	21594
<b>Other Military</b>	100	0	1052	679	535	1336	1274	1873	1713	708	0	378	9648
<b>Civilian</b>	0	0	1349	0	35	100	225	240	475	57	727	55288	58496
<b>TOTALS</b>	314	561	2662	1497	2508	3515	2429	2990	6071	3195	5077	58919	89738

Table 2.2, continued:

<b>TY2002</b>	<b>OCT</b>	<b>NOV</b>	<b>DEC</b>	<b>JAN</b>	<b>FEB</b>	<b>MAR</b>	<b>APR</b>	<b>MAY</b>	<b>JUN</b>	<b>JUL</b>	<b>AUG</b>	<b>SEP</b>	<b>TOTAL</b>
<b>TNARNG/TNANG</b>	4200	2657	795	2007	1917	4023	2197	2562	5086	455	2026	2264	30189
<b>Other Military</b>	696	1220	1442	80	362	817	235	328	964	883	1281	635	8943
<b>Civilian</b>	240	203	56	275	490	270	330	250	1217	1847	629	194	6001
<b>TOTALS</b>	5136	4080	2293	2362	2769	5110	2762	3140	7267	3185	3936	3093	45133
<b>TY2003</b>	<b>OCT</b>	<b>NOV</b>	<b>DEC</b>	<b>JAN</b>	<b>FEB</b>	<b>MAR</b>	<b>APR</b>	<b>MAY</b>	<b>JUN</b>	<b>JUL</b>	<b>AUG</b>	<b>SEP</b>	<b>TOTAL</b>
<b>TNARNG/TNANG</b>	3468	3462	800	1968	3621	2897	2044	3276	4832	2292	702	423	29785
<b>Other Military</b>	652	230	1375	0	67	1084	178	154	846	1248	980	378	7192
<b>Civilian</b>	608	123	430	158	312	380	269	664	141	2468	688	180	6421
<b>TOTALS</b>	4728	3815	2605	2126	4000	4361	2491	4094	5819	6008	2370	981	43398
<b>TY2004</b>	<b>OCT</b>	<b>NOV</b>	<b>DEC</b>	<b>JAN</b>	<b>FEB</b>	<b>MAR</b>	<b>APR</b>	<b>MAY</b>	<b>JUN</b>	<b>JUL</b>	<b>AUG</b>	<b>SEP</b>	<b>TOTAL</b>
<b>TNARNG/TNANG</b>	5462	8670	248	2155	6474	3674	1366	360	872	315	474	793	30863
<b>Other Military</b>	0	816	1122	0	120	1829	2742	640	123	43	594	323	8352
<b>Civilian</b>	350	0	268	360	0	300	1610	900	390	416	260	27	4881
<b>TOTALS</b>	5812	9486	1638	2515	6594	5803	5718	1900	1385	774	1328	1143	44096
<b>TY2005</b>	<b>OCT</b>	<b>NOV</b>	<b>DEC</b>	<b>JAN</b>	<b>FEB</b>	<b>MAR</b>	<b>APR</b>	<b>MAY</b>	<b>JUN</b>	<b>JUL</b>	<b>AUG</b>	<b>SEP</b>	<b>TOTAL</b>
<b>TNARNG/TNANG</b>	1401	895	60	54	348	990	1276	946	2130	4407	7205	2869	22581
<b>Other Military</b>	105	240	0	72	516	893	330	70	633	600	3124	776	7359
<b>Civilian</b>	199	70	42	98	0	238	208	251	680	2987	2630	819	8222
<b>TOTALS</b>	1705	1205	102	224	864	2121	1814	1267	3443	7994	12959	4464	38162
<b>TY2006</b>	<b>OCT</b>	<b>NOV</b>	<b>DEC</b>	<b>JAN</b>	<b>FEB</b>	<b>MAR</b>	<b>APR</b>	<b>MAY</b>	<b>JUN</b>	<b>JUL</b>	<b>AUG</b>	<b>SEP</b>	<b>TOTAL</b>
<b>TNARNG/TNANG</b>	738	1742	378	956	1874	2876	10236						18800
<b>Other Military</b>	808	308	554	114	533	740	1324						4381
<b>Civilian</b>	530	468	570	387	254	0	10						2219
<b>TOTALS</b>	2076	2518	1502	1457	2661	3616	11570						25400



**Figure 2.5: National Guard (TNARNG/TNANG) monthly use of VTS-C (average for 2002-2005).**

Training activities on VTS-C are variable. The types of training on VTS-C in the future are expected to be similar to previous years, as shown in Table 2.3. Typical uses include small arms range firing, maneuvering, and combined arms training including field bivouac; tracked and wheeled vehicle operations on developed roads and major trails; mounted and dismounted maneuvers; and weapons firing. Off-road maneuvers are permitted within designated open terrain areas and in designated fringe areas (concealment parking sites) within 100 feet of specified roads and trails within the maneuver area. Up to one battalion-size infantry, artillery, engineer, or combat service support unit, conducting non-live fire exercises, can be accommodated at one time.

**Table 2.3. Types of training anticipated.**

Type of Training
Airborne, air assault operations
Lane Training Event using WTBD Task (Warrior Task Battle Drills)
AWQ, IWQ, and Crew served weapons on small arms ranges
Field artillery units doing collective training to include maneuver from one firing position to another
Field Training Exercise (FTX) and Command Post Exercise (CPX) operations which include setting up the Unit Headquarters in a field Tactical Operations Center
Military Police (MP) unit operations primarily route security and surveillance, company sized units
Land Navigation Course for OCS, MP, and others
Obstacle Course, company or platoon size elements
Basic to Advanced classroom instruction
Tank and Bradley qualifications
Mounted Land Navigation Course – All unit types
Artillery Training and Familiarization
Grenade Launcher Training / Qualifications
Light Infantry Training – Primarily Company/Platoon Tactics
Urban Assault Course Training - Infiltration, breaching, and clearing operations

## 2.6 EFFECTS OF TRAINING ON NATURAL RESOURCES

Military training can have both negative effects on and positive benefits to natural resources. Maneuver damage is by far the largest negative effect on the natural resources at VTS-C. Maneuvering heavy tracked and wheeled vehicles across even the best-suited landscapes can cause damage to vegetation and soils. For this reason, soils at the VTS-C require timely land rehabilitation efforts at appropriate intervals. Vegetation as well as soils can be damaged by regular use on areas such as trails, bivouac sites, and firing points. Wildlife populations can also be harmed by field equipment training, small arms firing, or by mission related wildfires.

The impact level of typical TNARNG training activities is given in Table 2.4. “Low” impact activities are those which generally will not disturb the vegetation or soil and will require no rehabilitation. “Medium” impact activities may cause some disturbance or change which may require minor rehabilitation or which may recover over time without aid. “High” impact activities typically cause significant change to the soils or vegetation of the area which will require timely attention to avoid or minimize long-term alteration of existing conditions. Some training activities may be conducted at different levels of disturbance.

**Table 2.4: Military training and land use activities that may cause soil or vegetation disturbance.**

<b>Training Activities</b>	<b>Low Impact</b>	<b>Medium Impact</b>	<b>High Impact</b>
Small unit infantry tactics	X		
Reconnaissance	X		
Terrain/map analysis	X		
Escape and evasion	X		
Infiltration	X		
Land navigation – mounted and dismounted	X		
Patrolling	X		
Nuclear, Biological, Chemical training with simulated agents	X	X	X
Engineer reconnaissance	X		
Tactical bivouac occupation/displacement		X	X
Cold weather operations	X	X	X
Cover and concealment		X	
Field fortifications		X	X
Install/clear minefields			X
Construct obstacles			X
Breaching and clearing operations			X
Construct and maintain main supply routes	X	X	
Demolition training			X
Nonstandard fixed bridges		X	
Bridging and rafting operations		X	
Fording operations		X	
Mobility and countermobility			X
Weapons qualifications/familiarization		X	
Mechanized maneuvers (tracked or wheeled)			X
Artillery training (setup and firing)			X
Direct fire			X
Aerial operations	X		

Five basic management techniques can be used to minimize military training effects to the soil and vegetation resources: (1) limit total use; (2) redistribute use; (3) modify kinds of uses; (4) alter the behavior of use; and (5) manipulate the natural resources for increased durability. These will be discussed throughout the management plan. One example of modifying the kind of use is the use of simulators and simulations at VTS-C. Various high-technology methods have been implemented at VTS-C to provide for increased safety, better use of available space, and reduced effects of noise on natural resources by eliminating the need for live-fire in certain situations. Expanded use of simulators and better equipment can reduce maneuver damage to land and soils while improving training realism.

Vehicle maneuvers, tracked and wheeled, have the potential to cause the greatest military related impact to the VTS-C ecosystem. Vehicles used by TNARNG range from Humvees to Abrams tanks. Military vehicle training may involve single vehicle maneuvers up to platoon or squadron size elements. Soil compaction and erosion are the most probable results of vehicle maneuvers. Appropriate planning (avoiding steep slopes, highly erodible soil types, and wet soils) and preparation (gravelling of tank trails, etc.) can mitigate much substrate damage. Immediate repair of any damaged areas after training maneuvers ensures no net loss of training area.

Vehicles may also be a significant factor in the introduction of non-native plant matter to the VTS-Catoosa natural areas. Invasive pest plants (IPP) are one of the most immediate threats to native ecosystems in the southeastern U.S. These exotic species can reproduce prolifically and spread rampantly throughout an ecosystem, causing significant disruption to the natural system. To minimize the threat of introducing of new invasive plant species, vehicles arriving at VTS-C from outside the county should be washed thoroughly to remove any soil, seeds, or plant parts before leaving the Cantonment to enter the training area.

Bivouacking has impacts similar to civilian campgrounds. Soil compaction and trampling of vegetation increase runoff rates and may lead to higher erosion. There may also be a change in vegetation composition to more damage- and disturbance-tolerant species. During wet conditions, vehicles may create ruts if pulled off-road. Rotation of sites and careful site choice can minimize the damage caused by bivouacking.

The greatest positive effect of the TNARNG mission on natural resources is the military presence. TNARNG land managers have tried to institute good land use practices such as reducing erosion and negative impacts on stream crossings and wetlands. Disturbances that significantly, and often permanently, change the landscape (for example, agricultural tillage, reduction of forest and wildlife habitat for development, and much recreational vehicle damage) are avoided on VTS-C, so that natural communities are relatively undisturbed and are left to return to their natural compositions. After training, the land is evaluated by training site personnel for any damage. If repair is needed, it is initiated at that time to ensure minimal erosion or loss of training land is occurring. If impacts are substantial, training is rotated to another site until the first area has recovered and can be used again.

## **2.7 NATURAL RESOURCES NEEDED TO SUPPORT MILITARY MISSION**

Due to the variety of units that utilize VTS-C, multiple environmental conditions are needed for training:

- Open woodland areas for bivouac
- Wooded maneuver areas for foot and vehicle traffic
- Road networks

- Pull-off points along roads
- Firing ranges
- Land navigation course
- Urban Assault Course

According to the Training Site Manager, the current site conditions meet most training needs. The steep topography of the site is a major limiting factor that can be minimally altered. The vegetation coverage of the site is acceptable (81% forested, 15% grassland). Sufficient large open grassland areas exist within the center of the site for most training needs. The majority of the forestland is adequate for its training uses.

There is, however, a need for additional small cleared areas for bivouac and other training within the woodlands of training areas C-4, C-5, and C-10. These open areas need to be less than 5 ac (1-2 ac typically) and situated far enough off the main roads to give a sense of seclusion. Six or eight desirable areas will be identified by training site staff for appropriate size, good location, and level ground. If the existing timber warrants, the areas will be incorporated into the timber sale schedule. If the areas do not contain merchantable timber, clearing will be conducted by the training site.

Additional clearing of trees is needed along the property boundary to create the mandated 25 ft line-of-sight buffer for security purposes. Such a buffer will also function as a perimeter firebreak, allow access to the fence for monitoring and repair, and in one section at the north end of the facility (TA C-9) will be expanded into an unimproved trail for wheeled vehicle training.

Additional range development projects are in the proposal or planning stages. Addition of a modified record fire range, relocation of the TTB, and development of a CACTF will involve the clearing of timber, leveling of ground, creation of access roads, and possible relocation of a small group of the federally listed threatened plant, large-flowered skullcap.

The boundary line-of-sight clearing has been addressed in Section 7 consultation with the USFWS for potential impacts on the large-flowered skullcap. Other projects will have to be assessed for potential impact on this plant, as well as on the endangered gray bat which is also found on the training site, and the impacts reviewed with the USFWS through informal and/or formal consultation in accordance with the Endangered Species Act.

A growing beaver population on the site has affected training lands by causing extensive flooding. Attempts to manage the pond levels mechanically have failed. The beaver population will need to be maintained at a lower level through hunting and/or trapping to minimize impact on the training mission and facilities.

To achieve the currently desired missionscape, the VTS-Catoosa needs additional small openings within heavily forested training areas, a cleared boundary fenceline, additional range features, and control of the beaver population. With these additions and modifications, the overall landscape of the VTS-Catoosa should continue to meet TNARNG training needs. Any significant change in mission will require that the missionscape be reexamined.

## 2.8 NATURAL RESOURCE CONSTRAINTS ON MISSION/MISSION PLANNING

Certain features of the natural environment represent potential limitations on training activities. The most significant at VTS-C are rare, threatened, or endangered species; topography; and surface water. The challenge is to protect these sensitive resources while still ensuring the full range of military training required by the mission. Many sensitive areas can be identified prior to any training activity and incorporated into the ambiance of the activity in the form of safety, off-limits, or contaminated areas. This allows protection of the environment in conjunction with more realistic training scenarios.

### 2.8.1 RTE species

Large-flowered skullcap (*Scutellaria montana*) is a federally- and state-listed threatened plant species that grows at VTS-C in small groups ranging in numbers from a few to hundreds per group (see Figure 3.9). This herbaceous species typically occurs in the understory of mature oak forests on the mid-range of slopes. Initial studies started in 2002, and monitoring and training have been in progress since 2004 to gather information and manage this species. Tracked or wheeled vehicles could destroy large numbers of plants, and so the locations where skullcap is known to occur are off-limits to vehicular traffic. These areas are open to foot-traffic except for during the primary growing and flowering season of the plant (March 1-June 30) when trampling might interfere with reproduction.

The gray bat (*Myotis grisescens*) is a federal endangered species. It has been captured feeding over Tiger Creek on VTS-C. To date, no caves or other hibernacula for the species have been found on the training site and so management is currently limited to protecting its foraging habitat. Stream quality and riparian habitat protection are important to maintaining the food source for this protected species, and so best management practices associated with streamside management zones must be integrated into training and land management activities.

### 2.8.2 Topography

VTS-C is located in the foothills of the Southern Appalachian Mountains. Slopes on the training site range from nearly level along the creeks to greater than 50%. The steeper areas are not suitable to some mounted training activities. In addition, the steep slopes are more prone to significant erosion problems. Roads up Sand Mountain have been closed in the past due to the erosion gullies that have formed. Care must be taken with activities that will disturb the soil or vegetation along the slopes, including such projects as building roads, locating and scheduling training, and off-road maneuvers. Immediate reclamation of disturbed areas should be incorporated into all training and site management plans.

### 2.8.3 Surface Water

Two creeks cross a large part of the VTS-C training area: Tiger Creek and its tributary Broom Branch. Water quality in these creeks is high and supports a wide variety of aquatic life. This quality must be protected from sedimentation, chemical pollutants, and damage to the streamside ecosystems. Care must be taken in all activities that could directly or indirectly impact stream conditions, such as stream crossings, vehicular maneuvers and training, fueling activities, and vegetation clearing. Current conditions in lowland parts of the training site, including large portions of the tank range along the banks of Tiger Creek, are too wet for vehicle access throughout much of the year.

## 2.9 GEOGRAPHIC INFORMATION SYSTEM (GIS) ASSETS

TNARNG supports a Geographical Information (GIS) Branch which is responsible for all GPS/GIS activities in support of the CFMO-Environmental Office mission. The TNARNG CFMO GIS Branch provides secondary support of the ITAM mission as it applies to the Environmental activities. The GIS Branch provides mapping, data mining, data storage/retrieval, statistical analysis, and data modeling. As



well as all data collection via GPS, surveying and research. In addition to required GIS/GPS functions the GIS Branch all provides first line Information Technology support, database development and web based publishing. Geospatial data must meet federal, DOD, Army, and NGB standards, including (Federal Geographic Data Committee (FGDC) and Spatial Data Standards for Facilities, Infrastructure, and Environment (SDSFIE). All TNARNG sponsored projects will be incorporated into the TNARNG integrated Geodatabase in support of all Training Site facilities, maintained by the GIS Branch.

The GIS database includes all facilities data, ITAM data, facilities and environmental data, including but not limited to: roads, structures, infrastructure, fencing, utilities, cultural resources, and natural resources, conservation, compliance as well as topographic maps, digital elevation models (DEM), TINs, and aerial photographic coverage of all sites. All environmental projects include gathering of GIS data for inclusion within the system. Additional needs are programmed into the STEP system as they become apparent.

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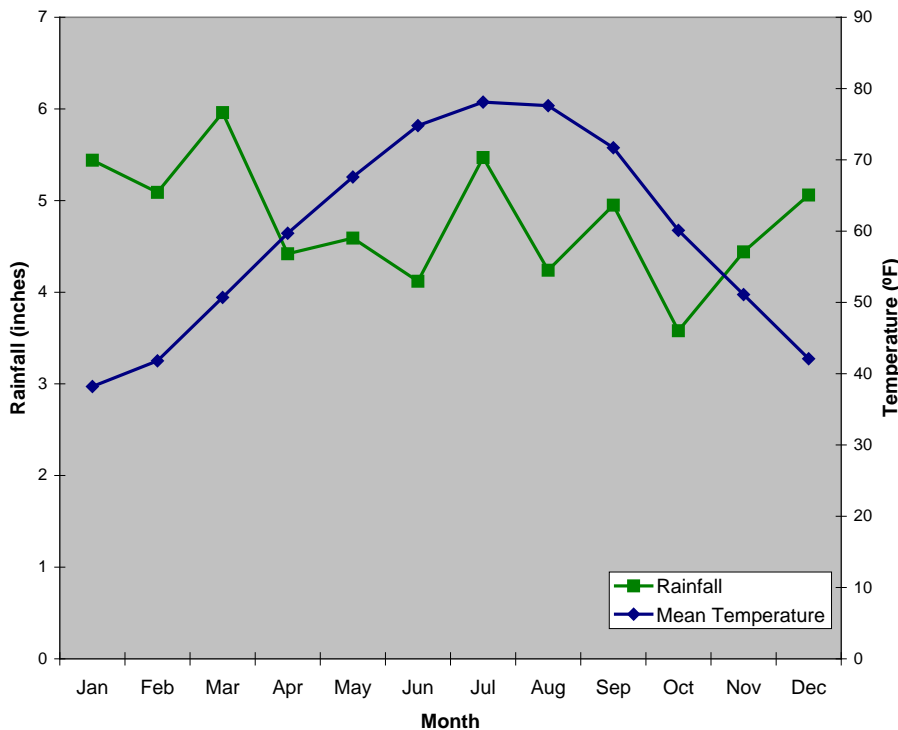
## CHAPTER 3 PHYSICAL AND BIOTIC ENVIRONMENT

### 3.1 CLIMATE

Catoosa County, Georgia, lies within the hot continental division of the humid temperate domain (Bailey 1996) and is characterized by hot summers and cool winters. Temperatures are not moderated much by the distant Atlantic Ocean or the Gulf Stream, and winter climates can be influenced by blasts of arctic air moving southward out of Canada (Georgia State Climate Center 1998). Overall, the climate is not considered a significant factor for the TNARNG. It rarely restricts or prevents training, but does account for what may be numerous state missions each year during weather related emergencies.

*Temperature:* The annual mean temperature for the 30-year period between 1961 and 1990 in Dalton, Georgia, was 59.5°F. Daily temperatures in the summer range from an average low of 65.4°F to an average high of 87.8°F. In the winter the average low is 30°F, and the average high is 51°F (UGA State Climate Office 2007).

*Precipitation:* Average annual precipitation for Dalton, Georgia, for the years 1961-1990 was 57.36 inches. Rainfall is evenly spread across the year, though slightly heavier in the winter and spring (Figure 3.1). The region sees little snow, averaging only 2.6 inches per year over the same 30 year period (UGA State Climate Office 2007).



**Figure 3.1: Mean daily temperature and mean monthly precipitation for Dalton, Georgia, 1961-1990** (data from UGA State Climate Office 2007).

*Relative Humidity:* Relative humidity is high in the region. In Chattanooga, the morning annual average humidity is approximately 86 percent, and the afternoon average is 56 percent. The highest rates for the year are 90-91 percent, occurring in the mornings in August-October. A little further south in Atlanta the relative humidity ranges from a morning average of 82 percent to an afternoon average of 56, with the highest rates of 87-89 occurring in the mornings in July-Sept (NOAA 2005).

*Wind:* The prevailing wind direction in Chattanooga is south; although during the winter months, the wind typically is from the north. The average annual wind speed is 6.4 miles per hour, and winds are strongest in the winter and spring. In Atlanta, wind speeds average 9.9 miles per hour and are also highest in the winter and spring. They tend to be northwest winds in the winter and spring and vary from west or east in the summer and fall (NOAA 1998).

*Climate and Training Exercises:* Average annual precipitation is a very important factor in determining the ability of natural resources to recover from military maneuver training effects. The seasonal distribution of rainfall at VTS-C (over 57 inches per year on average occurring evenly across the seasons) coupled with a growing season which averages 212 days (UGA State Climate Office 2007) allows vegetative cover to regenerate in a short period of time with minimal effort.

The regular rainfall also, however, results in wet soils during much of the year. Maneuver damage can be more extensive when soils are wet, and so training activity scheduling is very important in protecting the natural resources of VTS-C. Rainfall is lowest, and evaporation rates highest, in the summer months, which make those the ideal time for high impact training exercises. Damage to vegetation and soils can be decreased by scheduling high-impact training exercises during these months. Revegetation and maneuver damage repair is also most effective when performed in the winter months (November through March) or in the spring months (April and May) when temperatures begin to increase.

### **3.2 PHYSIOGRAPHY AND TOPOGRAPHY**

The VTS-C lies in eastern Catoosa County, Georgia, within the Armuchee Ridge district of the Ridge and Valley physiographic province, a part of the Appalachian Valley (Hodler and Schretter 1986). This region is described as a series of prominent, narrow, chevron-shaped ridges that run southwest to northeast and rise steeply to 600 to 700 feet above the intervening stream valleys. The ridges are capped mostly by sandstone, while valley floors are generally underlain by less resistant shales and limestones (Hodler and Schretter 1986).

The land surface of the VTS-C ranges from nearly level in the Tiger Creek floodplain and stream terrace to very steep, with Sand Mountain dominating the landscape to the northwest (Figure 3.2). The highest point of elevation on the site is approximately 1,332 feet above the National Geodetic Vertical Datum of 1929, which is approximately sea level. Elevations on the training site range from approximately 755 feet above mean sea level (msl) to 1,332 feet above msl. Elevations of 755 feet msl generally occur along creek channels, and elevations of 1,200 feet msl and higher are characteristic of Sand Mountain and another unnamed mountain to the west. Slopes on VTS-C range from 0% to 53% (U.S. Geological Survey 1983).



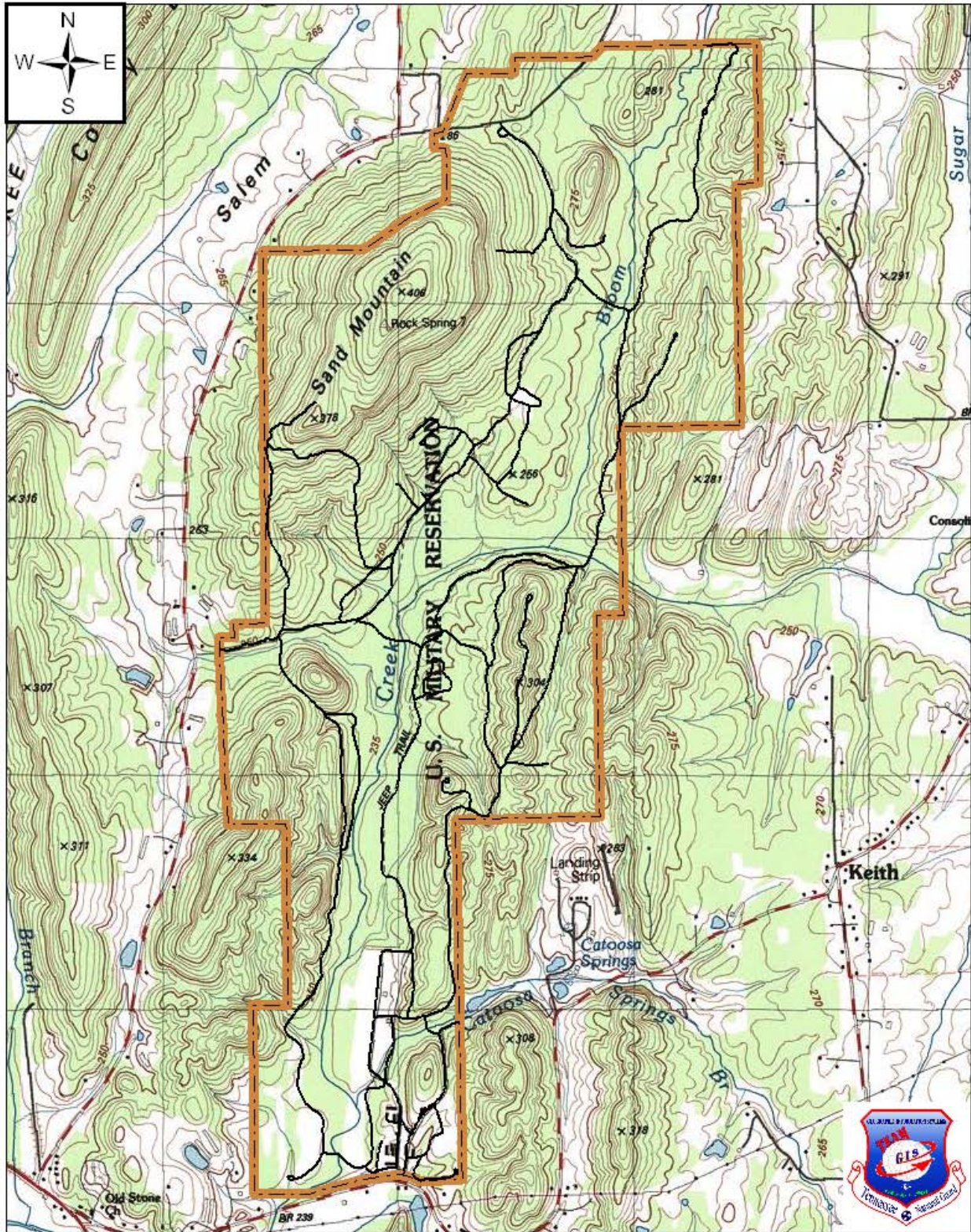


Figure 3.2: Topography of VTS-Catoosa.



### 3.3 GEOLOGY

VTS-C is underlain primarily by Paleozoic (Silurian-Devonian-Mississippian-Pennsylvanian) sedimentary rocks, including Rome and Red Mountain formations, Floyd Shale, and Pennsylvanian undifferentiated rocks (Georgia Department of Natural Resources 1976; Hodler and Schretter 1986). The hills and ridges of the region were created by compressional forces from the southeast causing giant folds. East of Sand Mountain, older rocks were thrust over and now overlie younger rocks, and other faults resulted in realignment of formations (Lawrence 1993). The Rome formation of the Early Cambrian period underlies much of the eastern part of Catoosa County. This formation consists mostly of sandstone, siltstone, and claystone. The Red Mountain Formation consists essentially of sandstone and shale but has a few beds of limestone and fossil iron ore.

### 3.4 SOILS

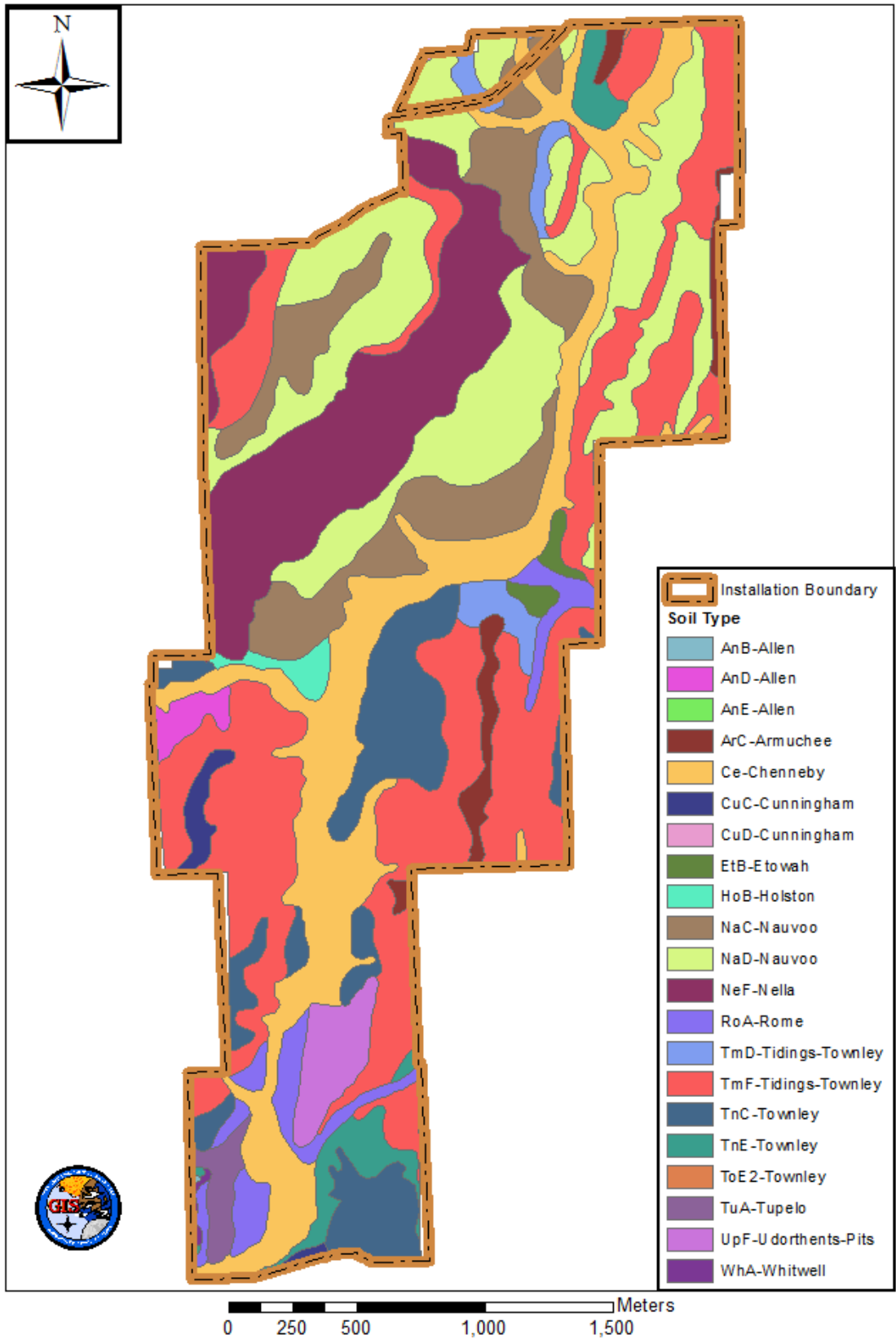
#### 3.4.1 Soil Descriptions

The United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) (then named the Soil Conservation Service) completed a soil survey for Catoosa County in 1993 (Lawrence 1993). Soils on VTS-C (Table 3.1 and Figure 3.3) are mapped in three major soil associations: Chenneby-Rome, Townley-Cunningham-Conasauga, and Townley-Tidings. These soil associations are generalized categories of soil series and types that occur together in a geographical location. They are named for the dominant soils present, but several other similar soils may be part of an association. A total of thirteen soil series are found within the three associations on VTS-C. Slope further divides these thirteen series into the 19 soil types displayed in Table 3.1 and Figure 3.3.

**Table 3.1: Soil Types on VTS-C (from Lawrence 1993).**

Symbol	Soil Name	Acreage
AnB	Allen silt loam, 2 to 6 percent slopes	0.36
AnD	Allen silt loam, 6 to 10 percent slopes	8.33
AnE	Allen silt loam, 15 to 25 percent slopes	0.39
ArC	Armuchee channery silt loam, 6 to 10 percent slopes	25.69
Ce*	Chenneby silt loam, 0 to 20 percent slopes*	250.06
CuC	Cunningham silt loam, 0 to 2 percent slopes	10.59
EtB	Etowah loam, 2 to 6 percent slopes	8.32
HoB	Holston fine sandy loam, 2 to 6 percent slopes	11.17
NaC	Nauvoo fine sandy loam, 6 to 10 percent slopes	75.60
NaD	Nauvoo fine sandy loam, 10 to 15 percent slopes	335.15
NeF	Nella fine sandy loam, 25 to 45 percent slopes	204.20
RoA	Rome silt loam, 0 to 2 percent slopes	47.77
TmD	Tidings-Townley complex, 10 to 25 percent slopes	25.29
TmF	Tidings-Townley complex, 25 to 45 percent slopes	418.47
TnC	Townley silt loam, 2 to 10 percent slopes	126.72
TnE	Townley silt loam, 10 to 25 percent slopes	33.79
TuA	Tupelo silt loam, 0 to 2 percent slopes	15.10
UpF	Udorthents-Pits complex, 6 to 45 percent slopes	28.15
WhA	Whitwell loam, 1 to 2 percent slopes	1.86
		1627.01

\* Indicates hydric soils.



**Figure 3.3: Soil Types on VTS-Catoosa.**

Chenneby-Rome soils occur on nearly level, very gently sloping ground on floodplains and stream terraces. They are loamy, somewhat poorly drained to well drained soils and are 60+ inches deep over bedrock. The soils at VTS-C which make up this association cover approximately 362 acres (22% of the training site) and include: Chenneby (Ce), Etowah (EtB), Holston (HoB), Rome (RoA), Tupelo (TuA), Udorthents-Pits complex (UpF), and Whitwell (WhA).

Townley-Cunningham-Conasauga is an upland soil association, occurring on gently sloping to moderately steep locations on ridgetops, hillsides, and uplands. They are well-drained or moderately well-drained soils with a loamy surface layer and a clayey subsoil. Depth to bedrock is typically 20 to 60 inches. At VTS-C, this association covers 523 acres (32%) and is made up of the following soil series: Armuchee (ArC), Cunningham (CuC), Nauvoo (NaD), Tidings-Townley (TmD), and Townley (TnC).

Townley-Tidings is another upland association and covers 46% of the training site (741 acres). The soils are strongly sloping to steep and well drained. They either have a loamy surface layer and clayey subsoil or are gravelly and loamy throughout. The bedrock is typically shale 20-60 inches deep. The soil series in this association at VTS-C include: Allen (AnB, AnD, AnE), Nauvoo (NaC), Tidings-Townley (TmF), and Townley (TnE).

NRCS has identified five hydric soil types that occur in Catoosa County. Of these five state-listed hydric soils, the NRCS has mapped one – Chenneby silt loam, Ce – at VTS-C (see Table 3.1, starred soil type “Ce”). Hydric soils are defined by the Soil Science Society of America as “Soils that are wet long enough to periodically produce anaerobic conditions, thereby influencing the growth of plants” (Soil Science Society of America 1987).

### 3.4.2 Soil Erosion Potential

Soil erosion potential, or erosivity, is of particular importance in an area that is subject to the effects of armored vehicular training. Tracked and wheeled vehicles should be used where the least damage will be done and where the soil is most capable of recovering from the impact. Soil erosion potential is principally influenced by rainfall (R), slope steepness and length (LS), soil texture or erodibility (K), cover protecting the soil (C), and special practices (P) such as terracing or planting on the contour. Humans can control the C and P factors, while R, LS, and K are a function of the soil’s geographic location, topography, and physical properties. The Universal Soil Loss Equation (USLE) ( $A=R*LS*K*C*P$ ) uses these factors to estimate the average annual soil loss due to sheet and rill erosion for a given soil with specific management. It provides the estimate in tons per acre per year. It does not include other sources of erosion, such as gully or bank erosion.

At VTS-C, the slope steepness and length (LS) of a soil influences the amount of soil erosion more than the other factors because this factor is more variable than others. Interpretation of the data found in the soil survey reveals that soil erosion and compaction are the primary problems affecting the soil resources at the VTS-C site. The erosion index (EI) shows the soils’ potential for erosion (Table 3.2) by considering the effects of rainfall, erodibility, and slope, and adjusting for differences in soil erosion tolerance.

On the VTS-C, 78% of the soils meet the criteria of highly erodible lands (marked with red in Table 3.2). Figure 3.4 makes the extent of these soils on the training site very apparent. These soils can tolerate little disturbance. Land management activities as well as training activities which will disturb the soil or eliminate vegetation should be minimized on these highly erodible soils. Where such activities cannot be avoided or relocated, plans for immediate reclamation and revegetation should be developed prior to the activity and implemented promptly after.



An additional problem with soils at VTS-C is excess water. Chenneby soils and the other soil series located along Tiger Creek and Broom Branch floodplains, Rome, Whitwell, and Tupelo, are prone to extreme wetness and flooding. Although these areas are typically very level and so the erosion potential is low, the prevailing wetness can be a problem for training and land management. Large vehicles, including tractors and bushhogs, cannot access non-road areas near the creeks without getting stuck and/or creating large tire ruts. This limits the usefulness of these areas and makes maintenance of open areas such as the tank range difficult. Soil moisture factors must be taken into consideration when scheduling activities.

**Table 3.2: Soil Erosion Potential**

Symbol	Acreage	Slope (%)	LS Minimum	LS Maximum	T-factor	K-factor	Erosion Index (EI)	HEL Class
AnB	0.36	2 to 6	0.26	0.3	5	0.28	3.6-4.2	PHEL
AnD	8.33	10 to 15	1.31	2.29	5	0.28	18.3-32.1	HEL
AnE	0.39	15 to 25	1.31	2.93	3	0.28	30.6-68.4	HEL
ArC	25.69	6 to 10	0.74	1.08	3	0.28	17.3-25.2	HEL
Ce	250.06	0 to 2	0.05	0.05	5	0.37	0.9	NHEL
CuC	10.59	2 to 6	0.74	0.9	3	0.32	19.7-24.0	HEL
EtB	8.32	2 to 6	0.26	0.31	5	0.37	4.8-5.7	PHEL
HoB	11.17	2 to 6	0.26	0.32	5	0.28	3.6-4.5	PHEL
NaC	75.60	6 to 10	0.74	1.21	3	0.28	17.3-28.2	HEL
NaD	335.15	10 to 15	1.31	2.58	3	0.28	30.6-60.2	HEL
NeF	204.20	25 to 45	4.16	12.26	5	0.15	31.2-92.0	HEL
RoA	47.77	0 to 2	0.05	0.05	4	0.28	0.9	NHEL
TmD	25.29	10 to 25	1.31	1.92	3	0.28	30.6-44.8	HEL
TmF	418.47	25 to 45	4.16	11.65	3	0.28	97.1-271.8	HEL
TnC	126.72	2 to 10	0.26	0.35	2	0.37	12.0-16.2	HEL
TnE	33.79	10 to 25	1.31	2.93	2	0.37	60.6-135.5	HEL
TuA	15.10	0 to 2	0.05	0.05	4	0.37	1.2	NHEL
UpF	28.15	6 to 45	None	None	None	None	None	PHEL
WhA	1.86	1 to 3	0.32	0.05	5	0.32	0.8	NHEL

Note:

LS = Topographic factor (length and steepness of slope)

T = Tolerable soil loss (acres/year)

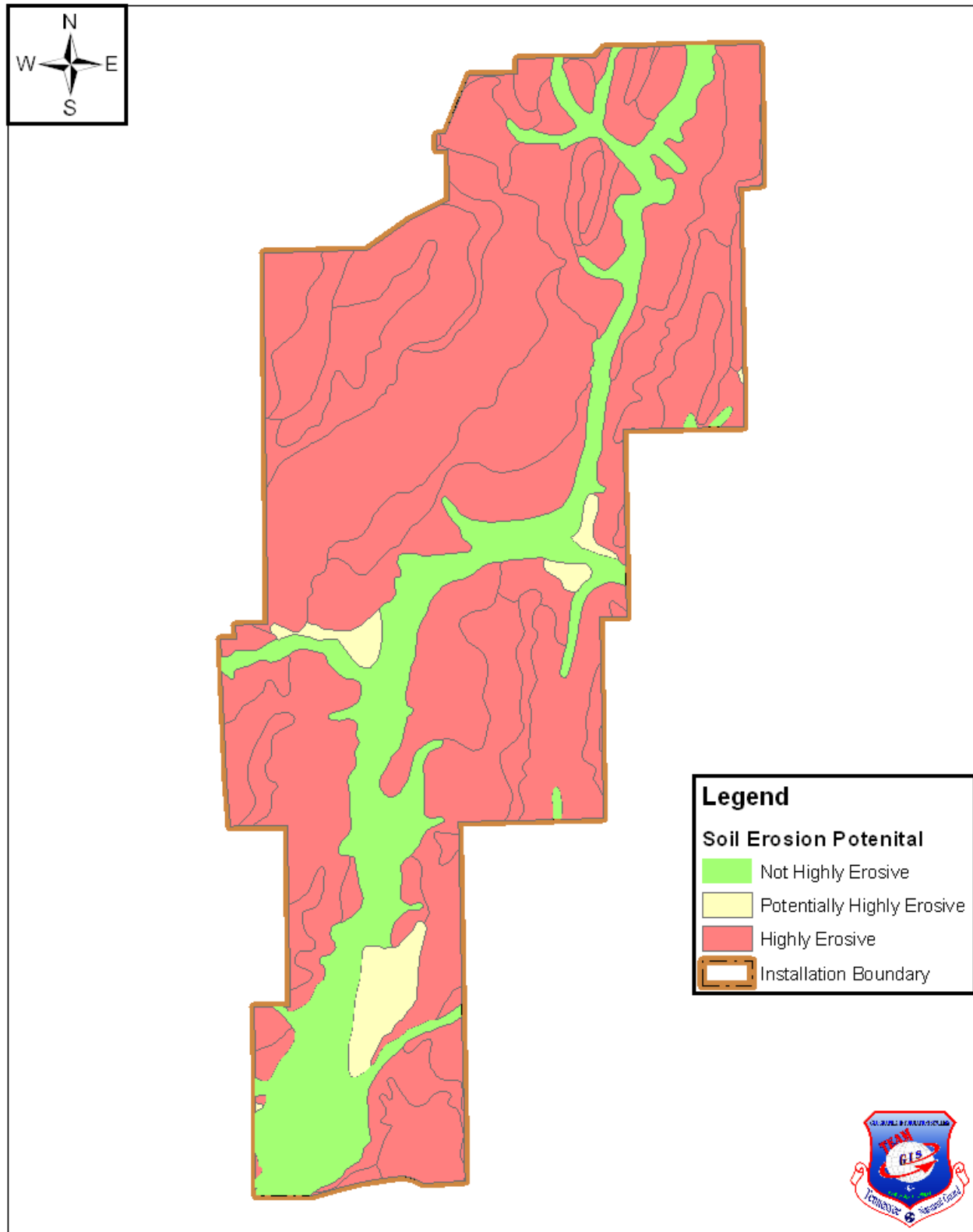
K = Soil erodibility factor

EI = Erosion Index

HEL Class: **HEL** = highly erodible land; **NHEL** = not highly erodible land; **PHEL** = potentially highly erodible land.

### 3.4.3 Prime Farmland

A prime farmland designation is given to an area if soils are present that have the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops. According to Lawrence (1993), approximately 16,194 acres in Catoosa County, or about 16 percent of the total county acreage, meet the soil requirements for prime farmland. The acreage in most crops and pasture has been gradually decreasing as more land is used for urban development. Most of the soils on



**Figure 3.4: Soil erosion potential on VTS-Catoosa.**

VTS-C are not suitable for farmland due to soil erosion by wind and water, low soil fertility, and wetness; however, four soil types (AnB, EtB, HoB, and WhA) fall into the prime farmland category, constituting 21.7 acres of the training site. Prime farmland on the VTS-C is not managed to produce crops, nor is it leased for agricultural production.

### 3.5 WATER RESOURCES

#### 3.5.1 Surface Water

The VTS-C lies within the Chickamauga watershed (USGS Hydrologic Unit #06020001); specifically, the Little Chickamauga Creek – East Chickamauga Creek or the Tiger Creek (HUC #0602000109) watershed. The training site is drained primarily by Tiger Creek and its tributaries, including Catoosa Springs Branch and Broom Branch. A 1998 delineation of regulated waters identified 11.6 miles of intermittent or flowing streams on the site (Minkin et al. 1998).

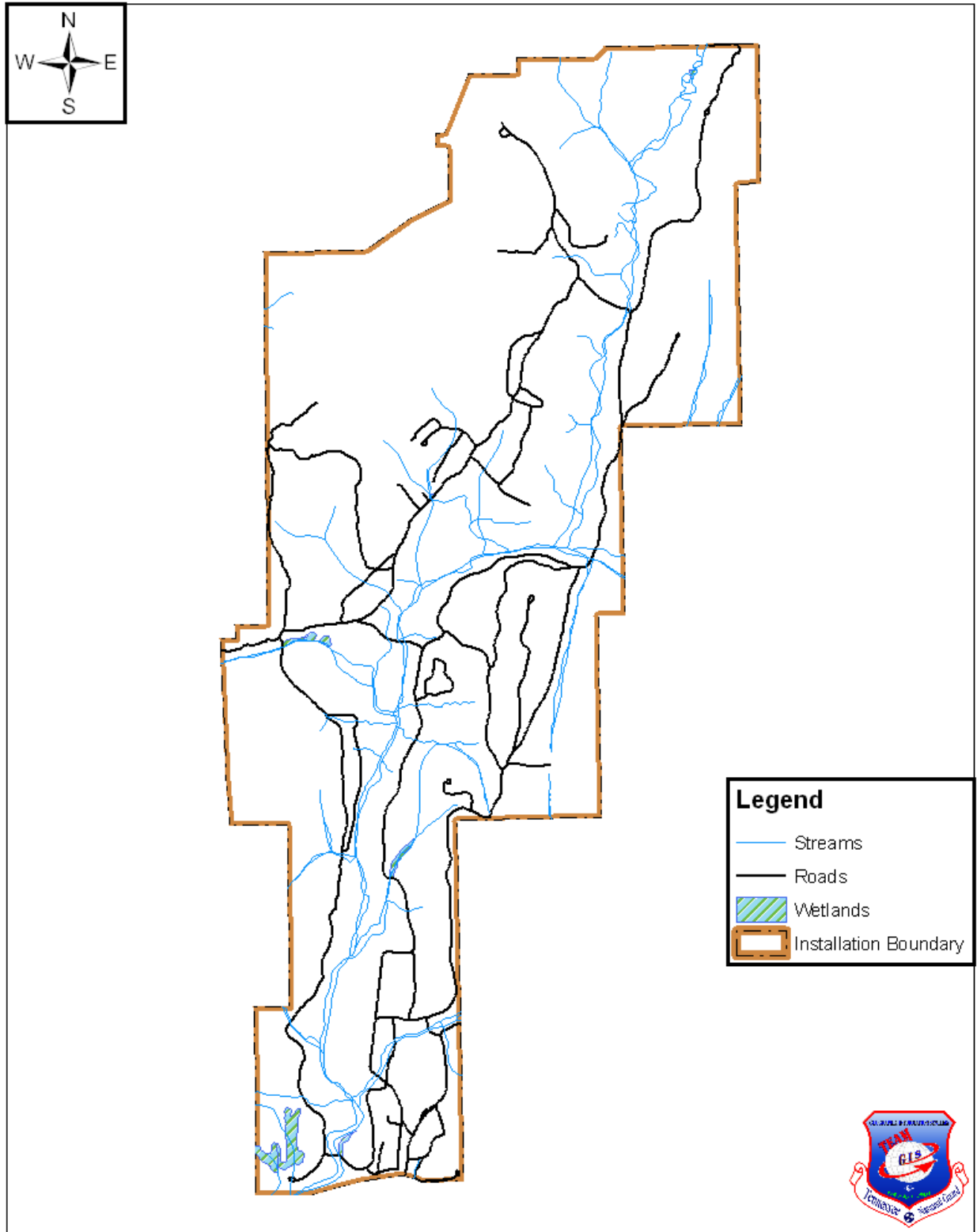
Tiger Creek originates in Whitfield County, GA, from underground springs. It flows south and southwest through heavily forested terrain into Catoosa County, GA. It proceeds west across Catoosa County, entering the VTS-C on its eastern border, approximately midway between the northern and southern boundaries. Within the training site, the creek turns south, collecting the drainage from the eastern slope of Sand Mountain, and exits the training site midway along the southern border. Tiger Creek ultimately flows into South Chickamauga Creek southeast of Ringgold, GA (Georgia 2006).

Broom Branch enters the VTS-C across the northern border near the northeast corner and flows approximately 7,500 feet south-southwest until its confluence with Tiger Creek. Catoosa Springs Branch enters the training site on the east boundary, approximately 1,100 feet north of the southern boundary. The creek flows in a westerly direction for approximately 900 feet before turning southwest and flowing another 900 feet to its confluence with Tiger Creek.

Tiger Creek and its tributaries are designated as Secondary Trout Streams by the Georgia Department of Natural Resources. A Secondary Trout Stream is one with no evidence of natural trout reproduction but that is capable of supporting trout throughout the year. Tiger Creek is stocked with trout twice per month during the stocking season of March through Labor Day (Georgia 2006). Trout streams are subject to additional controls intended to minimize sedimentation and maintain forest cover for temperature control. Current state regulation requires the maintenance of a 50 foot vegetated buffer on either side of a trout stream with permits required for any modification within that buffer area (DeMeo et al. 2005).

The upper reach of Broom Branch has been heavily impacted by beaver. In 2007, more than 20 maintained dams were counted along Broom Branch and its unnamed tributary north of the upper road, and much of the surrounding area had been flooded, leaving the defined creek channel obscured. Indications of beaver activity are present along Tiger Creek and Catoosa Springs Branch, as well. Beaver control efforts were initiated in FY07: USDA Animal Damage Control trapped three dozen beavers from the training site and broke down the known dams to restore creek flow. By mid-2008 there have been indications of some returning beaver activity.

One small pond on the site is shown on the USGS topographic map (Ringgold, GA, Quadrangle). It is a man-made pond behind a small dam on Catoosa Springs Branch from 1934 and is currently heavily clogged with silt and organic debris.



**Figure 3.5: Surface Water on VTS-Catoosa.**

### 3.5.2 Ground Water

Groundwater beneath VTS-C occurs in the Paleozoic Rock Aquifers. Soil and residuum form low-yield unconfined aquifers across most of the Valley and Ridge Providence of northwestern Georgia (Donahue 1998). For this reason, surface water is the primary source of water in the county. Chickamauga Creek provides water to the community of Ringgold. Drilled wells are widely scattered, and some areas of the county have no wells. Most drilled wells are less than 100 feet deep, but some reach to nearly 150 feet.

#### 3.5.2.3 Water Supply

VTS-C is supplied with water through the Catoosa County Utility District. There is one well located on the training site. It is not used as a potable water supply, but serves primarily to supply the vehicle wash rack.

#### 3.5.2.4 Wastewater Discharge

VTS-C wastewater discharge is to thirteen septic tanks across the facility. The washrack discharges to grade upslope of a wetland located off-site.

### 3.5.3 Water Quality

An initial water quality assessment was conducted for VTS-C during the fall (dry) and spring (wet) seasons in 1997/98 by Science Applications International Corporation (1998a). The purpose of the water quality analysis was to obtain current information on the existing conditions of the surface waters at the training site. The conclusion from this assessment was that the water quality in the surveyed creeks and ponds was “generally very good.”

Two rounds of sampling were performed in the study. The first sampling was performed on November 5-6 and December 11, 1997 (low flow), and the second sampling was conducted on April 28, 1998 (high flow). Ten stations were sampled for water quality throughout the training site including two in Tiger Creek (T-1 and T-5), two in Broom Branch (B-1 and B-3), two in Catoosa Springs Branch (C-1 and C-3), two in unnamed tributaries to Tiger Creek (U-1 and U-2), and two in ponds (P-1 and P-2).

The study found low concentrations of toxic metals, nutrients, anions, and fecal coliform. Calcium, magnesium, total hardness, sulfate, and total dissolved solids were many-fold greater at the Catoosa Springs Branch stations than any other stations during both rounds of sampling, suggesting that there is some off-site source for the elevated concentration. Complete results are available in the study report.

Although the initial assessment results for the training site indicate good water quality, the State of Georgia has developed a Total Maximum Daily Load (TMDL) Implementation Plan for the HUC #0602000109 watershed (Tiger Creek) in accordance with the GADNR Rules and Regulations for Water Quality Control, Chapter 391-3-6, Revised (November 2005). Tiger Creek’s designated use is fishing, and the creek is listed as impaired on Georgia’s 303(d) list for fecal coliform bacteria. The TMDL Implementation Plan lists the primary source of the bacteria as non-point from wildlife, agricultural livestock, and urban development.

Further water quality analysis will be conducted to identify any changes from the initial survey. In FY2008 a routine sampling program was initiated to test for fecal coliform levels on a monthly basis. In addition, water quality data will be collected in conjunction with an aquatic fauna survey initiated in FY2008.

### 3.6 WETLANDS

To meet the definition of “jurisdictional wetland” under Section 404 of the Clean Water Act, an area must exhibit three traits: (1) hydrophytic vegetation, (2) hydric soil, and (3) wetland hydrology. Areas that are periodically wet but do not meet all three criteria are not jurisdictional wetlands subject to Section 404 of the Clean Water Act. Areas that have been disturbed or that are classified as problem area wetlands, however, may not meet all three criteria due to man-induced alterations, but are still considered jurisdictional wetlands. Wetlands store water and minimize flooding. They also filter sediment, excess nutrients, and other impurities from water as it is stored. The aquatic vegetation found in wetlands protects shorelines from erosion and provides food and cover for wildlife. Wetlands provide habitat for micro- and macroinvertebrates that use or break down nutrients and contaminants.

A 1998 delineation of wetlands and other regulated waters was performed by Minkin et al. (1998) of the U.S. Army Engineer Waterways Experiment Station. To determine if an area would be considered a jurisdictional wetland under Section 404, this study applied the technical criteria for wetland delineation as described in the Corps of Engineers Wetlands Delineation Manual (U.S. Army Corps of Engineers 1987) and the Code of Federal Regulations (33 CFR 329.11(a)(1)). They found that VTS-C contained approximately 7.88 acres of wetlands and ponds, the majority located in the southwestern corner of the property (Figure 3.5).

This small area (0.5% of the installation’s total land area) constitutes a variety of wetland communities, with many situated along streams and drainageways. Six National Wetland Inventory (NWI) classes were found at VTS-C. The majority of the wetlands on VTS-C were emergent systems dominated by grasses (4.55 acres). In addition, there were approximately 2.36 acres of forested wetlands dominated by hardwood species and 0.97 acres of shrub dominated wetland.

In recent years, the beaver (*Castor canadensis*) population on the northern half of the training site has grown dramatically. A 2005 survey of Broom Branch identified over 25 individual dams in good repair. Another series of dams located on Tiger Creek in the middle of the tank range has expanded the associated “pond” substantially. These changes have significantly affected the usability of the area for training. A beaver control program has been initiated with the goal of reducing the population and associated flooding to acceptable levels.

### 3.7 VEGETATION

The VTS-C is part of a larger ecosystem that is known as the Gulf Slope Section of the Oak-Pine Forest Region (Braun 1950). Prior to widespread settlement and development, the natural landscape was composed of a mosaic of interacting communities linked by hydrologic flow, nutrient cycling, fire, animal movement, and transitions between communities. The modern landscape supports islands of somewhat natural areas (with one or more communities present) within a sea of anthropogenic features such as roads, buildings, and farms. Fire has probably been the principal historical disturbance, previously burning over small areas between natural barriers with moderate frequency and low intensity. Insect related disturbances have resulted from southern pine beetles (McNab and Avers 1994). Climatic related influences include occasional droughts and ice storms.

#### 3.7.1 Vegetation Community Classification

Climate and land use history influence the types of ecosystems found in Georgia. At the time of European settlement, most of VTS-C was probably covered by oak-hickory-pine forest and southern mixed forest. Approximately 82% of VTS-C is currently forested. The principal cover type is oak-

hickory, which includes southern red oak, white oak, post oak, red maple, winged elm, flowering dogwood, pignut hickory, and loblolly pine. In some areas, loblolly and shortleaf pines are dominant.

Ten natural communities were described in the Phase II natural resources survey by Science Applications International Corporations (SAIC 1998b) based on edaphic conditions and dominant species types. These community types were further refined by a 2006 survey (Dynamic Solutions 2007) which classified the vegetation on VTS-C according to the National Vegetation Classification Standard to the level of floristic alliance (Figure 3.6). These community classifications are described below.

### 3.7.1.1 Vegetated, Tree Dominated, Closed Tree Canopy, Evergreen

#### *Pinus taeda* Forest Alliance

Several loblolly pine plantations of varying ages occur in the southern portion of VTS-C. They were established as pure stands, but other species have invaded the understory, including red maple, sweetgum, black gum, black cherry, box elder, and eastern red cedar. If they remain free from major disturbance, these stands will likely succeed to more shade-tolerant hardwood species typical of the region. A number of the loblolly stands, however, have been impacted by southern pine bark beetle, resulting in high mortality of mature pines and leaving the future stand composition yet to be determined by competition among the surviving pines and the mixed hardwood species in the understory.

#### *Pinus (echinata, virginiana)* Forest Alliance

This alliance is characterized by natural stands of the native southern yellow pines, shortleaf pine and Virginia pine. These two species dominate the overstory, although loblolly pine and eastern redcedar may also occur naturally. These stands have a diverse canopy, including pignut hickory, basswood, black gum, yellow-poplar, black cherry, black oak, white oak, and sweetgum, as appropriate to the edaphic conditions, and an understory which includes dogwood, wild grape, and Christmas fern. This forest alliance on VTS-C is often infested with privet and honeysuckle.

### 3.7.1.2 Vegetated, Tree Dominated, Closed Tree Canopy, Deciduous

#### *Fraxinus pennsylvanica* Forest Alliance

Green ash grows along the bottoms and first terraces of Tiger Creek and Broom Branch throughout the training site. This forest alliance consists of species which are capable of withstanding frequent and, sometimes, prolonged flooding during the December to April wet season. Tree species typical of these stands include black gum, sweetgum, boxelder, black willow, black walnut, hackberry, red maple, pin oak, sycamore, basswood, redbud, and slippery elm. On the southern portion of VTS-C, this alliance has become dominated by privet up to 5-7 m in height.

#### *Quercus (alba, velutina, prinus)* Forest Alliance

Dominated by white oak, black oak, and chestnut oak, this alliance also contains mockernut hickory, black cherry, sassafras, American beech, post oak, shagbark hickory, dogwood, and sourwood. Several *Vaccinium* species are prevalent in the understory, as are wild grape, greenbriers, and Christmas fern. These stands typically occupy the upper and mid slope positions along the well-drained east- and west-facing slopes on the ridges throughout the training site.

#### *Quercus (alba, rubra, velutina) – Liriodendron tulipifera* Forest Alliance

Along the lower slopes and rolling hills in the center of the site the oaks of the previous alliance are joined by northern red oak and yellow-poplar. This alliance occupies higher quality sites with a more favorable moisture regime.

*Ulmus americana* – *Carya ovata* – *Celtis* Forest Alliance

There is one isolated stand of this type in the cantonment area. The area is mowed regularly and maintained with these three species over a crabgrass-dominated turf.

3.7.1.3 Vegetated, Tree Dominated, Closed Tree Canopy, Mixed Evergreen-Deciduous

*Juniperus virginiana* – *Quercus* (*prinus*, *velutina*) Forest Alliance

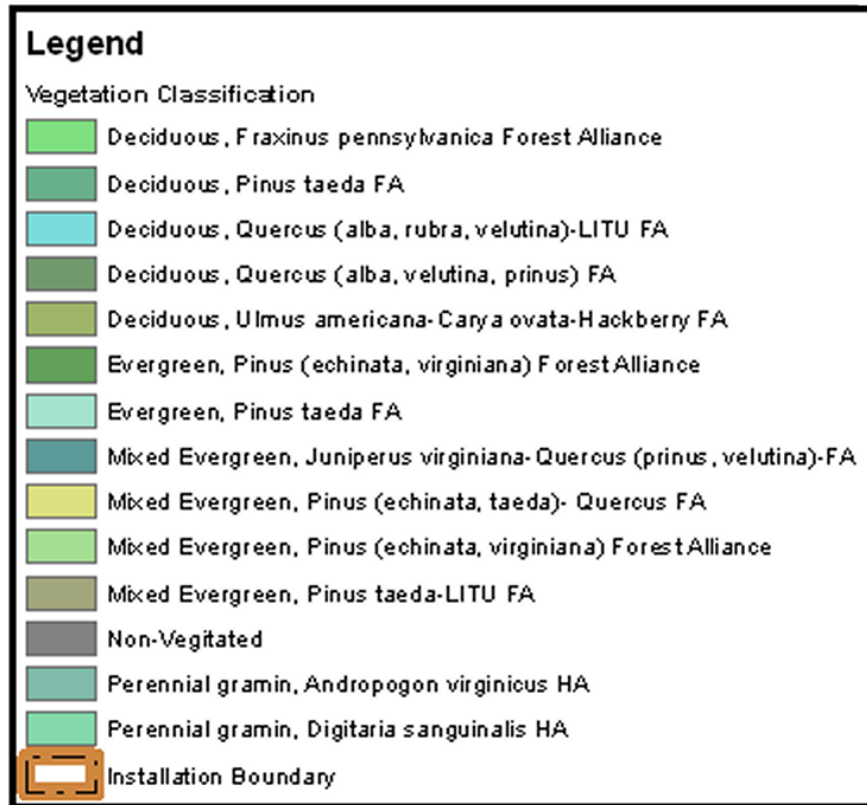
An area along the south slope of Sand Mountain has exposed limestone at the surface. This area is dominated by eastern redcedar, with hickories and dry-site oaks (chestnut oak and black oak) also common in the overstory and a variety of other species present including sourwood, redbud, and farkleberry.

*Pinus* (*echinata*, *taeda*) – *Quercus* Forest Alliance

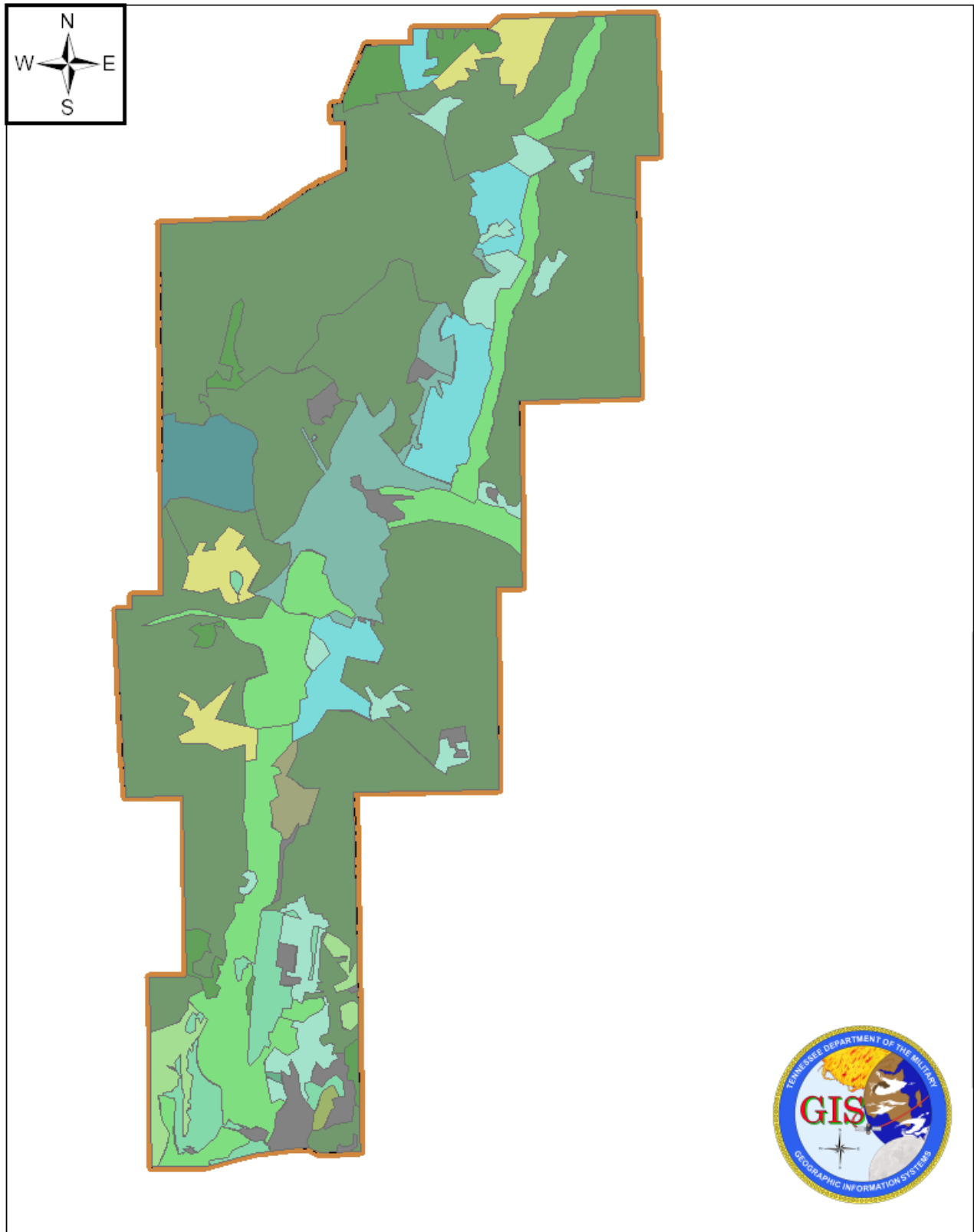
Areas of the training site which experienced disturbance may develop into a mixed stand in which shortleaf and loblolly pines dominate but oaks are also a significant component. Current stands of this type can be found on the northern edge of the property, as well as two areas west of Tiger Creek. The dominant hardwood canopy trees are black oak and chestnut oak. VTS-C is within the native range of loblolly pine, and so mixed stands of this type are a natural response to disturbance on dry sites in this region, not necessarily a result of human planting efforts.

*Pinus taeda* – *Liriodendron tulipifera* Forest Alliance

One area to the east of Tiger Creek is likely a response to heavy disturbance of a relatively moist site. Loblolly pine is the dominant overstory species, but it shares the stand with a significant yellow-poplar component.







**Figure 3.6: Vegetation communities on VTS-Catoosa.**

#### 3.7.1.4 Vegetated, Herb Dominated, Herbaceous Vegetation, Perennial Graminoid Vegetation

##### *Andropogon virginicus* Herbaceous Alliance

The tank range in the center of the training site represents the primary example of this alliance. The area is regularly mowed to maintain its open condition. The species composition varies across the site, but broomsedge is the dominant species throughout. Other species found in this alliance include common plantain, blackberry, thoroughwort, and honeysuckle. A number of tree species have seeded into the area, but the regularly mowing regime prevents succession to forest alliance from occurring.

##### *Digitaria sanguinalis* Herbaceous Alliance

The small arms ranges and the Cantonment areas which are mowed are dominated by crabgrass. Other species common in these areas are tall fescue, foxtail, plantain, white clover, and bermudagrass.

### 3.7.2 Forest Inventory and Management

#### 3.7.2.1 Past Forestry Operations

A forest inventory for the entire site was conducted in 1986 by the U.S Army Corps of Engineers, South Atlantic Division, Savannah District. At that time, the training site woodlands were composed primarily of a mixture of upland and lowland hardwoods with various species of oak and hickory, as well as yellow-poplar, ash, and maple, among others.

Since the mid to early 1980's, the forestry staff at the US Army Corps of Engineers, Savannah District has provided forestry management support to Catoosa. From 1982 to 1984, timber clearing was conducted in compartments 4 and 5 to create an impact area for tank firing. In addition, during the latter 1960's and the early 1970's, several road rights-of way and tank parking areas were cleared.

An emergency harvest of pine was conducted in 1988 to prevent the further spread of southern pine bark beetles and salvage the trees before they lost all value. Timber made available for harvest was located in the northeastern quadrant of the training site to the east and west of Broom Branch. Total board feet harvested was estimated at 3.5 million.

Since 1990, the Georgia Division of Forestry has provided technical expertise and professional judgment in planning for and applying various management practices related to prescribed burning. No further commercial timber harvests have been made by the TNARNG.

In 2001 another forest inventory was contracted with the U.S. Forest Service (USFS), Chattahoochee – Oconee District; however, this inventory was never completed due to personnel transfers with the USFS.

#### 3.7.2.2 Current Forest Inventory and Management

A forest inventory and a management plan were completed in 2006 by Thompson Engineering, Forest Management Group, and Aerostar Environmental Service via a contract through the U.S. Army Corps of Engineers, Mobile District. The training site was inventoried by training area, to ensure stand identification and management was compatible with other management activities on the training site. Stands were delineated through the use of aerial imagery and ground observations. Sample points were then taken in each stand (number of plots per stand was dependent on acreage of the stand) to collect the physical data needed to calculate timber volumes. The complete data for all forest stands is provided in the VTS-Catoosa Forest Management Plan (Thompson Engineering et al. 2006) and includes sawtimber and pulpwood volumes (apportioned by species/species groups), dominant and co-dominant species,

average basal area and DBH, average number of snags per acre, minimum and maximum tree ages, general health assessment, and current condition of the stand.

The forest inventory determined that a total of 1,313 acres (81%) of VTS-C were covered in forests in April 2005. The forest stands are typically dominated by red oaks and white oaks, with a substantial amount of pine in some stands. Yellow-poplar is a co-dominant in some stands, as is hickory. Timber volumes are given in Table 3.3. The average DBH for the entire installation was 11.7 inches, and the average basal area was 78.1 square feet per acre. Most stands are 20-40 years old; although some had trees approaching 70 years in age, and a few stands were dominated by young trees. The overall health of the forest stands was classified as good in April 2005, but there was evidence of a past infestation of southern pine beetles. In addition, stands in the impact area of the tank range show a significant amount of timber damage due to frequent hot fires.

**Table 3.3. Forest product volume summary for the VTS-Catoosa (from Thompson Engineering et al. 2006).**

Timber Product	Per Acre		Installation Total	
	Tons	Board feet	Tons	Board feet
<b><i>Sawtimber</i></b>				
Pine	5	640.1	6,837	875,273
Pole	0.1	6.4	137	8,751
CNS	1.9	198.8	2,598	266,370
Cedar	0	4.4	0	6,017
Red Oak	10.7	1485.4	14,631	2,031,136
Hickory	2.9	358.2	3,965	489,803
White Oak	7.2	941.7	9,845	1,287,681
Ash	1.1	148.2	1504	202,649
Poplar	4.8	650.9	6,564	890,041
Walnut	0.2	23.6	273	32,271
Misc. Hardwood	2.6	322.4	3,555	440,850
<b><i>Pulpwood</i></b>				
Pine	0.6	0.2	820	273
Hardwood	19.5	7.2	36,664	9,845

The forest inventory data was utilized to develop management prescriptions for each forest stand on VTS-C based on forest health and commercial timber production goals. Military requirements and goals were then incorporated into the final forest management plan for VTS-C presented in Annex 2. Timber harvests will be conducted on VTS-C for the purpose of opening up needed training areas and improving forest health. Forest health harvests will be thinning or small group selection cuts (creating a patchwork of 2-10 acre openings but removing no more than 30% of timber volume. Large areas (greater than 10 acres) will only be clearcut in the event that training needs demand open land.

The forest management plan identifies the priority for stand harvest for up to 17 years. The forest inventory is due to be repeated in 2015 to provide updated information which will be used to revise the management and harvest plan as needed. Thereafter, the plan will be reviewed and revised as needed in conjunction with the INRMP review process and at subsequent forest inventory periods.

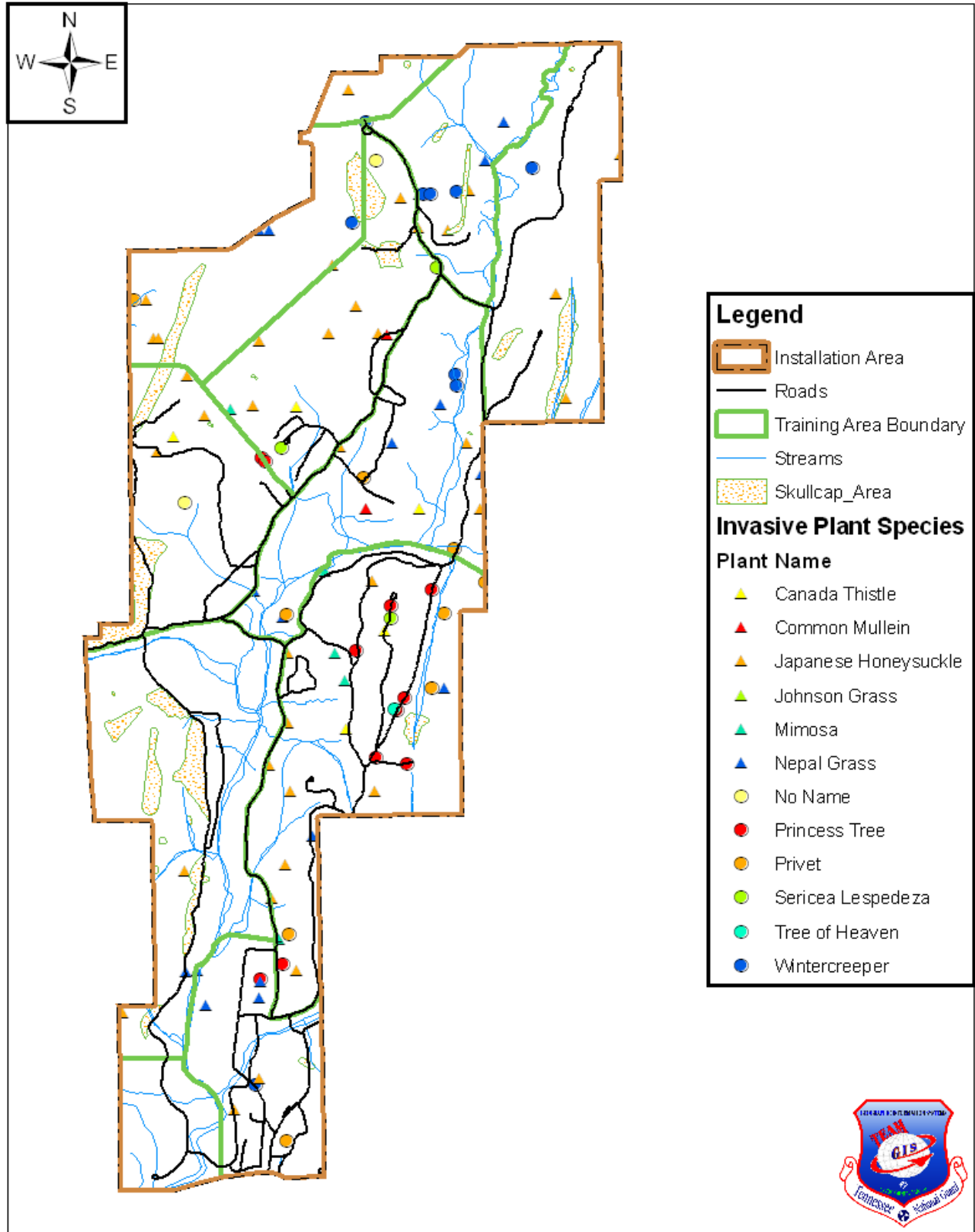
### 3.7.3 Invasive Pest Plants

Non-native plants have become a significant part of most ecosystems in this age of extensive international travel and trade. Many of the species brought into a new environment remain uncommon, requiring human intervention to reproduce and/or spread. Certain species, however, become invasive: they reproduce prolifically and spread rampantly throughout an ecosystem, causing significant disruption to the natural system. Because the predators and diseases of exotic species are rarely transplanted with them, the invasives lack natural control mechanisms. Invasive plants typically displace native species and change the species composition of a community. They can also change edaphic characteristics of the site by altering such factors as water use, shade, or flammability.

A number of invasive plant species can be found on VTS-C (Figure 3.7). A survey of the training site for invasive exotic species was completed in FY2006 (Dynamic Solutions 2006). Chief among the problem species are: privet (*Ligustrum* spp.), Japanese honeysuckle (*Lonicera japonica*), Nepal grass (*Microstegium vimineum*), sericea lespedeza (*Lespedeza cuneata*), and Canada thistle (*Cirsium arvense*). Tree-of-heaven (*Ailanthus altissima*), mimosa (*Albizia julibrissin*), wintercreeper (*Euonymus fortunei*), princess tree (*Paulownia tomentosa*), multiflora rose (*Rosa multiflora*), Johnson grass (*Sorghum halepense*), and woolly mullein (*Verbascum thapsus*) were also found on the training site. All of these species are listed as “severe threats” or “significant threats” on the Tennessee Exotic Pest Plant Council list (TNEPPC 2004). All landowners are requested to control such plants if found growing on their property. In addition to impacting native communities and threatening rare or endangered plant species, these exotic pest plants can interfere with training activities. Privet, in particular, can create dense, difficult-to-traverse stands which make an area unsuitable for mounted or dismounted maneuvers.

Complete eradication of these problem species is unlikely to be possible. In the case of small, recently established infestations – tree-of-heaven and wintercreeper at VTS-C – rapid control efforts may eliminate the species from the site. For the more prevalent species, an achievable goal is to reduce their numbers and spatial extent and to limit their impacts on native species. Control of these species is typically a combination of manual/non-chemical efforts and application of herbicides. A detailed plan of attack against these invasive pest plants is presented in Annex 4, Invasive Pest Plant Control.

At VTS-C, the use of chemical herbicides is limited by the presence of a federally listed Threatened plant species, the large-flowered skullcap (*Scutellaria montana*). To minimize the chance of accidental damage to the skullcap, herbicide use within and upslope of skullcap clusters is limited to that described in Annex 4: no herbicides will be used within a skullcap management group during the growing season for the skullcap (March through September), no foliar spray application of herbicides will be conducted within 50 feet of known skullcap locations during the skullcap growing season, and no chemicals which translocate through the soil from root systems will be utilized within 50 feet of known skullcap clusters at any time.



**Figure 3.7: Invasive pest plant species identified on VTS-Catoosa.**  
 (Point occurrences – large occurrences are not represented.)



### 3.8 FISH AND WILDLIFE

Data on the wildlife utilizing the training site have been collected through several surveys. The 1998 Phase II Natural Resources survey identified some species occurring on VTS-C (SAIC 1998b). A bird survey completed in 2008 added a substantial list of new species to the site tally (see Appendix F for species lists). A mammal survey and a reptile and amphibian survey were completed in 2010. The bird survey will be repeated on a five year schedule to maintain up to date information; the second survey is underway with results expected in 2013. Other vertebrate surveys will be conducted on a longer schedule (every ten years) unless changing conditions or concerns dictate resurvey earlier. Aquatic surveys have been conducted separately from the terrestrial examinations and are discussed in section 3.2.3.

#### 3.8.1 Migratory Birds

The migratory birds group is a category made up of species which move between at least two locations, typically one for breeding and one for overwintering. Protected species are identified in C.F.R. Title 50 Section 10.13. Songbirds, shorebirds, and waterfowl may fall into this category (those with at least some populations that breed in the continental United States and spend their non-breeding months in the tropics). Attention has centered on neotropical migrants since this group is experiencing steep rates of population decline. However, decreasing populations have also been observed in resident bird species, which do not migrate, and temperate-zone migrants, which only migrate within North America. It is DoD policy to promote and support a partnership role in the protection and conservation of migratory birds and their habitat by protecting vital habitat, enhancing biodiversity, and maintaining healthy and productive natural systems on DoD lands consistent with the military mission.

The Migratory Bird Treaty Act (16 U.S.C. 703-711) provides protection for migratory birds. Under the Act, willful, knowing attempts to take, kill or remove migratory birds is unlawful unless authorized by the U.S. Fish and Wildlife Service. Feathers or other parts, nests, eggs, and products made from migratory birds are also covered by the Act. Take is defined as pursuing, hunting, shooting, poisoning, wounding, killing, capturing, trapping, or collecting. Migratory bird hunting regulations, established by the U.S. Fish and Wildlife Service, allow the taking, during designated seasons of ducks, geese, doves, rail, woodcock, and some other species. In addition, permits may be granted for various non-commercial activities involving migratory birds and some commercial activities involving captive-bred migratory birds. Misdemeanor or felony violations of the Act by individuals or organizations may result in significant fines or imprisonment.

In Georgia, which falls within the Atlantic flyway for migratory birds, over 90 species of neotropical migrants depend on the forests, thickets, and fields of the state as areas to rest and refuel during their long migrations. Fifty-four migratory species nest and raise their young in habitats around the state (Georgia Natural Heritage Program 1999). At VTS-C, 36 bird species were identified during the 1998 Phase II Natural Resources survey (SAIC 1998b). A baseline survey of birds was initiated in 2006 and identified 134 species (see Appendix F) utilizing this training site for part or all of the year (AMEC 2008). Of these, only three are not included on the 10.13 migrant list: wild turkey, northern bobwhite, and European starling. The first two are protected by state and federal gamebird regulations, and the third is a non-native invasive species which is not protected from control efforts.

Executive Order 13186 (10 January 2001), "Responsibilities of Federal Agencies to Protect Migratory Birds" requires each federal agency taking actions that have, or are likely to have, a measurable negative effect on migratory bird populations to develop and implement a MOU with the USFWS within two years that shall promote the conservation of migratory bird populations. If any measurable negative effects on migratory bird populations at VTS-C are identified, the TNARNG will develop a MOU with the USFWS within two years.

### 3.8.2 Wildlife and Game Species

A comprehensive mammal survey conducted by AMEC Earth and Environmental, Inc., in 2008-10, identified 25 mammal species on the VTS-C. A herpetofauna survey was completed by URS in 2010 and identified 24 reptile and amphibian species on the training site.

Wildlife game species on VTS-C include white-tailed deer (*Odocoileus virginianus*), wild turkey (*Meleagris gallopavo*), northern bobwhite quail (*Colinus virginianus*), American woodcock (*Scolopax minor*), dove (*Zenaida macroura*), squirrel (*Sciurus* spp.) and other small game species, and several waterfowl species. There are currently no management activities specific to these species. Currently there is no hunting on VTS-Catoosa due to its small size, residential neighbors, and the potential for interference with training. For this reason, game management does not take precedence over general wildlife habitat management.

### 3.8.3 Aquatic Species

An aquatic survey was conducted in 1997-1998 to determine the ichthyofauna and benthic macroinvertebrate fauna of the VTS-C (SAIC 1998a). The aquatic survey was repeated in 2008 by URS. A separate mussel survey was conducted in 2007; its results are presented in the macroinvertebrate section below.

#### 3.8.3.1 Fish

The 1997-1998 survey included Tiger Creek, Broom Branch, Catoosa Springs Branch, two unnamed tributaries of Tiger Creek, and two ponds. A total of 3,387 fish, representing 33 species and three hybrids, was collected (see Appendix F for species list). The 2008 sampling collected fewer individuals due to sampling methodology differences. Fewer species were also collected in 2008 (29 species in the fall sampling), including one new species. The species that had been identified in 1997 but not 2008 were rare in the system, represented by only one or two individuals caught. Index of Biotic Integrity (IBI) metrics in 2008 indicates that VTS-Catoosa streams range from fairly poor to fair biotic quality.

No federal or state listed fish species were collected in either survey.

#### 3.8.3.2 Macroinvertebrates

The 1997/1998 aquatic survey included 15 sampling points for aquatic macroinvertebrate fauna, while the 2008 survey sampled benthic macroinvertebrates at 13 stations. The species list is contained in Appendix F. In the fall 1997, 8,798 organisms, representing 154 taxa, were collected; in spring 1998, another 13,105 organisms were collected, representing 172 taxa. The results of this survey and its associated habitat analysis indicate that aquatic habitat quality on VTS-C was generally very good and supported highly diverse benthic and fish communities, especially in Tiger Creek and Broom Branch (SAIC 1998a). The biotic index values calculated from the 2008 survey data indicated relatively unimpaired streams for all sampling stations except Catoosa Springs Branch, which was indicated to be slightly impaired. The lower quality indicators in this stream were consistent across water chemistry, fish, and macroinvertebrate indicators, and are probably a result of higher temperature and dissolved solids from the cattle pond on the creek just upstream of the training site boundary (URS 2010).

Freshwater mussels are one of the most endangered groups of aquatic species. The 1997/1998 survey identified five taxa of native mussels from live specimens and relict shells. Although none of these were federally listed species, it was determined that one – a *Villosa* sp. – might be a previously undescribed species. In addition, Asiatic clams (*Corbicula fluminea*) were common throughout the streams of the training site. In FY2007 a mussel survey was initiated to document the species diversity on the training site and further investigate the unique *Villosa* sp. The more recent survey found a significant change from

the earlier conditions: Asiatic clam was found in very high numbers, while native species were extremely rare. Only one live mountain creekshell (*Villosa vanuxemensis*) was found, in addition to several relicts of that species and of the rainbow (*Villosa iris*). There was no sign of the unknown *Villosa* in the 2007 survey. Competition from the Asiatic clam and high sediment loads provide the likely explanations of the loss of native mussels from the VTS-C. The 2008 aquatic survey again found significant numbers of *Corbicula fluminea*. However, larger numbers of a *Sphaerium* species were identified. This genus, the fingernailclams, includes several species native to Tennessee and one non-native European species that has been found in Tennessee. None of them are listed by NatureServe Explorer as found in the state of Georgia (NatureServe 2012). The lack of detail in the sampling report makes it impossible to know whether this result indicates a return of native fauna or an invasion of additional non-native species. A few individuals of a *Pisidium* species were sampled. This peaclam genus also has native and exotic species, but only native species are documented from Tennessee.

### 3.8.4 Pest Species

In the past, VTS-C has experienced problems with large numbers of feral hogs. Rooting by these animals is highly destructive of understory plant communities and is a significant threat to the federally listed large-flowered skullcap. Feral hogs were controlled previously by professional removal. If hog sighting or damage increase to unacceptable levels, a project will be initiated to reduce their numbers.

As noted previously, beaver have been active on the VTS-C in large numbers. Control activities initiated in 2006 reduced the population to zero, temporarily, and reclaimed much of the flooded training land. It is anticipated, however, that the population will rebound as young beaver move in from other areas. The beaver population is monitored by observation of dammed waterways by training site and Environmental personnel. Control efforts will be re-initiated if the acreage lost to training becomes significant again.

VTS-C is infested with the imported fire ant (*Solenopsis* spp.). This invasive pest has spread to encompass the whole of the southeastern U.S. and has been found as far west as New Mexico, Arizona, and California. The imported fire ant is a highly aggressive ant, dominating the areas it infests and generally causing a decrease in insect species diversity. It has a fierce sting which it will apply repeatedly to animals it encounters with minimal provocation. These stings are painful and can cause anaphylaxis in sensitive individuals. Humans, domestic livestock, and wildlife are all susceptible to injury by red imported fire ants (Williams et al. 2001). The imported fire ant is the subject of a USDA quarantine which restricts the transport of soil, plants with soil and roots attached, grass sod, and similar materials. Fire ants are most prevalent on the open ranges and Cantonment lawns on VTS-C. A program of broadcast bait application coupled with direct contact insecticide application to immediate threat mounds is used to minimize the impact of the fire ant on training activities.

## 3.9 RARE, THREATENED, OR ENDANGERED SPECIES

One federally listed plant species has been located on VTS-C: a rather large population of the threatened large-flowered skullcap (*Scutellaria montana*) occurs in clusters over most of the training site (see 3.9.1 and Annex 1). No other federally listed plant species are known from Catoosa County. Several state-listed plant species are documented with Catoosa County and but were not found on the site in the most recent rare, threatened, and endangered (RTE) species survey (SAIC 1998b):

- **Goldenseal** (*Hydrastis canadensis*) – listed as endangered in GA – A perennial, low-growing, rhizomatous herb with a solitary, greenish white flower. Found in rich, mesic hardwood forests with alkaline soils. Commercial exploitation puts this species at risk as it has been over-harvested



for medicinal uses. Additionally, goldenseal is sensitive to habitat alterations and encroachment of invasive species.

- **Least glade-cress** (*Leavenworthia exigua var. exigua*) – listed as a threatened by GNHP – A small winter annual with lobed basal leaves and solitary white flowers with yellow centers. Restricted to open areas in limestone cedar glades where soil is shallow and gravelly. Habitat loss is the primary threat for this species.
- **Great Plains ladies'-tresses** (*Spiranthes magnicamporum*) – listed as endangered by GNHP – A member of the orchid family, this perennial produces white flower spikes in early fall after the leaves have withered. Grows in basic soils and may be found in prairies, glades, and floodplains. Loss of habitat is the greatest threat for this species.
- **Glade meadowparsnip** (*Thaspium pinnatifidum*) – listed as endangered by GNHP – A Perennial herb in the carrot family; has white flowers and finely divided leaves. Occurs in forests and woodlands with rich, calcareous soils. There are no clear explanations for population declines. Forest succession and soil disturbances are potentially threats to this species.

The federally listed endangered gray bat (*Myotis grisescens*) has been captured over Tiger Creek on VTS-C, but no hibernacula have been identified on the training site. Further information on the gray bat is presented in section 3.9.2 and in Annex 1. Two additional federally listed animal species are documented in Catoosa County, but have not yet been found on the training site:

- **Spotfin chub** (*Erimonax monachus*) – threatened – This species occurs in clear creeks or medium-sized rivers with moderate gradient and rocky substrate. Range restricted to the Tennessee River drainage; presumed extirpated in Georgia. Species threatened by habitat loss and degradation.
- **Snail darter** (*Percina tanasi*) – threatened – The snail darter is found in shoals of creeks and small rivers, sometimes burrowing into sandy substrate. Habitat fragmentation due to stream impoundments is the main threat to this species.

In 2012 the USFWS identified the probable range of the endangered Indiana bat (*Myotis sodalis*) to include northwest Georgia. There are no recent records of this species from Catoosa County, but it must be treated as a possible species for the training site, requiring presence-absence surveys prior to any project involving the cutting of timber that might be habitat. A bat survey utilizing USFWS Indiana bat monitoring protocols was initiated in 2012 to provide baseline data on whether the species is utilizing the training site. Results are expected in late 2013.

A number of state-listed animal species are found in Catoosa County. They are all aquatic animals and have not been found on VTS-C, but habitat may be present to support them:

- **Chickamauga crayfish** (*Cambarus extraneus*) – listed as threatened by GNHP – Found in shallows and in leaf litter of high gradient streams. Has a naturally restricted range which is threatened by likelihood of stream impoundments in the area.
- **Eastern hellbender** (*Cryptobranchus alleganiensis alleganiensis*) – listed as threatened by GNHP – This entirely aquatic amphibian may be found in cool, clear streams with large rocks. The former range of these animals has been greatly diminished due primarily to habitat degradation.
- **Flame chub** (*Hemitremia flammea*) – listed as endangered by GNHP – Found in springs and spring-fed streams in areas with abundant aquatic vegetation. The primary threat to this species is habitat loss and degradation.

- **Popeye shiner** (*Notropis ariommus*) – listed as endangered by GNHP – Found in clear waters of large creeks and small to medium rivers with gravelly substrate. The main threats to these fish are habitat degradation due to siltation and other pollutants as well as stream impoundments.
- **Mountain madtom** (*Noturus eleutherus*) – listed as endangered by GNHP – Habitat consists of small to large rivers with fast-flowing, clear waters with sandy or rocky substrate. The mountain madtom is primarily threatened by habitat loss.
- **Stargazing minnow** (*Phenacobius uranops*) – listed as threatened by GNHP – Occurs in warm waters of creeks and small to medium rivers in rocky runs and riffles. The primary threat to this species is habitat loss and degradation.

A bat survey was completed in 2007: seven species were captured on the training site (see Appendix F); of these, only the gray bat is protected. Bird, mammal, herpetofauna, and fish surveys have been conducted since 2006. Species are listed in Appendix 7. The gray bat is the only federally listed species to have been identified. A new RTE survey was initiated in FY11; results are anticipated in 2013. Management plans will be developed for any species found and incorporated into Annex 1.

### 3.9.1 Large-Flowered Skullcap (*Scutellaria montana*) – Federal threatened, Georgia Natural Heritage Program threatened

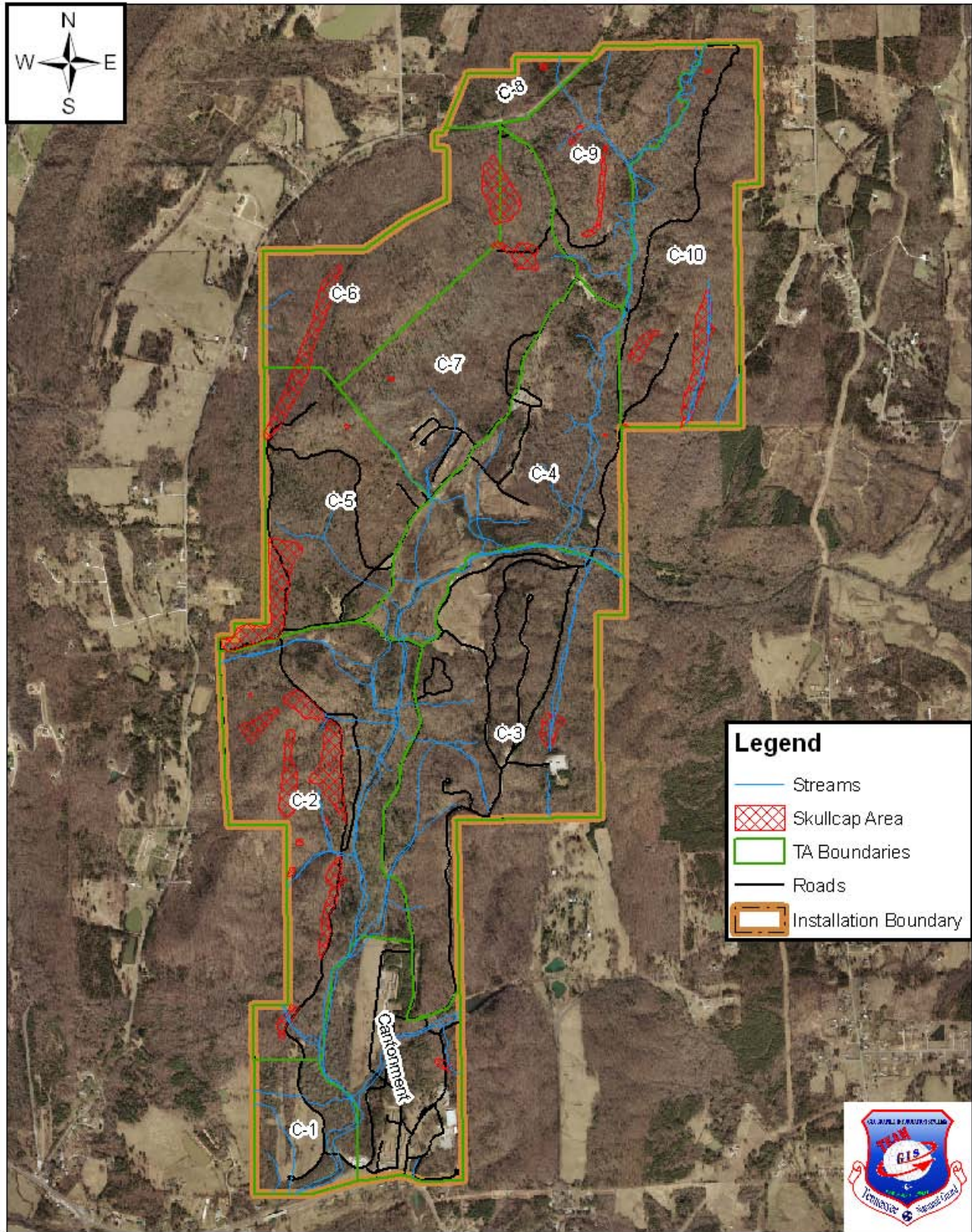
Overview: The U. S. Fish and Wildlife Service listed large-flowered skullcap (*Scutellaria montana*) as an endangered species in 1986. At that time there were seven populations known in Georgia and three in Tennessee. Over 90 % of the 7,000 plants known in 1986 occurred at only two sites (USFWS 1996). The USFWS defined a self-sustaining population as containing more than 100 plants. The species was reclassified (down-listed) to threatened in 2002, at which time 48 populations were known for a total of over 50,000 individual plants.

In 2002, TNARNG contracted SAIC to conduct a full site survey for the large-flowered skullcap. A total of 1,581 individual plants were found in sixty discrete clusters across VTS- C. These clusters were then clumped into 26 management groups based on geographic proximity and habitat similarity (Figure 3.8).

Description of species: Large-flowered skullcap is a member of the Lamiaceae or mint family. Chapman described the species in 1878 based on a location in Floyd County, Georgia. It flowers in mid-May to June. The corolla is blue and white with two-lobed calyx with a “cap” on the upper lobe. It has a solitary, erect, hairy, and square stem. Leaves are lanceolate to ovate, are serrated, and have opposite leaves.

Habitat/ecosystem: Large-flowered skullcap is endemic to northwest Georgia and southeast Tennessee. The habitat for the plant consists of rocky, slightly moist to dry, well drained and slightly acidic soils in slope, ravine, and stream bottom forests. Typically, the plant grows under mid- to late-successional oak-hickory canopies (*Quercus* spp. and *Carya* spp.). Usually, a deciduous shrub layer and moderately dense herb layer are present. Natural pine (usually shortleaf pine, *Pinus echinata*) can be present. The shrub layer often has some *Vaccinium*. This type of habitat is present at VTS-C.

Threats and competing species: Habitat alteration and destruction (as a result of logging, wildfire, grazing and development) are the principle threats to this species across its range. Conversion of oak-pine forests to pine plantations has resulted in known population losses. The large-flowered skullcap can probably tolerate some selective logging; complete canopy removal by clear-cutting likely would increase competition to an undesirable level. The large flowered skullcap is not considered to be a vigorous competitor. It is thought to be susceptible to competition by invasive, exotic, aggressive plants (especially Japanese honeysuckle) that tend to flourish after any type of disturbance. At VTS-C, invasive plant species are present near some of the skullcap management groups. Animal damage can also have an impact on large-flowered skullcap. At VTS-C indications of feral hog rooting have been noted near



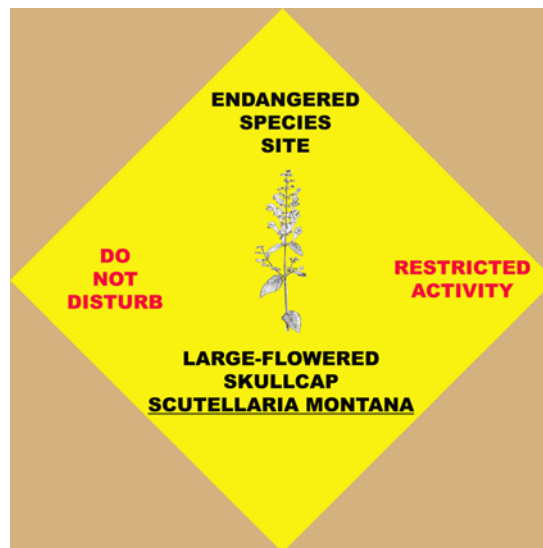
**Figure 3.8: Large-flowered skullcap occurrences on VTS-Catoosa.**



skullcap groups – as a perennial herb, damage to the rootstock could be a significant threat to the skullcap. Also, deer are believed to be eating the plants; indications of browse, especially removed floral parts, have been observed regularly during the annual monitoring of the plants.

Conservation measures: At VTS-C the large-flowered skullcap management groups are marked by signs (Figure 3.9). During the flowering season (March 1 – June 30), posted areas are closed to all access; the rest of the year posted areas are limited to foot traffic only. Maps produced for training use show the skullcap areas as limited activity sites, and training activities are designed to avoid impact to the plant or its habitat. Annual monitoring was initiated on the training site in 2004. For further information, see Annex 1.

**Figure 3.9: Large-flowered skullcap signs.**



### 3.9.2 Gray Bat (*Myotis grisescens*)

Gray bat colonies are usually restricted to caves or cave-like habitats located within a kilometer of a river or reservoir. In winter they utilize only deep, vertical caves having a temperature of 6-11 degrees centigrade. The largest member of its genus in the eastern United States, the gray bat weighs from 7 to 16 grams. Its forearm ranges from 40 to 46 millimeters in length (USFWS 1982). One feature which distinguishes this species from all other eastern bats is its uni-colored dorsal fur. The other bats have bi- or tri-colored fur on their backs. Also, the gray bat's wing membrane connects to the foot at the ankle instead of at the base of the first toe as in other species of *Myotis* (USFWS 1982). Gray bats feed on insects, of which the majority are aquatic species, particularly mayflies.

Gray bats were caught in the summer of 2006 foraging over Tiger Creek. No cave habitats have yet been located on the training site, but gray bats can travel up to 20 km from their roost site while foraging. Further surveys will be conducted as funding becomes available to more completely characterize the gray bat usage of VTS-C. A project was conducted in summer 2008 to radio-track the bats foraging on the training site to locate their roosting habitat. It was not possible to follow the gray bats to their roosts; however, it was determined that they were leaving the training site area.

More information is available in Annex 1, which will be updated with a management plan for this species when more details of the population are known and their management needs can be identified. The primary management strategy for gray bat on VTS-C at this time is to protect the riparian habitats which are known to be foraging habitat for this species.

### **3.10 CULTURAL RESOURCES**

#### **3.10.1 Paleoenvironment**

The current climate and vegetation of northern Georgia are the result of a long and complex interaction of natural and human-induced change. Prior to the arrival of humans, conditions during the last full glacial period (ca. 23,000 to 13,000 B.C.) were considerably cooler than at present. At that time, the study area was covered by a northern coniferous forest dominated by pines and spruce (Stanyard et al. 1998). When humans first arrived in what is now the Georgia region (ca. 13,000 to 8000 B.C.), the climate gradually warmed and precipitation increased. These trends occurred in conjunction with northern hardwoods replacing pine and spruce as the dominant overstory species. The Altithermal period from ca. 8000 to 3000 B.C. was a period of continued warming but decreased precipitation, with a dominant overstory vegetation of oak-hickory forest. Since ca. 3000 B.C., the climate has cooled slightly and precipitation has possibly increased, leading to the conditions that exist today. Since prior to settlement by Euro-Americans, oak-hickory stands have been decreasing and the number of pines has been increasing.

Vegetation within the Georgia Ridge and Valley has undergone extensive alteration in the past two centuries, complicating any estimation of the relative quantities of original species and their distribution across the landscape. The earliest Euro-American settlers reported large stands of yellow pine in the oak-hickory forests of the Ridge and Valley province. Whether these were the products of natural forces or the results of aboriginal hunting methods, which used fire to drive and concentrate game, is unknown. Large-scale clearing and cultivation of cotton in the nineteenth century removed large tracts of native forest and caused serious erosion. As a consequence, by the 1930s, much of the land had to be abandoned, with the result that up to 70 percent of the area now lies in secondary forest dominated by pine (Stanyard et al. 1998).

#### **3.10.2 Prehistoric Background**

Details on the prehistoric period in the southeastern United States and Georgia in particular are available in the TNARNG Integrated Cultural Resources Management Plan (ICRMP) for the Catoosa Training Center (TRC Garrow and SAIC 2002).

#### **3.10.3 Historic Overview**

##### The Contact Period

The earliest European contact with what is now Catoosa County was the de Soto expedition of 1540, which probably passed to the east of Catoosa County through the Conasauga River valley. The towns that the expedition visited reflected Mississippian Period culture, and were probably heavily impacted by the contact with these and other Spanish explorers. During the following century, European goods were incorporated into the American Indian trade, and disease and power struggles disrupted the old order.

By the time English explorers began arriving in the Tennessee River valley, the Cherokee tribe had emerged as the dominant culture and had established control of a large area that included eastern Tennessee, western North Carolina, and northern Georgia (Stanyard et al. 1998). At that time, the area around modern-day Chattanooga and northwest Georgia was essentially uninhabited, although a number

of important Indian trails passed through what would become Chattanooga. As a result of the American victory in the Revolution, in which the Cherokee sided with the British, many of the Cherokee were driven to the southern portion of their claimed territory, into what is now northwest Georgia.

During the late eighteenth and early nineteenth centuries, the Cherokee adopted many Western ways. Some Cherokee accumulated great wealth, managed large plantations, and owned slaves. Other Cherokee established farms, operated stores and taverns, and practiced trades, such as milling and blacksmithing. They settled in loosely structured towns in the fertile river valleys, where they practiced European-style farming, growing cash crops, such as corn and tobacco. One of the chiefs of the Cherokee, Captain Richard Taylor, lived near Ringgold at the northern end of the ridge that bears his name (located to the northeast of VTS-C).

Despite their acceptance of European culture, the Cherokee's right to their native homeland was never accepted by the American public, who continued to push for further concession by the Cherokee. By 1820, both legitimate and questionable treaties had reduced the Cherokee territory to the northwest corner of Georgia, north of the Chattahoochee River. Determined not to make any further concessions, the Cherokee organized the Cherokee Nation, a sovereign nation with a constitution modeled on that of the United States.

In 1835 after the discovery of gold in northern Georgia, a treaty was obtained from a small group of Cherokee, none of whom were officials in their government, agreeing to remove to lands west of the Mississippi. John Ross, then chief of the Cherokee, refused to recognize the treaty and resisted compliance, appealing to the U.S Supreme Court for support. Although the Supreme Court supported the Cherokee who refused to recognize the bogus treaty, President Andrew Jackson was generally unsympathetic to Native American causes and refused to enforce the court's decision. Despite passive resistance from the Cherokee, by 1838 federal troops had rounded up most of the remaining tribe members and forced them onto the Trail of Tears to Oklahoma. To avoid removal, numerous Cherokee fled to the mountains, while others abandoned the march en route to return to their homeland or take up residence along the trail.

#### Afro/Euroamerican Settlement

Permanent European settlement in Catoosa County probably began sometime after 1805, when construction was authorized for a Federal Road through the area to connect the southeast coast with the settlements of the upper Mississippi Valley. The road followed Georgia Highway 2 and US 41 in Catoosa County, passing within two miles of the training site. The road was used by settlers in Tennessee to drive their stock to markets in Georgia and South Carolina and to transport crops and products such as wheat, cotton, and whisky.

Catoosa County was created from Walker and Whitfield counties in 1853. In the 1830s the valleys in the area began to fill with pioneer farmers. The railroad soon followed: service from Atlanta to Dalton began in 1847, and the line to Chattanooga opened in 1850. The town of Ringgold was incorporated in December 1847.

One of the area's early attractions was its mineral springs, of which Catoosa Springs was said to be among the finest. Catoosa Springs is supposed to have been used by the Indians prior to the arrival of European settlers, and by 1849 there was an established resort centered on the springs. By 1854, the rail line had a stop, called Catoosa Platform, just southeast of Ringgold and southwest of the training site. By 1860, Ringgold was a thriving trade town in a county of 5,082, where wheat was the chief economic product. The cooler climate of the mountains did not support cotton well, and so there was little development of the plantation system, and slavery was not widely supported.

### Military History

The current area of the VTS-C was utilized for military activities as early as the 1850s when the resort at Catoosa Springs was used as a summer camp for cadets attending the Georgia Military Institute. From the fall of 1862 until September 1863, the buildings and grounds at Catoosa Springs were used as a Confederate hospital.

During the Battle of Ringgold, the Union forces pursued the retreating Confederates only as far as Stone Church before returning to Ringgold. The Union occupied the town throughout the winter of 1863-1864. Soldiers from both armies likely visited the springs during that period. At the beginning of the Atlanta Campaign, the Fourth Corps of the Army of the Cumberland marched from Cleveland, Tennessee, to Catoosa Springs. There was some fighting east of the springs during the march. The Corps remained encamped at Catoosa Springs from May 4 until May 7, when they marched on Tunnel Hill.

In 1904, land west of the Catoosa Springs recreational property was leased by the U.S. Army as a target range for soldiers stationed at Fort Oglethorpe. In 1906-07, the Army purchased 1174.5 acres; more land was acquired in 1910 through condemnation. Portions of this land were actively farmed at the time and may have supported several residences. This area was known as the "Target Range" or "Rifle Range" during its years of association with Fort Oglethorpe. A 1,000 yard rifle range was located at the south end of the property. In 1910, at least 12 structures existed, near Catoosa Springs Road and along Tiger Creek at the base of Sand Mountain. The range site was maintained and utilized by the Army through World War II.

In 1946, Fort Oglethorpe was deactivated and offered for sale to the public. The rifle range was originally included in the sale offer. The range site remained in surplus until 1948 when the U.S. Army recommended that it be placed under the jurisdiction of the Corps of Engineers for use by the Tennessee National Guard as a training site for its Ground Force Unit.

#### **3.10.4 American Indian Resources and Tribes**

The VTS-C is located on lands traditionally claimed as territory of the Cherokee. Kaskinampo/Coushatta and Yuchi and, marginally, some bands of Creek may have also ranged within the area. All archaeological sites identified during cultural resources surveys are potential American Indian sacred sites. To date, no American Indian sacred plant, animal, or mineral gathering localities are known from the VTS-C.

Currently, three groups of Cherokee are federally recognized. The Cherokee who traveled to Oklahoma are currently represented by the Cherokee Nation of Oklahoma and the United Keetoowah Band of the Cherokee of Oklahoma. The Eastern Band of Cherokee of North Carolina trace their ancestry to those Cherokee who remained in the mountains to avoid removal in 1838-1839.

Federally recognized groups of the Creek are the Alabama-Quassarte Tribal Town of the Creek Indian Nation of Oklahoma, the Kialegee Tribal Town of the Creek Indian Nation of Oklahoma, the Muskogee (Creek) Nation of Oklahoma, the Thlopthlocco Tribal Town of the Creek Nation of Oklahoma, and the Poarch Band of Creek Indians of Alabama.

Federally recognized tribes of the Coushatta are the Alabama-Quassarte Tribal Town of the Creek Nation of Oklahoma, the Coushatta Tribe of Louisiana, and the Alabama-Coushatta Tribe of Texas.

Only one group of Yuchi – those who relocated to Oklahoma with the Muskogee Creek – exists as a distinct cultural entity within a federally recognized group. These Yuchi, today represented by the Yuchi

Tribal Organization, petitioned the federal government for recognition as a separate group; the government has proposed denying the petition (<http://www.doi.gov/bia/bar/yuchidx.html>).

In 2003, TNARNG initiated tribal consultation with all federally recognized tribes which have ties to Tennessee and northwest Georgia. The list of tribes involved is presented in Appendix G. Consultations have occurred in 2003, 2004, and 2005. All interactions between the TNARNG and the tribes that have historic ties to the Catoosa region are conducted in accordance with the DoD Annotated American Indian and Alaska Native Policy (27 Oct 1999).

### **3.10.5 Cultural Resources Identified on VTS-C**

In September and October 1997, TRC Garrow Associates Inc. (Stanyard et al. 1998) conducted Phase I cultural resource investigations at the VTS-C. Archaeological and historic architectural surveys were included in the study.

Twenty archaeological sites and one isolated find were identified in the project area. Fourteen sites represent occupations, five represent historic occupations, and one site has both prehistoric and historic components. Nine prehistoric sites (9CT28, 9CT29, 9CT66, 9CT69, 9CT70, 9CT71, 9CT72, 9CT73, 9CT75) and three historic sites (9CT34, 9CT35, 9CT74) are recommended potentially eligible for the National Register of Historic Places (NRHP) under Criterion D. The other eight sites are recommended ineligible for the NRHP.

The historic architecture survey identified 17 historic architectural resources located among numerous non-historic resources near the south end of the installation. Of the 17 resources, three are recommended eligible for the NRHP; the rest are recommended ineligible due to loss of integrity. The three resources recommended NRHP-eligible are a 1934 concrete dam (with its associated pond) (HS-14)[TR-23]; a ca. 1907 target range (HS-15)[TR-27]; and a ca. 1940 concrete bridge (HS-17). HS-14 and HS-17 appear eligible under NRHP Criterion A for their roles in the military history of the local area, state, and region and under Criterion C as an intact site that continues to display its historic appearance and use. The State Historic Preservation Office (SHPO) concurred with these findings on August 5, 1998.

The inventoried buildings and structures were evaluated to determine if they comprised a potentially eligible NRHP district. Severe alterations to 14 of the 17 properties, non-historic infill construction, and changes in use had drastically altered the historic core area of the training center. In fact, an approximately equal number of historic and non-historic properties were located in the core area. Thus, it did not appear that a cohesive, eligible NRHP district existed at the facility.



## **CHAPTER FOUR MANAGEMENT GOALS: GOALS, OBJECTIVES, AND TASKS FOR NATURAL RESOURCES MANAGEMENT**

### **4.1 MILITARY MISSION GOALS AND OBJECTIVES**

VTS-Catoosa exists to provide a location and facilities for the training of Tennessee National Guardsmen. Ensuring the availability of mission-critical training land now and for the future is the primary objective of VTS-Catoosa natural resources management.

The following are military mission-related objectives that will be accomplished by or in cooperation with the natural resources management actions proposed in this VTS-C INRMP:

- Additional small cleared areas for bivouac and other training
- Improved visibility along roadways through selective tree cutting
- Meet security directives by clearing 25 ft buffer along perimeter fencing
- Augment range facilities: addition of modified record fire range and CACTF; relocation of TTB

### **4.2 NATURAL RESOURCES GOALS AND OBJECTIVES**

The ultimate goal of the TNARNG natural resources program is to maintain healthy natural ecosystems while training soldiers to meet the mission requirements. Training programs and land management are both long-term, ever-changing processes, and the goals and objectives presented here are intended to guide TNARNG activities for the foreseeable future. The projects list is scheduled five to ten years out and will be updated annually as needed.

#### **4.2.1 Ecosystem Management and Maintenance of Biodiversity**

In 1994, the Office of the Under Secretary of Defense for Environmental Security issued a memorandum to all forces in the Department of Defense (DoD) to implement Ecosystem Management on DoD lands. Ecosystem management blends multiple-use needs, provides a consistent framework to manage installations, and ensures that the integrity of the system of DoD lands remains intact. DoD Instruction 4715.3, “Environmental Conservation Program”, implements policy, assigns responsibilities, and prescribes procedures for the integrated management of natural and cultural resources on property under DoD control.

Ecosystems are “explicit units of the earth that include all of the organisms, along with all components of the non-living environment within its boundaries” (Ecological Society of America 1996). The aim of “ecosystem management” is to manage the land for the health of the whole rather than for constituent pieces, such as game species, timber, or rare species. Maintaining the system as a functioning whole ensures the continuing ability of that system to meet future needs.

Ecosystem management is not easily planned or measured. Many functions of an ecosystem take place on scales far larger and longer than most human activity, and the boundaries of an ecosystem are not easily defined. For the purposes of this INRMP, the property line of the training site will function as a permeable border around a series of interconnected systems (forest, grassland, riparian) which make up a whole, which is itself a part of a larger system. Management of the training site must focus on the training site, but must take into account the activities beyond the fenceline, as well.

VTS-C has a variety of community types, including the habitat for a federally listed threatened plant species, creating a high level of ecosystem diversity. The current patchwork of habitats has been created by the conjunction of past land use patterns, current military land use, and environmental gradients, and it may be drastically different from the environment found in the region prior to European settlement. However, it is a healthy, functioning system, as indicated by its high level of species diversity and the presence of rare species. It is the aim of this management plan that native biodiversity will be maintained at all levels within the ecosystems that make up VTS-C and that those systems will continue to function fully.

Goals:

- Provide the ecosystem types needed for training.
- Maintain or improve ecosystem and habitat diversity.
- Maintain or improve species diversity.
- Protect unique communities.

**Objective 1-1:** Manage for mission-suitable habitats or “missionscape”.

<i>Tasks</i>	<i>Targets</i>
<i>Identify natural resources characteristics needed for training activities on VTS-C through consultation with training site manager, training site commander, units, and trainers.</i>	1a. Missionscape statement development FY11
<i>Determine appropriate acreage and locations for given mission habitats based on training needs and VTS-C characteristics.</i>	1b. Missionscape plan development FY12
<i>Develop and implement management actions to create, improve, or expand mission habitats, as needed.</i>	

**Objective 1-2:** Identify ecotypes present on the training site and maintain up to date information regarding those systems.

<i>Repeat vegetation community survey every ten years.</i>	1c. Vegetation community PLS FY16
<i>Repeat wetland survey using USACE formal delineation guidelines every ten years.</i>	1d. Wetland PLS FY10 (in progress) and FY20.
<i>Repeat surface water quality assessment every 5 years.</i>	1e. Surface water quality assessment FY 14

**Objective 1-3:** Characterize the species composition, ecosystem health, and wildlife use of the significant habitats on VTS-C.

<i>Conduct a baseline survey for potential threatened and endangered species and repeat every 5 years.</i>	1f. Rare species PLS FY12
<i>Conduct a bat survey and repeat every 5 years.</i>	1g. Bat PLS FY13
<i>Repeat bird survey every 5 years.</i>	1h. Avian PLS FY12 and FY17
<i>Conduct an insect survey.</i>	1i. Insect PLS FY14
<i>Repeat aquatic fauna survey, including macroinvertebrate and vertebrate organisms every 5 years.</i>	1j. Aquatic fauna PLS FY14
<i>Repeat mammal survey every 10 years.</i>	1k. Mammal PLS FY18
<i>Repeat herpetofauna survey every 10 years.</i>	1l. Herpetofauna PLS FY19

**Objective 1-4:** Develop management strategies to protect ecotypes/habitats of importance.

<i>Identify and prioritize ecotypes of significance at regional and local</i>	1m. Map and priority list of
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<i>scales.</i>	extant ecosystems FY13
<i>Identify training or other threats to significant habitats</i>	
<i>Determine the necessity of significant habitats to training activities, and identify alternate areas for training where feasible.</i>	1n. Threat and usage details collected FY13
<i>Develop protection plan for significant habitats.</i>	1o. Protection plan FY14
<i>Implement measures of biodiversity at multiple scales to monitor habitat health (see Section 4.2.11)</i>	
<b>Objective 1-5: Manage for ecosystem health, wildlife, and improved habitat quality.</b>	
<i>Eliminate invasive exotic species where feasible (see Section 4.2.10)</i>	
<i>Initiate conversion to native species to restore natural vegetation communities, especially in grassland areas, where there is no conflict with military training.</i>	1p. Identify locations for native species restoration FY12 1q. Develop restoration plan FY13 1r. Implement restoration plan as possible
<i>Institute prescribed fire regime for grassland and forest management where appropriate, incorporating training site needs, nesting bird protection, and the historic fire regime (see Section 4.2.8)</i>	
<i>Implement measures of biodiversity at multiple scales to monitor habitat health (see Section 4.2.11)</i>	

#### 4.2.2 Rare, Threatened, and Endangered Species (RTE) Management

VTS-C is home to relatively large numbers of the federally threatened large-flowered skullcap (*Scutellaria montana*). Initial investigations of the species on VTS-C began in 2002 with a survey to establish the extent of its occurrence on the training site. Annual monitoring for the skullcap has been carried out on the training site since 2004.

The federally listed endangered gray bat (*Myotis grisescens*) has also been found on the VTS-C. Studies are still underway to determine the level of use this species makes of the training site. Monitoring protocols and management guidance will be developed for the gray bat as more information becomes available.

A variety of other rare, threatened, or endangered species are known to occur within the northwest Georgia region in habitats that can be found on VTS-C (see section 3.9). Annex 1 contains the Rare Species Management Plan. At this time, the plan is focused on monitoring and management activities for the large-flowered skullcap. Additional information will be added if other RTE species are identified on the training site and management protocols are developed for them.

##### Goals:

- Minimize conflicts between the training mission and species protection.
- Maintain healthy population of large-flowered skullcap (*Scutellaria montana*)
- Maintain habitat currently used by gray bat (*Myotis grisescens*)
- Avoid accidental takes of *S. montana* and *M. grisescens*
- Maintain native plant communities that support state and federal rare, threatened, or endangered species

- Cooperate with the US Fish & Wildlife Service and the State of Georgia Natural Heritage Program
- Ensure that VTS-C remains in compliance with the Endangered Species Act

**Objective 2-1:** Quantify and monitor groups of large-flowered skullcap on VTS-C.

<i>Conduct annual monitoring during</i>	2a. Annual monitoring
<i>Utilize results of annual monitoring and other data to track the plant population</i>	2b. Annual report of population condition
<i>Re-evaluate monitoring protocol in 2013 to determine need for continued annual monitoring and/or changes to methodology.</i>	

**Objective 2-2:** Protect the large-flowered skullcap groups on VTS-C.

<i>Maintain a posted perimeter around the large-flowered skullcap groups.</i>	2c. GPS location every other year Adjust sign positions as needed
<i>Develop training for soldiers and training site personnel to understand the restricted activities within posted groups.</i>	2d. Poster and training materials in FY12
<i>Continue regular communication with GADNR and USFWS, including consultation on major actions,</i>	As needed
<i>Work with universities or other research institutions to further knowledge of large-flowered skullcap.</i>	
<i>Develop other protection protocols as needed.</i>	

**Objective 2-3:** Investigate management alternatives and impacts.

<i>Develop experiment to test transplanting some individuals in conjunction with mandatory clearing of training site boundary fenceline.</i>	2e. Study results/report FY12
<i>Determine effect of selective burning on large-flowered skullcap.</i>	2f. Study results/report FY12
<i>Investigate the impact of herbivory on large-flowered skullcap.</i>	2g. Study results/report FY14
<i>Develop treatment protocol and track effects of herbicide and non-chemical control of invasive plants in the vicinity of large-flowered skullcap.</i>	2h. Study results/report FY15
<i>Identify other practices that might improve skullcap habitat and develop experimental protocols in cooperation with FWS.</i>	

**Objective 2-4:** Characterize and protect gray bat population on VTS-C.

<i>Resurvey bat species on VTS-C every 5 years.</i>	See Target 1g
<i>Track bats with radio-telemetry to determine location of roosts/hibernacula if significant change in species composition.</i>	As needed
<i>Perform survey to quantify gray bat population and its activities on VTS-C if roosts/hibernacula are located.</i>	As needed
<i>Develop management plan and monitoring protocol for the bats, their foraging habitat, and their hibernacula (if located on site).</i>	As needed

**Objective 2-5:** Quantify and monitor populations of state and federal RTE species on VTS-C.

<i>Incorporate Indiana bat survey protocol into regularly scheduled bat surveys.</i>	See target 1g
<i>Perform a comprehensive survey for RTE species every 5 years.</i>	See target 1f

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*Develop management plan and monitoring protocol for any new species identified on VTS-C, as needed.*

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**Objective 2-6:** Identify and manage native communities currently supporting or potentially supporting RTE species.

*Integrate community information with RTE information and develop community-based habitat management plans and monitoring protocols for significant habitats, as needed.*

*Control invasive pest plant species where impacting RTE habitats (see Section 4.2.10).*

*Monitor health of communities of interest through long-term vegetation monitoring program and repeat surveys (see Section 4.2.11).*

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**Objective 2-7:** Manage American chestnut orchard.

<i>Coordinate with TACF annually for additional seeds/seedlings and to share data.</i>	2i. Annual correspondence
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<i>Physically maintain orchards: water and fertilize seedlings, maintain fence, and mow field.</i>	2j. As needed throughout growing season
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<i>Survey and measure seedlings annually.</i>	2k. Annual survey
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<i>Coordinate with TACF for blight resistance testing</i>	2l. Consult in FY14
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### 4.2.3 Reclamation/Mitigation

Reclamation and mitigation are a part of the everyday management of the training site, largely under the ITAM program. Major projects of reclamation and mitigation are included under the more specific environmental topic involved (e.g., erosion control, wildlife habitat, etc.). The principle project addressed in this INRMP is the Tiger Creek streambank restoration effort, which is discussed in detail in section 4.2.4 Erosion Control.

### 4.2.4 Erosion Control and Soil Conservation

VTS-C has large areas of steep slopes and highly erodible soil (see Section 3.4). Vehicle traffic is kept to the roads where possible in these fragile areas; however, erosion problems do occasionally develop from the limited use of these areas, the heavier use of less sensitive sites, and/or natural forces. Erosion issues need to be identified and repaired as quickly as possible. Documentation of recurring problems will allow adjustments to training use to avoid such problem areas. In addition, one significant reclamation project is planned at this time:

- A section of Tiger Creek which runs through the tank range has experienced significant undercutting and slumping of the banks. Restoration of this area will require resloping the banks, stabilizing the soil along the shoreline, and revegetating the area with native bottomland species.

According to the 2005 DA Sustainable Range/Installations Environmental Activities Matrix, erosion control and repair is predominantly a facilities or range responsibility. The Environmental Office will provide survey and reporting support, technical guidance, and assistance with permits as required. Repair efforts will be funded in accordance with the matrix.

Goals:

- Keep topsoil in its place.

- Minimize the development of erosion and sedimentation problems on the training land.
- Rehabilitate existing erosion problems.
- Protect shorelines from unnecessary erosion.

**Objective 4-1:** Identify and rehabilitate degraded and eroding training land.

<i>Develop a reporting form for TNARNG soldiers and training site personnel to report erosion problems identified during other daily activities.</i>	4a. Form prepared FY11
<i>Install reporting form on the Environmental webpage for easy access for all personnel.</i>	4b. Form on website FY11
<i>Establish regular surveys of training areas to identify and prioritize degraded or eroded areas requiring rehabilitation</i>	4c. Annual surveys beginning FY12
<i>Develop a system for compiling erosion reports, prioritizing projects, and tracking project progress and budget through the ENV office.</i>	4d. Tracking system FY12
<i>Repair erosion problems as identified. (Typically a Facility responsibility.</i>	
<i>Develop an “erosion guide” for VTS-C that identifies areas experiencing repeated erosion and gives guidance in appropriate repair and avoidance methodology.</i>	4e. Erosion guide FY12
<i>Develop training for soldiers, commanders, and planners in best Management Practices and their applicability to TNARNG actions.</i>	4f. BMP training module FY13

**Objective 4-2:** Restore sections of Tiger Creek streambank that are badly eroded/slumping.

<i>Determine the most appropriate natural streambank stabilization methods for this project and develop plan to reslope banks, install stabilizing structures, and revegetate.</i>	4g. Restoration plan FY12
<i>Conduct mechanical work and install stabilization structures.</i>	4h. Physical work FY13
<i>Revegetate with native, bottomland species which will provide soil-holding capabilities but remain low-growing to comply with range line-of-sight requirements.</i>	4i. Revegetation in FY13 and FY14

#### 4.2.5 Watershed Management

The riparian ecosystem – the land adjacent to the streams and wetlands – is extensive on VTS-C, surrounding Tiger Creek, Broom Branch, Catoosa Springs Branch, and the wetland areas. It consists primarily of mixed bottomland hardwood forests; although a portion of the area surrounding Tiger Creek in the tank range has been converted to managed grassland. Riparian areas serve as the interface between aquatic and terrestrial ecosystems. They serve as valuable wildlife habitat and corridors, promote streambank stabilization, trap sediments and nutrients, filter runoff water, and help to moderate flooding.

Limited military training activities occur within riparian areas at VTS-C. For much of the year, the natural water table level makes the area too wet for vehicle or troop movement. Stream fording by vehicles and troops on foot is only permitted at designated, hardened sites.

All stream systems will be surrounded by functioning riparian zones, continuous throughout a watershed and connected to other watersheds by mixed species corridors. Riparian zones and corridors will be designated as riparian buffer areas [streamside management zones (SMZ)] on maps in the VTS-C training site office.

The TNARNG will maintain riparian habitats along streams by implementing at minimum a 50 foot streamside buffer zone on either side of every creek. Vehicular traffic in the SMZ will be kept to a minimum, and authorization must be obtained before conducting maintenance and construction activities. Foot traffic through riparian areas is not regulated, but vehicles will be kept to established roads and trails. Where wetlands are present, a 50 foot riparian buffer zone will be established and marked with Seibert stakes on all sides of the wetland.

The riparian habitat is variable in size. While the restricted-activity Streamside Management Zone is 50-foot on either side of the waterway, the actual riparian area typically extends much further beyond the streambank. All areas of bottomland hardwood forest should be considered to be within the riparian zone, and care should be taken to minimize impacts on water and habitat quality.

Riparian areas are particularly susceptible to invasion by exotic plant species. The bottomland forests around Tiger Creek and Broom Branch are heavily infested with privet (*Ligustrum* spp.) and Nepalese browntop grass (*Microstegium vimineum*). These species drastically modify the habitat quality of the area and will require intensive efforts to control.

The stretch of Tiger Creek through the tank range was heavily modified in the past. It currently has areas of bank sloughing and erosion and sections with insufficient vegetative cover. Reclamation of this problem is covered in Section 4.2.4 Erosion Control and Soil Conservation.

Goals:

- Minimize nutrient and sediment inputs from watersheds.
- Minimize non-point source pollution in watersheds through use of Best Management Practices.
- Understand the ecosystem dynamics and stressors within the watersheds.
- Retain/rehabilitate vegetative buffers on waterways.
- Incorporate watershed management concerns into training and land management planning.
- Improve trout habitat quality along the full length of streams on VTS-C.

**Objective 5-1:** Improve knowledge of existing riparian areas and their conditions.

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*Vegetation community surveys and aquatic fauna surveys as noted in Section 4.2.1*

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*Survey streams as part of regular erosion surveys as noted in Section 4.2.4*

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*Develop and implement monitoring protocol for water resources to assess water quality across the training site and at in-flow and out-flow points.*

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5a. Implement water monitoring FY13

**Objective 5-2:** Improve buffering quality of the riparian areas.

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*Perform riparian habitat assessments to identify degraded riparian corridors and prioritize restoration efforts.*

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5b. Riparian habitat assessments FY13

*Restore degraded buffers with appropriate native vegetation, as needed*  
*Repair erosion and sedimentation problems as identified, in accordance with Section 4.2.4*

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*Control invasive species in the riparian communities to allow native species to re-establish (see Section 4.2.10)*

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*Monitor riparian ecosystems to determine effects of management through long-term vegetation monitoring and repeat surveys (see Section 4.2.11).*

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**Objective 5-3:** Protect shoreline of Tiger Creek and all riparian areas from potential causes of erosion.

*Restrict all vehicular traffic, especially of large vehicles and machinery, along highly erodible soils at water's edge by maintaining, at minimum, a 50 foot riparian buffer zone (SMZ).*

*Post and maintain signs/Seibert stakes identifying SMZs.*

5c. Posting complete FY11 and checked biennially

*Maintain SMZs during all timber harvests and other clearing activities, retaining all trees that exist within the buffer zone.*

*Educate troops, management staff, and others on the importance of SMZs, the limitations to their use, and regulatory and permitting issues involved in riparian area activities.*

5d. SMZ training module FY13

**Objective 5-4:** Improve water quality for trout habitat.

*Measure water quality in terms of trout habitat requirements through stream system in conjunction with regular water quality assessment.*

*Develop and implement plan for improving stream habitat.*

See target 1e

**4.2.6 Wetlands Protection**

VTS-C has only a small area of jurisdictional wetlands (7.88 acres), mostly associated with the creek system on the training site. This ecotype is of importance for its chemical and sediment filtration functions as well as providing habitat for many species. A 50-foot buffer zone will be established surrounding wetland areas on VTS-C. Limitations for use of the buffer zone will be the same as those for an SMZ.

The Georgia Department of Natural Resources Environmental Protection Division, Water Protection Branch, and the Army Corps of Engineers protect wetlands by requiring state permits to alter waters of the state. These permits require that activities be undertaken in such a way that impacts to streams or wetlands are avoided or mitigated. Wetland criteria are provided within the general Water Quality Standards, and Best Management Practices identified for Forestry and Agriculture are applicable to wetland ecosystems.

**Goals:**

- Minimize operational impact of the military mission on wetlands.
- Maintain functional, healthy wetlands that are resilient to minor, inadvertent encroachments and impacts.
- Manage for no net loss of wetland acreage, function, or value.

**Objective 6-1:** Improve knowledge of existing wetlands and their conditions.

*Wetland surveys as noted in Section 4.2.1*

*Conduct a floristic study of wetland habitats. Significant flora will be subject to appropriate monitoring.*

6a. Floristic study FY13

*Conduct a faunal study of wetland habitats. Significant fauna will be subject to appropriate monitoring.*

6b. Fauna study FY13

**Objective 6-2:** Implement and enforce effective buffers around wetlands areas.

*Post signs identifying 50' wetland buffers*

6c. Post buffers FY12

*Identify areas surrounding wetlands that require a vegetative buffer or filterstrip (or repair thereof) for protection*

6d. Buffer zone vegetative assessment FY13



<i>Educate troops, management staff, and others on the importance of wetland buffers, the limitations to their use, and regulatory and permitting issues involved in wetland area activities.</i>	6e. Wetland training module FY13
<i>Visually monitor wetlands annually to ensure compliance with SMZs.</i>	

#### 4.2.7 Forest Management

The Forest Ecosystem occurs on approximately 94% (1,522 acres) of the training site. The desired future condition of the forest at VTS-C is a range of forest types and ages, approximating natural habitat conditions and providing needed training opportunities. Timber production is not a primary goal of forest management on VTS-C, but timber harvest may be an appropriate method to achieve training needs, native species restoration, or forest health goals.

The Army forest management program is required to support and enhance the immediate and long-term military mission while meeting environmental stewardship requirements as mandated by Federal laws. Army Regulation 200-3 states that "...it is the Department of Army policy to maintain, restore, and manage its forest lands on an ecosystem basis. The harvesting of forest products is allowed and encouraged when conducted consistent with protecting and maintaining a viable, self-sustaining ecosystem".

Currently, many of the stands on VTS-C are overmature in terms of timber production. Areas of the training site are too dense for effective training use. In other areas, the mature forest should be protected for the threatened large-flowered skullcap. A forest inventory and a timber management plan were completed in 2006. This information and training site plans were used to develop the overall management plan for forest resources in Annex 2.

##### Goals:

- Provide optimum forestland training opportunities for TNARNG.
- Maintain mature forest habitat for *Scutellaria montana*.
- Improve forest health and wildlife habitat through appropriate forest management techniques.
- Manage for native forest species appropriate to the region.

##### **Objective 7-1:** Maintain forest inventory and other information needed for forest management planning.

<i>Repeat forest inventory every 10 years.</i>	7a. Timber inventory FY15
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<i>Conduct planning levels surveys as noted in Section 4.2.1</i>	
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##### **Objective 7-2:** Improve training areas by selected timber harvesting.

<i>Determine needs of TNARNG for forestland training operations at VTS-C and identify areas requiring alterations to the forest stands for training purposes.</i>	7b. Consult with training site staff annually.
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<i>Identify management practices to create desired training conditions, as needed.</i>	
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<i>Implement timber management to support training, as needed. Program projects through STEP or RPTS as appropriate</i>	
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##### **Objective 7-3:** Improve forest health and habitat quality across the training site.

<i>Identify stands requiring improvement through forest inventory, planning level surveys, and general observation.</i>	7c. Annual update of FMP
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<i>Perform timber stand improvement activities IAW Annex 1.</i>	7d. Annual timber ROA.
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*Conduct prescribed burning, where appropriate, to improve forest health and wildlife habitat, IAW Annex 3 (see Section 4.2.8).*

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*Control invasive exotic species within the forest ecosystem IAW Annex 3 (see Section 4.2.10).*

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*Maintain appropriate stand conditions along and around waterways with streamside management zones and best management practices.*

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*Monitor changes to biodiversity and species composition through long-term vegetation monitoring, repeat surveys, and regular timber inventory (see Section 4.2.11).*

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#### 4.2.8 Fire Management

Catastrophic wildfire is not a common threat to northwest Georgia ecosystems but must be planned for. The Wildland Fire Management Plan (WFMP) for the VTS-C is found in Annex 3. It includes background information on wildland fire and fuels on the training site, fire suppression guidelines, and the prescribed burning plan. The existing road system at VTS-C provides the basis for a functional firebreak system; additional breaks may be needed. The natural ecosystems of VTS-C are not notably fire adapted, and so prescribed fire will be a small component of forest management on the training site. It can be an important tool for maintaining grassland areas, however.

Goals:

- Minimize threat of wildfire to the training site.
- Maintain fire breaks to control wildfire or prescribed fire.
- Utilize prescribed fire as appropriate to maintain training area conditions and native ecosystems.

**Objective 8-1:** Ensure sufficient firebreaks for protection of VTS-C resources and to prevent fire escape from the training site.

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*Identify additional firebreak locations needed.*

8a. Consult with training site and TDF FY12.

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*Create firebreaks where needed, with consideration for erosion potential and 508-line. VTS staff responsibility.*

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*Develop and implement schedule of maintenance for firebreaks. VTS staff responsibility.*

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**Objective 8-2:** Perform prescribed burning as appropriate for training and ecosystem management needs, IAW Annex 3.

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*Obtain training for TNARNG personnel for prescribed burning and wildland fire fighting.*

8b. Annual refresher training. Additional training opportunities as needed.

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*Obtain equipment needed for prescribed burning, as needed.*

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*Coordinate with the GA Forestry Commission or other organizations to provide a trained prescribed fire burn boss, as needed.*

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*Implement prescribed fire program in Annex 3 for fuel reduction, training area, and ecosystem management.*

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*Conduct postburn evaluations to monitor efficacy of prescribed fire program.*

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*Review Wildland Fire Management Plan annually and update as needed.*

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8c. Annual WFMP review.

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#### 4.2.9 Fish and Wildlife Management

Currently, there are no specific fish or wildlife management activities conducted at VTS-C. Ecosystem management focuses on maintaining or improving the system as a whole; therefore, TNARNG policy is to manage animal species through manipulation of their habitat. Appropriate treatment of the forest, grassland, and riparian ecosystems should benefit the species that utilize those habitats. However, further information about the species that are utilizing the training site will allow further enhancement of this plan for the benefit of wildlife species.

There is no open hunting or fishing at VTS-C due to concerns for security and for the safety of the public and the soldiers. The white-tail deer population may exceed the site's carrying capacity without control; TNARNG will work with the GADNR to determine if this is a problem and to carry out a solution. Feral pigs and beaver are also an intermittent problem on the training site which will be addressed in cooperation with the Georgia wildlife authorities. Control of pest animals is addressed in Section 4.2.10, Pest Management.

Tiger Creek and its tributaries on VTS-C are classified as trout streams by the state of Georgia. Management of riparian areas will be conducted with maintenance of trout habitat as a primary goal.

##### Goals:

- Limit negative impacts on wildlife or wildlife management by training activities or land management.
- Improve wildlife habitat where possible through management of native communities and use of native species.
- Improve trout habitat quality in streams throughout VTS-C.
- Determine carrying capacity of the training site for white-tailed deer and maintain population at that level.
- Manage feral pigs for the protection of the ecosystems and rare species (see also Section 4.2.10).
- Manage beaver populations to minimize loss of training lands.

##### **Objective 9-1:** Gain updated and complete data on wildlife use of VTS-C.

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*Perform baseline biological surveys as noted in Section 4.2.1.*

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*Conduct population counts for deer, beaver, feral hog or other species as needed.*

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##### **Objective 9-2:** Manage habitats for all native species, not just game species.

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*Protect and maintain native species vegetative buffers around water sources, in accordance with SMZ protocols (See Section 4.2.5).*

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*Install and maintain nest boxes for appropriate bird species, as possible.*

9a. Install boxes 2012; annual maintenance thereafter.

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*Convert grassland areas to native plant species where feasible. See section 4.2.1.*

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*Educate troops, management staff, and others on protection of wildlife species and habitats.*

9b. Wildlife training module FY13

##### **Objective 9-3:** Determine the necessity/feasibility of a hunting program for VTS-C.

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*Consult with the Training Office and training site personnel to determine if the military mission can be coordinated with limited public hunting access.*

9c. Hunting discussion FY13

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*Consult with GADNR about the potential need for additional public*

9d. Consultation FY13

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*hunting opportunities in Catoosa County and the suitability of VTS-C to fill that need.*

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*Gather information about game species populations on the training site and in the region.*

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9e. Game species population counts FY14

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*Consult with the GADNR about the carrying capacity of the training site and whether additional population control is needed for any game species.*

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#### 4.2.10 Pest Management

Pest Management at VTS-C is directed by the TNARNG Integrated Pest Management Plan (IPMP). Integrated Pest Management is “a comprehensive approach to pest control or prevention that considers various chemical, physical, and biological suppression techniques; the habitat of the pest; and the interrelationship between pest populations and the ecosystem” (Armed Forces Pest Management Board 1987).

According to DoD regulation and TNARNG policy, only DoD or State Certified Pesticide Applicators may apply any (restricted or general use) pesticide or herbicide to VTS-C property. The only exception to this rule is occasional small application of ready-made general use pesticides applied on a “self-help” basis due to an immediate need for personal safety (e.g., wasp spray in the motorpool, fire ant bait beside the walkway). Most chemical pest control on VTS-C is provided by contracted pest control company. VTS-C has one employee certified in the right-of-way category for in-house weed control. All chemical pesticide applications must be reported to the TNARNG Pest Management Coordinator (see Appendix H for forms).

VTS-C is infested with the imported fire ant (*Solenopsis* spp.). This is a highly aggressive ant, dominating the areas it infests and generally causing a decrease in insect species diversity. It has a fierce sting which it will apply repeatedly to animals it encounters with minimal provocation. These stings are painful and can cause anaphylaxis in sensitive individuals. Humans, domestic livestock, and wildlife are all susceptible to injury by red imported fire ants (Williams et al. 2001). The imported fire ant is the subject of a USDA quarantine which restricts the transport of soil, plants with soil and roots attached, grass sod, and similar materials. Fire ants are treated when the mounds pose an immediate threat to soldiers and other site users: around buildings, work stations, bivouac sites, firing points, training shelters, etc.

The primary natural resources aspect of pest management is the control of invasive species. Nonnative species have the potential to degrade training land at VTS-C and impact the usability of the land for Guard purposes. A variety of invasive pest plants are of concern at VTS-C: common privet, Japanese honeysuckle, Nepalese browntop, sericea lespedeza, and Canada thistle are the most prevalent. These plants can out-compete native plant species, change water and nutrient cycling, and drastically change the ecosystem in which they occur. An invasive pest plant management plan is included in Annex 4.

Two significant animal pests occur on the training site: feral pigs and beaver. The pigs dig up the roots of herbaceous plants for food and can have a major impact on rare species including the large-flowered skullcap, as well as disturbing the soil. Beaver are highly active in Tiger Creek and Broom Branch, creating water impoundments which kill timber, destroy bottomland ecosystems, and make the land unsuitable for training. The feral pig population has been reduced in the past by professional hunting. Trapping conducted in 2006 reduced the beaver population to near zero temporarily, but it is anticipated that new individuals will move into the vacated habitat. Hunting and trapping of these pest animals will be continued on an as-needed basis.

## Goals:

- Implement Integrated Pest Management according to the TNARNG Integrated Pest Management Plan (IPMP)
- Minimize the use of chemical pesticides and herbicides while achieving needed control.
- Ensure compliance with all legislation, regulations, and guidelines for pest management.
- Control animal and plant pests on the installation.

**Objective 10-1:** Control invasive species (IAW Executive Order 13112) to protect the natural ecosystems of the training site.

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<i>Repeat survey to identify and map invasive pest plant infestations every 5 years.</i>	10a. IPP survey FY12
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<i>Implement appropriate pest plant controls IAW Annex 4.</i>	10b. Annual implementation efforts
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*Monitor change in IPP infestations through long-term vegetation monitoring and repeat surveys (See 4.2.11).*

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**Objective 10-2:** Control invasive species for improvement of training areas.

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<i>Identify problem plant species that may interfere with training activities and develop control plan.</i>	10c. Training-specific IPP control plan FY14
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*Implement appropriate controls to eliminate problem plants from training areas. VTS responsibility.*

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*Monitor change through long-term vegetation monitoring and repeat surveys (See 4.2.11).*

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**Objective 10-3:** Control pest species for safety and comfort of training site users.

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<i>Install, as feasible, and maintain bat boxes and bird nest boxes for biological control of mosquitoes around buildings and bivouac sites.</i>	10d. Annual box maintenance
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<i>Regularly monitor training site for presence of imported fire ant infestations.</i>	10e. Annual fire ant survey
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*Control pest animal populations as needed. VTS responsibility.*

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**Objective 10-4:** Control pest animals for the protection of natural communities and RTE species and to minimize loss of training land.

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*Monitor feral pig impacts on vegetation in conjunction with routine vegetation monitoring (See 4.2.11).*

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*Implement controlled hunting in cooperation with GADNR or USDA Animal Control Services to limit population of feral pigs as needed. VTS responsibility.*

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*Map and monitor beaver populations and dams, in conjunction with annual stream erosion surveys, see Section 4.2.5.*

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*Implement beaver trapping/hunting and dam removal as needed, complying with all state and federal regulations applying to aquatic and riparian habitat alteration. VTS responsibility.*

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**4.2.11 Long-term Vegetation Monitoring**

The goal of long-term monitoring is to track changes to the land resulting from training activities or other forces. RTLA, under the ITAM program, is one form of monitoring which should be implemented at VTS-C. Additional monitoring is needed to track impacts and changes to the ecosystems on the facility.

The Environmental office initiated a vegetation monitoring protocol in 2002. In the fall of that year, plots were established at three TNARNG training sites (Catoosa, Milan and Tullahoma) following the original Land Condition Trend Analysis (LCTA) line transect-point quadrat methodology (three control plots and five special use plots). On examination of the original LCTA (now RTLA) methodology utilized in 2002, it was determined that the design was not consistent with current scientific methods utilized in the eastern U.S. ecotypes. An initial sampling was made in 2004 on eight rectangular plots at VTS-C located at the starting end of the original LCTA transects. Further modification of this design is needed to ensure thorough coverage of the site and statistical validity, and a larger sample size is essential to fully characterize the training site.

A comprehensive, scientifically valid monitoring program should be developed for the VTS-C. Data collected through a vegetation monitoring program will be used to track impacts of various management activities on overall habitat health on the training site, especially in riparian systems, forest stands, and rare species habitat.

Goal:

- To use data collected from analyses of long-term vegetation plots to monitor effects of training activities and land management practices at VTS-C.

**Objective 11-1: Develop and implement a vegetation monitoring program.**

<i>Develop vegetation monitoring protocols for VTS-C.</i>	11a. Monitoring protocol FY13
<i>Establish vegetation monitoring plots.</i>	11b. VTS-C plots in place FY15
<i>Resample monitoring plots as appropriate IAW monitoring protocol.</i>	TBD

**4.2.12 Grounds Maintenance**

Environmentally and economically beneficial landscaping practices can reduce maintenance costs while also providing wildlife habitat. Planting windbreaks around buildings, establishing forest, prairie, or wildflower areas, and reducing mowing are all ways to spend dwindling maintenance dollars more wisely, educate the public about the benefits of reduced maintenance, and become better stewards of the environment.

Goals:

- Maintain an attractive, functional landscape appropriate to TNARNG needs.
- Minimize the disconnect between “maintained” and “natural” landscapes.
- Decrease the use of chemical pesticides and herbicides.

**Objective 12-1:** Utilize regionally native plant species for all landscaping and restoration efforts if feasible.

*Use native grasses to seed exposed soils except where the native warm*

<i>season grass growth habit is incompatible with use (e.g., firing ranges).</i>	
<i>Use native shrubs, trees, and wildflowers for aesthetic plantings.</i>	
<i>Create a list of non-native plants to avoid and a list of native alternatives and their planting requirements for landscaping purposes.</i>	12a. Native planting guide FY11
<b>Objective 12-2:</b> Identify areas where the “edge” between maintained and natural can be blurred and adjust grounds maintenance activities to produce a less sharp division.	
<i>Survey the training site for appropriate boundaries between natural and maintained landscapes.</i>	
<i>Develop and implement a program to create more graduated edges. Ensure that changes to the vegetation structure will not affect training or safety.</i>	12b. Edge conversion plan FY14
<b>Objective 12-3:</b> Adjust maintenance schedules for protection of specific environmental values (e.g., breeding seasons of native birds).	
<i>Create list of values that may be impacted by grounds maintenance and determine appropriate scheduling and process for their protection.</i>	12c. List and details FY14
<i>Modify the ground maintenance calendar in the INRMP to reflect these protection efforts.</i>	12d. Calendar finalized FY14

#### 4.2.13 Recreational Use Management

At VTS-C, outdoor recreation is limited due to the primary mission of the training site and the danger it presents to public safety. Public access is restricted because of hazards related to training activities as well as on-going construction activities: small arms firing, convoy movement, training residue (e.g., fox holes and concertina wire), and training mechanisms (e.g., moving targets). All of these are potential hazards to outdoor recreationists on foot or in a vehicle. For this reason, public access to the training site is controlled by secured gates.

Any person entering the training site for any purpose prohibited by law or lawful regulation is trespassing. Criminal trespass is a misdemeanor under Georgia Code 16-7-21 and 38-2-306. It may endanger the life of the person entering the training site and the lives of Tennessee Army National Guardsmen and may interfere with training. Georgia Recreation Use Statutes (Liability of Land Owner to Person Using Land) are found in Section 12-3-116 of the Georgia Code.

##### Goals:

- Determine the viability and desirability of hunting or fishing programs at VTS-C in consultation with the GADNR.
- Identify and develop any other potential recreational use that will not interfere with training or result in hazardous situations for the public or TNARNG personnel.

#### 4.2.14 Cultural Resources Management

TNARNG has an approved Integrated Cultural Resources Management Plan (ICRMP) for the VTS-C in Georgia (separate from the ICRMP for the properties within Tennessee) and has conducted three consultations with 20 American Indian tribes with an interest in TNARNG properties. The ICRMP addresses cultural resources management in more detail and provides procedures to consider the effects that natural resources activities might have on cultural resources.

Natural resources management activities proposed in the INRMP that may require Section 106, Section 110, or tribal consultation include ground-disturbing activities associated with land rehabilitation and maintenance (erosion control and rehabilitation of eroded areas or trails). Some military training activities, e.g., engineering training and other ground-disturbing activities, are considered “undertakings” that are required to be conducted in accordance with the ICRMP. Each activity conducted in accordance with the INRMP must be coordinated through the Environmental Office’s Cultural Resources Manager and the ICRMP to ensure that they will comply with all applicable federal and state cultural resources requirements.

Goals:

- Manage cultural resources in support of the military training mission.
- Identify conflicts between cultural resources management and the training mission. Reconcile conflicts by ensuring continuance of the military mission while protecting cultural resources.
- Avoid impacts to historic, prehistoric, and archaeological resources on VTS-C in accordance with cultural resources laws and regulations.
- Maintain good relations with the American Indian tribes that have interest in TNARNG lands.

**Objective 14-1:** Adhere to guidelines presented in the TNARNG Integrated Cultural Resources Management Plan for VTS-C.

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**Objective 14-2:** Ensure that potential cultural resources sites are identified and are avoided during all natural resources management activities.

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**Objective 14-3:** Ensure that sites of prehistoric or historic significance which are encountered during natural resources management activities are properly reported, protected, and evaluated as required by state and federal regulations.

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**Objective 14-4:** Protect cemeteries on the VTS-C in accordance with the license.

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**4.2.15 Geographic Information Systems**

TNARNG Environmental has an extensive GIS database. It incorporates relatively complete training site information including all required SDS/FIE feature classes as required by National Guard Bureau. TNARNG GIS Branch meets or exceeds the CIP data calls required by NGB.

Goals:

- Continue to expand the information contained in the database and meet the ever growing demand to make data more readily available via interactive web applications.
- Utilize the data for training and management planning and for reporting purposes.

**Objective 15-1:** Maintain a constantly improving GIS.

*Identify the data layers captured and those still needed.*

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*Update older data layers and create new, as needed, or as information becomes available.*

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*Develop appropriate wording to be included in all Conservation contracts to ensure data is collected and presented in the correct format for the TNARNG GIS database.*

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15a. Review contract wording annually.



#### 4.2.16 Environmental Management Systems

The TNARNG Environmental office is in the process of developing an ISO 14001 Program. When completed, the environmental management system (EMS) and International Standard Organization (ISO) 14001 standard will:

- establish a mission-focused EMS within their purview;
- comply with Executive Order (EO) 13148, 'Greening the Government';
- conform to ISO 14001 per Department of Army (DA) and Army National Guard (ARNG) policy; and
- provide National Guard Bureau (NGB) with information regarding specific requirements for implementation.

EMS implementation will encompass the entire TNARNG installation, including VTS-C. The EMS implementation requirements apply to all installation missions, facilities, tenants, contractors, and activities. The surrounding communities, regulators, and other interested parties will be notified of the installation's EMS efforts and encouraged to become participants in and/or contributors to the process.

### 4.3 SUSTAINABLE RANGE PROGRAM (SRP)

The Sustainable Range Program (SRP) was conceived and implemented to improve the way the Army designs, manages, and uses ranges to ensure that current and future doctrinal requirements are met. As defined in AR 350-19, The Army Sustainable Range Program, the goal of the SRP is to maximize the capability, availability, and accessibility of ranges and training land to support training and testing requirements. The military mission is supported by the SRP through the integration of facilities management, environmental management, munitions management, and safety management to efficiently manage and maximize the capability, availability, and accessibility of ranges and training land to support training and testing requirements (Department of Army 2005).

The SRP gives attention to the increasing problem of encroachment on areas surrounding military installations. Encroachment has the potential to affect the accessibility and capability of the Army and the way the military trains. Because Army installations are located in regions that are increasingly urban and agricultural, the relatively natural landscapes found on these installations become islands of biodiversity.

There are eight overall objectives/core areas for the SRP that are designed to ensure the availability and accessibility of army training land (Department of Army 2005). These are:

1. Range Facilities
2. Range Operations
3. Range Maintenance
4. Encroachment
5. Environmental Responsibilities
6. Outreach
7. Integrated Management
8. Professional Development

The SRP program is the responsibility of the Training Site Commander. This program is closely tied to natural resources management and should be conducted in accordance with the standards put forward in

this INRMP. The Army's two components of the Sustainable Range Program are the Range and Training Land Program (RTLTP) and Integrated Training Area Management (ITAM).

#### **4.3.1 Range and Training Lands Program (RTLTP)**

The Range and Training Lands Program (RTLTP) provides centralized management and prioritization for planning, programming, design and construction activities for live-fire training ranges and maneuver training lands. The RTLTP process was developed to assist installations in the integration of mission support, environmental stewardship, and their economic feasibility (Department of Army 2005). In addition, the RTLTP identifies the needs for range projects and training land requirements for live-fire ranges and maneuver area. The RTLTP establishes how Army ranges are managed and maintained to support the mission requirements of each installation.

#### **4.3.2 Integrated Training Area Management (ITAM)**

The ITAM program serves as a link between the RTLTP and Natural Resources Management. ITAM provides range officers with the capabilities to manage and maintain training lands and support mission readiness and the Mission Essential Task List (METL). ITAM integrates the mission requirements derived from the RTLTP with environmental requirements and environmental management practices and establishes the policies and procedures to achieve optimum, sustainable use of training and testing lands by implementing a uniform land management program.

The ITAM program is a management and decision-making process that integrates army training and other mission requirements for land use with sound natural resource management practices. There are four components of the ITAM program: Range and Training Land Assessment<sup>1</sup> (RTLTA); Land Rehabilitation and Maintenance (LRAM); Sustainable Range Awareness (SRA); and Training Resources Integration (TRI). These areas do not fall under the control or responsibility of the Environmental Office. The goals and tasks included here are based on the SRP guidance, but may not be identical to the goals of the TNARNG SRP program.

##### **4.3.2.1 Range and Training Land Assessment**

RTLTA is a management procedure that inventories and monitors land conditions. It incorporates relational database and GIS technologies into the land use decision process. RTLTA collects physical and biological resources data from training land in order to relate land conditions to training and testing activities. These data provide the information to effectively manage land use and natural and cultural resources. It is the natural resources data collection and analysis component of the ITAM Program and is used as a standard base for inventory and monitoring on Department of Defense owned/managed properties (CEMML 1999). The intent of RTLTA is to acquire essential natural resource baseline information that is needed to effectively manage training lands. RTLTA surveys inventory plants and animals and describe the condition of the soils. The information obtained from RTLTA surveys may be integrated with standard data elements from ancillary components of ITAM (for example, cultural resources surveys, forest surveys, wetlands surveys, endangered species surveys, and water quality monitoring), satellite imagery, and aerial photography to portray a total picture of the natural and cultural resources of the training site. GIS is used to integrate all natural/cultural resources data and graphically display the relationships between individual resource components.

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<sup>1</sup> The Range and Training Land Assessment was formerly known as the Land Condition Trend Analysis (LCTA).  
Integrated Natural Resources Management Plan  
VTS-Catoosa

## Goal:

- To establish and maintain a monitoring system on VTS-C's training areas that will serve as an early warning system for the integrity of the training site's ecosystems.

## Tasks:

1. Establish special use plots as necessary on VTS-C.
2. Establish control plots as necessary on VTS-C.
3. Conduct inventories of vegetation, wildlife, and effects of training on RTLA plots.
4. Conduct short-term (every year) and long-term (every 3-5 years) monitoring of plots.
5. Utilize data to determine carrying capacity of training areas.
6. Utilize data to track changes in the training site's ecosystems.

#### 4.3.2.2 Land Rehabilitation and Maintenance

LRAM is a preventive and corrective land rehabilitation and maintenance procedure that reduces the long-term impacts of training and testing on an installation. It mitigates training and testing effects by combining preventive and corrective land rehabilitation, repair, and/or maintenance practices. It includes training area redesign and/or reconfiguration to meet training requirements. LRAM is an active component of the ITAM program that is designed to restore and maintain soil, vegetation, and water resources for long-term sustainable use and training realism. The program uses cost-effective technologies such as revegetation and erosion control techniques to reduce soil loss, control water runoff, and protect soil productivity and riparian areas (adjacent to water and wetlands). A key element in the LRAM program is the watershed or drainage basin approach to land rehabilitation. This approach ensures that land rehabilitation projects address actual land degradation problems, not just the symptoms.

## Goals:

- To ensure "no net loss" of training lands for military maneuver training.
- To protect, maintain, and improve soil, water, and air quality by providing adequate vegetative cover on all soils and maintaining appropriate drainage structures.

## Tasks:

1. Comply with all federal, state, and local laws and regulations pertaining to soil stabilization and water and air quality.
2. Provide adequate protection of natural resources by implementing best management practices.
3. Improve surface water quality by reducing sediment concentrations in streams and drainages on VTS-C.
4. Apply land rehabilitation treatment measures following troop training within the next optimum seeding period (spring or fall).
5. Reseed with native species in areas where they would be effective, productive, and cost-efficient.

#### 4.3.2.3 Sustainable Range Awareness

SRA provides a means to educate land users on their environmental stewardship responsibilities. It provides for the development and distribution of educational materials to land users. These materials relate the principles of land stewardship and the practices of reducing training and/or testing impacts. Environmental Outreach also includes information provided to environmental professionals concerning operational requirements. The purpose of SRA is to prevent unnecessary damage to the environment and in particular, training lands, by providing information to all site users.

The SRA program should focus on all land users to include soldiers, leaders, DA civilians, and the local community who may use training lands for recreational purposes. Sustainable Range Awareness is designed to improve their understanding of the effects of their mission, training, or activity on the natural resources of the VTS-C.

Goals:

- To create in those who use VTS-C a conservation ethic that will minimize damage to training lands and natural resources.
- To develop and implement a public education program to increase public awareness and acceptance of ecosystem management.

Tasks:

1. Develop the VTS-C field card that identifies environmental considerations and guidelines for military tenants utilizing the facilities and resources at VTS-C.
2. Develop other awareness materials for use on VTS-C.
3. Provide public service announcements to inform the public of events occurring on VTS-C.

#### 4.3.2.4 Training Requirements Integration

TRI is a decision making process that supports integration of all requirements for land use with natural and cultural resources management processes. TRI integrates the installation training and testing requirements for land use derived from the Range and Training Land Program (RTLTP); the range operations and training land management processes; and the installation training readiness requirements with the installation's natural resources conditions. Siting military missions (and other land uses) in areas best capable of supporting the activities is the main goal of TRI. TRI relies heavily on GIS and RTLA to determine land capabilities and includes rotation of training lands as well as scheduling lands according to their "carrying capacity" to support specific missions. TRI also includes those restrictions required to maintain quality training land, provide a safe training environment, and protect significant natural resources. When areas cannot be placed "off-limits" or signage cannot be used, the SRA program will serve to educate the training site users about site limitations.

TRI requires the involvement of and coordination between the POTO, Environmental, and Facilities staffs. The ITAM/TRI Committee, formed by the Adjutant General will serve as the mechanism to bring all the key players together. Coordination must take place for management to effectively schedule and properly allocate activities according to the land's ability to support training events with minimum environmental effects.

Goals:

- To ensure the sustainability of training lands for essential support of the military mission and environmental law compliance.
- To provide guidance to users of VTS-C regarding their conduct while on TNARNG property.

Tasks:

1. Determine the training land carrying capacity at the time a training event will occur.
2. Plan and distribute activities such as military training, rehabilitation of training damage, rare species habitat management, and natural resources management to minimize conflicts with each other.
3. Update the VTS-C Standard Operating Procedures (SOP), especially the environmental section.

## 4.4 NATURAL RESOURCES PROJECTS

### 4.4.1 Survey History

Effective management of natural resources is dependent on a solid understanding of current conditions and desired conditions. Current conditions are identified through baseline surveys which are repeated as needed as time, human use, or natural occurrence causes change in those conditions. Table 4.1 shows the planning level and other natural resources surveys which have been completed to date for VTS-C and the anticipated date of the next repetition, if required.

**Table 4.1. Surveys completed at VTS-C.**

Survey	Completed	Contractor	Next
Soil Survey for Catoosa County, GA	1993	Soil Conservation Service	NA
Phase I Natural Resources Survey	Mar 1994	Lockwood Greene Technologies	NA
Delineation of Wetlands	Sep 1998	US Army Engineers Waterways Experiment Station	2008
Natural Resources Aquatic Survey	Sep 1998	Science Applications International Corporation	2008
Phase II Natural Resources Terrestrial Survey	Nov 1998	Science Applications International Corporation	NA
Biological Survey for the Large-flowered Skullcap	Dec 2002	Science Applications International Corporation	Monitored annually
Forest Inventory	Apr 2005	Forest Management Group	2015
Biological Survey for Invasive Plant Species	Jan 2006	Dynamic Solutions LLC	2011
Vegetation Community Survey	May 2007	Dynamic Solutions LLC	2017
Biological Survey for Bats	May 2007	URS Corporation	2013
Avian Survey	Sep 2008	AMEC Earth & Environmental Inc.	2012
Aquatic Fauna Survey	Jan 2010	URS Corporation	2019
Mammal Survey	Feb 2010	AMEC Earth & Environmental Inc.	2020
Herpetofauna Survey	Mar 2010	URS Corporation	2020
Planning Level Wetland Survey	Jan 2012	URS Corporation	2021
Rare Species Survey	In process	URS Corporation	2016
Avian Survey	In process	URS Corporation	2017

### 4.4.2 Implementation of INRMP 2002-2006

One function of this Revised INRMP is to review the prior INRMP for “operation and effect” in accordance with the 2004 DoD Supplemental Guidance. As noted in Section 1.6, the format of the 2002-2006 INRMP was found to be unwieldy and difficult to apply. In addition, the project lists provided in the first INRMP were not complete, relative to the extensive lists of goals and objectives outlined in that document, and the layout made it difficult to identify the objective which a given project supported. In general, the previous INRMP was found to be ineffective in guiding actual land management efforts. It is hoped that many of its weaknesses have been eliminated in this iteration of the plan.

Despite the flaws in the first INRMP, natural resources management has progressed on VTS-C during the time since its implementation: a great deal of basic information has been gathered through planning level surveys, a working relationship has been developed with USFWS and GADNR with regards to two

federal threatened and endangered species, and the groundwork has been laid for a number of management actions which will be carried forward in this new INRMP. As an indicator of the current state of the program, the projects from the original INRMP have been incorporated into Table 4.2 with a description of the status of that project. Some have been fully implemented, and others are in progress. A few were sidelined for budgetary or time reasons. Several ITAM projects are incomplete due to the transfer during this period of monitoring duties from the Environmental Office to the ITAM Office, which lacks the personnel expertise needed to accomplish environmental monitoring. A number of these projects have been carried over with this revised INRMP and will be completed or implemented during the next five years (see Table 4.3).

**Table 4.2: Project Status from 2002-2006 INRMP.**

Area	Project/Management Action	Status
<b>Environmental</b>		
Ecosystem Management	Perform water quality monitoring	Initiated in 2008
	Conduct terrestrial insect and butterfly survey	Scheduled for FY14
	Conduct forest inventory	Completed 2006
	Conduct snail survey	Deemed unnecessary
	Identify known locations and suitable habitat of rare species on GIS maps	Completed 2002
	Post rare animal and plant locations in Range Control	Completed
	Monitor populations of rare fish on CATC <sup>2</sup>	Not conducted
	Create rare species identification fact sheets	In progress
	Develop a Fire Management Plan for CATC	Completed 2009 (WFMP)
	Conduct breeding and migratory bird survey	Completed 2008
	Conduct a nighttime snorkeling biosurvey of Tiger Creek	Not conducted
	Conduct a detailed mussel survey of Tiger Creek	Completed 2008
	Conduct periodic wetland ground-truthing investigations because of changes in hydrology due to beaver activities	Completed 2012
	Conduct an invasive pest plant species inventory and map (GIS) locations throughout the training site	Completed 2006
	Monitor invasive exotic species of plants and animals on CATC, especially tree of heaven, princess tree, common privet, and multiflora rose	Initial survey completed but monitoring not yet developed
Control or eradicate invasive exotic species of plants and animals	Initiated by ENV office in 2002, but sidelined by funding changes	
<b>ITAM</b>		
RTLTA (was LCTA in original INRMP)	Conduct floristic survey	Completed, 2007
	Determine locations for RTLTA special use plots on CATC	Completed by ENV office, 2002
	Establish 10 special use plots	Not completed – removed from ENV duties
	Establish other special use plots as necessary	Not completed – removed from ENV duties
	RTLTA plot monitoring	Initiated by ENV office, 2002, but sidelined by funding changes

<sup>2</sup> CATC is the acronym for Catoosa Area Training Center, an old name for the VTS-C. Integrated Natural Resources Management Plan  
VTS-Catoosa

Area	Project/Management Action	Status
	RTLA analysis	Not completed – removed from ENV duties
	Obtain Global Positioning System (GPS)	Obtained by ENV
TRI	Classify, inventory, and map all roads and trails	Completed
	Determine kind of maintenance roads and trails should receive -- gravel, revegetate, or trim vegetation and perform maintenance	Annual, on-going
	Update CATC SOP -- rewrite environmental section	Completed, 2008
	Meet with the ITAM/TRI committee on a regular basis	Lapsed
	Establish standards for the amount of military training that is environmentally sustainable for CATC training areas	Practiced but not documented
	Allocate units to particular Training Areas in Master Training Schedule	Annual, on-going
	Evaluate condition of training areas following each training activity with unit leader	On-going
LRAM	Inspect completed erosion control projects to ensure success	On-going
	Harden all stream crossings used by vehicles on CATC	Completed
	Obtain equipment needed to perform LRAM projects	On-going
	Implement Best Management Practices for LRAM projects	On-going
	Establish priorities and standards for correcting unacceptable erosion	In progress
	Replace culverts in conjunction with wetland hydrology protection and update GIS layer	Completed
	Inventory Catoosa for sites needing rehabilitation (spring/fall)	Annual, on-going
	Document any new problem areas after major storm and training events and prioritize for funding	On-going
	Stabilize existing roads and tracked vehicle trails	Annual, on-going
	Perform continuous maintenance LRAM projects (erosion control and revegetation)	On-going
	Maintain lane areas	On-going
	Erosion control on trails	On-going
	Maintain turning pads	On-going
	Vegetation clearing	On-going
	Maintain hardened staging areas	On-going
Continue cooperation with NRCS on developing a native reseeding mixture for CATC	Not completed	
SRA (was EO in original INRMP)	Develop troop field card	Not completed
	Conduct environmental briefings for using units	On-going
	Develop or purchase additional Environmental Awareness materials and equipment (laminator, handbook, posters)	Not completed
	Map environmental "points of interest" on Range Control maps and update as necessary	On-going
	Provide updated copies of Range Control maps to units using CATC each year	On-going

Area	Project/Management Action	Status
	Design and publish a website about the natural resources on CATC	Not completed
	Produce troop awareness video for CATC	Not completed

#### 4.4.3 Upcoming Natural Resources Projects for INRMP

Many natural resources and training site improvement projects are planned for the upcoming years. Most are identified either in Chapter Four of this plan or else in the Integrated Training Area Management (ITAM) 5-year plan. Table 4.3 lists all of these projects, listed according to management sphere (training, ecosystem management, endangered species, wetlands, etc.) and objective.

An estimated cost is provided for projects which are expected to involve any expenditure beyond manpower. Most of these projects have been entered into the appropriate budget system; however, implementation is subject to funding availability. The anticipated method of conducting the work is given as either contract (C) or in-house (IH). The “proponent” is identified in accordance with the Sustainable Range/Installation Environmental Activities Matrix as either the Environmental office (ENV), Facilities, or the ITAM program. In certain cases, two entities are identified. For these projects, it is anticipated that funding will be provided by one source, but that the other proponent will provide subject matter expertise. “SITE” represents work to be done by the training site staff itself, rather than funding.



**Table 4.3: VTS-Catoosa Natural Resources Projects.**

Management Area	Targets (Objectives in Green)	Project Origin <sup>1</sup>	Year	Est. Cost & Method <sup>2</sup>	Proponent <sup>3</sup>	Status	Actual Cost <sup>4</sup>	
1. Ecosystem Management	<b>1-1</b>	<b>Manage for mission-suitable habitats or “missionscape”.</b>						
	1a	Missionscape statement development	N	2011	IH	ENV	Complete	
	1b	Missionscape plan development	N	2012	IH	ENV		
	<b>1-2</b>	<b>Identify ecotypes present on the training site and maintain up to date information regarding those systems.</b>						
	1c	Vegetation community planning level survey every 10 years	R	2016	C \$40,000	ENV		
	1d	Wetland survey every 10 years	R	2010	C \$40,000	ENV	Complete	\$42,364 sw
			R	2020	C \$45,000			
	1e	Surface water quality assessment every 5 years	R	2014	C \$20,000	ENV		
	<b>1-3</b>	<b>Characterize the species composition, ecosystem health, and wildlife use of the significant habitats on VTS-C.</b>						
	1f	RTE planning level survey every 5 years.	N	2012	C \$40,000	ENV	In prog	\$89,300
	1g	Bat baseline survey every 5 years.	R	2013	C \$40,000	ENV		
				2018	C \$45,000			
	1h	Avian survey every 5 years.	R	2012	C \$35,000	ENV	In prog	\$69,282 sw
				2017	C \$37,500			
	1i	Insect baseline survey	N	2014	C \$35,000	ENV		
	1j	Aquatic fauna survey every 5 years.	R	2014	C \$25,000	ENV		
	1k	Mammal survey every 10 years	R	2018	C \$25,000	ENV		
	1l	Herpetofauna survey every 10 years	R	2019	C \$35,000	ENV		
	<b>1-4</b>	<b>Develop management strategies to protect ecotypes/habitats of importance</b>						
	1m	Map and priority list of extant ecosystems	N	2013	IH	ENV		
1n	Threat and training use details	N	2013	IH	ENV			
1o	Habitat protection plan development	N	2014	IH	ENV			
<b>1-5</b>	<b>Manage for ecosystem health, wildlife, and improved habitat quality</b>							
1p	Identify locations for native species restoration	N	2012	IH	ENV			
1q	Develop restoration plan	N	2013	IH	ENV			
1r	Implement restoration plan	N	As feasible	IH	ENV			

<sup>1</sup> Whether the project appeared in the earlier INRMP: N = new to this INRMP; C = carried over from previous INRMP; R = repeat of past survey.

<sup>2</sup> Probable method of conducting project: C = contract; IH = in-house. Cost is estimate only and is not guarantee of available funding.

<sup>3</sup> Party responsible for funding and/or conduct of action: ENV = environmental office; FAC = facilities maintenance funds; ITAM = training funds; SITE = training site staff.

<sup>4</sup> “sw” indicates the total price for a project contracted statewide on at least 3 of the training sites.

Management Area	Targets (Objectives in Green)	Project Origin <sup>1</sup>	Year	Est. Cost & Method <sup>2</sup>	Proponent <sup>3</sup>	Status	Actual Cost <sup>4</sup>	
2. RTE Management	<b>2-1</b>	<b>Quantify and monitor groups of large-flowered skullcap on VTS-C.</b>						
	2a	Large-flowered skullcap annual monitoring	N	Annual	C \$20,000	ENV		
	2b	Annual report of skullcap population condition	N	Annual	IH	ENV		
	<b>2-2</b>	<b>Protect the large-flowered skullcap on VTS-C.</b>						
	2c	GPS group boundaries and adjust signs	N	Biannual	IH	ENV		
	2d	Develop posters and training materials	N	2012	IH	ENV		
	<b>2-3</b>	<b>Investigate management alternatives and impacts.</b>						
	2e	Transplantation study results/report	N	2012	C \$35,000	ENV	Complete	\$25,090
	2f	Prescribed burning study results/report	N	2012	C \$35,000	ENV	Complete	\$25,090
	2g	Herbivory study results/report	N	2014	C \$60,000	ENV	In prog	\$63,455
	2h	IPP control study results/report	N	2015	IH \$10,000	ENV		
	<b>2-4</b>	<b>Characterize and protect gray bat population on VTS-C.</b>						
	<b>2-5</b>	<b>Quantify and monitor populations of state and federal RTE species on VTS-C.</b>						
	<b>2-6</b>	<b>Identify and manage native communities currently supporting or potentially supporting RTE species.</b>						
	<b>2-7</b>	<b>Manage American chestnut orchard.</b>						
	2i	Annual coordination with TACF	N	Annual	IH	ENV		
	2j	Annual orchard maintenance	N	Annual	IH \$4,000	ENV		
2k	Annual seedling inventory	N	Annual	IH	ENV			
2l	Blight testing coordination	N	2014	IH	ENV			
3. Reclamation / Mitigation	<b>No projects at this time.</b>							
4. Erosion control	<b>4-1</b>	<b>Identify &amp; rehabilitate degrading training lands.</b>						
	4a	Develop erosion reporting form	N	2011	IH	ENV	Complete	
	4b	Install reporting form on ENV webpage	N	2011	IH	ENV	Complete	
	4c	Annual erosion surveys	N	Annual	IH	ENV/SITE		
	4d	Erosion report tracking system	N	2012	IH	ENV		
	4e	Develop erosion repair guide	N	2012	IH \$2,000	ENV		
	4f	BMP training module	N	2013	IH \$1,000	ENV		
	<b>4-2</b>	<b>Restore section of Tiger Creek streambank that are badly eroded</b>						
	4g	Develop restoration plan	N	2012	IH \$15,000	ENV	In prog	
	4h	Conduct mechanical and physical repair work	N	2013	IH/C \$20,000	ENV		
4i	Revegetate streambanks	N	2013/14	IH/C \$20,000	ENV			
5. Watershed Management	<b>5-1</b>	<b>Improve knowledge of riparian areas &amp; conditions.</b>						
	5a	Implement water quality monitoring	C	2013 Annual	IH \$2,000 per year	ENV		

Management Area	Targets (Objectives in Green)		Project Origin <sup>1</sup>	Year	Est. Cost & Method <sup>2</sup>	Proponent <sup>3</sup>	Status	Actual Cost <sup>4</sup>
	<b>5-2</b>	<b>Improve buffering quality of the riparian areas</b>						
	5b	Riparian habitat assessments	N	2013	IH \$5,000	ENV		
	<b>5-3</b>	<b>Protect shoreline of Tiger Creek and all riparian areas from potential causes of erosion.</b>						
	5c	Post SMZs and maintain biennially	N	2011	IH \$5,000	ENV	In prog	
	5d	SMZ training module	N	2013	IH \$1,000	ENV		
6. Wetlands Protection	<b>5-4</b>	<b>Improve water quality for trout habitat</b>						
	<b>6-1</b>	<b>Increase knowledge of wetlands and conditions.</b>						
	6a	Wetland floristic study	C	2013	C \$25,000	ENV		
	6b	Wetland fauna study	C	2013	C \$25,000	ENV		
	<b>6-2</b>	<b>Implement and enforce buffer areas around wetlands.</b>						
	6c	Post signs identifying 50' buffer zones	N	2012	IH \$3,000	ENV		
7. Forest Management	6d	Buffer zone vegetative assessment	N	2013	IH	ENV		
	6e	Wetland buffer training module	C	2013	IH \$1,000	ENV		
	<b>7-1</b>	<b>Maintain needed forest information.</b>						
	7a	Repeat forest inventory every 10 years.	R	2015	C \$20,000	ENV		
	<b>7-2</b>	<b>Improve training areas via forest management.</b>						
	7b	Consult with training site staff	C	Annual	IH	ENV		
8. Fire Management	<b>7-3</b>	<b>Improve forest health and habitat quality.</b>						
	7c	Review data and update forest management plan	C	Annual	IH	ENV		
	7d	Annual timber ROA and RPTS system info	C	Annual	IH	ENV		
	<b>8-1</b>	<b>Ensure effective fire break system.</b>						
9. Fish & Wildlife Management	8a	ID additional fire break locations needed	C	2012	IH	ENV, FAC		
	<b>8-2</b>	<b>Implement prescribed fire program.</b>						
	8b	Annual refresher training	C	Annual	C \$1,000 per year	ENV, FAC		
9. Fish & Wildlife Management	8c	Annual WFMP review/update	C	Annual	IH	ENV		
	<b>9-1</b>	<b>Gain updated and complete data on wildlife use of VTS-C.</b>						
	<b>9-2</b>	<b>Manage habitats for all native species.</b>						
	9a	Install nest boxes and maintain annually	R	2012	IH \$1,000	ENV		
	9b	Wildlife training module	C	2013	IH \$1,000	ENV		
	<b>9-3</b>	<b>Determine the necessity/feasibility of a hunting program for VTS-C.</b>						
	9c	Discussion with training site over potential	N	2013	IH	ENV		
10. Pest Management	9d	Consult with GADNR on need in region	N	2013	IH	ENV		
	9e	Game species population counts	N	2014	C \$30,000	ENV		
	<b>10-1</b>	<b>Control IPP for ecosystem health.</b>						
	10a	Invasive pest plant survey every 5 years	R	2012	C \$35,000	ENV		

Management Area	Targets (Objectives in Green)		Project Origin <sup>1</sup>	Year	Est. Cost & Method <sup>2</sup>	Proponent <sup>3</sup>	Status	Actual Cost <sup>4</sup>
	10b	Annual implementation of IPP control plan	C	Annual	IH/C \$10,000	ENV		
	<b>10-2</b>	<b>Control pest species for training area improvement.</b>						
	10c	Develop training specific IPP control plan	N	2014	IH	ENV		
	<b>10-3</b>	<b>Control pests for TNARNG safety and comfort.</b>						
	10d	Install and maintain bat boxes and bird nest boxes	C	Annual	IH \$1,000	ENV		
	10e	Annual fire ant survey	N	Annual	IH	ENV		
	<b>10-4</b>	<b>Control pest animals for the protection of natural communities and RTE species and to minimize loss of training land.</b>						
		Implement controlled hunting of feral pigs		As need		FAC		
	Implement beaver trapping and dam removal		As need		FAC			
11. Long-term Monitoring	<b>11-1</b>	<b>Develop and implement a vegetation monitoring program.</b>						
	11a	Develop monitoring protocol	C	2013	C \$10,000	ENV		
	11b	Establish vegetation monitoring plots	C	2015	IH	ENV		
12. Grounds Maintenance	<b>12-1</b>	<b>Utilize regionally native species for all planting.</b>						
	12a	Develop native planting guide	N	2011	IH \$500	ENV	Complete	
	<b>12-2</b>	<b>Blur the “edge” between maintained and natural areas.</b>						
	12b	Develop edge conversion plan	N	2014	IH \$500	ENV		
	<b>12-3</b>	<b>Adjust maintenance schedule to benefit environment.</b>						
	12c	Create list of values impacted by ground maintenance.	N	2014	IH	ENV		
12d	Modify maintenance calendar in INRMP	N	2014	IH	ENV			
13. Recreational Use Management	<b>No projects at this time.</b>							
14. Cultural Resources	<b>Projects are defined in the TNARNG ICRMP.</b>							
15. GIS	<b>15-1</b>	<b>Maintain constantly improving GIS.</b>						
	15a	Review contract wording	C	Annual	IH	ENV		

## **CHAPTER 5**

### **RESOURCE PROTECTION GUIDELINES**

#### **5.1 LAND MANAGEMENT GUIDELINES**

The projects identified in the previous chapter are intended to improve the management and conservation of the natural resources on VTS-C. In addition to large-scale projects, however, appropriate care is necessary in the day-to-day operations and activities of the training site to ensure excessive damage is not inflicted through misuse or carelessness. The following sections provide guidance for the major activity categories occurring on VTS-C to ensure that TNARNG abides by all relevant laws and regulations, the intent of this INRMP, and good stewardship in its use and management of the training site's resources.

##### **5.1.1 Training Operations**

VTS-C exists for the purpose of training National Guardsmen, and that training does have environmental impacts. The following guidelines should be incorporated into all training activities:

###### **Roads and Vehicles**

- Only existing roads and trails will be utilized. No new entrances will be made into any training area or range without the approval of VTS-C Range Control.
- Track vehicles are restricted to trails and hardened crossings when authorized to move between training areas.
- Vehicular use of hardwood stands is limited to roads as much as possible, except for special training areas. Bivouac sites and other training areas should be rotated to minimize impact on the soils and vegetation.
- Vehicles brought to VTS-C from off-site should be thoroughly washed upon arrival at the Cantonment of VTS-C before entering the training areas to minimize the spread of invasive species.

###### **Plants and Animals**

- Personnel will comply with State Game and Fish Laws.
- Interaction with wildlife should be avoided due to health and safety concerns.
- Do not disturb food plots, experimental exclosures, or other wildlife management equipment or facilities.
- Avoid areas identified as containing large-flowered skullcap. All large-flowered skullcap occurrences on VTS-C will be posted with signs in accordance with AR 200-3 (see Figure 3.9 for sign).
  - There will be no off-road vehicular traffic through large-flowered skullcap posted areas.
  - There will be no soil-disturbing activities within posted areas without prior approval of the TNARNG Environmental Office.
- Trees will not be cut without prior approval of the Environmental Office and the VTS Commander. Brush and small vegetation may be used for camouflage and training barricades. Upon completion of the exercise, camouflage and trail barricades will be properly policed.

### Streams and Wetlands

- Streamside Management Zones (SMZs) shall be identified around all water bodies. Perennial streams will have an SMZ extending 50 feet to either side of the stream for a total width of 100 feet, in accordance with Georgia trout stream guidelines. There shall be an SMZ 50 feet wide surrounding all wetland areas.
- Avoid operating vehicles in SMZs.
- Road crossings of riparian zones and streams will only be conducted at designated points.
- Spills will be immediately contained and reported according to the VTS-C Spill Prevention Control and Countermeasures (SPCC) Plan.
- Foot traffic is allowed in wetlands.
- Vehicular traffic is not allowed in wetlands except on established roads.
- There will be no dredging, filling, or dumping of material within wetland areas. Any exceptions have to be approved by the Environmental Office and required state and/or federal permits obtained before the activity takes place.

### Wildfire Management

- Open burning is not allowed without a permit.
- Avoid spark-producing activities in dry weather.
- The use of tracer rounds will be suspended during periods of very high fire danger. The National Fire Rating System can be accessed at <http://www.wfas.us/> under “Fire Danger Rating.”
- Accidental fires in training areas will be combated by the unit occupying the area, or the nearest unit to an unassigned area, immediately upon discovery.
- The discoverer of a fire will immediately notify VTS-C Range Control and his own immediate superior officer. The next higher headquarters will also be advised, and Range Control will immediately notify the Environmental Office.
- Each succeeding commander in the chain of command will take action as appropriate to provide forces to extinguish or control fires pending arrival of fire fighting specialists.
- Georgia has a general prohibition against open burning during the months of May, June, July, August, and September – “smog season.” In Catoosa County, the only legal exceptions to this prohibition are agricultural burns, forestry prescribed burning (requiring permitting from the Georgia Forestry Commission), recreational and cooking fires, authorized training of fire-fighters, operation of open flame equipment, and disposal of packaging materials which previously contained explosives (Georgia Rules for Air Quality Control, Chapter 391-3-1-.02(5), Open Burning).

### 5.1.2 LRAM and Construction

Activities which disturb the vegetation and soil can be particularly damaging to the environment if improper methods lead to erosion and sedimentation problems. Even actions intended to improve conditions, such as LRAM projects, can cause damage if not handled appropriately. LRAM and Construction are the two areas which routinely involve earth moving activities and should both be subject to the following guidelines:

- Follow the Erosion Control Best Management Practices listed in Table 5.1.
  - Additional information on erosion control procedures is available in the Manual for Erosion and Sediment Control in Georgia, Fifth Edition (Georgia Soil and Water Conservation Commission 2000) available at [http://www.gaepd.org/Documents/esc\\_manual.html](http://www.gaepd.org/Documents/esc_manual.html)

- Schedule and perform land rehabilitation projects as soon as possible following disturbance, allowing sufficient time for soils to recover. Seed during optimum seeding periods for individual species. Seeding made in fall for winter cover should be mulched.
- Use temporary erosion control methods (such as cover crops) during rainy periods to protect the soil.
- Include all necessary rehabilitation work, best management practices, and associated costs in project proposals and construction contracts and specifications.
- Only native plant species will be used for landscaping and reclamation work.
  - When planting native grasses, include non-persistent grasses that act as a cover crop for the first two or three years to minimize erosion before native species become established, for example: red top, timothy, winter wheat, and grain sorghum.
- Areas that fail to establish vegetative cover will be reseeded as soon as such areas are identified and weather permits.
- Present all construction project plans to the Environmental Office for review as far in advance as possible: special permits are required when disturbing federal jurisdictional wetlands or perennial or intermittent streams and will take time to obtain.

**Table 5.1: Erosion Control Best Management Practices (BMPs) for LRAM and Construction Projects.** From the TDEC Erosion and Sediment Control Handbook (Price and Karesh 2002)

### 1. Construction Management Measures

- a. Clearing and grubbing must be held to the minimum necessary for grading and equipment operation.
- b. Construction must be sequenced to minimize exposure time of cleared surface area. Grading activities must be avoided during periods of highly erosive rainfall.
- c. Construction must be staged or phased for larger projects. Areas of one phase must be stabilized before another phase can be initiated. Stabilization shall be accomplished by temporarily or permanently protecting the disturbed soil surface from rainfall impacts and runoff.
- d. Erosion and sediment control measures must be in place and functional before earth moving operations begin and must be properly constructed and maintained throughout the construction period.
- e. Regular maintenance is vital to the success of erosion and sediment control systems. All control measures shall be checked twice per week, 72 hours apart, before anticipated storm events, and after each rainfall. During prolonged rainfall, daily checking is necessary.
- f. Construction debris must be kept from entering any stream channel.
- g. Stockpiled soil shall be located far enough from streams or drainageways so that runoff cannot carry sediment downstream.
- h. A specific individual shall be designated to be responsible for erosion and sediment controls on each project site.
- i. If the area to be disturbed is 1 acre or greater, a Georgia General Storm Water Permit is required and a site-specific Erosion, Sedimentation, and Pollution Control Plan must be developed. The Notice of Intent and fees must be submitted to the State at least 14 days prior to any disturbance of the site.

### 2. Vegetative Controls

- a. A buffer strip of vegetation at least as wide as the stream shall be left along any stream bank. For VTS-C streams, the buffer zone will be at least 50 feet back from the water's edge on both sides.

- b. Vegetation ground cover shall not be destroyed, removed, or disturbed more than 15 calendar days prior to grading.
- c. Temporary soil stabilization with appropriate annual vegetation (e.g., annual ryegrass) shall be applied on areas that will remain unfinished for more than 30 calendar days.
- d. Permanent soil stabilization with perennial vegetation shall be applied as soon as practicable after final grading.

### 3. Structural Controls

- a. Staked and entrenched straw bales and/or silt fence must be installed along the base of all fills and cuts, on the downhill sides of stockpiled soil, and along stream banks in cleared areas to prevent transport of sediment into streams. Straw bales and/or silt fence may be removed at the beginning of the work day but must be replaced at the end of each work day.
  - b. All surface water flowing toward the construction area shall be diverted around the construction area to reduce erosion potential, using dikes, berms, channels, or sediment traps, as necessary. Temporary diversion channels must be lined to the expected high water level and protected by non-erodible material to minimize erosion. Clean rock, log, sandbag, or straw bale check dams shall be properly constructed to slow runoff and trap sediment.
  - c. Sediment basins and traps shall be properly designed according to the size of the disturbed or drainage areas. Water must be held in sediment basins until at least as clear as upstream water before it is discharged to surface waters. Water must be discharged through a pipe or lined channel so that the discharge does not cause erosion and sedimentation.
  - d. Streams shall not be used as transportation routes for equipment. Crossings must be limited to one point. A stabilized pad of clean and properly sized shot rock must be used at the crossing point.
  - e. All rocks shall be clean, hard rocks containing no sand, dust, or organic materials.
- 

### 5.1.3 Facilities Management

Maintenance of an attractive, tidy facility is important; however, even activities in a heavily modified cantonment area can impact the environment. Mowing, landscaping, and pesticide use in the managed landscape should be undertaken with consideration for this impact. The presence of the protected large-flowered skullcap, in particular, must be taken into account when performing basic maintenance projects:

#### Skullcap Protection

- Check with the Environmental Office prior to soil disturbance or vegetation removal activities to ensure there is no large-flowered skullcap conflict.
- Do not apply herbicides to large-flowered skullcap areas.
  - No herbicides will be applied within the boundaries of a large-flowered skullcap occurrence. The only exception is herbicide applied for the purpose of *S. montana* protection according to the Rare Species Management Plan and cleared by the Environmental Office .
  - Use of herbicides within 50 ft. of the boundary of a large-flowered skullcap occurrence will be limited to those products which do not translocate through the soil and to those application methods which minimize the risk of accidental drift to other plants.
- Report any damage or threat to a large-flowered skullcap plant or occurrence to the Environmental Office as soon as it is noted.



### General Facilities Maintenance Guidelines

- Only native species will be used for landscaping and replanting purposes without clearance from the Environmental Office. Native plants are better adapted to local conditions and generally require less fertilizer and herbicide/pesticide input. Use of natives also limits the spread of invasive, exotic species.
- Consider seasonal variables (e.g., timing and quantity of average rainfall, appropriate planting season) in planning and scheduling projects.
- Consider erosion factors when choosing sites for training, construction, or management activities.
- Always include appropriate surface restoration, fertilization, and seeding (or other revegetation practice) as the final stage of any project which disturbs the soil or vegetation.
- Apply Best Management Practices (BMPs) (see Tables 5.1 and 5.2) to all TNARNG projects.
- Use biological pest control methods wherever feasible and economical. Only apply pesticides when effective biological or mechanical control methods cannot be found or are prohibitively expensive. See TNARNG Integrated Pest Management Plan for more information.
- Pesticides and herbicides can only be applied by certified applicators and must be reported to the Pest Management Coordinator (see section 5.1.8 for more information).
- Herbicides will be utilized to control weedy vegetation in the most time- and cost-effective manner. The herbicide spray plan presented in Annex 5 will be updated yearly to meet training site needs.

#### 5.1.4 Road Construction and Maintenance

Roads can be a significant source of sediment, as well as an on-going drain on funds, if poorly designed. This is particularly true at VTS-C where slopes over 25% are common. Proper placement, design, and construction can alleviate many of the problems associated with unpaved roads, even when utilized by heavy wheeled and track vehicles. The State Forestry Best Management Practices (Table 5.2) deal largely with road construction and should be applied to all road building activities on VTS-C.

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**Table 5.2: Forestry Best Management Practices (also apply to Construction and Rehabilitation of Tank Trails).** From Georgia's Best Management Practices for Forestry manual (Georgia Forestry Commission 1999).

1. **Access Road Location.** Access roads shall be designed and located to prevent sediment from entering the waters of the State. Methods to prevent sedimentation to streams include, but are not limited to, the following:
  - a. Minimize the amount of road to be constructed by using existing roads where practical.
  - b. Roads should follow the contour of the land as much as possible with grades ideally kept below 10%.
  - c. Locate roads as far from streams and lakes as possible and practical.
  - d. Roads should be placed on high ground where possible for proper surface drainage.
  - e. Roads should be located on the southern or western aspect of ridges for maximum exposure to sunlight.
  - f. Locate roads outside of streamside management zones (SMZs – see Section 5.1.5) except for planned stream crossings.

- 2. Access Road Construction.** Access roads shall be constructed to prevent sediment from entering the waters of the State. Methods to prevent sedimentation include, but are not limited to:
  - a. To the extent possible, construct and revegetate new roads several weeks or longer in advance of logging/use.
  - b. Schedule construction for favorable (dry) weather.
  - c. Avoid excessive soil disturbance during road construction.
  - d. On permanent access roads with 3% or more grade, broad-based dips should be installed at proper intervals (30° angle across road surfaces), have reverse grades of 3%, and the bottom of the dips should be outsloped about 3%. If necessary, outfall of dips may need sediment barriers such as rock, hay bales or silt fence installed (see Georgia's Best Management Practices for Forestry manual for further information on design of broad-based dips).
  - e. On crown and ditched roads, install water turnouts at proper intervals. Turnouts should never tie directly into streams or water bodies. If necessary, outfall of turnouts may need sediment barriers such as rock, hay bales, or silt fence installed.
  - f. Avoid insloping of roads. Where unavoidable, use cross-drain culverts positioned under the road at a 30° angle and appropriate spacing. Place rip-rap at culvert outfall to prevent washing.
  - g. Keep roads free from obstructions and logging debris.
  - h. Roadbeds on erosive soils should be stabilized with appropriate measures.
  - i. Stabilize exposed soil on shoulders of access roads with any one or combination of the following: seed and mulch, silt fence, hay bales, excelsior blankets, or geotextiles.
  - j. Avoid using ditches on steep roads.
- 3. Stream Crossings**
  - a. Avoid or minimize stream crossings. If crossings are necessary, roads should cross streams as close to right angles as possible.
  - b. Avoid crossings at bends in the stream.
  - c. The road fill shall be bridged, culverted, or otherwise designed to prevent the restriction of expected flood flows.
  - d. The fill shall be properly stabilized and maintained during and following construction to prevent erosion.
  - e. Vegetative disturbances shall be kept to a minimum.
  - f. The design, construction, and maintenance of the road crossing shall not disrupt the migration or other movement of those species of aquatic life inhabiting the water body.
  - g. Borrow material shall be taken from upland sources wherever feasible.
  - h. Approaches to all permanent or temporary stream crossings should be made at gentle grades of slope (3% or less) wherever possible.
  - i. Approaches should have water control structures, such as water turnouts or broad-based dips, on both sides of a crossing to prevent road runoff from entering the stream.
  - j. Stabilize approaches, if necessary, with rock extending at least 50 feet from both sides of the stream bank during the operation.
  - k. For temporary access roads, temporary bridges or spans are favored over culverts or fords.
  - l. Build wetlands fill roads outside the SMZ, except when crossing the channel. Cross-drainage structures (culverts, bridges, portable spans, etc.) may be necessary to allow for surface water movement across the site.
  - m. Stabilize exposed soil around permanent or temporary stream and wetland crossing with any one or a combination of the following: seed and mulch, hay bales, rock, silt fence, geotextiles, and/or excelsior blankets.
  - n. Avoid using asphalt materials for low water crossings.
  - o. Avoid anything that impedes the free or expected flow of water.
  - p. When bridges are used:
    1. With watersheds of 300 acres or more, use bridges to cross streams if other alternatives are not suitable for containing storm flows.

2. Remove temporary bridges and stabilize approaches and stream banks when operations are completed.
- q. When fords are used:
  1. Locate fords where stream banks are low and the bottoms are relatively hard and level.
  2. Where necessary, establish a smooth, hard-surface low water crossing. For a permanent ford use gravel or rock-filled Geoweb or concrete pads. For temporary fords, use dragline mats or logs to armor the stream bottom.
  3. Material should not significantly impound stream flow, impede fish passage, or cause erosive currents. Remove temporary crossings from the channel when operations are completed.
- r. When culverts are used:
  1. Size permanent culverts so that the cross-sectional area will accommodate expected 25-year, 24-hour storm flows.
  2. Size temporary culverts so that the cross sectional area will accommodate the 2-year, 24-hour storm flows.
  3. Under normal conditions, two alternative methods of culverting are acceptable:
    - a. Smaller multiple culverts can be substituted to provide for the same cross-sectional area of pipe.
    - b. A combination of a smaller culvert(s) with rock surfaced road dips constructed in the roadbed to handle the runaround flow from larger storm events.
  4. Culverts less than 15 inches in diameter are not recommended.
  5. Multiple culverts should be spaced at a distance of at least one-half the culvert's diameter.
  6. Place the culvert in a straight section of the stream and free of obstructions.
  7. Place the bottom of the culvert at the same elevation as the bottom of the stream.
  8. Stabilize fill at ends of a culvert with either rip-rap, Geoweb, excelsior blankets, gabions, headwalls, grass seed and mulch, hay bales, etc.

#### **4. Road Maintenance and Retirement.**

- a. Maintain existing roads in accordance with BMPs.
- b. Avoid excessive traffic on wet roads.
- c. Minimize road grading and reshaping on hilly or mountainous terrain unless required to repair damaged road sections.
- d. Keep outfall of broad-based dips, water bars, and water turnouts open at all times. If necessary, install sediment barriers such as rock, hay bales, or silt fence just below outfall.
- e. Retire temporary roads by reshaping and/or constructing water bars at recommended intervals. Stabilize as necessary by seeding and mulching or scattering logging debris over the road surface.
- f. Periodically inspect retired roads to assure stabilization techniques are still effective and permanent stream crossings are clear and operating properly.

#### **5.1.5 Water Resources**

The water resources on VTS-C include several different ecotypes: trout streams, intermittent streams, the riparian areas surrounding the streams, and wetlands. While the characteristics of these sites can vary widely, they share the key factor of water and a significant role in the water cycle as well as being important habitats for many creatures. Protection of water resources is of the utmost importance, and they are habitats that can be easily damaged by accident or careless action. One of the simplest BMPs for protection of water resources is the establishment and use of Streamside Management Zones (SMZs).

Streamside management zones are buffer strips adjacent to perennial or intermittent streams or other bodies of water within which activities are limited in order to protect water quality. They shall be designated and managed to buffer water temperatures, prevent sediment and other pollutants from entering waters of the State, and provide travel corridors and habitat for wildlife. SMZs should be established along any stream (perennial or intermittent) or water body where the potential exists for the movement of sediment or pollutants into the stream or water body. Georgia does not provide a set minimum width for an SMZ. The width of the SMZ should be based upon slope and susceptibility of the soil to erosion.

For VTS-C, a minimum buffer of 25 feet will be established for intermittent streams. This applies to both sides of the stream (total minimum width of 50 feet). All perennial streams on VTS-C – Tiger Creek, Broom Branch, Catoosa Springs Branch, and their primary tributaries – are classified as trout streams by the state of Georgia. Minimum SMZ width for a trout stream is 50 ft on each side. There will be no harvesting of any timber within the first 25 ft closest to the stream, and the remainder of the SMZ will have no more than 50% of the canopy cover removed. In association with wetlands, establish SMZs at least 50 feet in width surrounding the wetland area. BMPs for actions within streamside management zones are given in Table 5.3.

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**Table 5.3: Perennial and Intermittent Stream SMZs.** From Georgia’s Best Management Practices for Forestry manual (Georgia Forestry Commission 1999).

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|---|
| <ol style="list-style-type: none"> <li>1. Avoid operating any vehicles or other equipment within an SMZ.</li> <li>2. Minimize stream crossings.</li> <li>3. Except at planned stream crossings, locate new access roads outside the SMZ.</li> <li>4. Maintain existing roads within SMZs with adequate water control structures and stabilization measures as needed.</li> <li>5. Firebreaks should be installed parallel to streams and outside SMZs.</li> <li>6. Minimize prescribed fire intensity within SMZs to maintain forest floor cover and protect the soil surface.</li> <li>7. Periodically inspect the SMZ, evaluate the effectiveness of the BMPs, and adjust practices when necessary.</li> <li>8. There will be no vegetation harvest in the first 25 feet of the SMZ.</li> <li>9. Leave an average of 50 sq ft of basal area per acre evenly distributed throughout the SMZ or at least 50% canopy cover after a harvest to provide shade to the stream.</li> <li>10. Do not cut stream bank trees.</li> <li>11. Do not fell trees into the streambed or leave logging debris in the stream.</li> <li>12. Do not locate servicing or refueling equipment within an SMZ.</li> <li>13. Do not handle, mix, or store toxic or hazardous materials within an SMZ.</li> </ol> |
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In addition to the official BMPs for Streamside Management Zones, other actions and/or limitations specific to TNARNG activities are essential to maintain high water quality and habitat quality:

#### Streams and Riparian areas

- Training is allowed in riparian areas in accordance with guidelines for forestlands. Use extra caution to avoid causing sedimentation or other contamination of the associated waterway.

- There shall be no digging for training purposes, forest management, or construction activities within an SMZ without prior review and permission from the Environmental Office. Certain activities may require a state or federal permit prior to initiation of activity.
- Spills will be immediately contained and reported according to the VTS-C Spill Prevention Control and Countermeasures (SPCC) Plan.
- Dumping of any substance on the training site is not allowed.
- Monitor for erosion problems along stream banks. Report any erosion, exposed soil, or stream bank collapse to the Environmental Office as soon as possible.
- Utilize native species for plantings to stabilize banks. Vegetative structures are preferable to riprap or concrete structures in most circumstances.
- Use Erosion Control BMPs during all LRAM projects, road construction and relocation, and maintenance (see Table 5.1).
- Any activity that will impact a stream or wetland must be presented to the Environmental Office well in advance of the planned action date: special permits are required when disturbing federal jurisdictional wetlands or perennial or intermittent streams, and these permits take time to obtain.

#### Wetlands

- Foot traffic is allowed in wetlands.
- Vehicular traffic is not allowed in wetlands except on established roads.
- Any non-foot traffic, training, or land management activity to be conducted within a wetland should be coordinated with the Environmental Office.
- There will be no dredging, filling, or dumping of any material within wetland areas. Any exceptions will have to be approved by the Environmental Office and required state and/or federal permits obtained.
- Only herbicides and pesticides labeled for wetland/surface water use will be applied within wetland boundaries (e.g., Rodeo, Aquamaster, Habitat, Accord). Within 50 feet of any wetland boundary, foliar application of herbicides will be limited to those products labeled for application to water because of the risk of drift. All other herbicide applications made within the SMZ area will be made via stem treatments (cut stump, basal bark, or stem injection).
- Any ground disturbing activities near wetland areas that might alter the hydrology of the system must be reviewed by the Environmental Office Conservation Branch before any work takes place.
- Implement Erosion and Sediment Controls in construction areas and maneuver areas, streambank stabilization methods, and forestry BMPs to minimize delivery of sediment and chemical pollutants to wetland areas.
- Present all construction plans to the Environmental Office for review as far in advance as possible: special permits are required when disturbing federal jurisdictional wetlands or perennial or intermittent streams and will take time to obtain.

#### 5.1.6 Forestland Use

TNARNG manages forest stands for multiple uses: training, habitat, large-flowered skullcap protection, and timber. To maintain the health and integrity of the forest ecosystem certain key factors should be observed:

- Only existing roads and trails will be utilized. No new entrances will be made into any training area or range without the approval of VTS Range Control.

- Vehicular use of hardwood stands is limited to roads as much as possible, except for special training areas (e.g., bivouac sites, designated training points).
- Bivouac sites and other forested training areas should be rotated to minimize impact on the soils and vegetation. Site condition should be monitored semi-annually utilizing the existing long-term vegetation monitoring protocol or the RTLA methodology.
- Clearing or thinning of forest stands to improve or expand training areas will be coordinated through the TNARNG Environmental Office.
- Trees will not be cut without prior approval of the Environmental Office and the VTS Commander. Brush and small vegetation may be used for camouflage and training barricades. Upon completion of exercise, camouflage, and trail barricades will be property policed.
- Open burning is not allowed without a permit.
- Accidental fires in training areas will be combated by the unit occupying the area, or the nearest unit to an unassigned area immediately upon discovery. Contact Range Control immediately. See 5.1.1 Training Operations Guidelines for further wildfire information.
- Interaction with wildlife should be avoided due to health and safety concerns.
- Personnel using the area will comply with State Game and Fish Laws.
- Avoid areas identified as containing large-flowered skullcap. All large-flowered skullcap occurrences on VTS-C will be posted with signs in accordance with AR 200-3 (see Figure 3.10 for sign).
  - There will be no off-road vehicular traffic through large-flowered skullcap posted areas.
  - There will be no soil-disturbing activities within posted areas without prior approval of the TNARNG Environmental Office.

### 5.1.7 Grassland Use

The grasslands on VTS-C are principally managed, man-made grasslands (ranges); however, they can provide valuable habitat in addition to training opportunities. In order to improve the ecosystem value of the grassland area the following guidance should be applied to training and management activities:

- Avoid use of non-native species for reseeding grassland areas. Utilize a native mix appropriate to the site and intended use. In particular, discontinue the use of KY 31 tall fescue (*Schedonorus phoenix*) and the non-native lespedezas – Chinese or sericea lespedeza (*Lespedeza cuneata*), shrubby lespedeza (*L. bicolor*), and Korean or kobe lespedeza (*Kummerowia stipulacea*).
- Prescribed fire is a useful tool for maintaining grassland ecosystems. TNARNG will develop and implement a burning regime for management and hazard reduction purposes.
- Existing roads and trails will be utilized whenever possible. No new entrances will be made into any training area or range without the approval of VTS Range Control.
- Avoid mowing open grasslands from April to September for the protection of nesting birds. Areas in which taller growth will not impeded training should be mowed in late March and then allowed to grow until November. Where grasslands must be maintained low cut, maintain 25-50 foot buffer strips along the forest edges which will only be mown every 3-5 years.
- Protect large, non-fragmented tracts of quality habitat which are required as territory for survival and maintenance of neotropical migratory bird and large mammal populations.

### 5.1.8 Pest Management

Pest management is an important part of maintaining facilities and protecting the health and safety of personnel, as well as the integrity of natural ecosystems. TNARNG pest management activities are regulated by federal and state law and by DoD regulation. These restrictions and the management goals and guidelines for pest control on TNARNG facilities are presented in the Integrated Pest Management Plan.

- All applications of herbicide or pesticide on VTS-C must be by a State- or DOD-certified applicator.
- All applications of herbicide or pesticide must be reported to the TNARNG Pest Management Coordinator (see Appendix H for reporting forms and contact information).
- Use non-chemical control methods wherever feasible and economical. Only apply pesticides when effective biological or mechanical control methods cannot be found or are prohibitively expensive.
- Pesticides and herbicides should be applied at the time when they will be most effective against the pest in order to achieve maximum control for minimum application. See TNARNG Integrated Pest Management Plan for more information.
- There will be no herbicide application around *Scutellaria montana* except in accordance with the Rare Species Management Plan.
- Follow the Forest Service's Nonnative Invasive Plants of Southern Forests (USDA 2003) guidelines in controlling invasive plant species.
- Only native species will be used in landscaping and in reclamation work.

Contractors who apply pesticides on VTS-C must:

- Show proof of liability insurance.
- Have State commercial certification and licensing in the category or categories of work to be performed.
- Use only EPA registered pesticides or herbicides that are on the "Approved Pesticide List" for use on TNARNG sites (see Appendix H).
- Furnish TNARNG personnel with legible copies of specimen labels and the Material Safety Data Sheets of all pesticides proposed for use.
- Furnish TNARNG personnel with the information required for pest management record keeping (see Appendix H for reporting format).
- Pesticides must be mixed, stored, and disposed of in accordance with Federal, State, and local regulations and with procedures established by the TNARNG.

### 5.1.9 Cultural Resources Management

The TNARNG Cultural Resources Management Policy is defined in the Integrated Cultural Resources Management Plan (ICRMP) for VTS-C, Georgia. The following are key points in protection of cultural resources:

- The TNARNG will consult the Georgia Heritage Resources Survey so that known historic, archaeological, and paleontological sites may be avoided.
- Cemeteries will be protected and maintained through fencing.
- For ground disturbing undertakings (ICRMP SOP #5)
  - Prior to any ground disturbance, contact the Cultural Resources office (see "Contacts" at front of this plan) to verify that the site is clear of known cultural resources.

- The avoidance or mitigation of adverse impacts to NRHP eligible sites shall be proactively incorporated into the design and planning process rather than deferred until archaeological deposits may be discovered during actual construction.
- All machine aided excavations or other earth moving projects shall be designed to avoid damage to archaeological sites or other historic properties that may be eligible for inclusion to the NRHP.
- Until such time as the GA-SHPO has determined an archaeological site to be not eligible or has concurred with a recommendation that an archaeological site is not eligible, any newly discovered sites will be treated as potentially eligible and will be avoided whenever possible.
- In the event of Emergency Discovery of Archaeological Deposits (ICRMP SOP #6)
  - Contact the Cultural Resources Office immediately. Stop all work at the site.
  - Archaeological deposits which are newly discovered in the construction of any undertaking shall be evaluated for their NRHP eligibility.
  - Until such time a the GA-SHPO has determined an archaeological site to be not eligible or has concurred with a recommendation that an archaeological site is not eligible, any newly discovered sites will be treated as potentially eligible and will be avoided whenever possible.
  - Nothing in Section 106 or other federal regulations requires TNARNG to stop work on an undertaking. However, if the SHPO indicates that the property is significant, then TNARNG shall make reasonable efforts to minimize harm to the property.
- Treatment of Human Remains and Funerary/Sacred Objects (ICRMP SOP #8)
  - No Native American human remains, funerary objects, or sacred objects from VTS-C will be knowingly kept in government possession without initiating consultation.
  - Consultation regarding the disposition of Native American human remains, funerary objects, or sacred objects shall be initiated as soon as feasible.

## 5.2 MANAGEMENT SCHEDULE

Seasonality is an important factor in protecting natural resources. Certain activities should only be done at certain times of the year, and other actions have a higher probability of success in some months than in others. Table 5.4 provides a calendar for essential natural resources activities for VTS-C. This calendar will be revised as new needs are identified and information is gathered.



**Table 5.4: Natural Resources Calendar**

<b>Issue</b>	<b>January</b>	<b>February</b>	<b>March</b>	<b>April</b>	<b>May</b>	<b>June</b>
<b>RTE</b>					Large-flowered skullcap monitoring	Large-flowered skullcap monitoring
<b>Weed Control</b>			Pre-emergent weed control on gravel lots and roads	Growth regulator on lawn/range area grasses	Contact herbicide on fencelines and other points of concern	
<b>Revegetation</b>		Plant cool season grasses	Plant cool season grasses Fertilize	April 15 -> Plant native grass seed Plant cool season grasses Fertilize	Plant native grass seed Plant warm season grasses	Plant warm season grasses
<b>Erosion control</b>		Erosion survey				
<b>Prescribed Fire</b>	Hardwood Forest RxBurns	Hardwood Forest RxBurns	Grassland RxBurns	Grassland RxBurns		
<b>IPP Control</b>	Cut-stump, Stem injection, or Basal bark treatments	Basal bark treatments	Basal bark treatments	Basal bark treatments	Basal bark treatments; Hand pull	Cut-stump or Stem injection treatments; Foliar Spray; Hand pull

Table 5.3, continued:

Issue	July	August	September	October	November	December
<b>RTE</b>						
<b>Weed Control</b>		Contact herbicide on fencelines and other points of concern				
<b>Revegetation</b>	Plant warm season grasses	Plant cool season grasses	Fertilize P&K	Fertilize P&K		
<b>Erosion control</b>		Erosion survey				
<b>Prescribed Fire</b>						Hardwood Forest RxBurns
<b>IPP Control</b>	Cut-stump or Stem injection treatments; Foliar Spray; Hand pull	Cut-stump or Stem injection treatments; Foliar Spray	Cut-stump or Stem injection treatments; Foliar Spray	Cut-stump or Stem injection treatments; Foliar Spray evergreens	Cut-stump or Stem injection treatments; Foliar Spray evergreens	Cut-stump or Stem injection treatments; Foliar Spray evergreens

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