INTEGRATED

NATURAL RESOURCES MANAGEMENT PLAN

2021 – 2025
(UPDATE)

For the

Camp Dawson Army Training Site

Preston County, West Virginia

WEST VIRGINIA ARMY NATIONAL GUARD

Final
March 2021

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SIGNATURE PAGE ADDENDUM

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NATURAL RESOURCES MANAGEMENT PLAN

CAMP DAWSON ARMY TRAINING SITE
PRESTON COUNTY, WEST VIRGINIA
For Plan Period 2021 – 2025

(Update)
FINAL March 2021

This Integrated Natural Resources Management Plan (INRMP) meets the requirements for INRMPs as specified in the Sikes Act, as amended (16 USC §670a *et seq.*). It has set appropriate and adequate guidelines for conserving and protecting the natural resources of the Camp Dawson Army Training Site.

Approving Official:

_____ **Date:_____**

JENNIFER L. NORRIS
West Virginia Field Supervisor
U.S. Fish and Wildlife Service

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Approving Official:

_____ **Date:_____**

STEPHEN S. McDANIEL
Director
WV Division of Natural Resources

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Approving Official:

_____ **Date:**_____

WILLIAM E. CRANE
Brigadier General, WVARNG
The Adjutant General

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Approving Official:

_____ **Date:**_____

Anthony Hammett
Colonel, US Army
Chief, G-9 Army National Guard

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EXECUTIVE SUMMARY

This Integrated Natural Resources Management Plan (INRMP) is an update of the 2012-2017 INRMP for the Camp Dawson Army Training Site (CD-ATS). The INRMP has been updated for use by the National Guard Bureau (NGB) and the West Virginia Army National Guard (WVARNG) as the primary tool for managing natural resources at the WVARNG's 3,758-acre CD-ATS.

The CD-ATS must provide a variety of environmental conditions and ecosystems in which to train soldiers. This objective must be met in a way that provides for sustainable, healthy ecosystems, complies with all applicable environmental laws and regulations, and provides for no net loss in the capability of military installation lands to support the military mission of the installation. INRMPs help installation commanders manage natural resources more effectively so as to ensure that installation lands remain available and in good condition to support the installation's military mission. The CD-ATS published its most recent INRMP Revision in January 2012 to guide resources management on the installation for the years 2012-2017. The 2012 INRMP served as an Operational INRMP leading up to the finalization of this INRMP Update. Appendix A outlines goals, objectives, and implementation and will be updated annually.

The reasons for this INRMP update include (1) the addition of the Endangered Species Management Plan for the Federally endangered Indiana bat (Myotis sodalis) and threatened northern long-eared bat (Myotis septentrionalis) (2) the addition of climate change considerations; (3) outdated natural resources management goals, objectives, and projects and their implementation status; and (4) new Army National Guard (ARNG) guidance.

The INRMP update has been prepared in accordance with the provisions of the Sikes Act (16 United States Code (USC) 670a et. seq.); AR 200-1 –- Environmental Protection and Enhancement; Department of Defense Instruction (DoDI) 4715.03; and Army Policy.

Per DoD Supplemental Guidance, the 2012-2017 Operational INRMP was reviewed "as to operation and effect," to determine whether it meets the requirements of the Sikes Act and if it contributes to the conservation and rehabilitation of natural resources on military installations. Overall, the CD-ATS has benefited from using the INRMP as a management tool. This INRMP review was developed in cooperation with the U.S. Fish and Wildlife Service (USFWS) and the West Virginia Division of Natural Resources (WVDNR). Developed using an interdisciplinary approach, information has been gathered from the CD-ATS Environmental Office (CD-ATS-ENV) and training site staff, as well as other Federal, State and local agencies and special interest groups with an interest in the management of natural resources at the CD-ATS. Comments received on the draft INRMP have been addressed in the final INRMP and EA. Concurrence from the USFWS on the INRMP was provided (to be updated after review). A distribution list for the draft INRMP Update, as well as initial agency coordination and response letters, have been included in Appendix B.

The installation is located approximately three miles east of Kingwood in central Preston County along the Cheat River drainage in northeastern West Virginia and is under the command of the WVARNG. The primary purpose of the CD-ATS is to support the military missions of the WVARNG. The INRMP Update is designed to support and accommodate accomplishment of the military missions while providing for natural resources stewardship and management.

Specific goals identified by the INRMP Update in Appendix A are:

- GOAL 1: Sustain and enhance the military training mission through natural resource management
- GOAL 2: Restore and maintain ecosystem integrity through an integrated natural resources management program.
- GOAL 3: Protect, restore and maintain populations of rare plant and animal species on the CD-ATS in compliance with federal and state laws and regulations.
- GOAL 4: Protect, restore and maintain populations of the Indiana bat, northern long-eared bat, and running buffalo clover on the CD-ATS.
- GOAL 5: Manage game and nongame fish and wildlife species.
- GOAL 6: Protect and maintain the grassland/"old-field" ecosystem at the CD-ATS for the purposes of military training, soil stabilization, vegetative cover, and wildlife habitat.
- GOAL 7: Protect and maintain the forest ecosystems for military training and wildlife habitat.
- GOAL 8: Protect Maintain, and Improve Soil and Water Quality on the CD-ATS in Accordance with State and Federal Laws and Regulations.
- GOAL 9: Provide cost-effective and compatible landscaping for the Cantonment Area.
- GOAL 10: Protect and preserve cultural resources on the CD-ATS in accordance with state and federal laws and regulations.
- GOAL 11: Develop recreational opportunities in response to identified needs within the constraints of the military mission and consistent with sound ecological principles while maintaining the security of the CD-ATS.
- GOAL 12: Continue to develop and maintain a GIS system providing efficient data storage, retrieval, and presentation to facilitate fully informed management decisions.
- GOAL 13: Continue current partnerships and seek new partners interested in the stewardship of the CD-ATS's natural resource.
- GOAL 14: Increase natural resources management emphasis within administrative areas by partnering with internal CD-ATS organizations.

These goals are supported in the INRMP Update by objectives and projects, which provide management strategies and specific actions to achieve these goals. These objectives and projects are listed in Appendix A and will be updated annually.

These goals will ensure the success of the military mission and conservation of natural resources. The general philosophies and methodologies used throughout the CD-ATS natural resources management program are focused on conducting doctrinally required military training while maintaining ecosystem viability.

This INRMP Update provides a description of the installation (e.g. location, history and mission), information regarding the on-site and adjacent physical and biotic environment, and an assessment of the anticipated impacts to natural resources as a result of mission activities. Included within the INRMP Update are recommendations for various management practices designed to enhance the natural resource base and mitigate anticipated negative impacts that may result through the successful execution of the military mission at the CD-ATS.

Existing cultural resources at the CD-ATS are referenced within the context of established management protocols as a means of ensuring the compatibility of the INRMP Update and the cultural and historic resources included in the WVARNG's statewide Integrated Cultural Resource Management Plan (ICRMP).

Additionally, this INRMP Update presents methods that will increase the environmental awareness of WVARNG personnel, guest units using the CD-ATS for training, and the general public. The implementation of this INRMP Update at the CD-ATS will ensure the successful accomplishment of the WVARNG's military missions while providing for multiple uses of natural resources and promoting adaptive stewardship practices that sustain ecosystem and biological integrity. The INRMP Update complies with applicable Army and DoD policies, as well as applicable Federal, State and local mandates.

This INRMP Update includes, as Appendix C, an Environmental Assessment (EA) and a Record of Environmental Consideration (REC), that tiers off the EA for this INRMP update. The EA is written pursuant to the National Environmental Policy Act (NEPA) of 1969, as amended (NEPA, 42 USC §4321); Council on Environmental Quality (CEQ) regulations (40 Code of Federal Regulations [CFR] Parts 1500-1508); AR (*32 CFR Part 651*, *Environmental Effects of Army Actions); NGB NEPA Handbook, March 2002; and the NGB-ARE Memorandum 9 August 2004, Additional Guidance for National Environmental Policy Act Documentation.* The scope of this EA includes descriptions and evaluation of two alternatives, summarized as follows:

> Alternative 1: Preferred Action Alternative – Implement natural resources management measures as presented in the revised INRMP**.**
>
> Alternative 2: No Action Alternative – Continue with operations as currently conducted and do not implement the Proposed Action.

The EA summarizes the affected environment and assesses the environmental consequences of implementation. The assessment concludes that the known and potential impacts of the Proposed Action on the physical, biological, and cultural environment will generally be of a positive nature. The No Action Alternative could result in long-term degradation of both training lands and biological diversity and habitat because projects pertaining to the running buffalo clover, deer herd management, native grasses, invasive species, water resources and erosion control would not be implemented. Implementing this INRMP update will not result in significant adverse environmental effects. Public participation requirements of the Sikes Act Improvement Act and the DoD Supplemental Sikes Act Improvement Act Guidance were accomplished in this EA.

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ABBREVIATIONS AND ACRONYMS

ACHP	Advisory Council on Historic Preservation
AEDB-EQ	Army Environmental Database Environmental Quality module
AERO	Army Environmental Reporting Online
ALNC	Advanced Land Navigation Course
AMD	Acid Mine Drainage
AMSL	Above Mean Sea Level
AR	Army Regulation
ARNG	Army National Guard
ARPA	Archeological Resources Protection Act
AWP	Allegheny Wood Products
B&O	Baltimore and Ohio (Railroad)
BMP	Best Management Practice
C3	Command, Control, and Communications
CAP	Central Appalachian
CD-ATS	Camp Dawson Army Training Site
CD-ATS-ENV	Camp Dawson Army Training Site Environmental Office
CEQ	Council on Environmental Quality
CFMO	Construction and Facilities Management Office
CFR	Code of Federal Regulations
CSR	Code of State Regulation
CWA	Clean Water Act
DA	Department of Army
DBH	Diameter Breast Height
DDT	Dichloro-diphenyl-trichloroethane
DEA	Drug Enforcement Agency
DENIX	Defense Environmental Network Information Exchange
DoD	Department of Defense
DoDI	Department of Defense Instruction
DOQQ	Digital Ortho Quarter Quad
DPSMA	Department of Public Safety and Military Affairs
DRG	Digital Raster Graphics
DSCOPS	Deputy Chief of Staff for Operations and Plans
DUSD	Deputy Under Secretary of Defense
EA	Environmental Assessment
EIS	Environmental Impact Statement
EMS	Environmental Management System
EO	Executive Order
EQR	Environmental Quality Report
EPRWeb	Environmental Program Requirements
ESA	Endangered Species Act
°F	Degrees Fahrenheit
FBI	Federal Bureau of Investigation
FEMA	Federal Emergency Management Agency
FM	Field Manual
FMS	Field Maintenance Shop
FY	Fiscal Year
GIS	Geographic Information System
GSAB	General Support Aviation Battalion
HAZMAT	Hazardous Materials
HLZ	Helicopter Land Zone
HQAES	Headquarters Army Environmental System
HW	Hazardous Waste
HWP	Hazardous Waste Plan
ICP	Installation Contingency Plan
ICRMP	Integrated Cultural Resources Management Plan
INRMP	Integrated Natural Resources Management Plan
IPM	Integrated Pest Management
IPMP	Integrated Pest Management Plan
ISO	International Standards Organization
ITAM	Integrated Training Area Management
K_2O	Water-soluble potash
LIDAR	Light Detection and Ranging
LUA	Land Use Agreement
MBTA	Migratory Bird Treaty Act
MCA	Mountaineer Challenge Academy
METL	Mission Essential Task List
MOA	Memorandum of Agreement
MOS	Military Occupational Specialty
MOU	Memorandum of Understanding
N	Nitrogen
NAD83	North American Datum of 1983

NAGPRA	Native American Graves Protection and Repatriation Act
NAISA	National Aquatic Invasive Species Act
NBC	Nuclear, Biological, Chemical
NDAA	National Defense Authorization Act
NEPA	National Environmental Policy Act of 1969
NGB	National Guard Bureau
ARNG G9	Army Installations & Enviroment Directorate
NGB-ARI	NGB Army Installations Division
NHPA	National Historic Preservation Act
NOA	Notice of Availability
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NRO	Natural Resources Office
NTCHS	National Technical Committee for Hydric Soils
NWI	National Wetlands Inventory
NYDEC	New York Department of Environmental Conservation
OMS	Organizational Maintenance Shop
P_2O_5	Available phosphorous
PCMD	Polluted Coal Mine Drainage
PEM	Palustrine Emergent Wetland
PFO	Palustrine Forested Wetland
PL	Public Law
PLS	Planning Level Surveys
POTO	Plans, Operations and Training Officer
POW	Prisoners-of-war
PSS	Palustrine Scrub-shrub Wetland
RAID	Rapid Assessment Initial Detection
RBAF	Floodplain between the Cheat River and Route 72
RFMSS	Range Facility Management Support System
RRD	Rose Rosette Disease
RTI	Regional Training Institute
RTLP	Range and Training Land Program
SDZ	Surface Danger Zone
SHPO	State Historic Preservation Office
SITE	Training Site Operations Staff
SMCRA	Surface Mine Control and Reclamation Act
SOP	Standard Operation Procedure
SR	State Route
SRP	Sustainable Range Programs
STEP	Status Tool for the Environmental Program
STF	Student Training Facility
TA	Training Area
TAG	The Adjutant General
TCP	Traditional Cultural Properties
TNC	The Nature Conservatory
TSC	Training Site Commander
USACE	U.S. Army Corps of Engineers
USC	United States Code
USEPA	U.S. Environmental Protection Agency
USET	United South and Eastern Tribes, Inc
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	United States Geological Survey
UST	Underground Storage Tank
UTM	Universal Transverse Mercator
VDGIF	Virginia Department of Game and Inland Fisheries
WES	Waterways Experiment Station
WMA	Wildlife Management Area
WQC	Water Quality Certification
WVARNG	West Virginia Army National Guard
WVC	West Virginia Code
WVDA	West Virginia Department of Agriculture
WVDEP	West Virginia Division of Environmental Protection
WVDNR	West Virginia Division of Natural Resources
WVDOF	West Virginia Division of Forestry
WVGES	West Virginia Geological and Economic Survey
WVNHP	West Virginia Natural Heritage Program
WVSCA	West Virginia School Counseling Association
WVU	West Virginia University
WWII	World War II

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1.0 GENERAL INFORMATION

1.1 Purpose

This Integrated Natural Resources Management Plan (INRMP) is an update of the 2012-2017 INRMP for the Camp Dawson Army Training Site (CD-ATS). The INRMP has been updated for use by the National Guard Bureau (NGB) and the West Virginia Army National Guard (WVARNG) as the primary tool for managing natural resources at the WVARNG's 3758-acre CD-ATS.

The CD-ATS must provide a variety of environmental conditions and ecosystems in which to train soldiers. This objective must be met in a way that provides for sustainable, healthy ecosystems, complies with all applicable environmental laws and regulations, and provides for no net loss in the capability of military installation lands to support the military mission of the installation. INRMPs help installation commanders manage natural resources more effectively so as to ensure that installation lands remain available and in good condition to support the installation's military mission. The CD-ATS published its first INRMP in October 2001 to guide resources management on the installation for the years 2002-2006. The reasons for this INRMP update include (1) the addition of the Endangered Species Management Plan for the Federally endangered Indiana bat (*Myotis sodalis*) and threatened northern long-eared bat (*Myotis septentrionalis*) (2) the addition of climate change considerations; (3) outdated natural resources management goals, objectives, and projects and their implementation status; and (4) new Army National Guard (ARNG) guidance.

The National Defense Authorization Act (NDAA) of 2004 made a significant revision to the Endangered Species Act (ESA). NDAA stated that, "The Secretary [of the Interior] shall not designate as critical habitat any lands or other geographical areas owned or controlled by the Department of Defense, or designated for its use, that are subject to an integrated natural resources management plan prepared under section 101 of the Sikes Act (16 US Code [USC] 670a), if the Secretary determines in writing that such plan provides a benefit to the species for which critical habitat is proposed for designation." Under the 2004 NDAA, a military installation may have its INRMP obviate the need for critical habitat designation if the INRMP provides a benefit to listed species, and manages for the long-term conservation of the species.

If an Army Guard installation has federally listed threatened or endangered species, proposed federally listed threatened or endangered species, and/or candidate species on the installation, or unoccupied habitat for a listed species where critical habitat may be designated, the INRMP must specifically address the benefits of management of these actions for these species or habitats in the document. The benefit should be clearly identified in the document and included in the table of contents. This updated INRMP is intended to provide a benefit to, and gain a critical habitat exemption for, the following species: running buffalo clover, flat-spired three-toothed snail (*Triodopsis platysayoides*), northern long-eared bat (Myotis septentrionalis) and Indiana bat (*Myotis sodalis*).

Since its establishment in 1909, The CD-ATS has fluctuated in size from approximately 196.5 acres to 3758 acres, which it presently occupies. Today, the facility encompasses 1661 acres of state owned land that includes the Camp Dawson Proper and the Briery Mountain Training Area (TA). In addition to state owned training land, the CD-ATS acquired maneuver rights, through long-term lease agreements, on two other tracts of training lands. They are the Pringle Tract TA, 1593 acres, (privately owned) and the Volkstone TA, 504 acres (federally owned). Both training areas are federally supported. The CD-ATS is managed and operated by the West Virginia Department of Public Safety and Military Affairs (DPSMA) on behalf of the WVARNG, which is responsible for

the management of the entire site. The facility's boundaries extend across the Portland and Kingwood Districts in Preston County, West Virginia.

The purpose of this updated INRMP is to ensure that natural resource conservation measures and military activities on mission land are integrated and consistent with Federal stewardship requirements. In accordance with the Sikes Act Improvement Act, this updated INRMP shall, to the extent appropriate and applicable, provide for:

A) Fish and wildlife management, land management, forest management, and fish- and wildlife-oriented recreation;

B) Fish and wildlife habitat enhancement or modifications;

C) Wetland protection, enhancement, and restoration, where necessary for support of fish, wildlife, or plants;

D) Integration of, and consistency among, the various activities conducted under the plan;

E) Establishment of specific natural resources management goals and objectives and time frames for proposed action;

F) Sustainable use by the public of natural resources to the extent that the use is not inconsistent with the needs of fish and wildlife resources;

G) Public access to the military installation that is necessary or appropriate for the use described in subparagraph (F), subject to requirements necessary to ensure safety and military security;

H) Enforcement of applicable natural resource laws (including regulations);

I) No net loss in the capability of military installation lands to support the military mission of the installation;

J) Such other activities as the Secretary of the military department determines appropriate".

The WVARNG has embraced the concept of integrating natural resource management with its mission activities. The WVARNG recognizes that its current and proposed training activities can potentially use or consume the natural resources on mission land, and that successful execution of their mission is dependent upon the optimum maintenance of their environment in a mode of sustainable use. The WVARNG recognizes its responsibility to guarantee continued access to its land, air and water resources for realistic military training while ensuring that the natural and cultural resources entrusted to their care are sustained in a healthy condition for scientific research, education and other compatible uses by future generations.

The WVARNG is justifiably proud of its excellence in training, its natural resources heritage and its tradition of stewardship. As such, the WVARNG is committed to the planned, deliberate management of natural resources, supporting the installation operational mission, meeting or exceeding stewardship requirements, and enhancing the quality of life for its personnel and guests.

1.2 Authority

This updated INRMP has been prepared pursuant to the following laws, regulations, and directives:

- **The Sikes Act "Conservation Programs on Military Reservations" (16 USC §670a *et***

***seq*.), as amended** – Requires Federal military installations with adequate wildlife habitat to develop long-range integrated natural resources management plans and implement cooperative agreements with other agencies. Natural resources are to be managed for multipurpose uses and provide the public access to those uses to the extent consistent with the military mission. The act also sets guidelines for the collection of fees for the use of natural resources such as hunting and fishing.

- Department of Defense Instruction (DoDI) 4715.03, *Environmental Conservation Program*;
- Army Regulation (AR) 200-1, *Environmental Protection and Enhancement*;
- 32 Code of Federal Regulations (CFR) 651, *Environmental Effects of Army Actions*;
- AR 350-19, *Army Sustainable Range Program*, 30 August 2005;
- ARNG-IEZ Memorandum, *Army National Guard (ARNG) Installations and Environment (I&E) Directorate Policy for Integrated Natural Resources Management Plans (INRMP),* 20 March 2019

1.3 Responsibilities

Within the NGB headquarters, the Chief of G9 is responsible for reviewing the updated INRMP and advising CD-ATS-ENV and the Environmental Office in Charleston in concurrence with the U.S. Fish and Wildlife Service (USFWS), the West Virginia Division of Natural Resources (WVDNR), and other state agencies. The G9 ensures operational readiness by sustaining environmental quality and promoting the environmental ethic, and is responsible for tracking projects, providing technical assistance, quality assurance, and execution of funds.

The Adjutant General (TAG) is directly responsible for the operation and maintenance of CD-ATS, which includes implementation of this updated INRMP. TAG determines what the state's force structure (types and number of units, types of equipment, training events, etc.) will be at CD-ATS throughout the five year period of the INRMP. TAG ensures that all installation land users are aware of, and comply with procedures, requirements, and applicable laws and regulations that accomplish the objectives of the INRMP. TAG also ensures coordination of projects and construction between environmental, training, and engineering staffs. The key position within TAG's Office is the statewide Construction & Facilities Management Officer (CFMO). This office ensures that natural resource issues are considered in the West Virginia DPSMA/WVARNG budget and policies. This office provides overall guidance and policy direction to the environmental program, including management of CD-ATS's natural resources. Both offices are located at the WVARNG's headquarters in Charleston, West Virginia.

The CD-ATS-ENV is responsible for managing flora, fauna, air quality, and water quality of the training site; identifying compliance needs; and advising the WVARNG on the best ways to comply with federal and state environmental laws and regulations. The CD-ATS-ENV 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, preparing plans, and revising the INRMP after five years. The Training Site Operations Staff (SITE) at the CD-ATS is made up of the Training Site Commander (TSC), range operations, civilian personnel, and one primary stakeholder - Allegheny Wood Products (AWP). They ensure the implementation and success of this plan. SITE is familiar with all aspects of the training site, including training scheduling (and conflicts), locations of training

facilities, impairments or problems with human-made structures or natural functions, and needs for improvement or maintenance of the training land.

The statewide CFMO/Engineering Office provides a full range of environmental, financial, and engineering disciplines for all facilities under the jurisdiction of the DPSMA, including CD-ATS. The CFMO 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 WVARNG engineers. The CFMO also provides expertise in the development and production of Environmental Awareness materials for distribution to troop commanders.

The Staff Judge Advocate advises TAG, the Plans, Operations and Training Officer (POTO), and CFMO on laws and regulations that affect training land use and environmental compliance.

1.4 Management Philosophy

Both the current and updated INRMP describe the baseline conditions of natural resources at the CD-ATS and provide management programs and guidance allowing for the performance of successful military training, while providing for the conservation of renewable natural resources, preservation of rare and unique resources, and long-term resource sustainability. The updated INRMP incorporates new management plans and updated resource information. General plan expectations include the following:

- Provide a comprehensive plan for the WVARNG to carry out its mission while promoting ecosystem health and biodiversity at the CD-ATS and in the surrounding region;
- Document goals, objectives, guidelines, and future direction for natural resources management;
- Establish a framework for implementing natural resources programs and ecosystem management;
- Provide centralized information on the natural resources program status;
- Identify environmental constraints to land use so that military training can be matched to ecosystem carrying capacity;
- Identify mission-related impacts and options for conflict resolution;
- Serve as a baseline of existing environmental conditions for defensible future Environmental Assessments (EAs) and Environmental Impact Statements (EIS);
- Ensure that installations comply with environmental regulations;
- Identify, prioritize, and schedule long-term budget requirements.

The typical management programs addressed in an INRMP include training area management, land management, forest management, aquatic and terrestrial habitat management, special natural area management, fish and wildlife management, rare and endangered species management, pest management, fire management, recreational resource and activity management, and agricultural program management. The INRMP is a training-driven plan, created with a dual goal:

- To allow for the conduct of appropriate military training at levels necessary to maintain a full readiness posture for national defense and civil missions;
- To provide for management of natural resources in an ecosystem-oriented, sustainable manner, consistent with federal, state, and local regulations.

The overall policies and philosophy of land management at the CD-ATS are derived from AR 200-1, and 32 CFR 651. These policies, regulations and programs are based on the concept that natural resources management is an integral component of the primary mission of military use. The WVARNG must train; therefore, the WVARNG will manage the CD-ATS to conserve valuable training resources, including the natural environment. Management of natural resources on an ecosystem basis ensures the sustainable use of training lands while considering the effects on the surrounding environment and public concern.

This updated INRMP has been developed in cooperation with the USFWS and WVDNR. Developed using an interdisciplinary approach, information has been gathered from the WVARNG CD-ATS-ENV and training site staff, as well as other Federal, State and local agencies and special interest groups with an interest in the management of natural resources at the CD-ATS. Comments received on the draft INRMP have been addressed in the final INRMP. Concurrence from the USFWS and the WVDNR on the INRMP was provided in the form of a letter dated (insert).

1.4.1 Military Mission

The primary purpose of natural resources management at the CD-ATS is to support the military training mission. With regard to accomplishment of the military mission, the overall goal is *to maintain sustainable natural resources as a critical training asset* upon which to accomplish the mission of the WVARNG at the CD-ATS. Components of this overall goal include:

- Ensure no net loss in the capability of installation lands to support existing and projected military training and operations at the CD-ATS;
- Maintain quality training lands through range monitoring and damage minimization, mitigation, and rehabilitation.

This updated INRMP integrates aspects of natural resources management into the military mission. As such, it becomes the primary tool for ecosystem management at the CD-ATS while ensuring the successful, efficient accomplishment of the military mission. A multiple-use approach will be implemented through use of the updated INRMP to accommodate the presence of mission-oriented activities and provide for good stewardship, thereby maintaining and improving the quality, aesthetic values and ecological relationships of the environment.

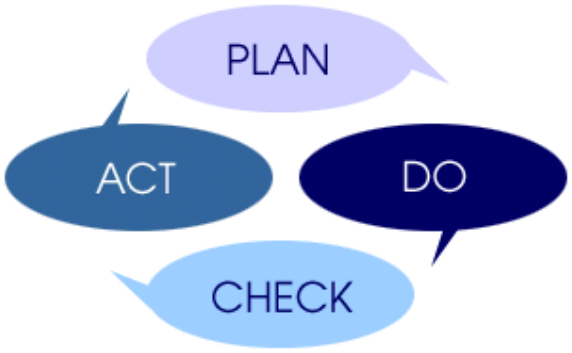
Implementation of this updated INRMP at the CD-ATS will successfully promote adaptive stewardship practices that protect and enhance natural resources for multiple use, sustainable yield and biological integrity, while supporting the military mission.

1.4.2 Environmental Management System (EMS)

This updated INRMP directly supports the WVARNG's and the NGB's EMS. Executive Order (EO) 13148 "Greening the Government through Leadership in Environmental Management" was signed in April 2000 and established a five-year EMS implementation goal for federal facilities. Developing and implementing an EMS is required at all Army installations, as well as at all ARNG installations. For the purpose of complying with the EO 13148 the WVARNG as a whole is considered to be a federal installation. The WVARNG has developed and is implementing an EMS that covers all its operations, facilities, and training sites. The EMS is part of the overall WVARNG management system and includes organizational structure, planning, responsibilities, practices, procedures and processes, and resource allocation for developing, implementing, achieving, reviewing, and maintaining environmental commitments. The International Standards

Organization (ISO)-14001 EMS model used by the WVARNG leads to continual improvement based upon a cycle of "plan, do, check, act":

- Planning, including identifying environmental aspects and establishing goals [plan];
- Implementing, including training and operational controls [do];
- Checking, including monitoring and corrective action [check];
- Reviewing, including progress reviews and acting to make needed changes to the EMS [act].



Source: USEPA, 2004

The EMS is continually updated through this cycle, fine-tuning its management of operations that may harm the environment. This continual improvement cycle is a fundamental attribute of the EMS that allows the system to adapt to the dynamic nature of the organization's operations.

This updated INRMP directly supports the WVARNG's and the NGB's EMS. Annual review of the INRMP in conjunction with the USFWS and the WVDNR will be conducted in order to support the concept of EMS. Annual reviews are discussed in **Section 8.3**.

1.4.3 Ecosystem Management

An ecosystem is the "sum of the plant community, animal community, and environment in a particular region or habitat" (Barbour et al, 1987). Ecosystem management may be defined as management "to restore and maintain the health, sustainability, and biological diversity of ecosystems while supporting sustainable economies and communities" (U.S. Environmental Protection Agency [USEPA], 1994).

The goal of ecosystem management encompassed in the updated INRMP is "to ensure that military lands support present and future training and testing requirements while preserving, improving, and enhancing ecosystem integrity" (DoDI 4715.03). Natural resources at the CD-ATS will be managed with an ecosystem management approach.

Biological diversity or biodiversity may be defined as "the variety of living organisms considered at all levels of organization, from genetics through species, to higher taxonomic levels, and including the variety of habitats and ecosystems, as well as the processes occurring therein" (Meffe and Carrol, 1994).

Biodiversity refers to the variety and variability among living organisms and the environment in which they occur. Biodiversity has meaning at various levels including ecosystem diversity, species diversity, and genetic diversity. The DoD has developed a Biodiversity Management

Strategy (Keystone Center, 1996). This document identifies five reasons to conserve biodiversity on military lands:

1) Sustain natural landscapes required for the training and testing necessary to maintain military readiness;
2) Provide the greatest return on the DoD investment to conserve and protect the environment;
3) Expedite the compliance process and help avoid conflicts;
4) Engender public support for the military mission;
5) Improve the quality of life for military personnel.

The Keystone Center report notes that the challenge is "to manage for biodiversity in a way that supports the military mission". This strategy identifies the updated INRMP as the primary vehicle to implement biodiversity conservation on military installations. The model process developed within the strategy includes the following principles:

- Support the military mission;
- Use joint planning between natural resources managers and military operations personnel;
- Integrate biodiversity conservation into the INRMP and other planning protocols;
- Involve internal and external stakeholders up front;
- Emphasize the regional (ecosystem) context;
- Concentrate on results.

Specific management practices identified in this updated INRMP have been developed to enhance and maintain biological diversity within the ecosystems at the CD-ATS.

1.4.4 Sustainable Range Program

The Sustainable Range Program (SRP) is the Army's overall approach for improving the way in which it designs, manages, and uses its ranges and training lands to ensure long-term sustainability. SRP is defined by its core programs, the Range and Training Land Program (RTLP) and the Integrated Training Area Management (ITAM) Program.

The Sustainable Range Program goal is to maximize the capability, availability, and accessibility of ranges and training lands to support doctrinal training and testing requirements, mobilization, and deployments under normal and surge conditions. Within SRP:

- Capability refers to the SRP core programs: the RTLP and ITAM Program.
- Availability refers to the non-environmental facility management functions.
- Accessibility refers to the environmental compliance and management functions

The objectives of the Sustainable Range Program are as follows:

- Modernize training and testing range facilities to sustain live training execution in accordance with training strategy requirements.

- Resource range and training land operations.
- Sustain range and training facilities.
- Maximize the accessibility of ranges and training land by minimizing restrictions brought about by encroachment factors.
- Focus the capability of the environmental program to fully support force readiness by sustaining the accessibility of ranges and training land.
- Develop and implement the Sustainable Range Outreach Program to improve public and stakeholder understanding of the Army's live training and testing requirements and clearly articulate and underscore activities supporting national security.
- Establish an interdisciplinary approach for sustaining ranges that integrates range safety, operational, facilities, and environmental management functions.
- Establish a multi-disciplined career program for range operations personnel that supports sustainable range management.

1.4.4.1 Range and Training Land Program

The Range and Training Land Program (RTLP) provides for the central management, programming, and policy for modernization of the Army's ranges and their day-to-day operations. Objectives include:

- Integrate mission support, environmental stewardship, and economic feasibility and define procedures for determining range projects and training land requirements to support live-fire and maneuver training. Define the quality assurance and inspection milestones for range development projects and the standard operating procedures to safely operate military training, recreational, or approved civilian ranges under Army control and support Commanders Mission Essential Task List and Army training strategies.
- Establish the procedures and means by which the Army range infrastructure is managed and maintained on a daily basis in support of the training mission.

1.4.4.2 Integrated Training Area Management

The Integrated Training Area Management (ITAM) Program provides Army Range Officers with the capability to manage and maintain training land by integrating mission requirements with environmental requirements and sound land management practices. To accomplish this mission, ITAM relies on its four components. The ITAM components are:

- **Training Requirements Integration (TRI).** Provides a decision support capability based on the integration of training requirements, land conditions, range facilities, and land management requirements.
- **Land Rehabilitation and Maintenance (LRAM).** Repairs, maintains, and reconfigures Army lands to meet maneuver training requirements.

- **Range and Training Land Assessment (RTLA).** Acquires and assesses land condition data to provide information supporting decisions that maximize the capability and sustainability of Army land to support maneuver training.

- **Sustainable Range Awareness (SRA).** Develops and distributes educational materials to users of training lands to avoid unnecessary training damage.

- **Sustainable Range Program Geographic Information Systems (SRP GIS).** The SRP GIS is a foundational support element to the entire SRP. The SRP GIS mission is to create, analyze, manage, and distribute authoritative standardized geospatial information, products, and services for the execution of training strategies and missions on U.S. Army ranges and training lands.

ITAM Objectives include:

- Achieve optimal sustained use of lands for the execution of realistic training and testing by providing a sustainable core capability that balances usage, condition, and level of maintenance. Implement a management and decision-making process that integrates Army training and other mission requirements for land use with sound natural resources management.
- Advocate proactive conservation and land management practices by aligning Army training land management priorities with the Army training and readiness priorities.
- Ensure mission needs are considered in environmental (e.g., INRMP, ICRMP, agricultural leases, annual burn plan, timber harvest plan) and facilities planning, and training land capabilities constraints are considered in mission planning.

1.5 Conditions for Implementation and Updates

1.5.1 Implementation

The WVARNG CD-ATS-ENV is responsible for directing the management of natural resources and for the development and implementation of the updated INRMP. Successful implementation of the updated INRMP will require:

- Administrative and technical support;
- Agency cooperation and technical assistance;
- Funding to include projects and required personnel;
- Priorities and scheduling;
- Production of project scopes and budgets;
- The ability to amend and revise this document as necessary.

Where projects identified in the plan are not implemented because of lack of funding, or other compelling circumstances, the installation will review the goals and objectives of this updated INRMP to determine whether adjustments are necessary.

1.5.2 Effectiveness

The primary measure of INRMP effectiveness is whether it helps prevent "net loss in the capability of military lands to support the military mission". The WVARNG is preserving the CD-ATS's capability to support training through its natural resource management practices outlined in the 2012-2017 INRMP and in this revision. The WVARNG continues to work with several partnerships and cooperative agreements (USFWS, WVDNR, West Virginia University [WVU], Natural Resources Conservation Service (NRCS), West Virginia Division of Forestry (WVDOF), West Virginia Department of Agriculture (WVDA), etc) to manage the forest, preserve sensitive areas, and practice effective soil conservation. These activities are coordinated through ongoing INRMP implementation.

Long-term management effectiveness is also evaluated through periodic inventories of species populations, habitat quantity and quality, and habitat values through the recurring PLS. Trends can be used to indicate the degree of success. The WVARNG will evaluate these recurring data as they become available.

A practical evaluation of INRMP implementation includes reviewing whether planned projects have been accomplished. Overall, the CD-ATS has benefited from using the INRMP as a management tool. The goals articulated in the 2012-2017 INRMP are being addressed through implementation of management actions recommended in the updated INRMP. Most of the specific management actions have been implemented through projects. A large number of the projects are recurring actions that are continued in this updated INRMP.

1.5.3 Agency and Public Participation

This updated INRMP has been developed in cooperation with the USFWS and the WVDNR. Developed using an interdisciplinary approach, information has been gathered from the WVARNG CD-ATS-ENV, as well as other Federal, State and local agencies and special interest groups with an interest in the management of natural resources at the CD-ATS. Comments received on the draft INRMP have been addressed in the final INRMP. Concurrence from the USFWS on the INRMP was provided. A distribution list for the draft INRMP, as well as initial agency response letters, have been included in Appendix B.

As stated in the DoD Supplemental Guidance, Section 2905(d)(1) of the Sikes Act mandates that the public be provided a meaningful opportunity to comment on the original INRMP. The original draft INRMP and draft EA were made available for public comment through newspaper advertisement and at the Kingwood Public Library. A copy of the public Notice of Availability (NOA) is included in Appendix B. No public comments or requests for a public meeting were received.

1.5.4 Revisions

The DoD Supplemental Guidance states that each INRMP "must be reviewed as to operation and effect by the parties thereto on a regular basis, but not less than every five years" according to 101(b)(2) of the Sikes Act. The updated INRMP is effective from the date of approval for a period of five years. The Sikes Act Improvement Act requires annual review of the INRMP to keep the plan current (see Section 8.3). Information such as that relating to the soils, natural vegetation, and environmental data, not requiring revision, will be retained in the plan. Periodic evaluations and revisions will be conducted under the management of the WVARNG CD-ATS-ENV with input

from NGB, WVARNG staff, USFWS, WVDNR and internal and external stakeholders, as appropriate.

1.5.5 Environmental Assessment (EA)

This updated INRMP includes, as **Appendix C**, an EA and a REC. The EA is written pursuant to the NEPA of 1969, as amended (NEPA, 42 USC §4321); Council on Environmental Quality (CEQ) regulations (40 CFR Parts 1500-1508); AR (*32 CFR Part 651*, *Environmental Effects of Army Actions); NGB NEPA Handbook, March 2002; and the NGB-ARE Memorandum 9 August 2004, Additional Guidance for National Environmental Policy Act Documentation.* The scope of this EA includes descriptions and evaluation of two alternatives, summarized as follows:

> Alternative 1: Preferred Action Alternative – Implement natural resources management measures as presented in the updated INRMP**.**
>
> Alternative 2: No Action Alternative – Continue with operations as currently conducted in the 2002-2006 INRMP and do not implement the updated INRMP.

The EA summarizes the affected environment and assesses the environmental consequences of implementation. The assessment concludes that the known and potential impacts of the Proposed Action on the physical, biological, and cultural environment will generally be of a positive nature. The No Action Alternative could result in long-term degradation of both training lands and biological diversity and habitat because projects pertaining to ESMP's, native grasses, invasive species, wildland fire management, and erosion control would not be implemented. Implementing this INRMP will not result in significant adverse environmental effects. Public participation requirements of the Sikes Act Improvement Act and the DoD Supplemental Sikes Act Improvement Act Guidance were accomplished through this EA.

2.0 INSTALLATION OVERVIEW

2.1 Location and Area

The CD-ATS, a WVARNG facility, is a 3,758-acre state-managed military training area located along the Cheat River drainage in northeastern West Virginia, approximately 3 miles southeast of Kingwood, where the terrain is mountainous (**Figure 1**, **Appendix D**). The CD-ATS is managed and operated by the West Virginia DPSMA on behalf of the WVARNG, which is responsible for the management of the entire site. The facility's boundaries extend across the Portland and Kingwood Districts in Preston County, West Virginia. The CD-ATS is located within the U.S. Geological Survey (USGS) Kingwood, West Virginia Quadrangle.

For the purpose of this plan, CD-ATS is divided into three distinct, non-contiguous Training Areas (TAs). These three TAs, summarized in **Table 1** and illustrated on Figure 1 (Appendix D), are all federally supported.

Table 1. Summary of Training Area Ownership and Acreages

Training Area (TA)		State-owned	Federally-owned	Privately-owned
Cantonment Area	Camp Dawson Proper	410	--	--
	Volkstone TA	--	504	--
	Briery Mountain TA	1251	--	--
	Pringle Tract TA	88	--	1504

Since its establishment in 1909, the CD-ATS has fluctuated in size from approximately 196.5 acres to 3,758 acres. The CD-ATS presently encompasses 1,749 acres of state owned land. Of that area, approximately 410 acres comprise Camp Dawson Proper, approximately 1,251 acres are contained in the Briery Mountain TA, and about 88 acres are found within the Pringle Tract TA. In addition to state owned training land, the CD-ATS acquired maneuver rights, through long-term lease agreements, on two other tracts of training lands. They are the privately owned, 1592-acre Pringle Tract TA and the federally owned, 504-acre Volkstone TA. Both training areas are federally supported. Detailed site location and ownership information for the three TAs are provided below. For ownership information refer to **Figure 2** (Appendix D).

2.1.1 Cantonment Area

The Cantonment Area is approximately 914 acres and consists of two training areas: Camp Dawson Proper and the Volkstone TA. The main gate is located three miles east of Kingwood, the county seat, and approximately 20 miles west of Oakland, Maryland.

2.1.1.1 Camp Dawson Proper

Camp Dawson Proper includes 410 acres and is located within the area known as Dunkard Bottom between the east bank of the Cheat River and the west slope of the Briery Mountains. Camp Dawson Proper is bounded on the north and east by detached rural single-family homes, a golf course and country club. The Cheat River flows north along the west and south boundary of Camp Dawson Proper. In 1988, the State of West Virginia, acting through the Public Land Corporation of West Virginia (a public benefit corporation), conveyed the legal title to the State Armory Board of the State of West Virginia. Camp Dawson Proper is owned and operated by the State Armory Board, DPSMA on behalf of the WVARNG.

2.1.1.2 Volkstone TA

The 504-acre Volkstone TA is owned by the U.S. Army Corps of Engineers (USACE), Baltimore District and licensed to the WVARNG for operation and management. This TA is located on the West Bank of the Cheat River, directly across the river from Camp Dawson Proper. The property extends from the riverbank to the top of the bluff to the northwest, averaging about 1,500 feet in width. The property encompasses the wooded slope of the bluff and the Cheat River floodplain. Morris Island, which is approximately 48 acres in size, is also included within the Volkstone property boundaries. Morris Island lies downstream of the old manganese extraction plant, directly across the river from the northwest boundary of Camp Dawson Proper. The Volkstone TA is bisected by a transportation corridor comprised of West Virginia State Route (SR) 72 right-of-way and the Baltimore and Ohio (B&O) Railroad right-of-way. These two rights-of-way run parallel to each other near the base of the bluff.

The Volkstone TA formerly was known as the Diamond Shamrock site and the Chemetals site because of past ownership. In 1979, Diamond Shamrock sold the Chemetals Division to Sedema Corporation, a Belgian company. The plant stopped operations in November 1985, following a major flood of the Cheat River and the Volkstone Company purchased the plant, including 500 acres in 1988. On December 6, 1996, the USACE-Baltimore District purchased the property and is the current owner. On February 7, 1996, the USACE-Baltimore District granted to the State of West Virginia a license to conduct training on the property for an indefinite period (see **Appendix E**). The USACE owns the timber rights on this land tract. Any harvesting activities have to be coordinated through them.

2.1.2 Briery Mountain Training Area

The Briery Mountain TA is located about 3.5 miles south of the Cantonment Area, and occupies approximately 1,251 acres. The Briery Mountain TA (1012.5 acres) was purchased by CD-ATS in 1966 and is currently owned and operated by the State Armory Board, DPSMA on behalf of the WVARNG. This TA is mainly second growth forest. In 1991, the State Armory Board acquired an adjacent 45-acre tract known as the Calvert property. In December of 2001 and 2003 respectively, the State Armory Board, acquired an adjacent 168.2-acre tract known as the Knotts Property (also known as the High Meadows) and an adjacent 71.5-acre tract known as the Bond property. A small portion of the east-central and west-central part is dominated by scrub-shrub habitat and used as a parachute drop zone and bivouac area (Naylor Landing Zone and the Calvert bivouac site) and a small portion of the south end contains a small limestone quarry used as a demolition site and bivouac area.

2.1.3 Pringle Tract Training Area

The Pringle Tract TA, located four miles south of Kingwood, is approximately 1,592 acres in size. The Pringle Tract TA is owned by AWP Incorporated, out of Petersburg, West Virginia and managed by the WVARNG. On 5 May 1998, the State Armory Board acquired a 88-acre tract known as the Yoder Property in the interior of the leased property (Figure 2, Appendix D). The Pringle Tract TA is located approximately 2 miles southwest of Camp Dawson Proper, across the Cheat River.

On 18 March 1996, AWP and the WVARNG entered into an agreement, in which AWP leased the Pringle Tract TA to the WVARNG for maneuver rights for 50 years. On the same date, in exchange for maneuver rights, the WVARNG granted AWP a license to harvest and manage timber located on CD-ATS's state-owned lands (Camp Dawson Proper and Briery Mountain TA). Lands subject to forestry operations under this agreement consist of approximately 1,250 acres. In turn, all three tracts are primarily used for timber production and military training activities.

Prior to the agreement, the WVARNG trained on the Pringle Tract TA through a temporary Land-Use Agreement. This was insufficient for training. Although acquisition of this property would be ideal, leasing the property allows for expenditure of federal funds for the development of the training area, to include a 40 millimeter grenade launcher range, Prisoner of War (POW) Training Area, Driver's Training, Two-Story Military Operations in Urban Terrain (MOUT) Site, and a Heavy/Light Equipment Training Area. See **Appendix E** for a copy of the license agreement between WVARNG and AWP.

2.1.4 CD-ATS Environmental Office Location

From Interstate 68 take Route 26 approximately 11 miles south to the town of Albright; just before crossing the Cheat River turn left on St. Joe Road, go approximately 3.5 miles then turn right onto the CD-ATS Road and go to the end of this road. At the Security Guard Station, ask for the Environmental Office, Building 414.

2.2 Installation History

CCD-ATS was established on May 7, 1909, when the West Virginia State Legislature authorized the purchase of 196.5 acres of land on Dunkard bottom along the Cheat River. The Camp was named in honor of William M. O. Dawson, a native of Preston County, who served as governor from 1905 to 1908. Training at CD-ATS began during the summer of 1909 and continued until the start of World War I. Because training was suspended, the camp was not used again until 1928 when Governor William G. Conley appointed Carleton C. Pierce, from Kingwood, West Virginia, as the State Adjutant General. CD-ATS was then reestablished as a training site for the West Virginia National Guard. Units trained regularly at the Camp until the outbreak of World War II. The United States Government leased the camp at the cost of $1.00 per year for use as a POW camp. Italian POW were in cantonment at the camp until the end of that war. Since the original land purchase, the WVARNG has acquired additional tracts of land that bring the present total land acreage to approximately 3,897 acres.

2.3 Military Mission

Per DoD Supplemental Guidance, the 2012-2017 INRMP was reviewed "as to operation and effect," to determine whether it meets the requirements of the Sikes Act and if it contributes to the

conservation and rehabilitation of natural resources on military installations. Updates required as a result of this review have been included within this INRMP.

The mission of the WVARNG to:

> "Successfully mobilize and deploy soldiers and units to meet our federal and state missions and to add value to the communities in which we live, work and serve."

The WVARNG has three Major Commands within the state organization. The Major Commands and their missions are as follows:

- 77th Brigade Troop Command: The federal mission is to prepare units and individuals to fight and win our Nation's wars as an integral component of the Army. The state mission is to provide military support to civilian authorities during natural disasters, civil disturbance, and other emergencies requiring humanitarian assistance.
- 111th Engineer Group: The federal mission is to mobilize and deploy to a theater of operation, and to command, plan and coordinate the operation of assigned and attached Echelons above Corps Engineer units. The state mission is to establish a field operating headquarters to assume command and control over assigned WVARNG units.
- 2/77th Troop Command: Includes the 2-104th General Support Aviation Battalion (GSAB), the 146st Med. Det., the Co D 245th AVIM, the 2/77th Troop Command Aviation Battalion, the DET 28 OSA COM and the Rapid Assessment Initial Detection (RAID) Detachment for counter drugs. Elements of the 2-104th GSAB alert and assemble; mobilize and complete post mobilization training; deploy to a theater of operations; conduct combat operations to include movement to a forward assembly area to perform air assault and air movement operations; to conduct combat electronic warfare and intelligence, target acquisition and reconnaissance missions; and to conduct command, control and communications (C3) flights to achieve the goals of the division or gain wartime command.

The 197th Regiment (Regional Training Institute) also teaches institutional courses at CD-ATS. Among the types of courses taught are Officer Candidate School, officer pre-command course, military occupational specialty (MOS) training, instructor training, and leader training.

The 1-80th Engineer Battalion, United States Army Reserve, teaches institutional course at CD-ATS also. Engineer MOS training and leader training is taught at this facility.

The counter drug program operated by the WVARNG is extensive and provides support to a wide range of federal, state, and local law enforcement agencies. This program is one of many conducted by the WVARNG in support of U.S. Customs, Drug Enforcement Agency (DEA), and local law enforcement agencies.

Youth programs are a vital part of the WVARNG's community based mission. Programs such as the Mountaineer Challenge Academy (MCA) are a preventive program for youths-at-risk. This program targets unemployed drug-free and lawful high school dropouts, 16 to 18 years of age. The five-month military-based residential program emphasizes citizenship, academic excellence, life-coping skills, community service, health and hygiene, leadership, skills training, and physical training.

2.3.1 CD-ATS Mission

The Mission and major goal of the CD-ATS is to provide realistic training opportunities for the WVARNG, the Army National Guard of other States, Army Reserve, Reserve Officer's Training Corps, and other Active and Reserve components of the Air Force, Navy, and Marine Corps. These opportunities impact favorable on unit readiness requirements, and allow the units to meet the challenges of their war time missions. As a Federally funded installation, Camp Dawson may also provide training opportunities to other Federal and State Government agencies as deemed appropriate by the Base Operations Manager and the West Virginia Adjutant General.

2.3.2 CD-ATS Usage and Training Activity

The most frequent training activity at CD-ATS is unit level tactical training, which includes small arms and non-mechanized tactical maneuver training or infantry field exercises. Unit size is company-level (90 to 150 soldiers). Tactical training typically involves land navigation, bivouacking, and construction of fortification and defensive positions, command post exercises, logistical exercises, and specialized training, and can also include the use of blank ammunition. Specialized training involving pyrotechnics and/or smoke should only be conducted away from forested areas or outside of the active bat roosting season. This training normally takes place on the Briery Mountain and Pringle Tract TAs. CD-ATS facilities are used to conduct training conferences for DoD, state, and federal agencies. Reserve personnel are stationed one weekend per month while other forces use the training facility for short-term training throughout the year. The site is primarily used for classroom training from November through March with limited field training. From May to August, the facility is used throughout the week for classroom and field training. Training facilities are also provided to Active and Reserve Components of the Navy, Marines, Air Force, Army, and non-DoD agencies such as the Federal Bureau of Investigation (FBI), DEA, Department of State, WVDNR, WVDOF, and West Virginia Department of Environmental Protection (WVDEP).

CD-ATS provides annual support for approximately 90,767 soldier-days of training for National Guard, reserve, and active component troops along with approximately 70,649 soldier-days for non-DoD agency training. CD-ATS has the capability to billet and support one battalion-size unit. In addition, there are enough bivouac sites to accommodate multiple battalion level operations. During the summer, troops conducting Annual Training, utilize the facilities for 10 to 15 days periods at a time with a fluctuation of troops at CD-ATS for the remainder of the summer. This training occurs intermittently throughout the year. However, most training takes place on weekends.

Military units that train at CD-ATS are scheduled and tracked using the Range Facility Management Support System (RFMSS). Information on training activities, dates, number of soldiers that participated, ranges/training areas used, equipment used, and bivouac/command center locations is recorded. According to the RFMSS detail utilization reports from 1996 to present, the specific types of training normally conducted at CD-ATS include:

Camp Dawson Proper: (state owned)

a. Small arms training

b. Winter survival training

c. Rappelling

d. Riot control and gas warfare agent familiarization

e. Engineering training

f. Physical Fitness

g. Leaders Reaction/Obstacle Course

h. Fixed/Rotary Wing

i. Cyber Operations

j. At risk youth

k. Conferences large and small

Pringle Tract TA: (privately owned)

a. Pyrotechnics (smoke operations)

b. Field training exercises

c. Land navigation

d. Bivouacking

e. Engineering equipment operator training

f. M203 marksmanship (non-dud producing) Training

g. Off Road driving courses

h. Multiple Landing Zones

Volkstone TA: (federally owned)

a. Field training exercises

b. Nuclear, biological, and chemical (NBC) training

c. Command post exercises

d. Law enforcement training

e. Military operation in urban environment

f. Military Police training

g. Live fire MOUT Facility

h. NIST certified robotics site

i. Landing Zone

j. Search and Extraction Course

Briery Mountain TA: (state owned)

a. Field Training Exercises

b. Bivouacking

c. Land Navigation

d. Demolitions Training

e. Modified Record of Fire Range

f. 650m Known Distance Range

g. Multiple Landing Zones

h. Live Fire Breach Facility

i. Special multipurpose range M2/MK19/240B SRTA Range

Available data on troop utilization of the CD-ATS for Fiscal Year 2018 is summarized in **Chart 1** and **Table 2**, by soldier days per year. A soldier day is one person per day. Thus, 365 people who stay at CD-ATS for 10 days are equal to 3,650 soldier days.

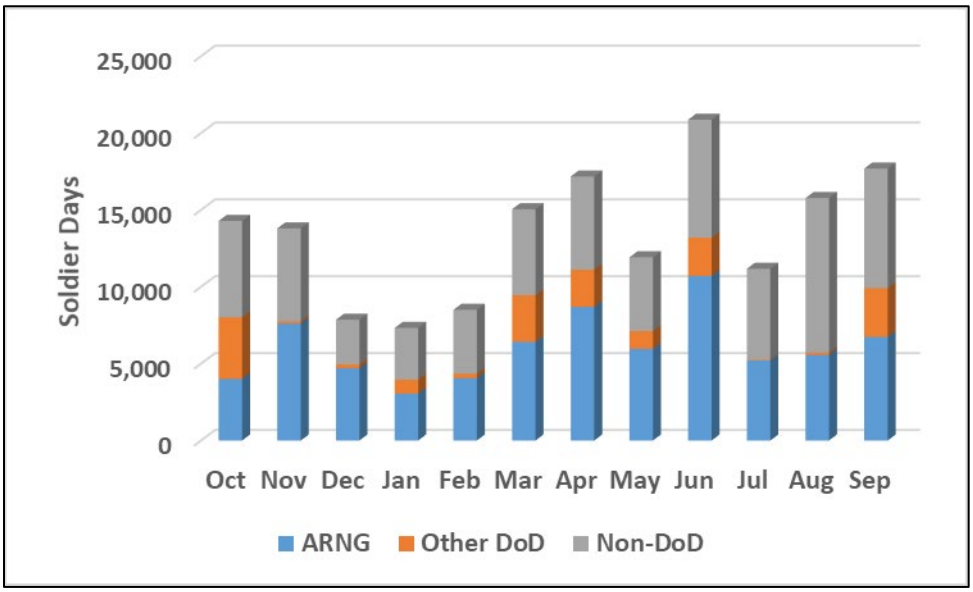


Chart 1. Number of Soldier Days Utilized on the CD-ATS by Category, FY 2018

Table 2. Number of Soldier Days Used on the CD-ATS by Month and Category, FY 2018.

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Totals
ARNG	54,007	57,618	34,710	33,047	14,062	36,420	28,692	45,962	210,703	35,195	55,576	16,740	672,672
Other DoD	54,011	2146	8236	3922	1294	43,036	92,423	21,157	22,493	250	2150	13,177	318,095
Non-DoD	66,273	66,039	32,913	23,363	54,150	45,594	26,067	44,806	27,682	35,931	710,052	97,779	570,649
TOTAL	**114,291**	**113,803**	**77,859**	**97,332**	**88,506**	**115,050**	**317,182**	**111,176**	**720,818**	**911,176**	**115,778**	**117,696**	**1,561,416**

2.4 Surrounding Communities and Land Use

The three training areas, including the Cantonment Area, Briery Mountain TA and the Pringle Tract TA are located within close proximity of each other and are bordered by rural, heavily forested, and steep lands, including private property, both residential and commercial.

Today, principal land use activities within the county and around CD-ATS include logging operations, some agriculture, and limited strip and deep mining for coal, although the amount of the coal mining has almost totally stopped due to Federal regulations, in particular, the 1977 Surface Mine Control and Reclamation Act (SMCRA). Due to the steep topography, the land immediately around CD-ATS is not suitable for large-scale agricultural purposes. However, limited agriculture does exist on small, relatively level areas, usually on valley floors and hilltops. Some industry (e.g. railroad, car cleaning and public utilities) can be found along the Cheat River, particularly toward Albright, West Virginia.

The area around Camp Dawson Proper is bound to the north by the Preston County Country Club. The Preston County Country Club maintains a year-round, full-time 18-hole golf course. Beyond the confines of the country club, the area is mixed forest and agriculture, until the small town of Albright, approximately 4 miles north of the main gate at CD-ATS. Several newer model homes are located on the periphery of the golf course. Immediately to the west of CD-ATS lies the Cheat River. Immediately to the east of CD-ATS, the land use is interspersed with several residential homes with some acreage and small farms, mixed in amongst a second-growth forest. Further east the area is predominantly forest. This includes the heart of the Briery Mountain. Here, the land use is primarily forested with very small pockets of agricultural land. Immediately to the south of CD-ATS, the land use is predominantly steep forestland. Moving south towards Rowlesburg, the Cheat River flows north, through what is commonly referred to as the "narrows" section. Here, the river is bound by steep mountains on both sides, Laurel Mountain on river left and Briery Mountain on river right. Eventually the Mountains become hills as the river makes a turn towards the Camp. During the summer months, the "narrows" class II-III whitewater is home to many local-rafting outfitters.

No zoning/land use restrictions or regulations outside of towns or incorporated areas are in West Virginia.

2.5 Historical Land Use Perspective

In 1776, when the French left the Ohio Valley, Frederick and Augusta Counties were formed. Monongalia County was subdivided from Augusta, and then, in 1818, Preston County was divided from Monongalia County. By 1776, there were 250 settlers in what is now Preston County. During this time, life in the area was crude and primitive, and there were hostilities between the settlers and the local Native Americans. Two forts, Fort Morris and Fort Butler, provided a haven for the settlers as late as 1785. In 1784, General George Washington journeyed to Preston County to inspect his land holdings. Washington had plans to develop canals and highways within Preston County, as he was mistakenly advised that someday the Cheat River might be used for Water Freight. On January 19, 1818, when Preston officially became a county, there were approximately 3,000 inhabitants. After the county was organized, industry, agriculture, iron works, post offices, gristmills, and roads became increasingly important and, for this reason, were developed. Warpaths were superseded by trails that led through the forests, allowing the exploration of the county (Thomas, 1998).

The Transition Period that lasted for 46 years was a time when the population of Preston County nearly doubled. The coming of the railroad brought many people to the area. Preston County was mainly an agricultural county. Furthermore, there was an abundance of iron ore; as a result, iron furnaces became successful. Coal mining was the backbone of prosperity for the county. In 1853, the first car of coal was taken from the area. Millions of dollars of investments were made and four million tons of coal was extracted. Other businesses in the area included tanneries, salt wells, limestone quarries, shook factories, and whiskey manufacturers (Thomas, 1998).

The Fairmont coalfield is the most productive of the four northern West Virginia fields. It includes six counties: Monongalia, Preston, Marion, Harrison, Taylor, and Barbour. The industrial development and business history of the Fairmont field prior to 1945 can be divided into five periods (Workman et al., 1994):

- The Wooden Age – 1775 to 1852
- Early Development – 1852 to 1886
- Expansion and Consolidation – 1886 to 1903
- Prosperity, Conflict, and Collapse – 1903 to 1933
- Reformation and Mechanization – 1933 to 1945

2.5.1 The Wooden Age

The wooden age marks the first extraction of coal in the Fairmont field. Although no estimates exist for this period, coal production was undoubtedly quite low because large quantities of wood were available and transportation was difficult. Neither the early speculators nor the first settlers who came to this area in the frontier period (1763 to about 1800) were much concerned about coal. The age of settlement coincided with the age of wood. The vast forest provided plenty of hardwood for fuel and for the manufacture of buildings, tools, and everyday items. Dwindling supplies of wood in the period after 1820 led to use of coal for domestic purposes, and to some extent for smithing and metalworking (Workman et al., 1994).

2.5.2 Early Development

Coal production for the export market, in the Fairmont field, began with the completion of the B&O Railroad, which passed through Preston County. On 22 June 22 1852, workmen laid the last rail and drove the last spike to complete the B&O Railroad between Fairmont and Chesapeake Bay. The appearance of the B&O west of the Appalachian Mountains established an indispensable link with national and international markets. Not only did the B&O provide access to the eastern market, the railroad itself became a major user of Fairmont coal.

Little is known of mining activity in the Fairmont field during the Civil War. Stymied by the turmoil of the war, coal mining and other industrial development were, nonetheless, eventually boosted by the war outcome. As the nation gradually recovered from the depression in the 1870s, the tempo of mining activity rose in the Fairmont field. Production stood at 523,671 short tons in 1880. Preston and Harrison counties were by then the major producers, each with over 100,000 tons. There were 44 mines in the Fairmont field. Only the Newburg-Orrel Coal & Coke Company operated more than one mine. The company owned three mines, two in Preston County and one in Harrison County. Four establishments distilled their product into coke. Most of this coke was used by two iron furnaces, one in Preston County and one in Taylor County (Workman et al., 1994).

2.5.3 Expansion and Consolidation

In this formative period, Fairmont operators made giant strides in expanding production and capturing markets. Production quadrupled, rising from 681,333 tons in 1890 to 5,049,146 short tons in 1900. In addition, during this period the West Virginia northern railroad was built between Tunnelton and Kingwood in Preston County; it was completed in 1887. As the coal industry grew from adolescence to adulthood in the 1886 to 1903 period, considerable growth also characterized the economy in the agricultural and manufacturing sectors. Agriculture remained the most important industry, with livestock (principally cattle) its main "cash crop". In 1900, Preston County ranked fifth in the value of its livestock. With the development of coke, oil and gas, and glass industries after 1890, the level of manufacturing increased as well (Workman et al., 1994).

2.5.4 Prosperity, Conflict, & Collapse

In this period Fairmont coal found wide acceptance in the Lake and eastern markets. Production rose to an amazing 33,326,709 tons in 1927. Spurred by unprecedented demand during the World War I years, numerous new companies were started. In the post-war period, a rapid cooling of the national economy created a problem of overproduction, which led to lower prices and wages after 1924. The resulting depression ruined many companies. Despite the dramatic growth in coal and manufacturing, the farm economy in the 1900 to 1920 period was stagnant. In all of the six Fairmont field counties, the number of farms dropped slightly. In 1910, industrial and political leaders launched a back-to-the-farm movement, which tried to encourage those who had forsaken the farms for the cities to return. The oil and gas fields are blamed for diverting many people's interests away from farming. The problem of overproduction would have presented no great problem if the tripartite cooperation of the World War I period could have continued. The market situation continued to deteriorate in 1923. By 1926, only four coal companies were operating in the Fairmont field (Workman et al., 1994).

2.5.5 Reformation and Mechanization

The Fairmont coal industry that emerged from the Depression and New Deal was far different than the one created in the nineteenth century. The era of small time operators ended. Large companies, such as Consol dominated the Fairmont coal industry. Although forced into receivership in 1932, Consol was reorganized in 1934 and remained the largest and strongest firm in the field. An important aspect in the 1930's restructuring of the coal industry was the push that nationwide collective bargaining gave to mechanization. With wages equalized, it was no longer possible for one firm or region to undercut another with low wage policy. To remain competitive, firms had to make more efficient use of labor, which was now a fixed cost. Obtaining a higher volume of production at lower per unit cost was possible through mechanization (Workman et al., 1994).

2.6 Regional Land Use and Natural Areas

Preston County, formed on January 19, 1818, is one of 55 counties in West Virginia and is the only county in the United States with this name. In 2019 the population of Preston County was 33,432 which places 16th in the state. The County fits into a corner of the state bounded on the north by Pennsylvania and the Mason-Dixon Line and on the east by the state of Maryland. Preston County received its name from an established custom of naming new counties for the public men of the Old Dominion. The Virginia Assembly chose to honor James Patton Preston, then the Governor of Virginia, in selecting a name for the new county (Thomas, 1998).

The land of Preston County, as we know it today, is taken from an original land grant known as the north Neck Section of Virginia to Lord Thomas Fairfax. West of the Fairfax line, additional grants were made in 1745 of 100,000 acres and 60,000 acres. To mark property lines, one method used was known as the tomahawk rights (blazing trees to mark the boundary). In 1754, the Ohio Company obtained grants of land from the Virginia government. One of these, a 5,000-acre grant to Samuel and Thomas Eckarlin on the Cheat River, became known as Dunkard Bottom (Thomas, 1998). The brothers planned to establish a monastic community before Indians killed them. They were the first white men on record to settle in Preston County. Today, Dunkard bottom is the site of the CD-ATS.

This scenic high plateau Appalachian region has a variance in elevation from a low of 870 feet to a high of 3,236 feet. Mountains rise above the plateau, and streams have cut it deeply. The total area of the county is approximately 645 square miles, or 412,800 acres, but more than half of this land is in farms. The rest of the county is covered by second growth forest. With more tillable land than any other county in the state, Preston County is naturally a farming community, although mining, timber, recreation, and tourism are vital contributors to the county's economy. For years, strip and deep mining for coal predominated, however, since the late 1980's both have been steadily declining. Much of the coal in the county has been removed. Rural Preston County has over 2,000 small farms, primarily in the northern half of the county.

The Cheat River divides the county, north and south. The Cheat, a wild, impetuous, and rocky river with rapids and falls, claimed many of those attempting to ford; thus, it is aptly named because it cheated so many lives (Thomas 1998). The turbulent Cheat River was once an important artery for transporting countless thousands of massive saw logs to mills along its lower course. Prior to the Civil War, the Cheat was an important waterway used to haul boatloads of crude and finished ironware from foundries along its downstream pits. Some of these iron products ultimately reached St. Louis and even New Orleans (Wiley, 1993).

Lands surrounding the Cheat River watershed are full of rich natural resources, with diverse forest and abundant water. The "hook could hardly be dropped in the water without falling on the back of a fish," remarked one early pioneer. The Cheat Mountain Lodge logbook (pre-1900) indicates that many fishing trips on upper Shavers Fork would return with over a hundred brook trout (*Salvelinus fontinalis*) per day, and many of them between 12-15" in length. Classic native trout water, such as the Blackwater River, were well known destinations in the late 1800s for adventure fishermen, often with catches unreal by today's standards. Much of the Cheat River watershed is based around visible history illustrating the past and present of the coal industry. Many small, coal mines along the Cheat's floodplains date back to pre-commercial coal mining when local residents would use the coal for heating their homes or cooking. Mines within these areas have been used as early as the 1800s and might have supplied, not only the landowner, but also the local communities with energy.

Coal mining in West Virginia has provided thousands of jobs across many decades, fueling the country's energy needs and even supporting war efforts. West Virginia's coal is bituminous and occurs in seams of mineable thickness in 43 of the state's 55 counties. Economically, coal mining seems very lucrative, yet environmentally coal mining has shown its effects on many areas in West Virginia. The Cheat River is one area in particular that coal mining has taken a toll. Nearly 10,000 acres of abandoned mines drain millions of gallons of Acid Mine Drainage (AMD) into the Cheat River daily. Abandoned mine lands consist of old mining areas where mining ceased prior to the 1977 SMCRA. SMCRA set forth standards regarding mining regulations, especially reclamation practices. Prior to SMCRA mining regulations were very relaxed, which was detrimental to the surrounding environment. As a result, many miles of streams are essentially dead due to the AMD associated with the coal mining industry.

3.0 THE PHYSICAL ENVIRONMENT

3.1 Climate

The climate of the region is classified as humid mesothermal because of the 40-inch average annual precipitation and the relatively moderate temperatures. Because CD-ATS is beyond the immediate climatic effects of the Atlantic Ocean, its climate is much more of the continental than of the maritime type. As a result, the camp is subject to rather marked temperature contrasts between summer and winter. The latitude places CD-ATS in the zone of prevailing westerly winds, which are frequently interrupted by surges of relatively warm and cold air. Frontal storms (or systems) that move up the Ohio Valley are more common in the colder half-year and account for most of the precipitation. In the summer, showers and thunderstorms occur in the broad current of moist tropical air that tends to sweep northeastward from the Gulf of Mexico. The topographic setting, the prevailing wind system, and the rather frequent alternation of air masses having their origin in the Gulf (Maritime air) and Canada (Polar Continental air) account for the Camp's climate and the frequent day-to-day changes in the weather pattern.

Precipitation is usually ample for growing all crops common to the State. The average annual total of about 40 inches is rather evenly distributed throughout the year. The wettest month of the year is June, with an average of 4.22 inches (**Table 3**). The greatest amount of precipitation during any month for the 18-year period 1946-1963 was in August 1954, when 10.64 inches were recorded. The least amount occurred in October 1963, when only 0.24 inches were recorded.

Snowfall averages 30 inches per season at the airport and about 25 inches at the Lock and Dam station. Driving is frequently unfeasible in the City because roads at higher elevations outside of the camp are blocked by snow or ice. This is because the warmer valley receives more precipitation as rain instead of snow. In terms of area and number of people affected, snow is probably the greatest severe storm hazard. Since the storm of 1886, however, only two snowfalls have really paralyzed the Camp: the great storm of November 1950, when snow piled up to a depth of 32 inches, and the snowfall of January 1964, when snow accumulated to a depth of 17 inches.

Winters are moderate. The Camp receives an average of three cold waves per year but these seldom last more than a few days. On the average, the temperature goes below zero once every other year, reaches -12 degrees Fahrenheit (°F) once every 10 years, and -17 °F once every 25 years. Monthly averages of precipitation and temperature are shown in Table 3.

Table 3. Climate Data, CD-ATS, Preston County, WV

Month	Temperature (°F)			Precipitation (inches)				Mean Number of Days with > 0.01 inches Precipitation
	Daily Maximum	Daily Minimum	Monthly	Normal Total	Maximum 24 hours	Snow & Ice Mean Tot.	Snow & Ice Max 24 Hour	
Jan	41	24	32	3.5	1.6	8.0	11.0	7
Feb	43	25	34	2.8	1.4	7.3	10.0	7
Mar	51	31	41	3.4	1.8	5.5	10.7	8
Apr	63	41	52	3.3	2.7	0.4	2.0	8
May	73	50	61	3.6	2.8	0	0.6	9
Jun	81	58	70	4.2	1.7	0	0	8
Jul	84	62	73	4.1	1.7	0	0	8
Aug	82	61	72	4.1	5.0	0	0	7
Sep	77	54	65	2.8	2.4	0	0	6
Oct	67	45	56	2.4	3.6	0	0.60	5
Nov	52	34	43	2.7	1.6	2.8	17.7	7
Dec	42	26	34	2.8	1.8	6.0	6.0	8

The many rugged hills and ridges of the State moderate the cold outbursts that roll in from the plains with fresh west to southwest winds. They also break the force of the winds. The descent of the cold air into the valleys also leads to a slight warming of the air by compression. With clearing skies between storms, solar radiation becomes effective and results in many mild days during the cold season.

The freeze-free season in areas away from the river averages about 167 days. Valleys with poor cold air drainage and all elevations above 1,400 feet tend to have a shorter season. On the average, the freeze-free season begins 28 April and ends 15 October; the number of days has varied from 134 to 199. Temperatures of 32 °F or colder have occurred as late as 29 May and as early as 21 September.

Temperatures of 90 °F or above occur on an average of 15 days per year, mostly in June, July, and August. During the dry summer of 1953, there were 35 days above 90 °F. Cloud cover usually limits extremely high temperatures associated with higher humidity. Uncomfortably warm, humid afternoons can be expected on a few days during any summer. Typical of rugged hilly areas, gentle upslope breezes occur during the afternoons, and shortly after sunset, a gentle flow of cool air down the slopes to the valley floors often occurs. This nocturnal cooling is a pleasant feature of the warm season climate of this area. During the summer and fall, this cooling by air drainage frequently condenses the water vapor in the air, producing light fog that dissipates rapidly after sunrise. The frequency of fog is higher along the river and the valleys leading down into it. Such fogs and related temperature phenomena are a distinct warning of the need to provide control of both stationary and mobile potential and real sources of air pollution.

Night and early morning averages are about 80 percent, but they are lower in the spring (about 72 percent) and higher in the late summer and autumn (about 85 to 90 percent). This maximum in late summer and autumn is associated with the occurrence of nocturnal and morning fogs in the Cheat River valleys. By mid-afternoon, relative humidity may average between 45 and 55 percent in the summer months. However, the temperature humidity combinations are generally within the limits of human comfort.

CCD-ATS, as well as all of West Virginia, lies in a cloud belt. Possible sunshine is estimated at only about 33 percent in the winter and about 60 percent during the summer. Annually, there are an average of 85 clear days (0 to 30 percent cloud cover) and 165 cloudy days (80 to 100 percent cloud cover). Cloudiness is more pronounced over the Allegheny Mountains to the east. Prevailing surface winds are from the southwest to west. As typical of mountainous areas, the winds are generally light and under local topographical influences. The strongest winds are from the southwest and precede the passage of cyclonic storms moving up the Ohio Valley. Violent localized winds may accompany some of the more intense summer thunderstorms and may occur from any direction. Thunderstorms occur 40 to 50 days per year on the average, mostly during June and July. Damage is occasionally caused by lightning, winds, or hail. Sometimes heavy localized rains cause damage by erosion, sedimentation, and flooding. CD-ATS, during the period of record examined, did not experience a tornado, although the latent possibility does exist.

In March 2005, the West Virginia Division of Forestry in cooperation with the WVARNG installed a Remote Area Weather Station on the Pringle Tract TA. The purpose of the station is to collect

raw weather data in an effort to better predict more accurate fire weather forecasts for the north-central region of West Virginia.

3.1.1 Climate Change Considerations

CD-ATS is located within the National Climate Assessment (NCA) Northeast Region. The third NCA Northeast Region Climate Outlook projects increases in mean temperatures across the region and across all time periods and scenarios. Seasonal temperature increases are projected to be greater in summer than winter, which would result in increased frequency of extreme heat events and heat waves (number of consecutive days $>95^0$F), with larger absolute increases in the number of days greater than 95^0F in the southern latitudes. Reductions in the number of days $<10^0$F are projected across the region, with the greatest reductions occurring in the northern latitudes and higher altitudes. Precipitation is expected to be greater across the NCA Northeast Region, but the median percentage is small (~2%) and individual models show both negative and positive trends for precipitation. Models indicate the change in consecutive number of days with precipitation <0.3mm (drought) is minimally changed. Anticipated climate change effects on natural systems in the Northeast Region include shifts in species distributions, changes in community structure, and additional stressors on sensitive systems. The relatively small land area of CD-ATS suggests these impacts on natural systems will have limited direct effects, particularly with regard to regulatory constraints. However, CD-ATS does have federally-listed species and species of concern (See Section 6.4), and additional stressors on these species may increase regulatory compliance requirements (Hayden et al., 2013).

3.2 Physical Setting and Topography

The CD-ATS's three tracts are all located within the Appalachian Plateaus Geomorphic Province, which extends over most of West Virginia, more than one-half of Pennsylvania, and small parts of westernmost Virginia and Maryland. The province is bounded on the east and southeast by the Valley and Ridge Province and by a narrow strip of the Central Lowland Province in Erie County, Pennsylvania.

In most places, the eastern boundary of the Appalachian Plateaus is marked by an escarpment called the Cumberland Escarpment in Virginia and the Allegheny Front in West Virginia, Maryland, and Pennsylvania. A northward-facing erosion escarpment forms the boundary between the Appalachian Plateaus and the Central Lowland Provinces. The altitude of the Appalachian Plateaus Province is higher than that of the Valley and Ridge Province, as well as the Central Lowland Province (USGS, 1999).

3.2.1 The Cantonment Area

The Cantonment Area, made up of Camp Dawson Proper and the Volkstone TA, is located on both sides of the Cheat River. The topography of Camp Dawson Proper consists of floodplain and steep gorge slopes with an elevation range between 400 and 1,522 feet above mean sea level (AMSL) (**Figure 3a,** Appendix D). Slopes face predominantly to the west.

The majority of Camp Dawson Proper lies within the 100-year floodplain. Most of the level ground available on the post is used in support of installation operations. The greatest percentage of Camp Dawson Proper is well-maintained lawn. The adjacent Preston County Country Club (golf course)

to the north provides a continuation of improved grounds with scattered groups of trees. The ridge to the south and southeast of the Camp is used to support second-growth forest, comprised mostly of sugar maple (*Acer saccharum*), white ash (*Fraxinus americana*), basswood (*Tilia americana*), oaks (*Quercus* spp.), and hickories (*Carya* spp.). This entire ridge was harvested in 1997 and 1998 by AWP. Most of these trees were pole and small saw timber in size.

Little true riparian habitat occurs along the bank of the Cheat River on the CD-ATS side. Most of the riverbank is steep, with rubble and other material having been added over the years to protect the bank from erosion. Large native and planted trees such as sycamore (*Platanus occidentalis*), hemlock (*Tsuga canadensis*), oaks, and Norway spruce (*Picea abies*) are scattered along the top of the bank, while shrubs and smaller trees like sumac *(Rhus* spp.*)* grow among the rubble. Pierce Lake, a 5-acre pond, is located near the northeast border of the post.

The Volkstone TA property generally extends from the riverbank to the top of the bluff to the northwest, averaging approximately 1,500 feet in width. The bluff runs northeast to southwest, giving its steep slope a southeast aspect. The property encompasses the wooded slope of the bluff and the floodplain of the Cheat River. Morris Island, approximately 48 acres in size, is also included in the property. The topography of the Volkstone site consists of floodplain and steep gorge slopes with an elevation range between 400 and 1,522 feet AMSL (Figure 3a, Appendix D). The aspect is predominantly easterly.

In addition to an unused manganese plant site, the floodplain portion of the property contains a mixture of old-field, bottomland hardwood forest, and a band of riparian habitat along the river. A powerline right-of-way crosses some of the property near the top of the bluff. A small portion (about eight acres) of this area is an abandoned strip mine. Most of the highwall area is powerline right-of-way while the terrace has reverted to forest. The small bench supports some of the larger diameter trees on this slope. A sandstone outcrop runs near the 1,600-foot contour. Morgan Run, heavily affected by PCMD, crosses the southwest end of the property, while two small, unnamed streams (shown as perennial but most likely intermittent) drain hollows on the slope of the bluff.

Morris Island is located downstream of the manganese plant site with the mid-point of the island near River Mile 33.5. Bottomland hardwood forest covers about 60 percent of the island. The island receives very little human visitation as access requires crossing the river.

3.2.2 Briery Mountain Training Area

The topography of the Briery Mountain TA consists of a rolling upland plateau with an elevation range between 1,900 and 2,800 feet AMSL (Figure 3b, Appendix D). The primary aspect is northwesterly.

Several roads and jeep trails provide vehicular access and fragment much of the area. When not being used for military training, the area was formerly open to the public as the Briery Mountain WMA. Public access is no longer permitted due to the safety danger zone of the new Modified Record Firing Range (MRFR) which became active in 2012. Nearly all of the Briery Mountain TA was in second-growth hardwood forest, before the entire training area was harvested in 1997 and 1998 by AWP.

3.2.3 Pringle Tract Training Area

The topography of the Pringle Tract TA (**Figure 3c,** Appendix D) consists of a rolling upland plateau and steep gorge slopes with an elevation range between 1,300 and 2,000 feet AMSL. The aspect is primarily easterly.

3.3 Geology and Soils

Geologic resources of an area typically consist of surface and subsurface materials and their inherent properties. Geologic factors influencing the ability to support structural development are seismic properties (for example, potential for subsurface shifting, faulting or crustal disturbance), soil stability, and topography. Soils are unconsolidated materials overlying bedrock or other parent material. Soils play a critical role in both the natural and human environment. Soil structure, elasticity, strength, shrink-swell potential and erodibility determine the ground's ability to support man-made conservation practices, structures and facilities. Soils are typically described in terms of complex type, slope, physical characteristics and relative compatibility or constraining properties with regard to types of land use and/or construction activities.

3.3.1 CD-ATS Geology

The overall geology of Camp Dawson Proper is the Allegheny Formation. This is made up of sandstone, siltstone, shale, limestone, and coal. The Volkstone TA contains the Pottsville Group, consisting of red gray shale, siltstone, and sandstone. The Briery Mountain TA consists of the Pottsville Group, the Mauch Chunk Group, the Greenbrier Formation, and the Pocono Group. The Pottsville Group is found throughout the training area and consists of sandstone, limestone, and coal. The Mauch Chunk is found in the southern section of the Briery training area. The Greenbrier Formation is located in the southern section of the training area and consists of limestone, shale, and sandstone. The Pocono Group is also found in the southern section of the training area and

consists of shale, limestone, and sandstone. The geology of the Pringle Tract TA consists of the Conemaugh Group, the Mauch Chunk Group, and the Allegheny Formation. The Conemaugh Group is found on the plateau and consists of shale, siltstone, sandstone, a few thin bands of limestone, and coal. The Mauch Chunk Group is found on the gorge slopes and consists of shale, sandstone, and a few thin bands of limestone. The Allegheny Formation occurs at the base of the gorge slopes (WV Geological and Economic Survey [WVGES], 1968).

3.3.2 CD-ATS Soils

The NRCS completed the *Soil Survey of Camp Dawson, Preston County, West Virginia* in 2001. This survey revised the former 1959 Soil Survey. Unlike the standard soil surveys, it mapped soils at a scale of 1:12,000. Soils within the Cantonment Area, Briery Mountain TA, and Pringle Tract TA are mapped in **Figures 4a**, **b**, and **c**, respectively (Appendix D). This survey "kicked off" the Preston County wide survey, which was completed in 2006, revising the former 1959 Soil Survey. Twenty-five (25) soil components were identified, with five subdivided into slope classes to create a total of 45 soil mapping units (NRCS, 2001) (see **Table 4**). For more detailed soil information refer to the CD-ATS soil survey (NRCS, 2001). Soil management concerns are addressed in **Section 6.5.2.1**.

Prime farmlands are monitored by the NRCS to ensure preservation of agricultural lands that are of statewide or local importance. Soils designated as prime farmland are capable of producing high yields of various crops when managed using modern farming methods. Designation of such lands is based on soil type present. Approximately 230 acres (five percent of the CD-ATS) of CD-ATS soils are classified as prime farmland soils. Prime farmland soils include Chavies fine sandy loam, Philo silt loam, Pope fine sandy loam, Tilsit silt loam, and Gilpin silt loam and Zoar silt loam with three to eight percent slopes.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part. These soils are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation. Melvin silt loam, Knowlton silt loam, and Armagh silt loam with three to eight percent slopes are classified as hydric soils, which cover approximately 60 acres (1.5 percent) of the Briery Mountain TA

Photo 2. Soil Survey Review, Briery Mountain Training Area, CD-ATS, October 2000.
Photo by Ladd Williams

Photo 3. Soil Survey Review, Briery Mountain Training Area, CD-ATS, October 2000.
Photo by Ladd Williams

Table 4. NRCS Soil Map Units, CD-ATS, Preston County, West Virginia					
Map Unit Name	**Mapping Symbol**	**Acres**	**Prime Farmland**	**Hydric**	**Erosion (Water)**
Armagh silt loam, 3-8 percent slopes	ArB	8	No	Yes	Moderate
Bethesda-Rock outcrop complex, very steep	BeF	40	No	No	Very severe
Buchanan loam, 8-15 percent slopes	BuC	16	No	No	Severe
Buchanan loam, 8-15 percent slopes, extremely bouldery	BxC	200	No	No	Severe
Cateache channery silt loam, 8-15 percent slopes	CaC	4	No	No	Severe
Cateache channery silt loam, 15-25 percent slopes	CaD	14	No	No	Severe
Chavies fine sandy loam	Ch	29	Yes	No	Slight
Clymer loam, 15-25 percent slopes, very stony	ClD	375	No	No	Severe
Clymer loam, 25-35 percent slopes, very stony	ClE	38	No	No	Very severe
Clymer loam, 35-50 percent slopes, very stony	ClF	33	No	No	Very severe
Craigsvilles gravelly sandy loam	Cr	4	No	No	Slight
Ernest silt loam, 8-15 percent slopes	ErC	12	No	No	Severe
Fairpoint channery silt loam, 3-8 percent slopes	FaB	36	No	No	Moderate
Fairpoint channery silt loam, 8-15 percent slopes	FaC	106	No	No	Severe
Fairpoint channery silt loam, 15-25 percent slopes	FaD	126	No	No	Severe
Fairpoint channery silt loam, 25-35 percent slopes	FaE	33	No	No	Very severe
Fairpoint-Rock outcrop complex, steep	FrF	65	No	No	Very severe
Gilpin silt loam, 3-8 percent slopes	GlB	23	Yes	No	Moderate
Gilpin silt loam, 8-15 percent slopes	GlC	95	No	No	Severe

Table 4. NRCS Soil Map Units, CD-ATS, Preston County, West Virginia					
Map Unit Name	**Mapping Symbol**	**Acres**	**Prime Farmland**	**Hydric**	**Erosion (Water)**
Gilpin silt loam, 15-25 percent slopes	GlD	77	No	No	Severe
Gilpin silt loam, 25-35 percent slopes	GlE	15	No	No	Very severe
Gilpin silt loam, 8-15 percent slopes, very stony	GsC	65	No	No	Severe
Gilpin silt loam, 15-25 percent slopes, very stony	GsD	5	No	No	Severe
Gilpin silt loam, 25-35 percent slopes, very stony	GsE	80	No	No	Very severe
Gilpin Variant – Shouns-Macove complex, 35-70 percent slopes, very flaggy	GvF	36	No	No	Very severe
Knowlton silt loam, 0-3 percent slopes	KnA	22	No	Yes	Slight
Laidig gravelly loam, 15-25 percent slopes, extremely bouldery	LbD	270	No	No	Severe
Laidig gravelly loam, 25-35 percent slopes, extremely bouldery	LbE	185	No	No	Very severe
Lily channery loam, 8-15 percent slopes	LlC	29	No	No	Severe
Lily channery loam, 8-15 percent slopes, very stony	LsC	127	No	No	Severe
Lily-Rock outcrop-Buchanan complex, moderately steep, rubbly	LxE	80	No	No	Severe
Melvin silt loam	Me	15	No	Yes	Slight
Macove-Gilpin complex, 35-70 percent slopes, very stony	MgF	1046	No	No	Very severe
Philo silt loam	Ph	48	Yes	No	Slight
Pope fine sandy loam	Po	74	Yes	No	Slight
Quarry, limestone	Qm	2	No	No	Slight
Quarry, sandstone	Qo	2	No	No	Slight
Shouns silt loam, 8-15 percent slopes	ShC	4	No	No	Severe

Table 4. NRCS Soil Map Units, CD-ATS, Preston County, West Virginia					
Map Unit Name	**Mapping Symbol**	**Acres**	**Prime Farmland**	**Hydric**	**Erosion (Water)**
Shouns silt loam, 25-35 percent slopes, very stony	SkE	79	No	No	Very severe
Shouns-Macove-Cateache complex, 35-65 percent slopes, very stony	SmF	97	No	No	Very severe
Tilsit silt loam, 3-8 percent slopes	TlB	29	Yes	No	Moderate
Udorthents, smoothed	Ud	92	No	No	Variable
Udorthents-Urban land complex, 0-5 percent slopes	UuA	133	No	No	Slight
Zoar silt loam, 0-3 percent slopes, rarely flooded	ZoA	3	Yes	No	Slight
Zoar silt loam, 3-8 percent slopes,	ZoB	4	No	No	Moderate

Source: NRCS, 2001

3.4 Hydrology

3.4.1 Surface Waters

CD-ATS is located in the Monongahela River basin. Surface waters associated with the CD-ATS include the Cheat River, ponds and streams. Surface water resources within the Camp Dawson Property include 12 ponds/lakes (approximately 9.4 acres) and 20 miles of intermittent and perennial streams. Named streams consist of Pringle, Morgan, and Stamping Ground Creeks Surface waters and wetlands within the Cantonment Area, Briery Mountain TA, and the Pringle Tract TA are depicted in **Figures 5a**, **b**, and **c**, respectively (Appendix D).

The Cheat River is a major tributary of the Monongahela with a 1,442 square mile drainage area. This watershed includes forestlands, agricultural lands, mining area, industrial operations, and suburban population centers. The Cheat River originates in the mountains of Parsons, West Virginia at the confluence of the Black Fork and Shavers Fork. The Cheat River offers many recreational activities such as white water rafting and fishing.

The greatest flows generally occur between December and April when soils are already saturated or frozen resulting in a seasonally high runoff coefficient. Most winter/early spring high flows result from heavy prolonged rainfall over large areas sometimes accompanied by snowmelt. Large flows occurring during the summer are usually the result of intense thunderstorm activity.

Lowest flows usually occur between August and October when surface runoff is at a minimum. As surface runoff declines, unregulated streams are fed more and more from groundwater storage. The

Cheat River is only a few feet deep in the CD-ATS area during the low flow period. During these times, river traffic is limited to small recreational craft, such as canoes and small boats.

Within the Cantonment Area, surface drainage is collected by a network of ditches, which empty into the Cheat River. Pierce Lake (or pond), a five acre man-made pond located on the east side of the Camp Dawson Proper, receives surface water flows. Morgan Run, located on the other side of the Cheat River from CD-ATS, flows eastward into the Cheat River through the southern end of the Volkstone TA. On the Briery Mountain TA, the two forks that make up Stamping Ground Run flow northwest before exiting the site. On the Pringle Tract TA, Pringle Run, the largest and most polluted drainage channel flows eastward into the Cheat River. On Briery and Pringle, small, steep streams that only flow after a rain event or in the spring are common in these areas. Intermittent, seasonal ponds also occur in various locations throughout the Briery Mountain and Pringle Tract TAs.

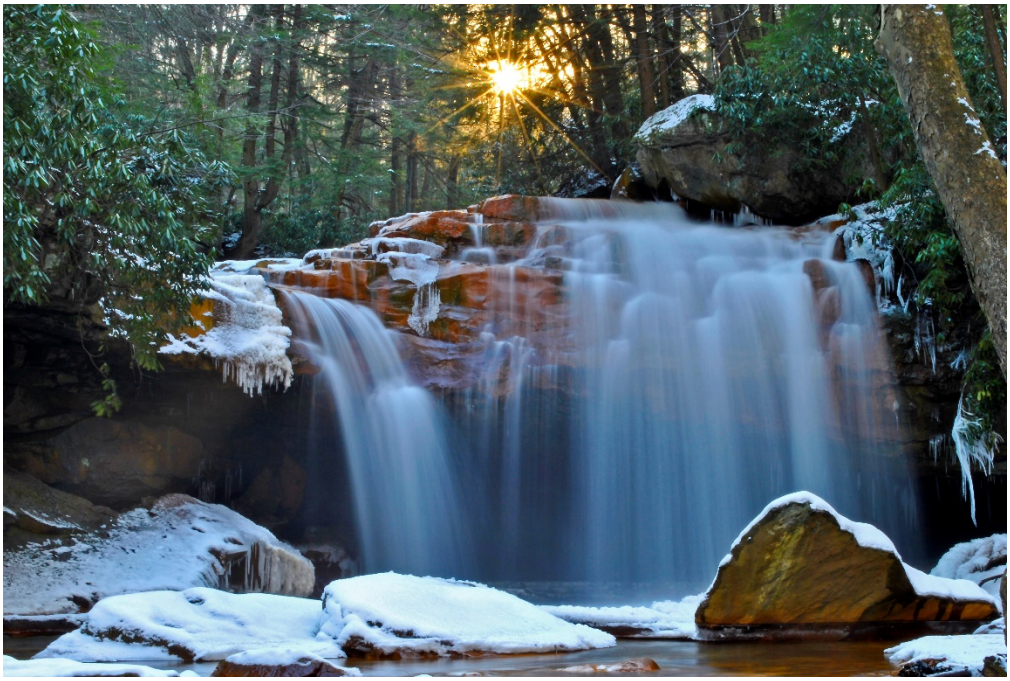


Photo 4. Pringle Run Waterfall, Pringle Tract Training Area, CD-ATS. *Photo by Ryan Snyder.*

The USGS has a gauging station in Rowlesburg and Albright, which are approximately eight miles upstream and three miles downstream, respectively, of CD-ATS. The drainage area at Rowlesburg is 939 square miles and 1,044 square miles at Albright. Regulatory agencies, such as the USGS and the WVDEP, monitor water quality in the Cheat River. Major impacts to the Cheat River include acid mine drainage.

The CD-ATS stretch of the Cheat River is heavily contaminated by AMD characterized by low pH and the presence of metals. Both, Morgan and Pringle Run, which are across the river from Camp Dawson Proper, have been heavily contaminated by AMD.

3.4.2 Floodplains

Floodplains generally are areas of low, level ground present on one or both sides of a stream channel that are subject to either periodic or infrequent inundation by flood waters. Floodplains are typically the result of lateral erosion and deposition that occurs as a river valley is widened. High water tables and flooding are associated with floodplains. Inundation dangers associated with floodplains have prompted federal, state, and local legislation limiting the development in these areas to recreation, agriculture, and preservation activities. Floodplains are regulated by the Federal Emergency Management Agency (FEMA) with standards outlined in 44 CFR Part 60.3.

EO 11988 (*Floodplain Management*) requires agencies to assess the effects that their actions may have on floodplains and to consider alternatives to avoid adverse effects and incompatible development on floodplains. CD-ATS is located on the edge of the flood-prone region of the Cheat River. According to data from the USGS, the 63-year mean flow rate of the Cheat River near Kingwood is 2,298 cubic feet per second. The range for flows rates during 1988 was 43 to 21,800 cubic feet per second. The maximum flow rate on record was 190,000 cubic feet per second on November 4, 1985. This unusually high flow rate caused the river to overflow its banks and flood the surrounding areas. During this flood, the river rose 16 feet above its normal level. This flood (the "500-year flood event") wiped out most of the buildings in the Cantonment Area and left the previous armory under eight feet of water. All subsequent buildings were rebuilt above the 100-year floodplain (as defined by the FEMA) (WVARNG, 2001).

3.4.3 Wetlands

The USACE and the USEPA define wetlands as:

> "Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas."

Both Federal and State laws and regulations protect waters of the state, which includes wetlands. The Clean Water Act (CWA) is the primary law protecting U.S. waters. Section 404 of the CWA (33 USC 1344) prevents the discharge of dredged or fill material into waters of the U.S. without a permit from the USACE. Generally, whenever a Section 404 permit is required, a Section 401 Water Quality Certification (WQC) issued by the State of West Virginia is also required.

EO 11990 (*Protection of Wetlands*) requires Federal agencies to take action to minimize the destruction, loss or degradation of wetlands, and to conserve and enhance the beneficial values of wetlands.

The USACE, Waterways Experiment Station (WES) conducted a post-wide wetland planning level survey for the CD-ATS using aerial photograph interpretation combined with ground-truthing and subsequent modifications. The planning level survey was completed in 2001. The WES boundaries are not jurisdictional boundaries. During this planning level survey, approximately 9.6 acres of wetlands were surveyed, which consisted of two palustrine forested (PFO) and three palustrine scrub-shrub (PSS) wetlands located on the Volkstone TA and 14 palustrine emergent (PEM) wetlands located within all three TAs (Lee et al., 2001).

A jurisdictional wetland survey of the CD-ATS was conducted in the summer of 2006. A total of 44 wetlands were delineated comprising 14.2 acres. Of the 44 wetlands, 43 of these wetlands are jurisdictional wetlands; the remaining wetland, which is located on Camp Dawson Proper, did not meet the definition because it is continuously mowed (Anderson & Rentch, 2006). **Table 5** summarizes the type and location of these wetlands at the CD-ATS. Refer to Figures 5a, b, and c (Appendix D) for the wetlands delineated during the 2006 surveys.

Table 5. Wetland Type and Location, CD-ATS, Preston County, West Virginia

CCD-ATS Land Tract	Wetland Type	Total Number	Acreage
Camp Dawson Proper	PEM	2	0.21
	PFO		0.43
Briery Mountain TA	PEM	12	0.71
	PSS		0.18
Pringle Tract TA	PEM	16	1.80
	PSS		0.41
Volkstone TA	PEM	14	6.74
	PSS		3.67

Source: Anderson & Rentch, 2006

3.4.4 Ground Water

Aquifers in consolidated sedimentary rocks in the Appalachian Plateaus Province are divided into the two categories: the Mississippian aquifers and the Permian and Pennsylvanian aquifers. The CD-ATS is located in the Permian and Pennsylvanian aquifers. Water yielding rocks are sandstones. Well yields in the Permian and Pennsylvanian sandstones range from five to 400 gallons per minute. Coal beds and seams also store and transmit water because they commonly are fractured. Devonian siltstone, shale, and thin-bedded sandstone are not aquifers, but they locally yield sufficient water for domestic and commercial supplies, especially where the rocks are fractured.

Most of the groundwater moves through local or intermediate-scale flow systems; no regional flow occurs. Underground mining of coal disturbs the natural groundwater flow system by creating new fractures that increase permeability and alter direction of flow. Groundwater tends to flow toward mines, which are usually dewatered by pumping. Adverse effects of mine drainage on well yields are greatest where the mines are not much deeper than the bottoms of the wells and where vertical fractures connect the aquifers and the mines. Abandoned mines can collapse, which causes fracturing of the rocks that overlie the mine and might be accompanied by an appreciable

depression on the land surface. These conditions are likely to enhance recharge to the groundwater system and to reduce surface runoff and evapotranspiration.

Total freshwater withdrawals from consolidated sedimentary rock aquifers in the Appalachian Plateau were estimated to be 282 million gallons per day during 1985. About 47 percent was withdrawn for domestic and commercial supplies, and about 41 percent was pumped for industrial, mining, and thermoelectric power purposes (most of this water was used for coal mining operations). The remaining water withdrawn was used for public water supply and agriculture (Trapp & Horn, 1997).

3.4.4.1 Regional Water Quality

The chemical quality of water in the freshwater parts of the bedrock aquifers of the Appalachian Plateaus Province is somewhat variable, but generally is satisfactory for municipal supplies and other purposes. Most of the water in the upper portions of the aquifers is suitable or suitable after treatment. Saline water or brine is near the surface in much of the area because circulation of fresh groundwater generally extends no more than a few hundred feet below the land surface.

Contamination of groundwater by the improper construction or plugging of oil and gas wells is a common problem in the Appalachian Plateaus Province. While practices are generally prohibited now, impacts from past activities remain. In coal-mining areas, which in the Appalachian Plateaus Province are generally within the limits of Pennsylvanian rocks, ground water commonly includes water that has been in contact with mine activities or that has infiltrated and leached mine spoil piles. Water affected by coal-mining operations is usually acidic. The acid water commonly contains large concentrations of iron, manganese, sulfate, and dissolved solids and is highly colored (Trapp & Horn, 1997).

3.4.4.2 CD-ATS Water Quality

Prior to August 2001, the CD-ATS obtained its drinking water from a well located near the Cheat River. The drinking water well was taken out of service once the municipal connection was made to the City of Kingwood. During the period of time when the drinking water well was in use, water quality parameters were assessed. Water quality parameters tested included lead, copper, nitrate, nitrite, inorganics, and regulated organic chemicals. All samples were deemed below the regulatory level except for lead in February 1994. All subsequent lead samples were below the action level (WVARNG, 2001).

The CD-ATS operated a fuel point near the present location of the motor pool of Organization Maintenance Shops (OMS) # 4. The site previously had a 6,000-gallon diesel Underground Storage Tank (UST) and a 6,000-gallon gasoline UST that leaked. The diesel and gasoline tanks were removed in 1993 and 1995, respectively. In 1998, a contract was awarded to remove the contaminated soil and install monitoring wells to determine if the groundwater had been contaminated. Approximately 3,029 tons of contaminated soil from the former tank pits is stockpiled near the small arms ranges. Four monitoring wells were installed to a depth of 16 to 25 feet. The wells were sampled quarterly over a one-year period. Groundwater samples had hydrocarbon levels below the state action limit for all four sampling events. As a result, groundwater monitoring ceased in 2000.

In February 1997, approximately 1,200 gallons of JP-8 (jet fuel) were released due to a failure of the underground piping from the aviation fuel point. Over the course of an investigation, 126 soil samples, 18 groundwater samples, and one surface water sample were collected. Approximately 190 cubic yards of soil were removed and treated. On August 1998, the WVDEP issued a No Further Action letter for the JP-8 release.

On 18 January 2018, approximately 1,644 gallons of F-24 was released from AST # 1 at the Camp Dawson fuel farm.
Most of the fuel was released to the concrete pads, then to the secondary containment pit and ultimately made its way to the oil water separator. Some fuel contaminated the grass/soil downhill from the tank.

On 19 Jan 2018, Weavertown Environmental Group pumped approximately 3,000 gallons from the oil water separator into a 6k tanker. Additionally, the fuel that was retained on the concrete pads was absorbed using socks, pigs and kitty litter and was placed in ten 55 gallon metal drums. The concrete pads were pressure washed and that waste from pressure washing operations was also pumped into the 6k tanker. The 6K tanker has a total of approximately 3,225 gallons.

Over the course of the spring 2018, approximately 33 tons of soil was dug up next to AST #1 to remove fuel contaminated soil and disposed of at Meadowfill Landfill in Bridgeport WV.

In June 2018 Weavertown Environmental Group returned to clean/pressure wash the concrete pad around the AST #1, the secondary containment pit, and cleaned out the oil water separator. All waste water/sludge from the cleaning was contained in a vac-truck totaling 3,100 gallons. Flash point >201 F, so disposed of as Non-Hazardous to Weavertown Transfer in McDonald, PA.

4.0 ECOSYSTEMS AND THE BIOTIC ENVIRONMENT

4.1 Ecosystem Classification

The CD-ATS, including all three tracts discussed in this plan, is located within The Nature Conservancy's (TNC) Central Appalachian (CAP) Ecoregion. Ecoregions are areas of similarity in ecosystems and in the type, quality, and quantity of environmental resources (Pater et al., 1998). The CAP Ecoregion, stretching from Pennsylvania to Northern Tennessee, is primarily a high, dissected, rugged plateau composed of sandstone, shale, conglomerate, and coal.

> "This section comprises part of the Appalachian Plateau geomorphic province is a maturely dissected plateau characterized by high, sharp ridges, and low mountains, and narrow valleys. It has a prominent structural and topographic grain created by broad, northeast to southwest trending folds in the bedrock. Drainage is dendritic to trellis, but primarily the former" (McNab and Avers, 1994).

4.2 Vegetation

A baseline floristic survey of the CD-ATS was conducted by the WVDNR - Natural Heritage Program (WVNHP) during the 2000 growing season and updated in the summer of 2005 and spring of 2006 (Streets, 2006; Streets, 2001). A total of 603 species of plants were identified with 105 families represented (**Appendix F**). More than fifteen percent of the flora identified was either exotic or introduced. Some of these species are invasive to the natural plant habitats found on the CD-ATS. The most prevalent of these are Japanese knotweed *(Polygonum cuspidatum)*, garlic mustard *(Alliaria petiolata)*, Japanese stilt grass (*Microstegium vimineum*) and rambler or multiflora rose *(Rosa multiflora)*. Japanese knotweed was found to grow within the flood scoured river edges. These edges are naturally open communities maintained by periodic flooding creating riverside prairies. Riverside prairies are home to many rare plants in West Virginia. Garlic mustard was found growing along most of the tributaries in the Pringle and Volkstone TAs and in the floodplain forest along the Cheat River. These areas are also home to a host of native plant taxa. Japanese stilt grass was found to occur on many of the old logging roads on Briery Mountain. Multiflora rose was found growing throughout the survey area, making it a possible threat to all native plant communities at that CD-ATS with the exception of closed canopy forest (Streets, 2006).

A total of 14 plant communities were classified, characterized, and mapped in 2000 (Vanderhorst, 2001). These included ten forest communities and four herbaceous communities. A revision of the 2000 vegetation classification was conducted during the 2005 growing season in order to map vegetation within the new land acquisitions and to ensure vegetation mapping covered the newly surveyed CD-ATS boundaries. An additional three forest communities were identified during the subsequent survey (Vanderhurst & Streets, 2006). Communities that were identified during both of these surveys include:

- Mature floodplain forest;
- Successional floodplain forest;
- Mixed mesophytic forests of colluvial slopes;
- Hemlock ravines;
- Successional forests of low elevation plateaus;
- Pine plantations;
- Transitional forests of high elevation colluvial slopes;

- Mixed montane hardwood forest;
- Sub-xeric oak forest;
- Xeric oak/evergreen heath forest;
- Forest seeps;
- Oak-hickory;
- Successional tulip poplar forests;
- Riverscour prairies;
- Herbaceous wetlands;
- Bottomland old fields;
- Old fields.

These plant communities are described briefly below. Refer to **Figure 6a**, **b**, and **c** (Appendix D) for the location of plant communities on the Cantonment Area, the Briery Mountain TA, and the Pringle Tract TA (respectively). Additional information on these plant communities may be found in the *Vegetation Classification and Mapping of Camp Dawson Army Training Site, Preston County, West Virginia: Second Approximation* (Vanderhorst and Street, 2006), which is available in the CD-ATS Environmental Office.

***Mature floodplain forest*.** This community occurs on an island and along the shores of the Cheat River in the Volkstone and Camp Dawson Proper tracts. The tree canopy is dominated by yellow buckeye (*Aesculus flava*), beech (*Fagus grandifolia*), tulip-poplar (*Liriodendron tulipifera*), and northern red oak (*Quercus rubra*) alone or in some combination. Sugar maple and black cherry (*Prunus serotina*) are codominant trees in all plots. Additional canopy trees in some plots include red maple (*Acer rubrum*), sweet birch (*Betula lenta*), bitternut hickory (*Carya cordiformis*), pignut hickory (*Carya glabra*), basswood, and slippery elm (*Ulmus rubra*). Cover in the herbaceous layer varies in relation to understory cover and ponding. Herbaceous cover is sparse in areas, which are heavily shaded, and/or in depressions, which have standing water for significant periods during the growing season.

***Successional floodplain forest*.** This community occurs on the floodplain of the Cheat River in the Volkstone and Camp Dawson Proper tracts. Canopies in the plots are dominated by black locust (*Robinia pseudoacacia*) or bitternut hickory. Additional canopy trees in the plots include sweet birch, shagbark hickory (*Carya ovata*), white ash, black cherry, and slippery elm. The tall shrub layer in both plots includes musclewood (*Carpinus caroliniana*) and hawthorn (*Crataegus* spp.). Rambler rose, an exotic species, is abundant in the short shrub layer. The shrub layers also include saplings of shade tolerant trees. Poison ivy (*Toxicodendron radicans*) is an abundant vine. The herbaceous component is characterized by species adapted to moist alluvial soils and flooding disturbance. Abundant species include Indian strawberry (*Duchesnea indica*), Virginia wild rye (*Elymus virginicus*), white grass (*Leersia virginica*), Virginia knotweed (*Polygonum virginianum*), wingstem (*Verbesina alternifolia*), and the exotic ground ivy (*Glechoma hederacea*).

***Mixed mesophytic forests of colluvial slopes*.** This community occurs on colluvial slopes with limestone parent material at the south end of the Briery Mountain tract. Dominant and codominant canopy trees include sugar maple, basswood, yellow buckeye, beech, tulip-poplar, northern red oak, and red maple. Additional important canopy trees include sweet birch, white ash, slippery elm, black locust, and tree of heaven *(Ailanthus altissima*). Common shrubs include: spicebush *(Lindera benzoin*), black elderberry *(Sambucus canadensis*), and rambler rose, an invasive exotic. The herbaceous layer is usually lush and diverse. Populations of the Federally-listed endangered running buffalo clover were found during the 2005-

2006 survey on the Volkstone and Briery Mountain TAs (see **Figure 7a** and **7b**, respectively) (Streets, 2006). This species is dependent on some disturbance and was found in areas disturbed by logging and by the removal of tree of heaven, an invasive tree species. CD-ATS-ENV staff continue to monitor and manage for the Briery TA population; however, the Volkstone TA population is no longer present on the training area. The disappearance of the Volkstone TA population is likely due to canopy closure and over competition by Japanese stiltgrass (*Microstegium vimineum*).

Hemlock ravines. This community occurs in small areas along creeks. It occurs on stream terraces and extends up the lower slopes on northerly aspects. This forest is dominated by a mixture of evergreen conifer and deciduous hardwood trees over an often dense layer of evergreen shrubs. Common canopy trees include: hemlock, beech, tulip-poplar and sweet birch. Additional canopy trees which may have significant cover include yellow birch *(Betula alleghaniensis*), cucumber magnolia *(Magnolia acuminata*), black cherry, and northern red oak. The shrub layer is dominated by big rhododendron (*Rhododendron maximum*) and may include lesser amounts of mountain holly (*Ilex montana*), witch-hazel (*Hamamelis virginiana*), and spicebush. The ground layer has low to moderate cover and species richness dominated by ferns.

***Successional forests of low elevation plateaus*.** This community represents the forests of the upland plateau of the Pringle Tract TA, which is dissected by Pringle Creek and its tributaries, and small areas above the gorge slopes in the Camp Dawson Proper and Volkstone TA. The tree canopy is dominated by some combination of tulip-poplar, black cherry, red maple and sugar maple. Codominant canopy trees in some plots include beech on clay soils and black locust in the youngest stands. The shrub layer usually includes elderberry, but it is not dominant. The most common herbs are white snakeroot (*Ageratina altissima*), four-leaved wild yam (*Dioscorea quaternata*), sweet-scented bedstraw (*Galium triflorum*), wood nettle (*Laportea canadensis*), false Solomon's seal (*Maianthemum racemosum*), smooth sweet cicely (*Osmorhiza longistylis*), Christmas fern (*Polystichum acrostichoides*), common cinquefoil (*Potentilla simplex*), wreath goldenrod (*Solidago caesia*), and violets (*Viola* spp.). The stoloniferous ground pine (*Diphasiastrum digitatum*) is the dominant ground cover in large patches of this community.

***Pine plantations*.** This community occurs primarily on reclaimed strip mines on the plateau of the Pringle Tract TA. This community is dominated by a monoculture of even-aged planted white pine (*Pinus strobus*). "Natural" trees, which dominate the fallow strips and occur in lesser amounts in the plantation strips, include red maple, black cherry, pin cherry (*Prunus pennsylvanica*), and black locust. The shrub layer includes the native spicebush and the exotics' black alder (*Alnus glutinosa*), autumn olive (*Eleagnus umbellata*), and rambler rose. Herbaceous cover varies with amount of shading. Herbs with high cover in less shaded stands include hairy sweet cicely, ebony sleenwort (*Asplenium platyneuron*), white avens (*Geum canadense*), clearweed (*Pilea pumila*), and Virginia knotweed. Cutleaf grapefern (*Botrychium dissectum*) has a high indicator value for this community within the study area.

Transitional forests of high elevation colluvial slopes. This community occurs on the upper south facing colluvial slopes at the south end of the Briery Mountain TA. This forest is dominated by a mixture of hardwoods over relatively dense tall and short shrub layers. Canopy dominants include: sugar maple, black cherry, red maple, northern red oak and black oak *(Quercus velutina*). Other canopy trees include shagbark hickory, white ash, and tulip-poplar. Striped maple (*Acer pensylvanicum*) and common greenbrier (*Smilax rotundifolia*) dominate the understory.

Mixed montane hardwood forest. This community occupies mesic aspects of the upper slopes of Briery Mountain TA. The tree canopy is dominated by red maple, black cherry, northern red oak, and tulip-poplar. Additional common trees include sugar maple, sweet birch, white ash, cucumber magnolia, chestnut oak (*Quercus prinus*), and white sassafras (*Sassafras albidum*). Chestnut (*Castanea dentata*) saplings may be found in this community, indicating possible historical overstory dominance by this tree prior to its

decimation by blight. The shrub striped maple is a diagnostic of this community and is often dominant in the subcanopy along with tree saplings.

Additional common shrubs include serviceberry (*Amelanchier arborea*), witch-hazel, mountain holly, and flame azalea (*Rhododendron calendulaceum*). There is usually a well-developed layer of scrambling, armed vines including green brier and raspberries (*Rubus* spp.). The herbaceous layer has only moderate diversity but cover can be quite high, especially in stands with open canopies.

Sub-xeric oak forest. This community occupies drier aspects of the upper slopes of the Briery Mountain TA. This is a small patch forest dominated by deciduous hardwoods adapted to dry-mesic conditions over a mixed shrub layer of scrambling vines and deciduous heath. The dominant canopy species include red maple, chestnut oak, and northern red oak. Other common canopy species include white oak (*Quercus alba*), tulip-poplar, and black cherry. Like all forests in the Briery Mountain TA, tree composition of this community has been significantly altered by selective harvests. Characteristic species of subcanopy trees include black gum (*Nyssa sylvatica*) and white sassafras. The low shrub layer is typically dominated by a mixture of green brier and late low blueberry (*Vaccinium pallidum*). The herbaceous layer has relatively low diversity and is composed primarily of tree and shrub seedlings, clonal ferns and species of panic grasses (*Dichanthelium* spp.). This community is poorly developed on the Briery Mountain TA, representing the mesic end of oak/heath forests in the state.

Xeric oak/evergreen heath forest. This community occurs in one narrow band in the Briery Mountain TA. It is on a dry, rocky, convex upper slope with a west to southwest aspect. The community is bisected by the main Briery Mountain Loop Road and by logging skid trails. This is a small patch forest community dominated by xeric adapted oaks over a mixture of evergreen and deciduous shrubs. Dominant trees in the rather short upper canopy (about 60 feet tall) include chestnut oak, scarlet oak (*Quercus coccinea*), and red maple. White oak occurs in the canopy in lesser amounts. The subcanopy is dominated by the above species and by black gum. Tree saplings in the shrub layer include root sprouts of chestnut, indicating probable historical dominance by this species prior to its decimation by blight. The shrub layer is characterized by moderate to dense cover by shrubs including mountain laurel (*Kalmia latifolia*), late low blueberry, black huckleberry (*Gaylussacia baccata*), and teaberry (*Gaultheria procumbens*), Ground cover is generally sparse.

Forest Seep. This community occurs in seeps on the Briery Mountain TA on shallow alluvial deposits and residual soils in the headwaters of small, low, gradient perennial streams. Occurrences are jurisdictional wetlands. The tree canopy consists of species typical of the surrounding upland forest which are rooted on the edges and overhang the wetland community. Trees observed include black cherry, white ash, and red maple. The shrub layer includes streamside alder (*Alnus serrulata*), spicebush, and winterberry holly (*Ilex verticillata*). The fairly dense herbaceous layer is dominated by wetland indicator species including mannagrass (*Glyceria melicaria*), fowl mannagrass (*Glyceria striata*), drooping sedge *(Carex prasina*), common rush (*Juncus effusus*), leafy bulrush (*Scirpus polyphyllus*), cinnamon fern (*Osmunda cinnamomea*), northern bugleweed (*Lycopus uniflorus*), and marsh blue violet (*Viola cucullata*). Mosses include American woodsy mnium (*Plagiomnium ciliare*), bordered brook moss (*Platylomella lescurii*), and wolly large leaf mnium (*Rhizomnium appalachianum*).

Mixed montane hardwood forest. This community is the matrix forest of the Briery Mountain TA. Similar younger even-aged stands also occur on the plateaus of the Pringle Tract TA. The overstory vegetation reflects the effects of historical logging. Due to recent selective cuts, the understory is well developed and crowded with saplings, rambling vines, and clonal ferns. The tree canopy is dominated by red maple, black cherry, northern red oak, and tulip-poplar. The dominance of red maple is attributed to its low value as timber, while the high representation of black cherry is likely a silviculture strategy to increase the volume of this high value timber tree for future harvest. Striped maple is often the dominant in the subcanopy along

with tree saplings. Additional common shrubs include serviceberry, witch-hazel, mountain holly, and flame azalea. There is typically a well developed layer of scrambling, armed vines including green briar and species of raspberries. The herbaceous layer has only moderate diversity but cover can be quite high, especially in stands with open canopies. The hay scented fern (*Dennstaedtia punctilobula*), a type of clonal fern, is the most abundant herbaceous species. Rare sedge species were observed in this community, glomerate sedge (*Carex aggregata*) and Appalachian sedge (*Carex appalachica*).

Oak – hickory forests. This community occurs on a ridge spur above the Cheat River on the Volkstone TA. This small forest stand is more mature than most CD-ATS forests. Old growth features include age class diversity (including oak regeneration) and large coarse woody debris (snags and fallen trunks). The tree canopy includes northern red oak, black oak, white oak, and mockernut hickory (*Carya alba*). Additional species in the subcanopy include sugar maple, shagbark hickory, and red maple. Shrubs include service berry, black haw (*Viburnum prunifolium*), and maple-leaf viburnum (*Viburnum acerifolium*). Dominant herbs include Pennsylvania sedge (*Carex pensylvanica*) and may-apple (*Podophyllum peltatum*).

Sub-xeric oak forests. This community occupies dryer aspects along the upper slopes of the Briery Mountain TA and is an intermediate between the mesic mixed montane hardwood and the xeric oak/evergreen heath forest. The dominant canopy species in the plots are (in decreasing order of mean cover) red maple, chestnut oak, and northern red oak. Characteristic species of subcanopy trees include black gum and white sassafras. The tall shrub layer commonly includes the above listed species and striped maple. The low shrub layer is typically dominated by a mixture of green brier and late low blueberry. The herbaceous layer has relatively low diversity and is composed primarily of tree and shrub seedlings, clonal ferns such as hay scented fern, New York fern (*Thelypteris noveboracensis*) and tree club moss (*Lycopodium obscurum*), and grasses such as mountain oatgrass (*Danthonia compressa*), and bushy panic grass (*Dichanthelium dichotomum*). Characteristic herbs which occur in trace amounts include Indian pipe (*Monotropa uniflora*), Indian cucumber root (*Medeola virginica*), and whorled loosestrife (*Lysimachia quadrifolia*).

Successional tulip poplar forests. This community occurs within the Briery Mountain TA, Pringle Tract TA, and Volkstone TA in areas, which have been repeatedly logged and on abandoned farmland and mines. Development of this community type is an indication of past canopy disturbance that resulted in a sunny environment necessary for optimal growth of the shade intolerant tulip-poplar. Additional tree species in the tree canopy include black cherry, red maple, black locust and pignut hickory. Common shrubs include elderberry, alternate-leaved dogwood (*Cornus alternifolia*), spicebush, late low blueberry, and maple-leaf viburnum. The most common herbs are white snakeroot, four-leaved wild yam, sweet-scented bedstraw, wood nettle, smooth sweet cicely, Christmas fern, New York fern, wreath goldenrod, wingstem, and violets. The stoloniferous ground pine is the dominant ground cover on the Pringle Tract TA.

Xeric oak / evergreen heath forests. This community occurs in one narrow band within the Briery Mountain TA, and is bisected by the main Briery Mountain Loop Road and by logging skid trails. Dominant trees in the rather short upper canopy (about 60 feet tall) include chestnut oak, scarlet oak and red maple. The subcanopy is dominated by the above listed species and black gum. Tree saplings in the shrub layer include root sprouts of chestnut, indicating probable historical dominance by this species prior to its decimation by blight. The shrub layer is characterized by moderate to dense cover by species in the Ericaceae (the heath family). Diagnostic shrubs include the evergreen mountain laurel, and the deciduous late low blueberry and black huckleberry. Ground cover is sparse, composed primarily of tree seedlings and a few scattered herbs which are adapted to dry, acidic, nutrient poor soils. Herbaceous species include pink

lady's slipper *(Cypripedium acaule*), Indian cucumber root, Indian pipe, and bracken fern (*Pteridium aquilinum*).

***Riverscour prairies*.** This community occupies scoured cobble zones along the Cheat River in the Camp Dawson Proper and Volkstone TA. This is a linear small patch community dominated by tall grasses with scattered shrubs and short trees and a high diversity of herbaceous plants adapted to full sun and frequent disturbance. Sycamore is the most abundant species, but western catalpa (*Catalpa speciosa*) was also found in most plots. Tall shrubs include streamside alder (*Alnus serrulata*) and musclewood. Native short shrub species include silky cornel (*Cornus amomum*), ninebark (*Physocarpus opulifolius*), raspberries, Ward's willow (*Salix caroliniana*), and silky willow (*Salix sericea*). The short shrub layer also includes the exotic privet (*Ligustrum vulgare*), Japanese honeysuckle (*Lonicera japonica*), and rambler rose. Codominant grasses in all sampled stands were big bluestem (*Andropogon gerardii*) and switch grass (*Panicum virgatum*).

***Herbaceous wetlands*.** This community occupies wet alluvial bottomlands in the Volkstone TA. This small patch wetland community is dominated by grasses with scattered trees and shrubs. Scattered small trees include black locust, black willow (*Salix nigra*), and red ash (*Fraxinus pensylvanica*). The exotic shrub rambler rose and native silky cornel occur in this community. The dominant grasses are rice cutgrass (*Leersia oryzoides*) and reed canary grass (*Phalaris arundinaceae*).

Herbaceous wetland indicator species include hollow Joe-Pye weed (*Eupatorium fistulosum*), common rush, great blue lobelia (*Lobelia siphilitica*), bugleweed (*Lycopus virginicus*), monkey flower (*Mimulus ringens*), cinnamon fern, royal fern (*Osmunda regalis*), black bulrush (*Scirpus atrovirens*), golden ragwort (*Packera aurea*), New York ironweed (*Vernonia noveboracensis*), and marsh blue violet.

***Bottomland old fields*.** This community occurs on abandoned farmlands within the bottomlands of the Volkstone TA. This is an herbaceous community with high cover dominated by tall composites and grasses. The dominant species are wingstem and reed canary grass. Tree species found in the plots include hawthorn, red ash, black cherry, and slippery elm. The exotic shrubs rambler rose and autumn olive are invasive in this community. Vines include raspberries and poison ivy. Characteristic herbaceous species in addition to the dominants include false nettle (*Boehmeria cylindrica*), crown vetch (*Coronilla varia*), deer-tongue grass (*Dichanthelium clandestinum*), Indian strawberry, hollow Joe-Pye weed, grass-leaved goldenrod (*Euthamia graminifolia*), white avens, ground ivy, wrinkled leaf goldenrod (*Solidago rugosa*), and American germander (*Teucrinum canadense*).

Old field. This herbaceous community is dominated by mostly exotic grasses and forbs with scattered early successional trees and exotic shrubs. Common herbaceous species include: meadow fescue (*Festuca pratensis*), an exotic cool season grass, and broom sedge (*Andropogon virginicus*), a native warm season grass. Other native species include: deertongue grass and Indian grass (*Sorghastrum nutans*). Additional exotic grasses that are common include sweet vernal grass (*Anthoxanthum oderata*), tall oat-grass (*Arrhenatharum elatius*), orchard grass (*Dactylis glomerata*), velvet grass (*Holcus lanatus*), perennial rye grass (*Lolium perenne*), and timothy (*Phleum pratense*). The forb component is dominated by exotic reclamation species and weeds. Exotic forbs include Queene Anne's lace (*Daucus carota*), St. John's wort (*Hypericum perfoliatum*), oxeye daisy (*Leucanthemum vulgare*), birdsfoot trefoil (*Lotus corniculata*), English plantain (*Plantago lanceolata*), low hop clover (*Trifolium campestre*), red clover (*Trifolium pratense*), and white clover (*Trifolium repens*). The most common native forbs are field basil (*Clinopodium vulgare*), common cinquefoil, Canada goldenrod (*Solidago canadensis*), and swamp goldenrod (*Solidago uliginosa*).

4.3 Fish and Wildlife

The WVU Wildlife and Fisheries Resources Program conducted a comprehensive faunal inventory in 2000-2001 and again in 2006 at the CD-ATS. Surveys were conducted targeting the avian, small mammal, and herpetofauna communities. More limited surveys also were conducted for moths, fishes, benthic invertebrates, and butterflies in 2000-2001. Species documented during these surveys at the CD-ATS included 39 mammals, 106 bird species, ten reptiles, 19 amphibians, 141 moths, 24 fishes, and eight benthic invertebrates (Anderson & Kerns, 2006; Anderson et al., 2002a). Taxa lists for fauna at the CD-ATS are provided in Appendix F.

4.3.1 Mammals

A total of 39 mammals (including bats) were identified consisting of nine rare mammal species (Appendix F). Mammals were surveyed using Sherman live traps, tomahawk live cage traps, snap traps, pitfall traps, and scent stations. Mole species were targeted specifically with Victor Out-of-Site and plunger traps (Anderson & Kerns, 2006; Anderson et al., 2002a).

Bats were surveyed using mist netting in the summer of 2002 and 2006 and using acoustic sampling and mist netting in the summer of 2013, 2016 and 2019. No Indiana bats have been captured via mist netting on the CD-ATS (Mann & Brack, 2006; Schwierjohann et al., 2002). A total of eight bat species were observed during the 2002 and 2006 surveys, including the state rare eastern small-footed bat (*Myotis leibii*) and silver-haired bat (*Lasionycteris noctivagans*). In 2013, 2016 and 2019 Indiana bats were positively identified via acoustic sampling. Additionally, northern long-eared bats were captured and identified during the 2013, 2016 and 2019 surveys (De La Cruz & Karp, 2013; De La Cruz & Schroder, 2016; Schroder & Maltba, 2019).

Photo 5. Mammal Scent Station. CD-ATS. *Photo by Amy Spurgeon. WVU Wildlife and Fisheries Program*

4.3.2 Birds

A total of 106 bird species were observed including eight rare bird species (Appendix F). Birds were surveyed using point count sampling within six different habitat types, which included forest edge, forest interior, riparian edge, riparian interior, reclaimed mine areas, and developed areas. Both double-observer point count methodologies were conducted at all point locations on the CD-ATS. The combined double-observer technique uses two observers: one is designated the primary observer and the other is selected as the secondary observer. The primary observer is responsible for identifying and verbally communicating all birds he/she detects to the secondary observer. The secondary observer records this information along with birds that are not detected by the primary observer. The independent double-observer approach is similar to the previously described double-observer method. The difference is that observers record data separately on different data sheets and do not verbally converse with each other during the point count (Anderson & Kerns, 2006; Anderson et al., 2002a).

The CD-ATS provides habitats and open space for a wide variety of migratory birds that migrate annually within and beyond North America (see Appendix F). Regardless of how these migratory birds use the CD-ATS, their presence provides important ecological services and an important indicator of ecosystem health. Primary considerations with regard to migratory bird management are compliance with the Migratory Bird Treaty Act (MBTA); implementation of migratory bird management actions in accordance with EO 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*; and support, contribution and compatibility with the goals and efforts of numerous regional migratory and game bird conservation programs. In response to EO 13186, the DoD entered into a Memorandum of Understanding (MOU) with the USFWS that outlines agency responsibilities. Per the MOU, the DoD is committed to the following responsibilities:

- Follow all migratory bird permitting requirements for intentional take
- Encourage incorporation of comprehensive migratory bird management objectives into relevant DoD planning documents
- Manage militatary lands and non-military readiness activities in a manner that supports migratory bird conservation, habitat protection, resortation, and enhancement
- Inventory and monitor birds on DoD lands to facilitate decisions about the need for, and effectiveness of, conservation efforts
- Work cooperatively with USFWS and state fish and wildlife agencies to promote timely development, effective review, and revisions of INRMP, including any potential revisions to promote the conservation of migratory birds
- Incorporate conservation measures addressed in regional or state bird conservation plans in the INRMP development process
- Consistent with safety and security requirements, allow USFWS and other partners reasonable access to military lands for conducting sampling or survey programs
- Consistent with safety and security requirements, support the economic and recreational benefits of bird-related activities by allowing public access to military lands for recreational uses
- Develop policies and procedures for facilities design that will promot the conservation of

migratory bird populations and habitat

- Consult with USFWS prior to implementing any activity that has, or is likely to have, a measurable negative effect on migratory bird populations

Virtually all birds that occupy the CD-ATS throughout the year are protected under the MBTA. The MBTA controls many actions that may negatively affect migratory birds, particularly collection and transportation of birds. Special purpose permits may be requested and issued that allow for the relocation or transport of migratory birds for management purposes.

There are no bird conservation plans that encompass the CD-ATS. However, a rare species monitoring plan is currently in place for early successional habitat. This monitoring plan was initiated in 2008 and evaluates trends and changes in golden-winged warbler (*Vermivora chrysoptera*) occurrences at established sampling points on suitable habitat throughout the Pringle TA.

4.3.3 Reptiles and Amphibians

A total of ten reptile and 19 amphibian species were identified during the 2000-2001 and 2006 surveys including one rare snake and one rare salamander (Appendix F). Herpetofauna were captured using pitfall arrays designed to target small, surface active species. Funnel traps were used to capture snakes. Turtle traps were placed in one pond within the Camp Dawson Proper and Volkstone TA. In addition, complete searches were conducted in 25 x 25 foot quadrants (Anderson & Kerns, 2006; Anderson et al., 2002a).

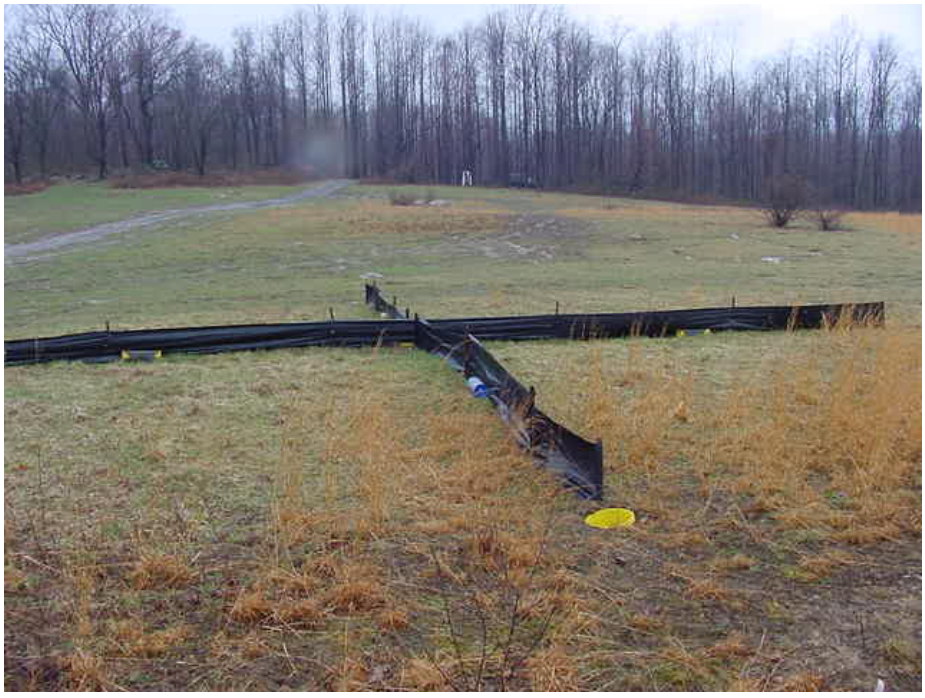


Photo 6. Pitfall Array, Briery Mountain Training Area, CD-ATS. *Photo by Amy Spurgeon. WVU Wildlife and Fisheries Program.*

4.3.4 Butterflies and Moths

A total of 141 moth species were observed during the 2000-2001 surveys (Appendix F). No rare species were observed. Light traps were used to collect night-flying lepidopterans. In addition, all field personnel looked for unusual moth and butterfly species (Anderson et al., 2002a).

4.3.5 Fish and Benthic Invertebrates

A total of 24 fish species and eight benthic invertebrate species were collected during July and August 2000 (Appendix F). Thirteen sites (four ponds and nine stream sites) were selected for sampling. Fish sampling was conducted using a 0.12 inch seine and a backpack electrofisher. Benthic sampling was conducted using D-frame sweep nets. Stream sections (each approximately 300 feet) with all available habitat types, such as pool, run and riffles, were sampled within each selected tributary (Stamping Ground Run, Pringle Run, Lick Run, and Church Creek Run (Morgan Run)). Additionally, a 300-foot section of the main-stem of the Cheat River was sampled at the mouth of Pringle Run, and 300-foot sections were sampled on each side of the island in the Cheat River adjacent to the Camp Dawson Proper (Anderson et al., 2002a).

No fish were collected at the following eight sites: an unvegetated pond on the Volkstone area, 150-foot section of Pringle Run at mouth, 300-foot section of Pringle Run approximately 0.6 miles upstream from mouth; tributary to Pringle Run near Westgate from mouth to 300 feet upstream; Church Creek Run (Morgan Run) from mouth to State Route (SR) 72 bridge; Stamping Ground Run from culvert on access road 300 feet to first fork; 300-foot section of the left fork Stamping Ground Run; and Lick Run from SR 72 crossing to 300 feet upstream. Cross-referencing of water quality samples indicated that streams that did not have fish were severely impacted by AMD.

4.3.6 Land Snails

As a result of the critical faunal survey for the Federally threatened flat-spired three-toothed snail, a total of 39 species of snails were discovered (Appendix F). However, surveys did not identify any flat-spired three-toothed snails within CD-ATS training areas. Field personnel visually surveyed areas containing potentially suitable habitat during late 2001 and 2002. General habitat types selected included:

- Old growth trees (150+ years), particularly sweet birch and chestnut oak
- An understory comprised primarily of rhododendron, particularly great laurel
- Shallow acidic soils, with numerous rock outcrops
- Deep fissures and cracks (at least 3 feet deep) in areas with high humidity, shaded by boulders and/or vegetation were considered suitable habitat.
- Leaf litter, rock outcrops, and crevices were thoroughly searched during each survey period. Snails were identified primarily through external characteristics using taxonomic keys (Schwierjohann et al., 2002).

4.4 Threatened and Endangered Species

The running buffalo clover, observed on the northern portion of the Volkstone TA and the southeastern edge of the Briery Mountain TA, is the only known Federally-listed plant species to occur within the CD-ATS (see Figure 7a and 7b**,** Appendix D). CD-ATS-ENV staff continue to monitor and manage for the Briery TA population; however, the Volkstone TA population is no longer present on the training area. The disappearance of the Volkstone TA population is likely due to canopy closure and over competition by

Japanese stiltgrass (*Microstegium vimineum*). The only known Federally-listed animal species known to occur within the CD-ATS are the endangered Indiana bat and the threatened northern long-eared bat. CD-ATS is also within the range of the endangered Virginia big-eared bat although surveys have indicated they are not currently or historically present on CD-ATS training lands. Critical faunal surveys were conducted in 2002 for the cheat three-tooth land snail and the Indiana bat. A mist net survey for the Indiana bat was conducted again in the summer of 2006. No endangered or threatened bats or snails were observed during these surveys (Mann & Brack, 2006; Schwierjohann et al., 2002). A summer acoustic and mist-netting survey for the Indiana bat was conducted again in 2013, 2016, and 2019. Indiana bats were positively identified via acoustic sampling but none were captured. Additionally, northern long-eared bats were captured and identified during the 2013, 2016, and 2019 surveys (De La Cruz & Karp, 2013; De La Cruz & Schroder, 2016; Schroder & Maltba, 2019). The USFWS requests that bat surveys be conducted every three years because mist net surveys are considered current for three years; the summer they are completed and the following two summers.

In addition to Federally-listed species, rare species are assigned State Ranks by the WVNHP and Global Ranks by NatureServe. These ranks are based on the species' documented occurrences and distributions. Other factors, such as habitat and threats to existing populations, may affect these rankings. Species with state ranks of S1, S2, or S3 are tracked by the WVNHP. A total of 30 rare species observed at the CD-ATS have a state rank of S1, S2, or S3 (see **Table 6**). Management strategies for CD-ATS rare, threatened, and endangered species is provided in **Section 6.4**.

Table 6. Rare, Endangered, and Threatened Species observed at the CD-ATS

Common Name	Genus/Species	Global Status	State Status	Federal Status
BIRDS				
Alder flycatcher	*Empidonax alnorum*	G5	S3B, S3	-
Black-billed Cuckoo	*Coccyzus erythropthalmus*	G5	S3B	-
Cliff swallow	*Petrochelidon pyrrhonota*	G5	S3B, S3	-
Golden-winged warbler	*Vermivora chrysoptera*	G4	S3B, S3	-
Great-blue heron	*Ardea herodias*	G5	S2B, S4	-
Sharp-shinned hawk	*Accipiter striatus*	G5	S3B, S3	-
Spotted sandpiper	*Actitis macularia*	G5	S3B	-
Swainson's thrush	*Catharus ustulatus*	G5	S1B	-
Yellow-bellied sapsucker	*Sphyrapicus varius*	G5	S1B, S3N	-
PLANTS				
Barbara's Buttons	*Marshallia grandifolia*	GNR	S2	-
Blue Ridge St. John's-wort	*Hypericum mitchellianum*	G3	S1	-
Butternut	*Juglans cinera*	G4	S3	-
Emory's sedge	*Carex emoryi*	G5	S2	-
False Indian-plantain	*Hasteola suaveolens*	G4	S3	-
Glomerate sedge	*Carex aggregata*	G5	S2	-
Greater Straw Sedge	*Carex normalis*	G5	S3	-
Marsh Spikerush	*Eleocharis palustris*	G5	S3	-
Running buffalo clover	*Trifolium stoloniferum*	G3	S3	LE
Small-fruited Agrimony	*Agrimonia microcarpa*	G5	S1	-
Smooth Rose	*Rosa blanda var. blanda*	G5T5Q	S2	-
Whip Nutrush	*Scleria triglomerata*	G5	S2	-
White Alumroot	*Heuchera alba*	G2Q	S2	-
REPTILES/AMPHIBIANS				
Northern red salamander	*Psuedotriton ruber*	G5	S3	-
Timber Rattlesnake	*Crotalus horridus*	G5	S3	-
MAMMALS				

Table 6. Rare, Endangered, and Threatened Species observed at the CD-ATS				
Common Name	**Genus/Species**	**Global Status**	**State Status**	**Federal Status**
Allegheny woodrat	*Neotoma magister*	G3G4	S3	-
Eastern small-footed bat	*Myotis leibii*	G3	S1	-
Indiana bat	*Myotis sodalis*	G2	S1	LE
Long-tailed shrew	*Sorex dispar*	G4	S2S3	-
Meadow jumping mouse	*Zapus hudsonius*	G5	S3	-
Northern long-eared bat	*Myotis septentrionalis*	G4	S1S2	LT
Silver-haired bat	*Lasionycteris noctivagans*	G5	S2	-
Southern bog lemming	*Synaptomys cooperi*	G5	S2	-
Southern pygmy shrew	*Sorex hoyi winnemana*	G5T5	S2S3	-
Southern rock vole	*Microtus chrotorrhinus carolinensis*	G4G3	S2	-
Star-nosed mole	*Condylura cristata*	G5	S2	-
FISH				
Bluebreast darter	*Etheostoma camurum*	G4	S3	-
FEDERAL STATUS LE = Endangered = Endangered throughout range LT = Threatened = Threatened throughout range GLOBAL RANK DEFINITIONS Basic Rank: G1 = Critically imperiled G2 = Imperiled G3 = Vulnerable G4 = Apparently secure G5 =Secure ? = Rank Uncertain		STATE RANK DEFINITIONS Basic Rank S1 = Critically imperiled S2 = Imperiled S3 = Vulnerable S4 = Apparently secure S5 = Secure S#S# = Numeric range rank: A range between two of the ranks that denotes a range of uncertainty about the exact rarity of the species. SH = Historical (not observed within last 20 years) B = Breeding population N = Non-breeding population ? = Rank uncertain		

Source: R. Snyder pers. www.wvdnr.gov/Wildlife/RareSpecList.shtm (25 Mar 2019); WVNHP, 2016

5.0 MISSION IMPACTS ON NATURAL RESOURCES

5.1 Land Use

The CD-ATS was first established in 1909 and comprised less than 200 acres. The installation is now a 3,797-acre state-managed military training area located along the Cheat River drainage in Preston County, West Virginia. The CD-ATS maintains sufficient small arms ranges, cantonment facilities and three non-contiguous TAs for company (100 to 200 soldiers) force-on-force training. TAs include the Cantonment Area (Camp Dawson Proper and the Volkstone TA), the Briery Mountain TA, and the Pringle Tract TA (Figure 1, Appendix D). The CD-ATS is a collective training area capable of supporting individual and collective training for Soldiers and units up to the battalion level (up to 1000 personnel). The CD-ATS is called "home" by the:

- Service Battery, 1st Battalion 201st Field Artillery
- Company C, 2nd Battalion 19th Special Forces Group (Airborne);
- Special Operations Forces Equipment Pool (Rigger Shop)
- 229th Engineer Detachment (Utility)

- 197th Regiment (Regional Training Institute [RTI])
- WVARNG Training Site Command
- First Battalion (Engineer) 80th Division (IT)
- The Mountaineer Challenge Academy
- Field Maintenance Shop (FMS) #4 and the CD-ATS staff and support personnel, all of which are units/organizations of the WVARNG.

5.1.1 Cantonment Area

The 914-acre Cantonment Area, which includes the Camp Dawson Proper and Volkstone TA, contains mainly improved grounds. In addition to military units occupying the facilities within the Cantonment Area, several of the buildings on CD-ATS have been turned over to the MCA and the Student Training Facility (STF). The MCA is located at CD-ATS and occupies five buildings within the cantonment area. The MCA trains at-risk youths to become contributing members of society using the eight core components of the Challenge model in a quasi-military environment during a 22-week residential and one-year follow-up program. The STF was completed in 1987 and occupies six buildings at the CD-ATS. The STF is a federal facility directly associated with Fort Bragg, North Carolina. The Department of the Army (DA) utilizes the buildings for classroom training from March through October. Advanced Land Navigation is the primary type of training for the DA while at the CD-ATS. The WVARNG utilizes the STF buildings during the winter months on an as needed basis.

The WVARNG has access to the following training facilities on the Cantonment Area**:**

- basic weapons marksmanship ranges (2 ranges are inactive)
- One special live fire area
- 14 other, nonlive fire facilities
- Nine light maneuver areas
- ELive fire shoot house
- Manganese Plant
- Armed Forces Reserve Center and the RTI
- Rappel Tower
- Combat Simulators (EST, VCOTT, HEAT, Call for Fire)
- First Responder Training Rubble Pile
- Leadership Reaction Course
- Mine Resistant Ambush Protected Rollover Trainer (MRAP)

The Cantonment Area contains the following major support facilities:

- Engagement skills center

- A Multi-Purpose Building-Gymnasium
- FMS #4
- STF (federally supported)
- State maintenance compound
- Directorate of Logistics warehouse
- Range control and range maintenance facility
- Troop medical clinic
- Chapel
- Army Air Force Exchange Service
- Ammunition supply point
- Enlisted annual training barracks
- Bachelor enlisted quarters/bachelor officer quarters
- Recreational cottages and quarters
- Water and waste treatment plant
- Obstacle course
- Land Navigation Course
- Parade Field
- Rappelling tower/Climbing wall
- Small arms ranges (25 meter, pistol, and Known Distance)
- Grenade Range
- Small lake for fishing
- Picnic shelters
- NBC chamber
- Heliport with refueling capabilities
- 4,500 foot by 50 foot paved runway
- RTI building which contains
    - 16 classrooms of various sizes and functions
    - 25 Meter indoor swimming pool
    - 123 Single room quarters
    - 12 (4) person suites

- Three (2) person suites
- Dining Facility
- Snack Bar
- Post Exchange
- Barber shop
- Operational area for 197th RTI
- Fitness Center

5.1.2 Pringle Tract TA and Briery Mountain TA

The Pringle and Briery Mountain TAs comprise approximately 2,900 acres of undeveloped and forested land available for training, which may include maneuvers. Both training areas are forested and undeveloped. Both will accommodate limited armor maneuver. The Pringle Tract TA contains bivouac sites, an intermediate Land Navigation Course, driver training, a 12N equipment training site, an M-203 range, driver's training, FOB, two-story MOUT site, and three helicopter landing zones (HLZ). The Briery Mountain TA contains bivouac sites, an Advanced Land Navigation Course (ALNC), lanes training, a demolition range, a Modified Record Firing Range (MRFR), MK19/50 CAL TP range, a live fire breech facility, and three HLZs.

5.1.3 Off-Site Training Areas

In addition to lands owned by the state or lands obtained through lease agreements, maneuver rights have been obtained through Land Use Agreements (LUA) on approximately 15,500 acres throughout Preston County. Also, outside the boundaries of Preston County, but within an hour to a 1.5 hours drive from Camp Dawson Proper, there are approximately 641,000 acres of Monongahela National Forest and approximately 46,000 acres of private lands for which LUAs are in effect. These lands are available for training of units utilizing the CD-ATS, but the WVARNG does not manage natural resources at these sites. Types of training typically include land navigation, foot traffic, lanes training, parachute drops, and light infantry.

5.2 Current Potential Impacts

5.2.1 Minimum Impact Training

The types of training activities that generally have a minimal impact on natural resources in many cases require undisturbed cover to conceal movements. As such, the disturbance is no greater than walking through the woods or open areas, and would normally require no extraordinary precautions, limitations or restrictions. **Table 7** provides a summary of the types of minimum impact training that occur at the CD-ATS. Because minimum impact training has few adverse effects on natural resources at the CD-ATS, these types of training will not be restricted from any part of the CD-ATS.

Table 7. Minimum Impact Training at the CD-ATS	
Type of Training	**Training Activity**
Tactical Training	Small Unit Infantry Tactics Reconnaissance Tactical Bivouac Occupation/Displacement Terrain/Map Analysis Escape and Evasion Infiltration Non-Live Fire Exercises Small Airborne Operations
Basic Soldier Skill Training	Land Navigation Terrain Analysis Patrolling Engineer Reconnaissance Mobility and Countermobility
Engineer Training	Engineer Reconnaissance Mobility and Countermobility Aircraft Loading Training Foot Bridging
Specialized Training	Riot Control and gas warfare agent familiarization Water Purification Expert Field Medical Badge Course Medical Examination Facility Rappelling Rigging

Source: WVARNG, 2001

5.2.2 Maximum Impact Training

Some types of training devices disturb soils, vegetation or both. Secondary impacts to the soil and water resources may affect the water quality, fish populations and wildlife inhabitants. Such disturbances may require corrective actions such as adding soil, seeding, mulching, and/or installation of erosion control devices, sedimentation structures, or other management practices. **Table 8** provides a summary of the types of maximum impact training that occur at the CD-ATS. Section 6.5.2.1 provides methods of preventing and reducing impacts associated with training activities that can result in greater disturbances.

Table 8. Maximum Impact Training at the CD-ATS	
Type of Training	**Training Activity**
Tactical Training	Tactical Bivouac Occupation/Displacement Cold Weather Operations Command Post Exercises
Basic Soldier Skill Training	Cover and Concealment Field Fortification Cold Weather Survival Construct Obstacles
Engineer Training	Install and Clear Minefields Breaching and Clearing Operations Construct and Maintain Main Supply Routes Cut, Fill, and Haul (Horizontal) Operations Construct Obstacles Demolition Training Nonstandard Fixed Bridging (Timber Trestle) Bailey Bridge M4T6 Bridge/Rafting/Fixed Span Operation Ribbon Bridge/Rafting Operations Field Fortification Class 60 Bridging/Rafting Operations Light Tactical Raft (LTR) Operations Vertical Construction Training Quarry/Rock Crushing Operations
Specialized Training	Recovery

Source: WVARNG, 2001

5.3 Potential Future Impacts

The ultimate goal of this updated INRMP, as well as its subsequent additions or revisions, is to ensure continuous military training capability for the WVARNG, while managing for the mutual sustainability of the natural resources at the CD-ATS. The development and implementation of an active ecosystem management program will accommodate the WVARNG's training mission, while emphasizing a holistic, adaptive management style that focuses on maintaining biological diversity. Future development of the CD-ATS to meet the training needs of the WVARNG will be addressed in the CD-ATS Master Plan, which is currently being developed. The majority of new development is planned within the Cantonment Area, which is already a highly developed maintained land area.

The primary environmental impacts associated with training site development will be to soil and surface water resources from the construction of buildings, ranges, parking, and roadway access changes. Other potential impacts to vegetation and wildlife may arise from new range construction on the Briery Mountain TA and Pringle Tract TA as these areas are mainly forested and undeveloped lands. The specific impacts from training site development will be reviewed in a separate NEPA document.

Expansion of available training land on the CD-ATS is necessary to support the current training requirements of the WVARNG using the site. Consequently, the WVARNG is considering additional acreage to better achieve the military training mission. If additional acreage is acquired, effects on specific natural resources must be assessed for each new tract. Any information obtained during site assessments will be incorporated into the INRMP during revision, to occur no later than five years from the date of the plan's approval. Because most of the tracts that would be leased surrounding the CD-ATS are similar to

the current training site, the WVARNG can assume that mission effects to any new sites would be similar to effects described at the existing site.

In general, the following criteria that can be obtained from soil surveys will be applied when investigating potential acquisitions (see Section 3.3.2 for a description of soils on the CD-ATS).

- Slopes less than six percent are ideal
- Drainage should be internal to the training site
- Seek soils with the following properties:
    - K-factor less than 0.35
    - T-factor greater than 4
- Hydrologic Soil Groups A and B are preferred; Hydrologic Soil Group C is borderline

Land Use Capability classes I, II, III, V are preferred. Land Use Capability Classes IV, VI, VII, and VIII have severe limitations.

5.4 Natural Resources Needed to Support the Military Mission

The WVARNG requires a mixture of open and forested land areas to support military training requirements. Realistic training is dependent upon an intact natural setting. Degraded training lands, soil erosion, degraded forests, and silted streams may degrade or prevent sustainable long-term training. Degradation of natural resources results in inadequate training, impaired readiness, and wasted training dollars. Maintaining healthy ecosystems keeps the training land continuously available for use by soldiers. Healthy ecosystems are resilient and can support long term training needs. The WVARNG needs the land and its natural resources to function together in a healthy ecosystem to support training.

5.5 Natural Resources Considerations for Mission Planning and Initiation

A wide variety of projects and activities impact the CD-ATS natural resources, which include soils and geological formations, ground and surface waters, air, vegetation, animals, and their habitats. Construction and maintenance work, grounds keeping, public events, public access (for example, hunting and fishing), and other activities need to be considered individually and collectively for their effects on the environment.

Per DoD Supplemental Guidance, the 2012-2017 INRMP was reviewed "as to operation and effect," to determine whether it meets the requirements of the Sikes Act and if it contributes to the conservation and rehabilitation of natural resources on military installations. Updates required as a result of this review have been included within this INRMP.

Military training can have both negative and positive effects on natural resources. Command Post Exercise training, vehicular traffic, logging, and construction damage are by far the largest negative impacts on the natural resources at the CD-ATS. Excavation and maneuvering heavy wheeled vehicles across even the best-suited landscapes can damage vegetation and soils. For this reason, soils and vegetation at the CD-ATS require timely land rehabilitation efforts following such activities. In addition, vegetation (and occasionally soils) can be damaged by regular use on areas such as trails, bivouac sites, and firing points. Soil and vegetation impacts can lead to soil erosion, soil compaction, loss of wildlife habitat, and introduction of unwanted pests and weeds. Wildlife populations can also be harmed by field equipment training, small arms firing, or by mission-related wildfires.

Four basic management techniques can be used to minimize military training effects to the soil and vegetation resources: (1) redistribute use; (2) modify kinds of uses; (3) alter the behavior of use; and (4) 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 operation of simulators and simulations at the CD-ATS. Expanded utilization of simulators and better equipment can reduce maneuver damage to land and soils, while improving training realism.

The greatest positive effect of the WVARNG mission on natural resources is the military presence. In recent years, the WVARNG has developed several new ranges on the Briery TA, but otherwise the training lands have remained mostly undeveloped open space. The WVARNG employs a full-time ATS Environmental Manager and three support staff to implement a full-scale land management program aimed at maintaining, enhancing, and restoring the landscape.

The natural resources at the CD-ATS may present some limitations to field training exercises. CD-ATS-ENV maintains updated ecological surveys to obtain current information pertaining to CD-ATS biodiversity. Threatened and endangered species are an example of what may challenge field training exercises. Additionally, steep mountains and several wetland areas will limit the allowable area for many training activities if adverse environmental impacts are to be minimized.

Refer to **Sections 6.3** through **6.9** for additional information on how to properly manage these natural resources limitations during mission planning. Laws and regulations that pertain to these natural resources are also incorporated into Chapter 6.

6.0 NATURAL RESOURCES PROGRAM MANAGEMENT

6.1 Natural Resources Program Management

Per DoD Supplemental Guidance, the 2012-2017 INRMP was reviewed "as to operation and effect," to determine whether it meets the requirements of the Sikes Act and if it contributes to the conservation and rehabilitation of natural resources on military installations. Intra- and inter-agency cooperation, coordination, and communication at the Federal, State and local levels (for example, USFWS and WVDNR) are requisite to the success of the INRMP Update. Specialized expertise is required to adequately manage natural resources at the CD-ATS. Technical assistance will be sought from Federal and State agencies, universities, and special interest groups. The USFWS and WVDNR review the plan and are a signatory to the INRMP Update. Concurrence from the USFWS on the INRMP on the 2012-2017 INRMP was provided in the form of a letter dated 12 June 2013 and by WVDNR in form of a letter dated 01 March 2013.

6.1.1 Administrative and Technical Support

The Natural Resources Program at the CD-ATS is administered by the Camp Dawson ATS Environmental Office (CD-ATS-ENV). Responsibilities of the CD-ATS-ENV include:

- Implementing this INRMP Update;
- Providing oversight and coordination with other agencies;
- Coordinating with the SRP Coordinator to ensure training lands are managed in a sustainable manner;
- Developing and implementing programs to ensure the inventory, delineation, classification, and management of all applicable natural resources to include: wetlands, scenic areas, endangered and threatened species, sensitive and critical habitats, and other natural resource areas of special interest
- Providing for the training of natural resources personnel;
- Maintaining natural resources management records;
- Reviewing all environmental documents (for example environmental impact assessments and remedial action plans) and construction designs and proposals to ensure adequate protection of natural resources, while ensuring that technical guidance as presented in this INRMP Update is adequately considered;
- Evaluating impacts of training missions and providing guidance to trainers;
- Coordinating the cultural resources program and Section 106 compliance;
- Coordinating with local, State, and Federal governmental and civilian conservation organizations relative to the CD-ATS natural resources management program;
- Coordinating hunting and fishing programs;
- Implementing and executing AR 200-1;
- Assisting the Adjutant General with developing funding priorities for all natural resources program and compliance activities.

The CD-ATS-ENV also receives support from the CD-ATS staff, each of whom has significant duties in addition to natural resources support. Additional labor resources may include:

- Federal agencies (for example, USFWS, NRCS, USACE, and the U.S. Army Environmental Center);
- State agencies;
- Local and regional Universities;
- Scouting groups;
- Special interest groups (for example, Audubon Society, Boy Scouts, and sportsmens' clubs).

6.1.2 Cooperative Agreements

6.1.2.1 Federal Agreements

The DoD and subcommand entities have Memorandums of Understanding (MOU), Memorandums of Agreement (MOA), and other cooperative agreements with other federal agencies, interest groups, and various state agencies in order to provide assistance with natural resources management at installations across the United States. Generally, these agreements allow installations and agencies or interest groups to obtain mutual conservation objectives. The DoD agreements applicable to the CD-ATS include:

- MOU between DoD and the USFWS concerning ecosystem-based management of fish, wildlife, and plant resources on military lands;
- MOU between DoD and the USFWS per EO 13186 *Responsibilities of Federal Agencies To Protect Migratory Birds;*
- Cooperative Agreement between the DoD and The TNC for assistance in natural resources inventory;
- MOA for Professional and Technical Assistance Conducting Biological Surveys, Research and Related Activities between the DoD and the National Biological Service of the Department of the Interior;
- MOU between the DoD and the USEPA with respect to Integrated Pest Management (IPM);
- MOA for Federal Neotropical Migratory Bird Conservation Program and addendum ("Partners in Flight-Aves De Las Americas") among DoD, through each of the Military Services, and over 110 other Federal and State agencies and non-governmental organizations;
- MOU between the U.S. Army Environmental Center and the USDA, NRCS for Watershed and Environmental Enhancement of U.S. Army Installations;
- MOU between the DoD and Ducks Unlimited, Inc. to provide a foundation for cooperative development of selected wetlands and associated uplands in order to maintain and increase waterfowl populations and to fulfill the objectives of the North American Waterfowl Management Plan, within the context of DoD's environmental security and military missions;
- MOU for Watchable Wildlife Programs.

6.1.2.2 State and Local Agreements

West Virginia Division of Natural Resources. The WVDNR is a cooperator in the implementation of this plan in accordance with the Sikes Act. This agency, along with the USFWS, will assist the CD-ATS-ENV in developing the INRMP Update so that a tripartite agreement is reached among the installation and the agencies. The WVDNR –Wildlife Diversity Section of the WVDNR completed a flora inventory and vegetation community mapping for the training site in 2001 and 2005-2006 (Streets, 2006; Vanderhorst and Streets, 2006; Streets, 2001; Vandorhorst, 2001), and an invasive species inventory in 2003 (Grafton, 2004).

Allegheny Wood Products. On 18 March 1996, AWP and the WVARNG entered into an agreement, in which AWP leased the Pringle Tract TA to the WVARNG for maneuver rights for the next 50 years. On the same date, in exchange for maneuver rights, the WVARNG granted AWP a license to harvest and manage timber located on the CD-ATS's state-owned lands (Camp Dawson Proper and Briery Mountain TA). See Appendix E for a copy of the license agreement between WVARNG and AWP.

U.S. Army Corps of Engineers – Baltimore District. The Volkstone TA, which is part of the CD-ATS Cantonment Area, is owned by the USACE – Baltimore District and licensed to the WVARNG for operation and management (Appendix E).

West Virginia University - College of Agriculture, Forestry, and Consumer Science. WVU has been an active partner at the CD-ATS. WVU conducted surveys to determine species presence and relative abundance of fauna on the newly acquired tracts, and conducted surveys for Allegheny woodrats (*Neotoma magister*) and wildlife surveys on early successional habitats. In addition, they completed a jurisdictional wetland delineation on all known wetland areas on the training site (Anderson & Rentch, 2006).

The Forestry Program prepared a Comprehensive Timber Inventory and Forest Ecosystem Management Plan in 2002 for the CD-ATS, and the Natural Resource Analysis Center has provided onsite Geographic Information Systems (GIS) support for the CD-ATS natural resources program.

Natural Resources Conservation Service. The NRCS is currently an active partner at CD-ATS. The NRCS developed soil mapping and completed a soil classification report for the CD-ATS in 2001. The NRCS has also assisted CD-ATS-ENV with on-site soil sampling, pond design and bank stabilization projects in recent years.

6.2 Geographic Information Systems

Geospatial information pertaining to natural resources is maintained by the Camp Dawson Environmental Office. Geographic Information System (GIS) and Global Positioning System (GPS) technology is used to create, manipulate, analyze, and organize geospatial data to aide to the day to day operation of the Camp Dawson Natural Resources Program. All geospatial data is projected in World Geodetic System 1984 Zone 17 North (WGS 1984 UTM Zone 17N). In addition, as dictated by National Guard Bureau (NGB), all geospatial data maintained by the Camp Dawson Environmental Office is compliant with Spatial Data Standards for Facilities Infrastructure and the Environment (SDSFIE) version 4.0.

The following is a list of natural resources related geospatial data maintained by the Camp Dawson Environmental Office:

- Boundaries
- Surface Water
- Flora Planting Areas
- Timber Harvest Areas
- Soils
- Threatened and Endangered Species (Including known roosting sites or hibernacula)
- Vegetation Classifications
- Surface water features (Rivers, Streams, Lakes, Ponds)
- Watershed Areas
- Wetlands

Along with maintaining vector based geospatial data, the Camp Dawson Environmental office works with National Guard Bureau to create aerial imagery and Light Detection and Ranging (LiDAR) data on a periodic basis.

In addition to maintaining this data, the Camp Dawson Environmental Office creates and maintains geospatial resources for the West Virginia Army National Guard Environmental Compliance Program, Camp Dawson Engineering Office, Sustainable Range Program and Camp Dawson Training Site Command. This involves managing geospatial data related to infrastructure and training features located at Camp Dawson.

6.3 Fish and Wildlife Management

Hunting and fishing activities are permitted on the CD-ATS unless suspended by the TSC. The public is

restricted to the Pringle Tract TA. Hunting and fishing at the CD-ATS is discussed in greater detail in **Section 6.10**.

A *Wildlife Management Plan* was developed for the CD-ATS in 2001 (Anderson et al., 2002b). Specific management guidelines were established for the Cantonment Area, the Briery Mountain TA, and the Pringle Tract TA. In addition, a white-tail deer (*Odocoileus virginianus*) management plan was developed in 2004 (Anderson et al., 2004).

For more information, a copy of these plans can be obtained through the CD-ATS Environmental Office. Recommendations from these plans are incorporated into the goals, objectives and management recommendations set forth below. Laws and regulations pertaining to the management of fish and wildlife include:

- CWA (33 USC §1341);
- Bald and Golden Eagle Protection Act (16 USC 668-668c)
- EO 11990, Protection of Wetlands;
- EO 11988, Floodplain Management;
- EO 13186, Responsibilies of Federal Agencies To Protect Migratory Birds;
- ESA (7 USC 136;16 U.S.C. 460 et seq. [1973] as amended);
- Fish and Wildlife Conservation Act (USC §2901 et seq.);
- Fish and Wildlife Coordination Act, as amended (16 USC §661 et seq.);
- MBTA, as amended (16 USC §703-712); NEPA (42 USC §4321 et seq.);
- PM—Creating a Federal Strategy to Promote the Health of Honey Bees and Other Pollinators (2014)
- Sikes Act Improvement Act (16 USC §670a-o);
- Code of State Regulations (CSR) § 58-49, General Hunting;
- CSR § 58-50, Deer Hunting Rule;
- CSR § 58-60, Fishing Regulations;
- WVC §20-2, Wildlife Resources.

These laws and regulations are described in **Appendix G.**

6.3.1 Fish

Fishing is allowed in the ponds and streams at the CD-ATS and in the Cheat River in accordance with state and federal laws and regulations. However, several of the streams and ponds do not contain fish. Cross-referencing of water quality samples indicated that streams that did not have fishes were severely impacted by AMD.

During the 2000-2001 faunal inventories, a total of 24 fish species were identified (Appendix F). Fish were captured in the following water bodies within the CD-ATS and in its vicinity:

- Vegetated pond on the Volkstone TA;

- Pond at West Gate on Pringle Tract TA;
- Pierce Lake on Camp Dawson Proper;
- Cheat River at mouth of Pringle Run (300 feet along Rt. 72);
- Morris Island (back water areas on both sides adjacent to Camp Dawson).

However, only six of the 24 species were observed in the ponds located within the CD-ATS. Overall, the fish assemblages found in the ponds indicate that water quality is adequate, although no fish were found in the unvegetated pond on the Volkstone TA. If recreational fishing is the preferred management of these ponds, then various strategies, such as manipulation of cover types, food types, and water quality, could be explored to improve fishing activities.

The presence of young-of-year, juveniles, and adults of game fishes in Pierce Lake indicate that water quality is good and reproduction is not a concern. No additional stocking is recommended at this time. Fish structures made from Christmas trees and cement blocks can be added to provide additional cover for fishes. Once shoreline habitat has been established, waterfowl and other waterbirds may use this area more extensively as well.

In 2015, CD-ATS-ENV received support from the Sustainable Range Program (SRP) and other tenant units in the use of manpower and equipment for the construction of the Calvert Pond adjacent to the Modified Record Firing Range (MRFR) on the Briery TA. ENV staff partnered with the NRCS for the pond design. The Calvert Pond was stocked with largemouth bass, bluegill, yellow perch, channel catfish, and fathead minnows in 2016.

The WVARNG will implement the following strategies, when feasible, in the streams and ponds to maintain or enhance fish populations at the CD-ATS:

- Monitor water quality;
- Access manganese plant debris and refuse and take measures to reduce or prevent soil and water contamination in the surrounding areas;
- Identify sources of Acid Mine Drainage (AMD), particularly within Pringle Run. This contamination has resulted in a low diversity of aquatic organisms. Implement measures to improve riverine habitats only after sources of AMD pollution are contained and neutralized (for example, capping mine portholes).
- Maintain buffer zones of no less than 100 feet slope distance on either side of perennial or intermittent streams, and no less than 25 feet on either side of ephemeral streams. Maintaining a healthy riparian area (including native trees, shrubs, and herbaceous plants) around streams will reduce the amount of sedimentation into Pringle Run and the Cheat River proper.

In addition to fish holding water bodies, CD-ATS training lands contain many smaller water bodies and pools that provide high value amphibian breeding ponds.

6.3.2 Wildlife

The following wildlife management objectives and activities will be conducted at the CD-ATS when they do not deter from the military mission:

- Protect and maintain existing wildlife habitats, with emphasis on habitats that support Federal or State listed rare, endangered and threatened species;
- Increase populations of game species, such as white-tailed deer, wild turkey (*Meleagris gallopavo*), and ruffed grouse (*Bonasa umbellus*), for hunting, aesthetic, and non-consumptive use;
- Conduct population surveys and monitor populations of game species (deer, turkey and ruffed grouse);
- Habitat improvement through the use of invasive species control measures;
- Minimize disturbance within wetland and floodplain areas during the spring and fall months to reduce anthropogenic-related stress on migrating waterfowl
- Manage the Pierce Lake and Calvert Pond ecosystems to provide habitat for fish and other aquatic animals;
- Maintain existing and create new pollinator plots in appropriate locations;
- Erect bat houses, girdle trees and manage prescribed fire units as outlined in the Endangered Species Management Plan (ESMP) for Indiana (*Myotis sodalist*) and Northern Long-Eared Bats (*Myotis septentionalis*) for Camp Dawson Preston County, West Virginia (De La Cruz and Schroder, 2016)(**Appendix I**);
- Retain snags for wildlife habitat ;
- Establish brush piles and rock piles for protective cover and loafing sites for a variety of wildlife species. Game birds such as wild turkeys, grouse, and quail (*Coturnix* spp.) will use brush piles for thermal and loafing cover (Payne and Bryant, 1998). See **Section 6.3.2.3** for more information.

Refer to **Section 6.6** and **6.8** for additional management recommendations pertaining to aquatic and terrestrial habitats, respectively, on the installation.

6.3.2.1 Big Game Management

White-Tailed Deer Management. In 2004, a white-tail deer density survey and management plan was developed for the CD-ATS's long-term deer management program (Anderson et al., 2004). A copy of this plan is available in the CD-ATS Environmental Office. The goal of this program is to maintain a healthy and well-balanced herd within all three TAs.

Density estimates from the camera survey were 111.0 deer per square mile on the Cantonment Area, 6.3 deer per square mile on the Pringle Tract TA, and 42.1 deer per square mile on the Briery Mountain TA. Density estimates from spotlight surveys were 81.1 deer per square mile on the Cantonment Area, 5.4 deer per square mile on the Pringle Tract TA, 11.9 deer per square mile on the Briery Mountain TA. The male-to-female ratio of adult deer on the Cantonment Area (1:8.3) was heavily skewed toward the females, while the Pringle Tract TA (1:2.9) and the Briery Mountain TA (1:3.2) were less skewed. Recommendations are included for habitat and harvest management for the three training areas of the CD-ATS.

According to density estimates and male-to-female ratios of adult deer obtained during late September and early October 2003, the three TAs differed substantially and suggested management strategies between the three TAs will differ to manage for a sustainable and healthy deer population.

Even though more deer were observed on the Cantonment Area than the other two tracts, the male-to-female ratio was heavily skewed toward adult female deer. Overabundance of deer can lead to management

problems such as habitat damage from over browsing and nuisance deer activity in and around populated areas (Demarais et al., 2000; Jacobson and Guynn, 1995). From the results of this study, it appears that harvest strategies will be aimed at controlling the population level of white-tailed deer, while increasing the number of adult male deer.

Because this area is not open for public hunting, and only guardsmen are allowed to hunt the property, a unique opportunity exists to use harvest management as a population control strategy. All deer harvest recommendations will be followed in accordance with state hunting guidelines. Specific management recommendations for the Cantonment Area include:

- Yearly harvest trends must be monitored;
- Once harvest records are analyzed, the CD-ATS personnel will set the target number of adult female deer to be removed at approximately 70 to 80 percent of the total annual harvest, with adjustments made yearly if warranted;
- Require hunters on the property to kill a doe before they are allowed to take a buck;
- Restrict hunters to taking only antlers with three or more points on a side to increase the likelihood that bucks will survive to older age classes (Rosenberry, 2003; Hamilton et al., 1995);
- Establish regulations for hunting within the CD-ATS Cantonment Area that comply with State hunting guidelines;
- Educate hunters of new regulations.

If CD-ATS personnel are unsuccessful in obtaining harvest objectives, they may coordinate with the WVDNR to establish a special antlerless public deer hunt at CD-ATS that could be designed to minimize interference with the CD-ATS mission.

Deer populations are sparse within the Pringle Tract TA; however, the male-to-female ratio on the Pringle Tract TA was close to the 1:2 ratio generally sought after by managers wishing to maximize the mature male cohort of the population. Management of the habitat and white-tailed deer harvest on the Pringle Tract TA will be required in order to increase the size of the deer herd. The following recommendations were suggested by Anderson et al. (2004) to manage the deer herd on the Pringle Tract TA:

- Create openings similar to those on the Cantonment Area with high quality grasses and forbs for deer foraging within early successional habitats;
- Use prescribed burns, when feasible, to clear scrub-shrub areas and plant more beneficial species;
- Plant clovers in the spring and fall because of their nutritional value, nitrogen-fixing capabilities, and preference by deer;
- Existing open areas will be cleared and planted with about 19 pounds per acre of a clover/grass mixture (Anderson et al., 2002b).

The Briery Mountain TA had relatively moderate levels of deer and the male-to-female ratio was relatively even. Management of the Briery Mountain TA for deer will maintain high quality forest habitat with mast species and open areas for foraging. Other management recommendations include:

- Plant cool season grasses on 30 percent of the open areas and warm season grasses on 60 percent of open areas to provide a food source for white-tailed deer and other wildlife during different seasons (Anderson et al., 2002b);

As part of the new white-tailed deer management program, the CD-ATS land managers within the guidelines of state hunting regulations have begun issuing free hunting permits to public hunters on the Pringle TA and guardsmen for all three tracts. At the end of each annual hunting season, all permit holders are mailed a questionnaire survey to document hunting efforts and success for individual game species on each TA.

Currently, permits are issued with the request that harvested deer be reported. In the future, the WVARNG and WVDNR will need to work together on hunting enforcement to ensure that all white-tailed deer hunters on the property purchase permits and report harvest information.

Wild Turkey Management. The existing hardwood forest will minimally meet the hard mast requirements. The combined hardwood and coniferous forests will adequately meet roosting requirements. Wildlife habitat improvements resulting as secondary benefits from planned forest management activities, such as prescribed burning and thinning operations in pine plantations, will increase the present brood range by providing a variety of age classes in the herbaceous cover. Forest management for turkeys will encourage a high proportion of older, food-producing trees such as oak, cherry, hickory, beech, and ash. Young stands of trees can be thinned to encourage growth of more productive seed trees. Another management technique is woodland cutting to remove some of the overstory trees. Cuttings enhance the growth of summer grape (*Vitus aestivalis*), dogwood, viburnum, hawthorn, and other important shrubs of the understory.

General silvicultural treatments recommended for wild turkeys include:

- Manage for an open understory and an even distribution of age classes; although, this management practice may negatively affect the ground/understory nesting opportunities for songbirds of conservation concern.
- Maintain conifers at five to 30 percent within each timber management compartment containing conifers.
- Restrict tulip-poplar to less than 20 percent of any timber management compartment.
- Maintain at least 50 percent of each timber management compartment in mast producing tree species, the majority of which should be oaks.
- Do not disturb slash areas during the nesting season (April-July).
- Limit clearcuts to less than 30 acres wherever possible.
- Do not remove soft mast producing trees and shrubs during timber operations.
- Set rotation lengths of 100 years or more in even-aged management.

Spring seeps, areas where ground water emerges to the surface along hillsides or other locations, are important to winter turkey populations. Since the temperature of the water is above freezing, the seeps remain open throughout the winter. The vegetation and insect larvae found there provide food during this critical season. Wild turkey food production in these seeps may be improved by thinning the tree canopy surrounding seeps. Sunlight encourages additional greenery, which in turn attracts more insects and adds to the egg and larva content of the seep. However, any additional daylighting in an area to increase insects for turkey poults should first consider an assessment of invasive plant species presence in the vicinity. Any benefit derived from the daylighting may be obviated by rapid expansion of invasive infestations in response to new daylighting. Native insect populations often decline in response to increased amounts of invasive plants.

This herbaceous cover will attract a variety of insects that are an important source of protein for young turkey poults. The management of grass openings for a variety of successional stages of vegetation will increase the availability of insect and herbaceous food as well as nesting cover. The fields that are created and planted to warm season grasses provide excellent brood habitat, legume mixtures added to the warm season grass mixtures provide an added benefit to turkeys. Large, individual clearcuts over 30 acres are generally regarded detrimental to wild turkey habitat. Using strip clearcuts provides forested corridors which wild turkey have been known to use. These corridors are used by nesting hens, and the adjacent edges of clearcuts serve as a brood range.

6.3.2.2 Small Game Management

Ruffed Grouse Management. Small clearcuts in mature forest are favorable for ruffed grouse populations and increase early successional hardwood stands. Numerous acres of forestland at the CD-ATS have been clearcut, and if managed properly, can benefit the ruffed grouse. For future forest management planning, clearcuts in strips 100 feet across and 300 feet long would also greatly benefit grouse. Two clearcut strips adjacent to the first strips will be done every ten years on a 20-year rotation. Twenty years later, the first two strips will be cut again. The slash should be left scattered throughout the harvest area in order to protect the regeneration of the site from deer browsing, provide cover necessary for ruffed grouse chicks in the area, and the tops of brush provide low perches for songbirds. These clearcuts will be left to grow back into hardwood stands.

Escape cover will be provided along the edges of large open areas such as the impact area and ranges that currently occupy grassland type habitat. The cover can be of any type of brushy vegetation as long as it affords protection for the birds. Winter cover can be created in deciduous woodlands by underplanting with evergreens, such as spruce (*Picea* spp.) and laurel, which are shade tolerant species. As already mentioned in the wild turkey section, herbaceous areas provide good ground cover for grouse broods. Ideally, there will be about three acres of scattered openings per 40 acres of woodland, with each opening about a ¼ acre in size. Each ¼ acre opening should include a tapered zone of transition to the adjacent timber stands. Fifty to 75 yards is the ideal width of the transition zone and the silviculture treatment employed is thinning. Thinning is to occur around openings and at sites where any other timber activity has a band or transition zone between disturbed and untouched sites. This thinning should leave mast trees for diversity, wildlife benefit, and/or for physical structure. The cut trees can either be dropped and left or extracted if of commercial value.

WVDNR recommends that if the ¼ acre openings are utilized to increase insect habitat for grouse chicks, that the created openings be disked, planted with native seed mix, and maintained with primarily native flora. If necessary, the area can be limed but it is not recommended that fertilizer be used. If invasive and non-native herbaceous and wood vegetation species colonize the area, herbicide may be needed.

American Woodcock (Scolopax minor) Management. American woodcock require several habitat types and need an area with a constant supply of earthworms. Woodlands characterized by moist, but not flooded areas, are good feeding sites for the woodcock; shrub patches adjacent to streams, small watercourses, and springs. Feeding cover is essential for high numbers of woodcock. As alder and hardwoods get taller and the area they occupy will become more opened and as a result woodcock in the vicinity could become more susceptible to avian predation. Since the useful life of an alder or hardwood cover for feeding is short (about ten years), periodic rejuvenation of cover is necessary. The best feeding areas are shrubby, with 25 percent of the ground covered by herbaceous vegetation. Additionally, shrubs shade the ground and prevent the growth of a thick sod of grasses and forbs, which makes it difficult for the birds to probe.

Areas designated for woodcock management will be brush hogged or clear-cut in strips 50 feet wide. The clear-cut strips will be separated by uncut strips 200 feet wide. The strips will be cut across any wet area

or stream running through the cover. Then, in five years time, new strips will be cut next to the old strips. Thus, the entire cover will be cut and replaced in 20 year cycles. When clear-cutting forested strips, slash piles can be pushed to the side for woodcock cover since slash free areas provide attractive courting sites. During the day, woodcocks use brushy areas for resting, nesting, and brood cover. Aspen, hawthorn, and dogwood provide particularly good cover.

Bobwhite Quail (Colinus virginianus) Management. Native eastern bobwhite quail have been extirpated in West Virginia. However, WVDNR has begun efforts to reintroduce the species to the state. Any future bobwhite quail management and reintroduction efforts on CD-ATS training areas will be coordinated with the WVDNR's Bobwhite Project leader.

6.3.2.3 Non-Game Management

The following sections are specific management prescriptions that can be conducted at the CD-ATS to improve the overall habitat of several wildlife species.

Small Mammals. Small mammal species on CD-ATS are plentiful and rather unremarkable in species composition. One area of interest is the lack of occurrence of the deer mouse (*Peromyscus maniculatus*), which may be caused by loss of appropriate habitat due to over browsing by deer.

A diversified bat population can be established with efforts to control encroachment of shrubbery around ponds. Consideration to bat habitat will be made when conducting timber harvest or when clear-cutting an area. When old buildings are torn down, they will be inspected for evidence of use by bats. The tricolored bat (*Perimyotis subflavus*) and little brown bat (*Myotis lucifugus*) which are currently under status review for federal listing are known to roost in anthropogenic structures such as barns. If populations or colonies are located, alternative structures in the form of rocket boxes and little brown bat style maternity boxes will be established in appropriate areas (Appendix H). Bark roosts are more readily used by Indiana bats than the traditional or rocket style boxes. Management strategies and actions for the endangered Indiana bat and the federally threatened Northern Long-eared bat are outlined in the ESMP (Appendix I).

Snags. Live standing dead trees or snags are vital habitat features for a number of mammal and bird species (Payne and Bryant, 1998). The general rules below should be followed for retention of snag trees on the CD-ATS:

- Leave all hard snags in early stages of decay, damaged and dying trees, and defective trees except those considered safety hazards.
- Select snags and defective trees for retention that meet or exceed the minimum size requirements for nesting (usually woodpeckers). Place emphasis on larger diameter trees because the larger trees remain standing longer, retain bark longer, and support a larger variety of wildlife.
- If a tradeoff must be made, retain hard snags in favor of soft snags, large diameter (greater than 15 inches diameter breast height [DBH]) snags in favor of small diameter snags, tall (greater than 59 feet) snags in favor of short snags, and snags with greater bark cover in favor of snags with little bark cover.

Existing Snags. While uneven-aged management is more appropriate for snag management, existing snags can be left standing with even-aged management practices as well. In even-aged stands, the most appropriate area for leaving snags is around the edges of the cutting units (Mannan et al., 1996). Snags left in the interior of a cutting unit can be beneficial to wildlife, but they should be at least 60 feet tall to provide substantial cover and reduce interference from other management practices (Dickson & Huntley,

1985). All snags in uneven aged stands should be retained unless they are interfering with the growth of a valuable timber tree or causing a hazard. This will allow the maximum availability of cavities for various wildlife species (Mannan et al., 1996).

Creating Snags. One way to artificially create snags is to girdle large trees (12-inch DBH) (Payne and Bryant, 1998). This practice is particularly applicable when releasing crop trees in oak cover types. Rather than cutting individual trees that are in direct competition with the crop tree, surrounding trees can be girdled to reduce competition. While girdling surrounding trees may not release crop trees as quickly, the delay is offset by the value of the remaining snag to wildlife (Perkey and Wilkins, 1990). Snag trees should be evenly distributed within each of the forest cover types. Although clumps of snags are more useful for providing cover, they increase competition within and among species for den and nesting sites (Titus, 1983).

Nest Boxes. Artificial nesting cavities may be constructed and placed within the training areas forests for cavity-nesting birds and mammals. These artificial cavities provide nesting and roosting structures in the absence of natural cavities. Boxes are particularly beneficial in areas where snags and natural cavities are uncommon. Nest boxes can benefit songbirds such as black-capped chickadee (*Poecile atricapilla*), tufted titmouse (*Baeolophus bicolor*), white-breasted nuthatch (*Sitta carolinensis*), and great-crested flycatcher (*Myiarchus crinitus*). Boxes also can benefit birds such as the eastern screech owl (*Otus asio*), northern saw whet owl (*Aegolius acadicus*), and mammals such as the gray squirrel (*Sciurus carolinensis*) and northern/southern flying squirrel (*Glaucomys* spp.).

Placement and construction of nest boxes will be done according to Stokes (1990) and Payne and Bryant (1998). Directions for various types of nest boxes can be found in Appendix H. Construction of these nest boxes may be good projects for local Boy Scouts or Girl Scouts. For project plans, stop by the CD-ATS-ENV to obtain the publications *Woodworking for Wildlife* and/or *Woodlands and Wildlife*.

Squirrels. Most of the oak and mixed hardwood-pine stands on the Pringle Tract TA are managed on timber rotations. For this reason, we recommend that squirrel nest boxes be placed at a density of one every five acres throughout all applicable sites with limited snag tree abundance on the Pringle Tract TA (Payne and Bryant, 1998). Maintenance will be necessary on a regular basis for monitoring of use, cleaning, and repair. Keeping nest boxes relatively clean will reduce the opportunity for parasites to arise in wildlife using the boxes.

Songbirds. Songbird nest boxes can be used to enhance nesting opportunities for secondary cavity nesters when primary cavity nesters or good cavity trees are unavailable (Mitchell 1988, Payne and Bryant 1998). About 50 species of North American cavity nesting birds have been shown to use artificial nest structures, and almost one half of these species occur on Pringle Tract TA (Mitchell 1988). Nest boxes are often placed in clearings, field edges, or forest edges to provide habitat for bird species that use open habitat and forest edges. Placing nests in interior forest areas can enhance cavity availability for bird species that require larger forest tracts (Mitchell, 1988; Payne and Bryant, 1998). WVDNR recommends that CD-ATS provide a list of songbird species that will be targeted for nest box deployment. Songbird species may have very specific nest box preferences. If the WVDNR is aware of the species that will be targeted for the nest box program they will be better able to make recommendations regarding the specific nest box designs and deployments.

Open Habitat Birds. Because there are an abundance of open habitat bird species that use the reclaimed mine areas on top of Pringle Tract TA, nest boxes will be installed along field and forest edges to enhance nesting capabilities for these birds. Of particular interest in open habitat is the American kestrel. CD-ATS-ENV will coordinate with the Avian Conservation Center of Appalachia to install and monitor kestrel boxes at suitable sites. About four to eight boxes of varying sizes per 2.5 acres will maximize

nesting opportunities and minimize conflict between territorial species (Mitchell, 1988). Many designs, sizes and materials are available for constructing songbird boxes (Payne and Bryant, 1998). Payne and Bryant (1998) provide a list of designs and sizes that target various species. Maintenance will be needed to remove old nest materials and eliminate exotic species such as European starlings and house sparrows (*Passer domesticus*) that frequently invade nest boxes (Zeleny, 1976). Much can be done to exclude European starlings and house sparrows simply by modifying the size of the box opening.

Wood Ducks. For wood ducks, boxes on posts or trees must be placed four to five feet above water surfaces, and 15 to 40 feet above land surfaces. Boxes should be grouped and spaced at 100-foot intervals. Additionally, boxes should be placed so that the entrance hole is visible to ducks on the water. Ideally, boxes on land should be 30 to 100 feet from the water's edge to reduce the risk of predation. In addition, placing guards on trees or posts that restrict the ability to climb can minimize nest predation. Several inches of wood shavings should be placed in the box with shaving material being replaced each winter. Boxes in place prior to March 1st are available for wood ducks that arrive in the spring. Appendix H provides information on constructing nest boxes.

Brush and Rock Piles. Brush piles and rock piles are easy and inexpensive methods of providing a variety of wildlife species with protective cover and loafing sites. Game birds such as wild turkey, grouse, and quail will use brush piles for thermal and loafing cover (Payne and Bryant, 1998). A host of mammalian species that occur on the Pringle Tract TA including shrews, mice, voles, woodrats, squirrels, rabbits, raccoons (*Procyon lotor*), and skunks also are known to use brush piles when cover is scarce (Yoakum et al., 1980; Martin and Steele, 1986). Generally, brush piles are most beneficial to wildlife when they are placed near food sources like forest edges (Payne and Copes, 1986, Payne and Bryant 1998).

Brush piles can be constructed of living or dead limbs, slash and debris from harvesting, downed logs, or old fence posts. The base of the pile should be composed of relatively rot resistant material like oak and locust logs, large stones, metal grills, cinder blocks, or old tires (Payne and Copes, 1986).

Creating Brush Piles. Brush piles can be constructed from dead or living tree limbs, large stumps, old fence posts, or slash and debris from tree harvesting. Brush piles should be spaced 200 to 300 feet apart and no more than ¼ mile from a water source (Payne and Copes, 1986). Piles should be at least five feet high and at least five to ten feet long (Martin and Steele, 1986), and should be placed within 165 to 490 feet of cover or other food sources. Place large logs at the base to form the central core of the pile, and use smaller branches to fill gaps in the core and the outer parts of the brush pile. Slash and tops from tree harvesting combined with old logs and downed trees make excellent brush pile material. Brush piles should be located adjacent to food sources and other types of cover such as hedgerows, clearings, woodland-field edge, and ponds within the Cantonment Area. Be sure to establish brush piles (away from potential ignition sources) over bowl-shaped depressions.

The Pringle Tract TA is also ideal for constructing brush piles. The area is logged regularly leaving piles of downed logs and slash. Many discarded tires and metal items are littered throughout the property. In addition, there are many open areas created by mining and logging roads. For these reasons, we recommend piles be constructed as a cover source for game birds and small and medium mammals. Approximately two to ten brush piles per 2.5 acres are enough to provide habitat for the largest variety of animals. To produce the best results, brush piles on the Pringle Tract TA should be constructed along hard forest edges. Hard edges are abrupt changes of habitat, such as a forest edge next to a reclaimed mine site. Several piles also should be constructed near the junction of large skidder trails to provide cover for animals using these corridors as travel paths. For many species, piles should be within 1,600 feet of water, but this is not a major concern on the Pringle Tract TA because of all the puddles in road ruts that gather stores of water during rain events. Brush piles will need to be checked periodically, and

possibly refurbished with new materials if the old limbs are rotting and being pulled away (Martin and Steele, 1986).

In addition to tree limbs, brush piles can also be created in conjunction with vine tangles to provide cover and soft mast for foraging woodrats. Vines such as grapevines, Virginia creeper, poison ivy, and greenbrier provide food (soft mast and seeds) and cover for numerous species. These vines fruit between August and November, the same time woodrats forage for debris to add to their middens. (A midden can include food and debris such as bones, sticks, dried manure, and shiny metal objects). The fruits of these vines may persist throughout the winter and thus are an important energy bonus for woodrats which do not hibernate.

Vine tangles can be created by: 1- targeted forest thinning to get more sun onto an anemic shaded surface; 2- dropping a tree with a vine in its crown; and 3- creating a brush pile to support a vine tangle.

Look for vines in tree canopies along the perimeters of rock covered openings. If a vine is competing with the canopy of a hard mast producing tree such as an oak or hickory, cut the vine. Common, non-hard mast producing trees with vines in their canopies are good candidates for cutting. When cutting the non-mast producing tree be sure not to cut the vine.

Brush piles along the perimeters of forest openings and along the forest edges can provide cover for woodrats. A good guideline size for piles is 6 feet high by 16 feet wide. The pile can be dense in the middle and loose outside; the big material on the bottom and the small material on top. Avoid creating a pile under a snag as this will promot predation of rats.

Per the WVDNR recommendation, CD-ATS will incorporate "living" brush piles as a management strategy. A "living" brush pile will provide food, escape cover, bird nesting sites, protection for new stump sprouts, and advance tree reproduction. A "living" brush pil is loosely organized brush with: 1- a perimeter of herbaceous plants and tree seedlings; 2- a covering of vines; 3- a framework of hinge-cut small trees and/or; 4- a combination of this living material.

Even if vines are not present a living brush pile can be created by cutting partially through the trunks of a few saplings up to 10 feet tall and leaving as much of the bark intact as possible. Push the trees over into a pile or 'teepee'. Birch and maple saplings are good tree choices. These hinge cut trees will live for a few years and they will form the loose base for a larger brush tangle.

Creating Rock Piles. Rock piles also provide a microhabitat for small mammals and herptiles. Rock piles should be at least six feet apart, nine to 12 feet across, and three to six feet high, and occupy a total area of about 30 square feet. Several piles of this size located near cover, feeding areas, or water are better than one large pile (Payne and Bryant, 1998). Do not create rock piles by taking rocks from existing natural forested rock habitat; these areas should be left undisturbed if the forested habitat is intact. Instead use only salvaged rocks (e.g. rip-rap) for the construction of rock piles.

Ephemeral and Small Pools. Ephemeral and small pools located throughout the base are important breeding sites for many amphibians that live on the CD-ATS. These amphibians are an important link in the food web that exists in this community, as many species of reptiles, amphibians, mammals, and birds rely on amphibians for a portion of their diet. The breeding sites for these amphibians are critical habitat for these species and will be protected from disturbance whenever possible. Pools known to have large numbers of amphibian eggs and larvae will be flagged with the hopes of preventing vehicles from traveling through them. These sites will be flagged in early spring, during the period when wood frogs (*Rana sylvatica*) and spotted salamanders (*Ambystoma maculatum*) are breeding, and protected until late spring when most larvae have metamorphosed and left these ponds. In addition to protecting these pools and

ponds, cover boards will be placed in suitable habitat nearby to provide ground cover for snakes and other herptiles during the active seasons.

Roadsides and Other Miscellaneous Areas. Roadsides can provide wildlife habitat if maintained appropriately. Minimize roadside mowing. Mow only one mower width from the edge of the road except in areas where mowing is needed for visibility and safety reasons. Mow the grass to height of six inches or higher if possible. Develop roadside and ditch habitat for wildlife by mowing on a three to five year rotation. Plant these areas with native grasses, wildflowers for pollinators, and shrubs when compatible with drainage structures in use. Pollinator plots should be well marked to avoid pesticide applications.

Wildlife crossing signs may be placed on paved roads to remind military personnel and other motorists that wildlife may be attempting to cross. The CD-ATS road and the Whetsell Settlement road are especially important, and signs will make motorists aware of the possibility of encountering wildlife on these roads, thus hopefully reducing the occurrence of road mortality.

6.3.3 Nuisance Wildlife and Wildlife Diseases

Diseases affecting fish and wildlife may occur on the installation. As outlined in AR 200-1 installation Natural Resources personnel will consult with appropriate Army Veterinary Corps personnel regarding large-scale fish and wildlife deaths and unnatural behavior occurring on the installation. CD-ATS-ENV personnel will also immediately contact Dr. James Crum at the Elkins Operations Center (304) 637-0245 and the District I Wildlife Biologist, Mr. Steve Rauch, at (304) 825-6787.

CD-ATS-ENV personnel will take measures to avoid migratory bird nesting in areas that may cause problems such as under pavilion shelters or on eaves above doorways. Deterents such as bird spikes or repellent sprays/gels can be placed in potential problem areas at the beginning of the nesting season to discourage migratory birds from nesting in these locations. Other deterents such as scare tape or reflective disks can be used in areas where they don't interfere with military training or other human activies. If nests must be physically removed from a problem area it would be considered purposeful take and would require a permit from the USFWS.

USDA APHIS Wildlife Services conducted seasonal BASH surveys at Camp Dawson AAF in the Spring, Summer, Winter and Fall of 2017 to address installation concerns of potential hazards relating to overabundance of Canada Goose and White-tailed Deer. The reports concluded that the number of whitetail deer and Canada geese is concerning and are capable of creating a very serious BASH issue. A working BASH plan was developed in coordination with the USDA that utilizes USDA APHIS Wildlife Services biologists/technicians to conduct a wildlife damage management program at Camp Dawson. One of the keys to success is to use an integrated approach which allows methodologies to be employed strategically throughout the year, maximizing the effectiveness of each management technique. The Plan has been contracted and funded through Aviation for the past three years.

6.4 Management of Threatened and Endangered Species Habitats

This section presents information about the management of sensitive species that are located or may be located at the CD-ATS, and requirements and strategies for management. The Indiana bat, northern long-eared bat, and running buffalo clover are the only Federally-listed species known to occur at the CD-ATS. No critical habitat is found at the CD-ATS. Laws and regulations pertaining to the management of threatened and endangered species include:

- ESA of 1973 (16 U.S.C 1536);

- Sikes Act Improvement Act (16 U.S.C.670a et seq.);
- AR 200-1;
- MBTA of 1918;
- Bald Eagle Protection Act of 1940 (16 U.S.C. 668-668d, 54 Stat. 250);
- DoDI 4715.03, Environmental Conservation Program;

These laws and regulations are described in Appendix G.

The NDAA of 2004 made a significant revision to the ESA of 1973. NDAA stated that, "The Secretary [of the Interior] shall not designate as critical habitat any lands or other geographical areas owned or controlled by the DoD, or designated for its use, that are subject to an integrated natural resources management plan prepared under section 101 of the Sikes Act (16 USC 670a), if the Secretary determines in writing that such plan provides a benefit to the species for which critical habitat is proposed for designation." Under the 2004 NDAA, a military installation may have its INRMP obviate the need for critical habitat designation if the INRMP provides a benefit to listed species, and manages for the long-term conservation of the species.

If an Army Guard installation has federally listed threatened or endangered species, proposed federally listed threatened or endangered species, and/or candidate species on the installation, or unoccupied habitat for a listed species where critical habitat may be designated, the INRMP must specifically address the benefits of management of these actions for these species or habitats in the document. The benefit should be clearly identified in the document and included in the table of contents. This INRMP Update is intended to provide a benefit to, and gain a critical habitat exemption for, the following species: Indiana bat, northern long-eared bat, Virginia big-eared bat, running buffalo clover, and flat-spired three-tooth land snail.

6.4.1 Management Strategies

The WVARNG will manage threatened and endangered species by avoiding sensitive areas during training, preventing damage to sensitive areas, and rehabilitating damaged areas. Known locations of rare plants and animals must be protected and these populations preserved.

The occurrence of rare, threatened, and endangered species is subject to change over time as a result of either recruitment, identification of additional protected species, or the change in status of species currently present at the CD-ATS. Therefore, surveys will be conducted periodically to maintain current floral and faunal inventories at the CD-ATS. Several efforts have been made to determine whether any special status species are present within the CD-ATS, which include the 2000-2001 and 2006 faunal inventories (Anderson and Kerns, 2006; Anderson et al., 2002a), the 2001 and 2005-2006 vascular plant inventories (Streets, 2006; Streets, 2001), the critical faunal survey for the Cheat three-tooth land snail and Indiana bat (Schwierjohann et al., 2002), the 2006 bat survey (Mann & Brack, 2006), the 2013 bat survey (De La Cruz & Karp, 2013), the 2016 bat survey (De La Cruz & Schroder, 2016) and the 2019 bat survey (Schroder & Maltba, 2019).

6.4.1.1 Federally-Listed Species

The endangered running buffalo clover was discovered in 2005-2006 in the northern portion of the Volkstone TA and on the southeastern edge of the Briery Mountain TA (see Figure 7a and 7b**,** Appendix D). The running buffalo clover, the only known Federally-listed plant species residing on CD-ATS lands, is found within the mixed mesophytic forests of colluvial slopes vegetation community (Streets, 2006). The Cheat three-tooth land snail and Indiana bat have known occurrences in Preston County. The USFWS requested that surveys be conducted for these species. A survey was conducted in 2002 (Schwierjohann et

al., 2002). No Federally-listed bats or snails were observed. Additional bat surveys were conducted in 2006 (Mann & Brack, 2006), 2013 (De La Cruz & Karp, 2013), 2016 (De La Cruz & Schroder, 2016), and 2019 (Schroder & Maltba, 2019). Indiana bats (endangered) and northern long-eared bats (threatened) were positively identified via acoustic sampling in 2013, 2016 and 2019 and represent the only known Federally-listed mammals residing on CD-ATS lands. In addition to acoustic hits, several northern long-eared bats were captured via mist netting in the 2013, 2016 and 2019 surveys. In 2016 and 2019, several attempts were made to radio track reproductive females in order to identify any maternity roost sites on or near the CD-ATS but none were located in those efforts.

Habitat and management information for these Federally-listed species is provided below.

Running Buffalo Clover. Running buffalo clover is a perennial herb that grows to a height of three to six inches. This species flowers from mid-April to early June, and is easily propagated from cuttings. The running buffalo clover occurs in three geographical regions: Appalachian (West Virginia and southeastern Ohio), Bluegrass (southwestern Ohio, central Kentucky, and Indiana), and the Ozarks (Missouri). The original habitat for the species is believed to have been areas of rich soils in the area between open forest and prairie. These areas are believed to have been maintained by the disturbance caused by the buffalo (*Bison bison*). The reason for this species decline is not known. However, it is believed to be related to the disappearance of large herbivores from the plant's habitat (USFWS, 1992). This species occurs now in areas with moderate infrequent disturbance (for example, old logging trails, dirt paths and mowing); mesic soils often derived from limestone; rich woods with native wildflowers; lawns of old houses; cemeteries; and filtered sunlight (USFWS, 2006).

Current threats to this species include habitat destruction, habitat succession, invasive species plant competition and inherent biological vulnerabilities (reliance on pollinators, seed scarification, dispersal mechanisms, and dependence on disturbance). Management options for the running buffalo clover are not easily discerned because of its apparent need for periodic disturbance. More information is needed to understand the level of periodic disturbance needed to maintain this species (USFWS, 2005; WVDNR, 2005).

Photo 7. Federally Endangered Running Buffalo Clover. *Photo by Ryan Snyder.*

The USFWS has implemented management strategies in areas with the running buffalo clover to try to maintain and enhance current populations. Some strategies, such as no herbicide usage, invasive plant removal via hand pulling or raking, and restricted mowing between April and July, have proven to have some success in maintaining existing populations. However, other strategies, such as prescribed fire, have not been found to be beneficial most likely due to a lack of root structure with this species (USFWS, 2006).

The USFWS, WVDNR and CD-ATS-ENV will work together during the 2021-2025 implementation period to identify ways to manage this species at the CD-ATS so that it can coexist with the training needs of the WVARNG and the public use of the area. In particular, the CD-ATS-ENV will look for innovative ways to manage this species in concert with training disturbance. The WVARNG developed an Endangered Species Management Component (ESMC) for this species that was completed and included into **Appendix I** of this INRMP during the 2007-2011 implementation period.

A habitat suitability model developed by the WVDNR suggests that the southern and eastern portions of CD-ATS have a very high likelihood of habitat suitable for RBC (**Appendix D**). The WVDNR suggests that surveys be conducted along old roads and skid trails in the areas of highest likelihood within CD-ATS.

The USFWS proposed the running buffalo clover for delisting on August 27, 2019 [Docket No. FWS-ES-2018-0036]. Section 4(g)(1) of the Act requires the USFWS, in cooperation with the States, to implement a monitoring program for not less than 5 years for all species that have been recovered and delisted. Therefore, a delisting determination would not affect CD-ATS management and monitoring practices during the 2021-2025 implementation period.

Indiana Bat. The Indiana bat is a medium-sized bat with dull grayish chestnut fur. This bat's diet consists of insects, especially soft-bodied moths, beetles, flies, and caddisflies that are trapped under closed tree

canopies over small streams. Females and juveniles feed within the airspace of riparian and floodplain trees, while males feed in the densely wooded area near the top of the trees. The decline of Indiana bat populations is a result of several factors that include the loss and degradation of suitable hibernacula; human disturbance during hibernation; pesticides; the loss and degradation of forested habitat, particularly stands of large, mature trees; and forest habitat fragmentation.

The USFWS recommends that mist nest surveys be conducted at the CD-ATS every three years. Indiana bats were positively identified via acoustic sampling during the 2013, 2016 and 2019 bat surveys. The WVARNG will continue to coordinate with the USFWS. The WVARNG developed an Endangered Species Management Component (ESMC) for this species in accordance with AR 200-1 that was completed and included into **Appendix I** of this INRMP during the 2012-2017 implementation period. Additionally, Beneficial Forest Management Practices for WNS-affected Bats: Voluntary Guidance for Land Managers and Woodland Owners in the Eastern United States. A product of the White-nose Syndrome Conservation and Recovery Working Group established by the White-nose Syndrome National Plan has been added to the ESMC (**Appendix I**) as an addendum for this INRMP Update.

Northern Long-eared Bat. The northern long-eared bat is a medium-sized bat about 3 to 3.7 inches in length but with a wingspan of 9 to 10 inches. As its name suggests, this bat is distinguished by its long ears, particularly as compared to other bats in its genus, Myotis, which are actually bats noted for their small ears (Myotis means mouse-eared). White-nose syndrome, a fungal disease known to affect bats, is currently the predominant threat to this bat, especially throughout the Northeast where the species has declined by up to 99 percent from pre-white-nose syndrome levels at many hibernation sites. Although the disease has not yet spread throughout the northern long-eared bat's entire range (white-nose syndrome is currently found in at least 25 of 37 states where the northern long-eared bat occurs), it continues to spread. Experts expect that where it spreads, it will have the same impact as seen in the Northeast.

As with the Indiana bat, the USFWS recommends that mist nest surveys be conducted at the CD-ATS every three years. Northern long-eared bats were recorded acoustically and captured via mist netting in the 2013, 2016 and 2019 surveys. The WVARNG will continue to coordinate with the USFWS. The WVARNG developed an Endangered Species Management Component (ESMC) for this species in accordance with AR 200-1 that was completed and included into **Appendix I** of this INRMP during the 2012-2017 implementation period. Additionally, *Beneficial Forest Management Practices for WNS-affected Bats: Voluntary Guidance for Land Managers and Woodland Owners in the Eastern United States. A product of the White-nose Syndrome Conservation and Recovery Working Group established by the White-nose Syndrome National Plan* has been added to the ESMC (**Appendix I**) as an addendum for this INRMP Update.

Flat-spired Three-tooth Snail. Little is known about the ecology and natural history of the flat-spired three-tooth land snail. The shells of adult flat-spired three-tooth land snails range from 0.76 to 1.0 inch in diameter. The spire, or the dorsal surface of the shell, is quite flat and not conical (cone-shaped) as in most snails. The shell is brown and the body dark gray. The "three-tooth" portion of this animal's name is rather misleading; this snail has only one "tooth" located inside the aperture (opening) of the shell (other closely related species do have three "teeth"). This tooth is actually a thickening in the wall of the shell that is thought to help the snail defend itself against predators, such as snail-eating beetles, that try to enter the snail's shell to attack the animal. When these snails mature, a white lip is formed around the edge of the aperture, and the snail's shell stops growing. This snail is frequently associated with outcroppings of sandstone. Areas where this snail occurs are usually wooded and dominated by sandstone cliffs or areas of large sandstone boulders. The snails are often found in cracks and crevices in the rocks. Because the current known distribution of the flat-spired three-tooth snail is patchy and little is known about the ability of the animal to move among sites or to withstand inbreeding, it is not known whether habitat fragmentation constitutes an important threat (Schwierjohann et al., 2002).

Only one area within the CD-ATS, an approximately 25 acre plot to the north in the Cheat River Canyon (Pringle Tract TA), contained habitat with the physical characteristics typical of sites used by the flat-spired three-tooth snail (Schwierjohann et al., 2002). No further consultation with the USFWS for the flat-spired three-tooth snail is required unless activities are planned within the 25-acre area identified as suitable habitat (see **Figure 8**, Appendix D). No critical habitat is established for this species. Because the 25-acre area is rather rugged, comprising of heavily wooded vegetation and extremely steep slopes near the Cheat River, it does not impact training activities to avoid this 25-acre area. If the flat-spired three-tooth snail is observed on the installation during future surveys, the WVARNG will develop an ESMC.

6.4.1.2 Rare State-Listed Species

Habitat information and management recommendations for the rare species observed at the CD-ATS are discussed below.

Birds

Alder Flycatcher (Empidonax alnorum). Alder flycatchers were recorded at the S-curve along the main road on the Pringle Tract TA. Alder flycatchers primarily inhabit brushy swamps, meadows, and bogs, especially areas with beaver activity. Management for this rare species includes:

- Maintain existing areas of brushy upland areas for nesting and cover.
- Preserve existing swamps and wet meadows with large trees to provide potential habitat for alder flycatchers.

American Kestrel (Falco sparverius). Although the American kestrel is the continent's most common and widespread falcon, WVDNR considers it a species of conservation concern. The American kestrel inhabits open areas covered by short ground vegetation where it hunts mostly from perches, frequently from utility wires along roadside berms, but also by hovering, especially when suitable perches are lacking. The kestrel is attracted to human-modified habitats and has been recorded on the Cantonment Area of CD-ATS. WVDNR recommends that CD-ATS staff coordinate with the Avian Conservation Center of Appalachia to install and monitor kestrel boxes at suitable sites.

Belted Kingfisher (megaceryle alcyon). The Belted Kingfisher inhabits diverse aquatic habitats where it typically perches over clear open water before plunge-diving for prey-chiefly fish, but also other aquatic animals such as crayfish. The kingfisher has been observed along the Cheat River on the Cantonment Area of CD-ATS. The availability of suitable nesting sites—earthen banks where nesting burrows can be excavated—is important for the distribution and local abundance of this species. The kingfisher prefers to excavate a nesting burrow near its fishing territory, raising a single brood annually. Kingfishers are sensitive to disturbance and may avoid or vacate habitats that are frequented by humans, particularly when breeding. CD-ATS staff should avoid any activities that disturb stream banks, particularly along the Cheat River.

Black-billed Cuckoo (Coccyzus erythropthalmus). The black-billed cuckoo, a long-tailed bird of soft browns and gray with a black bill, is secretive and heard more often than it is seen. The preferred habitat of this species is young forest early successional habitat. Large insects, especially caterpillars, and some fruits and seeds make up the diet of this cuckoo. Loss and degradation of riparian habitats and water diversion are some of the largest threats to this species. WVDNR recommends considering timber management to create/enhance early successional habitat as per golden wing warbler BMPs and create interior openings in mature forests. The black-billed cuckoo was first observed in the Camp Dawson Proper and Pringle Tract TA during the 2000-2001 fauna survey (Anderson et al., 2002a; Hughes, 2001).

The black-billed cuckoo was recorded again in 2018 and 2020 on the Pringle TA during golden-winged warbler point-count surveys.

Broad-winged Hawk (Buteo platypterus). The broad-winged hawk is a common breeder in the large deciduous and mixed-deciduous forests of the northeast. Nesting pairs spend most of their time beneath the forest canopy, perch-hunting for insects, amphibians, reptiles, mammals, and birds. This hawk has been observed on both the Pringle and Briery TAs. Management for this species should include maintaining small clearings and wetlands in the vicinity of nesting areas. This hawk appears to select larger trees (>20cm DBH) for nesting and should be considered in timber-management activities.

Cerulean warbler (Setophaga cerulean). The cerulean warbler was most recently documented on CD-ATS in 2012 during surveys for the Cerulean Warbler Occurrence Atlas for Military Installations. One singing male was documented within the Cantonement Area. It was noted during this survey that most of CD-ATS lands are too disturbed or too high elevation to provide suitable habitat. Cerulean Warblers breed in large tracts of older deciduous forests with tall trees. In the Appalachian Mountains many warblers nest on north and east-facing slopes and tend to gravitate toward gaps or openings in the canopy. Management for this declining species should focus on forestry practices such as long rotation timber extraction and selective logging to create natural canopy gaps and uneven-aged forest stands.

Chimney Swift (Chaetura pelagica). Chimney swifts were recorded on Camp Dawson Proper during fauna surveys. Habitat for this bird is generally more urban areas where there are large concentrations of chimneys for nest sites and communal roosts. Access to suitable nesting and/or roosting microhabitat appears to be more important than macrohabitat. Management for this bird should include maintaining un-capped chimneys on existing billeting quarters throughout the CD-ATS. Chimney cleanings should be scheduled either before or after the breeding season and the damper should be closed during summer months.

Cliff Swallow (Petrochelidon pyrrhonota). Cliff swallows were recorded on Camp Dawson Proper during fauna surveys. Habitat for this bird includes open areas adjacent to water, which are close to man-made structures, including bridges and rural buildings. Microhabitat often consists of two surfaces forming a right angle with overhead protection (building corners, pavilion rafters, etc.) Access to microhabitat on structures must be maintained. Cliff swallows regularly and preferentially reuse nests from earlier years. WVDNR strongly suggests that site managers do not remove nests unless the nests clearly impede site operations. Cliff swallows are aerial insectivores and catch almost all of their prey while in flight. This species has been adversely affected by the introduced house sparrow, which often usurps nesting cavities and lowers cliff swallow nesting success. Management for this rare species includes:

- The Cheat River Bridge and surrounding buildings provide cliff swallows with nesting habitat. Nests built on buildings will not be disturbed during the breeding season.
- Cleanup of nearby waterways affected by AMD would increase populations of aerial insects and provide higher quality foraging areas for cliff swallows.
- Enhancement of riparian corridors with native forbs and shrubs would improve insect populations; this enhancement would also help the black-billed cuckoo and alder flycatcher.

Eagles—Bald Eagle (Haliaeetus leucocephalus) and Golden Eagle (Aquila chrysaetos). The bald eagle has been observed year round on CD-ATS primarily along the Cheat River cooridor while the golden eagle is a winter migrant that has been recorded on the Pringle TA during camera trapping surveys along the ridgeline. In 1962, the U.S. Bald and Golden Eagle Protection Act outlawed harming these birds, their eggs, and their nests. The most likely threat to eagles on CD-ATS is collisions with vehicles. CD-

ATS staff should make efforts to relocate any road-killed deer or other large mammals to safer feeding areas away from vehicle traffic.

Eastern Meadowlark (Sturnella magna). The WVDNR considers the eastern meadowlark likely to occur at CD-ATS; however, it has not yet been identified on-site during fauna surveys. Eastern meadowlarks are most common in native grasslands and prairies. Because vast swaths of grasslands are hard to find in parts of the eastern U.S., eastern meadowlarks will breed in many kinds of grassy areas as long as they can find about 6 acres in which to establish a territory. Maintaining the planted native grassfields on CD-ATS should continue to provide suitable, preferred habitat for this declining species. Early mowing during the nesting season should be avoided.

Field Sparrow (Spizella pusilla). The field sparrow is commonly observed on CD-ATS training areas. Field sparrows seek out open habitat with low perches, such as abandoned agricultural fields and pastures, fencerows, road and forest edges, and openings in wooded areas. Field sparrows are common, although their populations have dropped considerably in the last 50 years. Field sparrow habitat can best be maintained by protecting some woody vegetation in fields undergoing succession, and by thinning shrubs and saplings in forested habitat to maintain openings.

Golden wing (Vermivora chrysoptera) and Blue Wing Warbler (V. pinus). Golden-winged Warblers were recorded on all CD-ATS TAs. Golden-winged warblers favor overgrown fields, power cuts, and other early successional habitats. Blue wing warblers are hybridizing golden wing warblers out of existence. However, both are considered SGCN and WVDNR considers the two species together for management purposes.

Management for this rare species includes:

- Creation/maintenance of early successional habitats using golden winged warbler BMPs; priority should be given to sites with historical occurrences of these species.

Great Blue Heron (Ardea herodias). A great blue heron was observed flying over the Cheat River while surveying birds on the Camp Dawson Proper. Great blue herons are the largest and one of the most well known herons that inhabit West Virginia. Habitat use of this bird includes marshes, lakes, ponds, and rivers, although nesting occasionally occurs away from riparian areas. Great blue herons were a victim of persecution for their feathers before they were protected in 1923. Management for this rare species includes:

- Work to minimize acid mine drainage in the Cheat River as well as in adjoining tributaries (for example, Pringle Run). This would aid in restoring the Cheat River to a condition that could potentially support a population of Great Blue Herons.
- Forested hillsides, which currently exist along the Cheat River, provide ample nesting habitat for Great Blue Herons. These areas will be managed accordingly to maintain existing nesting areas for this bird.
- WVDNR recommends conducting a survey for potential great blue heron nesting sites along suitable waterways.

Green Heron (Butorides virescens). Green Herons are occasionally observed within Camp Dawson Proper as they hunt for fish along Peirce Lake. Green Herons are one of the few tool-using bird species. It often creates fishing lures with bread crusts, insects, and feathers, dropping them on the surface of the water to entice small fish. Green Herons are still common but population declines have been recorded across most

of their range. Management strategies for this declining species will be similar to those of the Great Blue Heron. Maintaining natural riparian zones, improving water quality in the Cheat River watershed, and protecting and preserving wetlands throughout CD-ATS will provide suitable habitat for this bird during the breeding season.

Kentucky Warbler (Geothlypis Formosa). The Kentucky warbler is a brightly colored bird of the deciduous forests of the southeastern United States. It stays near the ground and the lower levels of the forest, and nests on the ground. The Kentucky warbler was most recently observed on CD-ATS during cerulean warbler surveys in 2012. One of the biggest threats to the Kentucky warbler is habitat loss and degradation, particularly the disappearance of forest understory caused by over-abundant white-tailed deer. Management for this declining species should include keeping the deer population under control through the CD-ATS hunting program.

Louisiana Water Thrush (Parkesia motacilla). The Louisiana Water Thrush is a member of the warbler family that stays close to moving water—especially forested streams and creeks. Waterthrushes feed on streambed ("benthic") invertebrates. This bird has been observed on both the Briery and Pringle TAs during point-count surveys. As a bird of forested streams, Louisiana Waterthrushes are sensitive to water pollution, forest fragmentation, and losses of habitat. Management for this species should include maintaining stream buffers during timber harvest activities and improving water quality on the AMD impacted streams on the Pringle TA.

Prairie Warbler (Dendroica discolor). The prairie warbler is a tail-wagging yellow warbler with black streaks down its sides. It is found in scrubby fields throughout the eastern and south-central United States, not on the prairies. The prairie warbler has been documented on the Pringle TA through varies point-count surveys. Population declines are largely attributable to loss of breeding habitat through development and natural change of shrubby habitat to forest. Management for this declining species should include maintaining the scrub-shrub habitat on the reclaimed strip mines of the Pringle TA.

Sharp-shinned Hawk (Accipiter striatus). Sharp-shinned hawks were observed on the Pringle Tract TA during the summer of 2000 with fledglings. These hawks inhabit mixed forests in the breeding season and frequent mountain ridges during migration. The primary prey of this hawk is small songbirds, although it occasionally feeds on small mammals and herpetofauna. Historically, the sharp-shinned hawk was common in the forested areas of the east, but had declined by the early 1900s due to persecution. The use of Dichloro-diphenyl-trichloroethane(DDT) in the 1950s also augmented the decline of this bird. Management for this rare species includes maintaining tracks of existing woodland and some conifer stands to serve as nest trees. Sharp-shinned hawk is not a species of high concern in WV but retention of suitable habitat could be useful.

Spotted Sandpiper (Actitis macularius). The spotted sandpiper is a medium sized shorebird that breeds in a variety of habitats, such as shorelines, grasslands, forests, and lawns, with some sort of stream, lake or pond nearby. This species feeds on aquatic and terrestrial invertebrates (Oring et al., 1997).

The spotted sandpiper was observed in the CD-ATS Cantonment Area during the 2000-2001 fauna surveys (Anderson et al., 2002a). The spotted sandpiper has experienced long term substantial declines in WV and is now nearly absent as a breeder. Adverse impacts to this species include channelization and loss of ponds, lakes and wetlands. It is recommended that habitats for this species be maintained at the CD-ATS for this rare bird species.

Veery (Catharus fuscenscens). The Veery is a small forest thrush that hops through the forest understory foraging for insects and fruit. Veeries breed in dense, damp, mostly deciduous woodlands, often near rivers, streams, and swampy areas. Veeries gravitate toward disturbed forests, where dense understory

provides nest sites. They usually build their nests on or near the ground and are prone to nest parasitism by Brown-headed Cowbirds. Veeries require a forest with dense understory for nesting but also nearby open forest understory for foraging. The Veery has been observed on Briery TA during point-count surveys and CD-ATS staff should continue to maintain forest habitat that provides nesting and foraging opportunities for this declining species.

Yellow-breasted Chat (Icteria virens). The largest of our warblers, the Yellow-breasted Chat is a widespread breeder in shrubby habitats across North America. The Yellow-breasted Chat is commonly observed on the Pringle TA during annual Golden-winged Warbler surveys. The Yellow-breasted Chat breeds in areas of dense shrubbery such as that found on the reclaimed strip mines of the Pringle TA. CD-ATS should continue to create and maintain this early successional habitat to promote the success of this declining species.

Yellow-throated Warbler (Setophaga dominica). The Yellow-throated Warbler is a common woodland bird of the southeastern U.S. It has been observed during point-count surveys on CD-ATS which is located at the northern edge of its breeding range. The Yellow-throated Warbler nests and performs most of its daily activities high in the forest canopy. Yellow-throated Warblers breed in pine forests with an open understory, bald cypress swamps, and woodlands near streams. It is recommended that CD-ATS staff make efforts to preserve and maintain these habitat types where available.

Plants

Appalachian Sedge. The Appalachian sedge, a perennial herb, is found in dry-mesic woodland openings. Flowers bloom in early spring to late May. This species prefers average to well-drained soils and can tolerate soils with low nutrient content. Areas containing this rare herb will be maintained and monitored. The Appalachian sedge was observed within the following communities at the CD-ATS:

- Mixed montane hardwood forest;
- Mature floodplain forest (Vanderhurst & Streets, 2006);
- Transitional forest of high elevation colluvial slopes (Vanderhorst, 2001).

Butternut (Juglans Cinerea). Butternut is found throughout the state. It grows in rich woods. Only one tree was found on the CD-ATS. A single butternut tree was found in the Volkstone TA on the island during the 2005-2006 survey, which is within 0.3 miles of the single tree located along the base of the southeasterly facing gorge slope of the Volkstone TA in 2000. The tree observed in 2000 was growing at 1,300 feet AMSL within a diffusely lit forest. A canker fungus critically threatens butternut. A potential management practice would be to identify and monitor populations to find resistant individuals that can be used for propagation (Streets, 2006; Streets, 2001).

Emory's Sedge (Carex emoryi). A single population of Emory's sedge was found growing in a thin patch along the Cheat River in the Volkstone TA (Streets, 2006). Emory's sedge is a grass-like perennial that occurs in colonial patches on the edges of large rivers including backwater channels in sandy gravel bars (Vanderhurst & Streets, 2006).

Glomerate Sedge. There are six historic records from four counties in West Virginia for the glomerate sedge. The CD-ATS, Preston County record and one from Jefferson County in 1994 are the only recent records. This sedge prefers dry woods and thickets often in calcareous soils. There is not enough information available to determine management needs for this species. All *Carex* species need to be collected across the state to get a better idea of the real status of these species (Vanderhorst, 2001).

Red Pine (Pinus resinosa). Red pine is heavily planted in West Virginia. Hardy and Pendleton Counties are the only counties known to support native populations. Native populations of red pine occur on dry rocky slopes at high elevations (adapted from Strausbaugh and Core 1977). The CD-ATS population was located within the strip mine reclamation area in the northern section of Pringle Tract TA. It is located at 1,800 feet elevation and has a southeasterly aspect. The red pine population found within the survey area was obviously planted. The WVNHP does not track planted pine stands. Therefore, no management recommendations are offered (Streets, 2001).

Thicket Sedge (Carex abscondita). The thicket sedge is a perennial herb that blooms from May to June. The preferred habitat of this species is dry or occasionally moist woods. Areas containing this rare herb will be maintained and monitored. The thicket sedge was observed within the following communities at the CD-ATS:

- Mixed montane hardwood forest;
- Transitional forest of high elevation colluvial slopes (Vanderhorst, 2001).

Reptiles and Amphibians

Northern Red Salamander (Pseudotriton ruber ruber). The northern red salamander is widely distributed throughout West Virginia. Its bright red or reddish orange flesh along with irregular, rounded black spots on its dorsal surface best characterizes this species. The iris of the eye is often a bright yellow, which helps distinguish it from others in the same genus. They have a stout body with a short, fleshy tail and can attain a total length of four to six inches.

This species is most commonly associated with springs and small streams in open or woodland sites where it can be found under logs, stones, mosses, or damp leaves. This species is most active at night and forages on a variety of organisms including earthworms, spiders, snails, slugs, and even smaller salamanders.

In West Virginia, breeding begins in summer and early fall with eggs (clutches of about 70) deposited in the fall. Eggs hatch within eight to ten weeks depending on water temperature. The larval stage lasts up to 30 months. Reproductive maturity is said to be three years for males and five years for females (Anderson et al., 2002a).

In order to maintain stable populations of this species, it will be important to identify the specific areas in which the species is known to occur as well as locating other, similar habitats that may support a population. Recommendations for protecting this species would include eliminating, or at least minimizing, all training and maneuvering activities in and around the known habitats. Keeping the habitat as natural as possible would be the greatest management approach. Any alterations made to the habitat could cause a decline in species abundance and may even eliminate the population.

Wood frogs (Rana sylvatica) and possibly Jefferson's salamanders *(Ambystoma jeffersonianum)* begin breeding as early as late February or early March. Woodfrog metamorphs typically leave pools by mid-June but other amphibians us vernal pools throughout the year. When possible access to pools should be restricted until the pool has dried and even then all attempts should be made to stay out of the pool footprint to avoid damaging the habitat.

Timber Rattlesnake (Crotalus horridus). Historically, timber rattlesnakes ranged from Maine to northern Florida and west to eastern Texas, Oklahoma and Kansas (Ernst, 1992). Timber rattlesnakes may still be found throughout much of this area; however, northeastern populations have significantly dropped in

numbers (Brown, 1992). Humans are the major source of the rattlesnake decline through habitat destruction, persecution, and collection (Dodd, 1987; Brown, 1992).

Timber rattlesnakes are one of the most docile rattlesnakes (Klauber 1972). Shortly following spring emergence, male and non-gravid (non-pregnant) timber rattlesnakes disperse to heavily wooded areas to forage. In contrast to the dense canopy cover and dense surface vegetation selected by foraging snakes, non-foraging gravid females move to open areas, most typically rocky outcrops (Reinert, 1984; Martin, 1992; Brown, 1992). Many of WVDNR's known gestation sites are in downed hollow logs and trees. Several days following birth, post-partum females will move into the forest to forage before the onset of hibernation. Another factor influencing habitat selection relates to snake coloration and the need to be cryptic to prey and predators. Light color morphs have more frequently been found in areas of greater leaf litter and close trees whereas dark animals are frequently found farther from trees and in areas of greater log cover (Reinert, 1984).

Management Implications: To enhance and ensure the success of rattlesnakes at the CD-ATS, the following is recommended:

- Canopy removal will be prohibited within a 1000-foot radius from each hibernacula (Reinert, 1999). Den structure should remain undisturbed.
- Human access to all hibernacula will be restricted during hibernation egress (15 April to 15 May) and ingress (15 September to 15 November).
- Enhance rookery sites that are becoming shaded over with selective tree removal. Such activities will only be undertaken between 1 November and 30 March. Access to all rookeries will be restricted (1000-foot buffer) between 30 May and 30 September.
- Educate personnel, visiting military, and hunters. A standard handout may be supplied outlining sensitive areas and stressing appropriate actions when confronted with a timber rattlesnake. Hibernacula and rookery locations should not be specifically identified. Although collection of rattlesnakes is probably uncommon on the CD-ATS, all personnel, visiting and otherwise, will be informed as to the status of the timber rattlesnake and the illegalities of collection (without permit).
- Wildlife Crossing Signs could be an added safety measure for all wildlife.
- Caution should be used in performing certain activities, such as mowing, in open areas. Thick grasses and shrubs will support an active small mammal community and as a result, attract foraging snakes.
- Identify and create additional rookeries/basking areas. WVDNR has guidance on how to identify and create additional rookeries and basking areas and this information can be provided upon request.
- Identify hibernacula, either through telemetry work or active searching during hibernation egress. WVDNR can also provide assistance to CD-ATS staff in identification and mapping of snake hibernacula.

Mammals

Allegheny Woodrat. Allegheny woodrats are moderately sized rodents closely associated with forested, rocky habitats in the Central and Southern Appalachians. Allegheny woodrats typically live in rock "islands" or colonies. This species is declining in most of its range, and speculations regarding the causes

of this decline are numerous. Further research on this secretive species could yield vital information on woodrat ecology and biology that may give some clues as to why this mammal is experiencing such widespread declines. Allegheny woodrats have only been found on the steep, rocky slopes of interior hardwood forest on the Pringle Tract TA so far, but scat piles have been observed on the Briery Mountain TA, and several areas on Volkstone TA provide suitable habitat patches (Anderson et al., 2002a).

Management Implications: To enhance and ensure the success of Allegheny woodrats at the CD-ATS, the following is recommended:

Any timbering activities that occur near or in areas where woodrats reside will take into account the need to provide a reasonable amount of forest cover around large, rocky south-facing slopes for the maintenance of woodrat populations on the CD-ATS. Given the known woodrat home range and local movement distances, it is recommended when timbering to aim for a 200 meter buffer around rocky habitat features to keep connectivity among woodrat populations. An exeption to this distance would be if selective thinning of the forest canopy is being conducted to promote mast trees like oak. At minimum 50 feet should be retained/buffered around forested rocky features when 200 meters can't be achieved.

Military activity will be limited in these areas, and any waste created by these activities will be removed from the forest so that woodrat populations are not affected by direct human contact.

Consistent monitoring of the Allegheny woodrat by CD-ATS-ENV personnel provides valuable information on population status and health. Personnel will also be searching new slopes on the CD-ATS to locate any new subpopulations of woodrats that might occur. Woodrats can be documented with only two nights of effort using game cameras as opposed to time expensive live trapping.

WVDNR recommends incorporating mast producing trees within riparian buffer strips or in close proximity to them if they are not already a component of the buffer strips. The establishment of travel corridors between rock outcrops would be beneficial management practice for the woodrat.

Eastern small-footed bat. The Eastern small-footed bat is slightly larger than the little brown bat with chestnut brown fur and a grayish belly. During winter, this species hibernates singly in the coldest portions of caves and mines usually near the entrances, and may be found hanging on the walls, ceilings, and even in cracks and underneath rocks on the floor (Whitaker and Hamilton, 1998). Little is known about summer habitat requirements. Summer roost sites may include rock crevices, under boulders, or buildings. Based on limited ecological data for the species, potential roost sites at the CD-ATS include concrete structures (bridges and old buildings), natural rock outcroppings, similar to those found in Pringle Tract TA and Volkstone TA, and mining high walls (Schwierjohann et al., 2002). In West Virginia natural rock features/talus slopes appear to be the main roosting habitat for eastern small footed bat. Protection of these rocky features, like for the woodrat would benefit eastern small footed bat, long-tailed shrew, Allegheny woodrat, and southern rock vole.

One male Eastern small-footed bat was observed near a bridge in 2002 and two (one male and one lactating female) were captured during 2006 mist net surveys at the CD-ATS (Mann & Brack, 2006; Schwierjohann et al., 2002). Eastern small-footed bats were also recorded acoustically and captured during mist-netting in 2013(1) and 2016(2) (De La Cruz & Schroder, 2016; De La Cruz & Karp, 2013).

Long-tailed Shrew (Sorex dispar). The long-tailed shrew inhabits the Appalachian Mountains from Maine to North Carolina, and was observed in all CD-ATS TAs during faunal surveys. This species is generally found in moist, rocky areas of deciduous or mixed deciduous-conifer forest. Long-tailed shrews are dark gray with slightly paler underparts in summer, and an overall slate gray in winter. Foods include small invertebrates and plant materials. When possible a 200 meter buffer should be maintained around rocky habitat features. At a minimum 50 feet should be retained/buffered around rocky features when 200 meters cannot be achieved. Just like for the southern bog lemming, CD-ATS personnel should

be informed not to leave any waste that could potentially be ingested, entangle, or otherwise harm populations of rare mammals. As shrews are invertivores they can easily ingest and bioaccumulate heavy metals and other pollutants from debris and trash left on the ground.

Meadow Jumping Mouse (Zapus hudsonius). Meadow jumping mice are small rodents with large hind feet and a bright yellow dorsal stripe. Ideal habitat for meadow jumping mice in this region includes damp meadows with lush ground cover and abandoned grassy fields. Thickets bordering ponds, streams, and grain fields also are commonly used by these rodents. The meadow jumping mouse is one of only three North American rodent species that exhibit true hibernation during the winter. Some common predators of meadow jumping mice include raptors, foxes, coyotes, bobcats, weasels, and snakes. The lack of habitat for this species is the primary reason for it being listed as rare by the WVDNR. The grassy areas of the Volkstone TA provide valuable habitat for this species to flourish, and a large number of meadow jumping mice have been collected from pitfalls on the Volkstone TA. The species was also collected in pitfalls on the other three tracts (Anderson et al., 2002a).

Grassy fields and wet meadows are ideal habitat for this mouse and also the southern bog lemming (*Synaptomys cooperi*). These grassy areas are relatively abundant on the Volkstone TA and reclaimed mine section of the Pringle Tract TA. Therefore, these grassland patches will be maintained and enhanced to provide cover and forage for the meadow jumping mouse and southern bog lemming. Since grassland habitat is scarce throughout the state of West Virginia, it is important to preserve the patches that do exist. So far, military activity in these areas has shown no negative impact on small mammal populations. Monitoring populations will give better evidence of any specific requirements or activities that might promote better quality habitat for meadow jumping mice or any other small mammal species.

Silver-haired bat. The silver-haired bat is one of the rarest and smallest bats in West Virginia. This bat has yellow-brown fur with a golden sheen and a black face. In the winter it is found hibernating in caves, however it is never abundant. Pregnant, lactating females have been captured. No maternity colonies have been located in West Virginia. The only known maternity colony was found in the expansion joints of a bridge in Kentucky. Populations of this bat are relatively stable; however increased use of caves and rock outcrops could impact this species (WVDNR, 2006). One silver-haired male bat was captured during the 2006 mist net surveys (Mann & Brack, 2006). Silver-haired bats were acoustically recorded in 2013 and 2016 but none were captured (De La Cruz & Schroder, 2016; De La Cruz & Karp, 2013).

Southern Bog Lemming. These small microtine rodents generally occur in low, damp bogs and meadows with heavy vegetation. In this region of the country southern bog lemmings are most commonly found in wet meadows on reclaimed mines. The range of the southern bog lemming stretches from northeastern Canada south to Tennessee and from the plains states to the east coast. This species creates small runways that are littered with trimmed vegetation and distinctly green scat piles. Some common predators of southern bog lemmings include raptors, foxes, bobcats, coyotes, weasels, and snakes. Southern bog lemmings generally occur at low densities throughout most of their range. This species is common in areas with high densities of bogs and marshes. West Virginia does not have an extensive wetland ecosystem to provide the quantity of habitat for this species to be considered abundant. Southern bog lemmings were captured in pitfall traps on all four CD-ATS tracts (Anderson et al., 2002a).

Habitat containing wet meadows on reclaimed mines is most prevalent on the Pringle Tract TA, and these meadows will be maintained to provide habitat for the southern bog lemming and meadow jumping mouse, which is also listed as rare by the WVDNR. Southern bog lemmings are also found in bottomland forest and any other riparian habitats. Therefore, riparian strips and wet meadows will be maintained. Mowing and burning are popular methods for maintaining meadows and other grassy areas. The CD-ATS populations of southern bog lemmings do not seem to be affected by the heavy military activity on the Volkstone TA, but troops will be informed not to leave debris and trash that could potentially harm

populations of rare mammals. Regular monitoring of population status is also important to observe trends in the status of this species.

Southern pygmy shrew (Sorex hoyi winnemana). The pygmy shrew's most distinguishable characteristic is its small size (only about two grams and approximately four inches). It is the smallest mammal in North America. This species inhabits wooded and open areas, wet or dry and makes burrows in the leaf litter and rotting logs. The pygmy shrew is active at all times of the day, but is typically most active at night. They emit a strong musky scent when marking territory and attracting a mate (Virginia Department of Game and Inland Fisheries [VDGIF], 2006). The southern pygmy shrew was observed during the 2000-2001 fauna surveys in Camp Dawson Proper, the Briery Mountain TA and the Pringle Tract TA (Anderson et al., 2002a).

Southern Rock Vole (Microtus chrotorrhinus carolinensis). The southern rock vole is a subspecies of the yellow nose or rock vole that occurs from northern Georgia up through the Appalachian Mountains into West Virginia. This species occurs in moist, rocky areas generally covered by birches, maples, hemlock, and mountain ash (*Sorbus* spp.). Typical predators include hawks, coyotes, foxes, weasels, copperheads, and timber rattlesnakes. This subspecies is likely considered rare due to a lack of available biological information and its secretive nature. Management of moist, rocky habitat for dense overstory and understory will not only benefit southern rock voles, but also a host of other uncommon small mammals that share these habitat requirements. Keeping management consistant for moist rocky habitat will help retain these unique microhabitat requirements for both southern rock vole and long-tailed shrew. The only rock vole found on the CD-ATS was collected in a pitfall trap on the Pringle Tract TA. However, all four CD-ATS tracts have suitable habitat. Continuous monitoring should be conducted on these wet, rocky slopes to provide population data for the rock vole on the CD-ATS. Since little is known about the biology of this secretive species, consistent monitoring in the future may indicate the importance of some specific habitat requirements (Anderson et al., 2002a).

Star-Nosed Mole (Condylura cristata). The star-nosed mole is differentiated from other moles by the 22 pink fleshy star-shaped projections on its nose. This mole is found in damp meadows, woods and swamps. Its tunnels often lead to streams or pools. The star-nosed mole is an adept swimmer and feeds from the stream bottoms (Venable, 2006).

This species was observed in all CD-ATS TAs during 2000-2001 faunal surveys (Anderson et al., 2002a). Continuous monitoring will be conducted within the wet meadows and woods to provide population data for the rock vole on the CD-ATS. Any waste generated by military activities should be cleaned up so that star-nosed mole populations are not affected by direct human contact.

Fish

Bluebreast Darter (Etheostoma camurum). The bluebreast darter is a small, olive green fish that usually reaches no more than three inches. Breeding males have orange tinted dorsal fins, small red spots on their sides, and a bright blue breast. This species spawns from May to June. Aquatic insects make up the majority of their diet. The preferred habitat includes fast-flowing stream sections with sandy gravel and large stone substrate (New York Department of Environmental Conservation [NYDEC], 2006).

The bluebreast darter was captured within the Cheat River at the Pringle Run confluence near the CD-ATS during the faunal survey (Anderson et al., 2002a). Management efforts for this species should include enhancing water quality and minimizing acid mine drainage in the stream segments within the vicinity of the CD-ATS.

Variegate Darter (Etheostamoa variatum) The Variegate Darter is a small benthic dwelling brown, teal,

and red-orange stream fish. This species is of northeast regional conservation concern (NEAFWA) due to decline of available habitat and the fact that a large percentage of its range occurs in this region as it is native and restricted to the Ohio River drainage. The Variegate Darter requires relatively unembedded cobble/boulder substrate with cool water of moderate pH.

The Variegate Darter was captured within the Cheat River at the confluence of Pringle Run on the CD-ATS during the faunal survey (Anderson et al., 2002a). Management efforts for this species should include enhancing water quality, minimizing the acid mine drainage in stream segments within the vicinity of CD-ATS, and minimizing the amount of sedimentation contribution from CD-ATS by maintaining sufficient riparian area around Pringle Run preventing runoff into the Cheat River.

6.5 Water Resource Protection and Soil Conservation

The CD-ATS-ENV is responsible for managing the WVARNG's water resources. A *Water Resources Management Plan* is was developed for the CD-ATS in 2006 and is on file in the CD-ATS Environmental Office. Laws and regulations that are associated with control and abatement of pollution in U.S. waters, and erosion control and soil conservation include:

- Federal Water Pollution Control Act as amended by the CWA of 1977 (33 USC §1251);
- U.S. Fish and Wildlife Coordination Act (16 USC §661);
- NEPA (42 USC §4321);
- EO 11990, Protection of Wetlands;
- EO 11752, Prevention, Control, and Abatement of Environmental Pollution;
- EO 12088, Federal Compliance with Pollution.
- Soil Conservation Act (16 USC §590a et seq.);
- Federal Water Pollution Control Act as amended by the CWA of 1977 (33 USC §1251);
- EO 11989, Off-road vehicle use;
- Sikes Act Improvement Act (16 USC §670 *et seq*.);
- AR 200-1, 32 CFR 651
- CSR 47-3, Pollution Prevention and Compliance Assistance Rule;
- West Virginia Code (WVC) §22-11, Water Pollution Control Act;
- WVC §22-13, Natural Streams Preservation Act;
- WVC §22-12, Groundwater Protection Act;
- WVC §19-1B-1, Logging Sediment Control Act

These laws and regulations are described in Appendix G.

6.5.1 Stormwater and Wastewater Management

Water quality of surface waters and groundwater can be impacted by natural resources management practices that affect stormwater runoff. Stormwater runoff is produced when rainfall at any time during a storm exceeds infiltration capacity of the soil. When this happens, water will accumulate in small depressions and run downslope as overland flow. Stormwater runoff can be a significant source of

pollutants and sediment into surface waters, especially in areas where groundcover has been disturbed. Water quality also may be negatively impacted by disturbances causing increased sedimentation to wetlands and stream channels. In addition, sources of stormwater and pollution at the CD-ATS could originate from the Cantonment Area or areas designated for fueling and maintenance activities. Stormwater runoff from impervious surfaces has a high potential to carry pollutants into wetlands, surface waters, and groundwater. Impervious surfaces at the CD-ATS include paved areas (for example, parking lots), roads, and buildings.

Currently, Best Management Practices (BMPs) are utilized during activities that could potentially affect water resources to prevent the introduction of contaminants into nearby streams, wetlands, ponds, and lakes (refer to **Section 6.5.2** for BMPs). The *Water Resources Management Plan* objectives are to:

- Assess the current availability of data regarding CD-ATS's water resources;
- Summarize available data and determine the quality of CD-ATS's water resources;
- Establish a baseline data gathering program to collect required additional water resources data;
- Identify areas where additional studies are needed to comprehensively assess CD-ATS's water resources;
- Identify particular water resources and/or specific locations that are management priorities or prime candidates for improvement;
- Provide realistic, scientifically sound, and implementable long-term monitoring and management strategies for CD-ATS's water resources.

6.5.2 Erosion and Soil Conservation

Erosion control and soil conservation are important water resource conservation issues. Accelerated erosion, continued compaction, or the removal of topsoil can drastically alter soils. Sediment resulting from erosion affects surface water quality and aquatic organisms. Two main types of soil erosion exist, wind erosion and water erosion. According to the soil survey, none of the soil components or mapping units has any significant erosion potential from wind. However, many of them are susceptible to water erosion. General BMPs are utilized during activities that could potentially affect water resources. Proper use of BMPs will prevent the introduction of sediments into the Cheat River and its tributaries, and the CD-ATS ponds, lakes, and wetlands. Examples of BMPs include: installing vegetative strips around a surface-water body to reduce runoff and sedimentation, and the use of silt fences. The CD-ATS will implement the following strategies:

- Coordinate with the Preston County Soil Conservation District and NRCS before implementing erosion control projects to ensure they are properly designed and implemented;
- Avoid constructing permanent structures within the floodplains;
- Revegetate barren ground as soon as possible;
- Minimize the use of pesticides and herbicides;
- Minimize the amount of impervious surfaces in newly developed areas;
- Restrict vehicle use to established roadways. Off-road vehicle use will only be allowed during dry conditions with the proper approval by the CD-ATS-ENV or their designee;
- Minimize troop movements in ponds, wetlands, streams, drainage ways, headwaters and unapproved offroad areas;

- Adhere to BMPs for construction activities described in the USEPA's Storm Water Management for Construction Activities;
- Ensure logging activities adhere to BMPs described in the WVDOF's W*est Virginia Silvicultural Best Management Practices for Controlling Soil Erosion and Sedimentation from Logging Operations* (**Appendix J**);
- Maintain erosion-control measures while ground disturbing activities are ongoing in accordance with the National Pollutant Discharge Elimination System (NPDES) permit requirements.
- Minimize erosion and the use of hazardous chemicals to protect groundwater in the area surrounding CD-ATS.

6.5.2.1 General Soil Practices and Concerns at the CD-ATS

Soils are complex systems that take centuries to develop. Accelerated erosion, continued compaction, or removal of topsoil can drastically alter them. According to the soil survey, none of the soil components or mapping units has any significant erosion potential from wind. However, many of them are susceptible to water erosion (Table 4). This includes the Bethesda-Rock outcrop, Buchanan, Cateache, Clymer, Ernest, Fairpoint, Gilpin, Laidig, Lily, Macove-Gilpin, and Shouns components. Together, these soil components total approximately 3,475 acres, over three-quarters of all four land tracts comprising the CD-ATS.

According to the soil survey, most of the soil-mapping units have severe limitations for virtually all developments. In addition, they have severe to moderate equipment limitations; the higher elevations soils tend to be in the severe category. The higher elevation soil mapping units also have high sheet erosion potentials, based on estimated soil loss. Therefore, any required developments must be carefully designed and located to avoid or limit soil erosion problems. Vegetative cover will be maintained on all soils on the Briery and Pringle Tracts, as well as on the slopes of the Cantonment Area.

Only 1.5 percent of the CD-ATS soils are classified as hydric soils by the NRCS. These areas may contain jurisdictional wetlands. Prior to impacting these areas (filling, modifying, draining, or construction), a jurisdictional wetland delineation will be performed and the proper permits obtained.

Soil compaction hinders root growth of established trees and shrubs. Compaction also reduces infiltration of water into the soil and results in ponded water where mosquitoes can reproduce. Over use of bivouac sites will result in soil compaction, thus, the following strategies will be utilized:

- Use ground guides when backing all vehicles off the road.
- Place human waste receptacles away from areas of vehicle traffic to avoid spills.
- Avoid damaging trees with vehicles. Damaged trees become susceptible to disease and insect infestation. Protect the trees. Forest cover protects the soil from erosion and provides tactical cover for training. Many of the soils where bivouac sites (i.e. Pringle Tract TA) are located have steep slopes and low tolerance to erosion making these soils highly erodible.
- Stay on roads during muddy conditions. Limit off-road vehicle use when soils are wet down to six inches and can be formed into a ball. Soils are easily compacted at this moisture content. Compaction kills plants because their roots have difficulty penetrating the soil and getting proper aeration. Plants hold the soil and keep it from eroding. If enough plants in an area have been killed, erosion can become a problem.

- Clean up all evidence that you have been at the site and dispose of waste in designated dumpsters. Do not bury or burn trash.
- Extinguish all sources of fire, including cigarette butts, before leaving bivouac sites. Monitor all fires. Fires can escape especially if weather conditions change drastically and can cause accidental forest or grassland fires.
- When possible, establish new bivouac areas on level areas like ridge tops that are not likely to erode. Also, select sites with trees that are tolerant of soil compaction and will persist at bivouac sites. Consult the CD-ATS-ENV prior to construction of bivouac sites.

Some types of training have the potential to destroy vegetation leaving bare soil. The following guidelines will serve to reduce such damage.

- When possible limit training exercises on soils with a high soil erosion index. Soils with an erosion index greater than 13 are very susceptible to erosion. If soil disturbing exercises must be conducted on these highly erodible soils, select locations on ridge tops where the land is relatively level.
- When possible, limit training when soils are muddy and alternate areas of use. Monitor these areas for signs of erosion, and take corrective measures. Advise the TSC if signs of erosion become evident.
- The disturbances produced may be minimal and not require restoration efforts. However, even small areas of disturbance can start a gully on sloping lands. Gullying can result in damage to vehicles and structures, degraded wildlife habitat, and deposition of silt into streams.
- Prohibit certain training activities from areas designated as wetlands, cultural resource sites, and the locations of threatened or endangered plants. Activities proposed for areas where rare species have been sighted must be handled on a case-by-case basis.
- Save excavated soil to fill foxholes or other small excavations, and pack soil to approximate undisturbed soil density. Replace the soil layers as they were; put subsoil in the hole first, and cover with the topsoil. Overfill holes to allow for settling. Vegetation becomes established more quickly in topsoil than in subsoil.
- If fill is needed for a training activity, take fill from an area that has already been disturbed rather than undisturbed forests or prairies. Pay attention to signs that restrict activities from certain areas.

6.5.2.2 Re-vegetation

There is the occasional reseeding of grasses and planting of trees to improve the training sites, and in areas disturbed by construction, training and related activities. Seeding is done to effectively establish vegetation to prevent erosion in areas of purposeful or inadvertent disturbance to the soil; the established vegetation also provides cover and food for wildlife. Seed germination, seedling establishment, plant growth and plant reproduction depends upon a variety of soil and climatic factors. Selection of appropriate seed and planting stock material and proper sowing and/or planting are critical to successful vegetation establishment. Revegetation of any disturbed area depends upon the chemical and physical properties of the material in which the plants will be rooted. Only native plant species may be used at the CD-ATS, unless specifically reviewed and approved by the CD-ATS-ENV. All areas seeded with grass must be mulched with a minimum of three square bales of straw per 1000 square feet of seeded area. Use mulch netting instead of straw on slopes over six percent. Information on soil amendments is provided below.

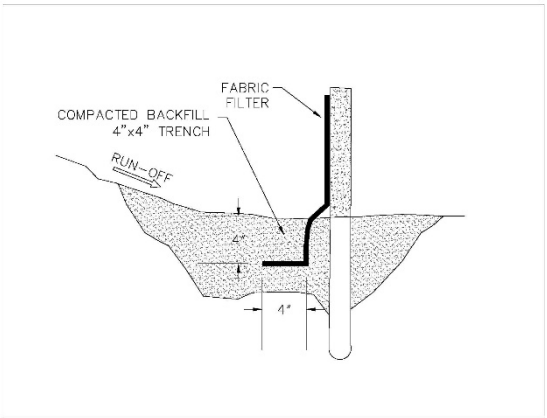
Soil Formations. Correct pH and phosphorus levels and the need for nitrogen fertilization are necessary for keeping adequate vegetative cover on lands used for military training. Therefore, soil amendments (lime and fertilizer) will be applied to rehabilitation sites before seeding. Proper application procedures should include soil analysis to ensure proper nutrient application levels. Other factors to consider are soil moisture, effects of the amendment on non-target species, weather patterns and potential contamination of streams, ponds and lakes.

Lime is used to neutralize acidic soils. The rate of lime application should be sufficient to raise soil pH to a value to support the species of plant material used for revegetation. Quality agricultural limestone is generally the preferred choice. Lime should be incorporated into the top six inches of soil, which allows better rooting of plants, and minimizes lime loss via rainfall runoff. Lime should not be applied under wet soil conditions because it is difficult to incorporate uniformly into the soil.

Fertilizers consist of three primary plant nutrients: nitrogen (N), available phosphorous (P_2O_5) and water-soluble potash (K_2O). Mixtures of fertilizer materials are commercially available; their grade or content is expressed as a ratio in weight percent as N:P:K. Fertilizer should be applied according to the results of the soil test. Fertilizers are also incorporated into the top two to four inches of soil, and should not be applied when soils are wet. In wet soils, salt from the fertilizer forms, which can significantly reduce the percentage of seed germination, especially with grasses. The effectiveness of bacteria inoculated on legumes is also reduced under such conditions.

6.5.2.3 Silt Fences

In addition to seeding and mulching areas greater than 150 square feet, use silt fences to prevent silt from leaving the site. Line the borders from which runoff could occur with silt fences. Install silt fences according to the instructions below.



- Place the silt fence at the lowest elevation of the graded area.
- Fasten silt fence securely to each steel support post or to woven wire, which is in turn attached to the steel fence posts.
- Embed silt fence in trench and backfill.
- At each end of the silt fence, turn fence upslope, and extend until ground surface rises.
- Inspect the silt fence frequently, and repair or replace promptly as needed.
- Remove accumulated silt when it reaches a depth of six inches. Dispose of sediment trapped by this practice in an area not prone to erosion.
- Remove silt fence when it has served its usefulness to avoid blocking storm flow or drainage.

6.5.2.4 Guidance for Roadways and Ditches

Provide V-shaped side ditches as shown in Field Manual (FM) 5-35 *Engineer Field Data* (DA, 1987). Size and shape the ditches according to this manual, generally with a 2:1 slope. Slopes should not be too steep to avoid bank sloughing. Provide properly sized and installed culverts according to FM 5-35 to protect

roadways and prevent erosion. In erosive areas, use riprap to stabilize the ditches. On steep erosive slopes, construct V-ditches with geotextile fabric and rip rap to add stability.

Shape and crown roads to drain water. Install culverts to improve drainage and minimize shrinking, swelling, and frost damage. Add crushed rock or gravel to prevent road damage caused by low strength.

Use straw bales in sloping areas where road ditches have a tendency to wash:

- Place straw bales end-to-end, perpendicular to the ditch to completely dam the waterway approximately every 50 feet. The anchored straw bales will slow the flow of water and prevent erosion.
- Place bales in a row with ends tight against adjacent bales.
- Embed each bale in the soil a minimum of four inches where possible.
- Anchor bales securely with wooden stakes or steel rebar driven through the bales. Angle the first stake in each bale toward previously laid bale to force bales together.
- At each end of dike, turn dike upslope, and extend until ground surface rises 18 inches.
- Seed ditch banks with the recommended grass mixture. After the grass becomes established, remove every other row. Remove additional bales as the grass grows in where the removed bales were.
- Inspect bales frequently, and repair or replace them promptly as needed.
- Inspect and eliminate gullies that form under the straw bales.
- Remove accumulated silt when it is six inches deep to avoid impeding or blocking storm flow or drainage. If the silt is not removed, storm water may cut a new gully around the dike.
- Remove bales when they have served their usefulness. Fill in and smooth the area.

6.6 Wetland, Floodplain, and Other Aquatic Habitat Protection

A jurisdictional wetland delineation of the CD-ATS was conducted in 2006 and a wetlands PLS was completed in 2001. Refer to Figures 5a, b, and c (Appendix D) for jurisdictional wetland locations from the 2006 survey. The CD-ATS has no pending Section 404 and 401 permits as of the effective date of this INRMP Update. There is no current involvement with local or regional wetlands banking.

EO 11988 (*Floodplain Management*) requires agencies to assess the effects that their actions may have on floodplains and to consider alternatives to avoid adverse effects and incompatible development on floodplains. CD-ATS is located on the edge of the flood-prone region of the Cheat River. Portions of the Cantonment Area (Camp Dawson Proper and the Volkstone TA) are located in the 100-year floodplain. Current surface inundation data and floodplain maps are available at the CD-ATS Environmental Office.

Laws, regulations, and executive orders pertaining to wetlands and floodplain protection and policies include:

- Rivers and Harbors Act of 1899;
- Fish and Wildlife Coordination Act of 1967;
- Land and Water Conservation Fund Act of 1968;

- Federal Water Pollution Control Act as amended by the CWA of 1977 (33 USC §1251);
- EO11988, Floodplain Management;
- EO 11990, Protection of Wetlands;
- NEPA (42 USC §4321);
- Sikes Act Improvement Act (16 USC §670 *et seq*.)
- WVC §22-11, Water Pollution Control Act;
- WVC §22-13, Natural Streams Preservation Act.

These laws and regulations are described in Appendix G.

During the 2002-2006 implementation period, efforts were made to increase aquatic habitat within Pierce Lake, an eight acre pond located near the northeast border of the post. Historically, the bank of the pond was mowed frequently, effectively eliminating any riparian habitat bordering the pond. In spring 2004, the CD-ATS-ENV in cooperation with the MCA planted approximately 140 hardwood species around the perimeter of the pond. Species planted included, river birch (*Betula nigra*), swamp white oak (*Quercus bicolor*), sugar maple, red osier dogwood (*Cornus stolinifera*), gray dogwood (*Cornus racemosa*), silky dogwood, and speckled alder (*Alnus incana*). In addition, a ten to 15 foot "no mow" vegetation buffer has been implemented to promote more suitable wildlife habitat and shading for aquatic species.

In 2015, CD-ATS-ENV received support from the Sustainable Range Program (SRP) and other tenant units in the use of manpower and equipment for the construction of the one acre Calvert Pond adjacent to the Modified Record Firing Range (MRFR) on the Briery TA. ENV staff partnered with the NRCS for the pond design. The Calvert Pond was stocked with largemouth bass, bluegill, yellow perch, channel catfish, and fathead minnows in 2016. The Calvert Pond serves as a water source for fire suppression on nearby ranges and provides recreation and training opportunities for soldiers.

The following guidelines will be implemented to ensure compliance and to maintain and enhance wetland, riparian corridor, and other aquatic habitats at the CD-ATS.

Wetlands

- Post signs in all known delineated wetland areas.
- Avoid conducting activities (filling, modifying, draining, or construction) within delineated wetlands at the CD-ATS.
- Subject proposed projects to environmental review by the CD-ATS-ENV if direct impact to wetlands cannot be avoided. The environmental review will seek to minimize the overall impacts, and determine the required permits and mitigation procedures for the proposed project. Any changes or impacts to wetlands at the CD-ATS will be documented.
- Mandatory, activity-free buffers will be placed around wetland to prevent potential indirect impacts to CD-ATS wetlands.

Floodplains

- Avoid construction of permanent structures within floodplains.
- Plant or encourage the growth of trees along stream banks at the CD-ATS to control stream bank erosion. Plant trees in areas where the forested corridor along the stream no longer exists. It is

recommended to maintain at least a 50-foot corridor of trees on both sides of streams, while a 100-foot corridor is preferred.

- Contact the CD-ATS-ENV before cleaning ditches to improve drainage, building roadways through drainage-ways, or using riprap to armor stream banks. These actions may require USACE permits.
- Build rock crossings where low water crossings exist at the CD-ATS to protect both vehicles from damage and water quality by minimizing sedimentation and erosion.
- Eliminate all timber management practices within riparian corridors and let them become old stands. If timber practices are maintained, create buffer strips. Buffer strips should be 245 feet wide, with an undisturbed zone at least 80 feet wide left adjacent to the water.

Retain snags within riparian areas for cavity dependent wildlife (for example, the federally endangered Indiana bat).

- Monitor stream banks and gully erosion along the streams within the training site boundaries. Walk the stream banks annually during the winter months when erosion is visible. Mark erosion sites on a map, and take corrective measures where appropriate. Corrective measures often require contacting the USACE and securing appropriate permits to complete the project.
- Restrict vehicular traffic, including lawn mowers, within riparian areas. Riparian areas will be defined around streams denoted in Figure 5a, b, and c (Appendix D). Water seeps and springs and adjacent saturated areas are unable to support troop activities and vehicle traffic. Occasional crossing of dry drainage-ways may be done without bridges or culverts with minimal impacts to the drainage way. Regular crossing requires the designation of crossing sites and the installation of temporary bridging or culverts. Vehicles are not permitted within established buffer zones without prior review and approval of the CD-ATS-ENV. Riparian areas will be established based on slope:
    - 50 feet for 0 percent slope;
    - 95 feet for up to 10 percent slope; and
    - 130 feet for up to 20 percent slope.

Other Aquatic Habitats

- Access water quality and if feasible reduce concentrations of pollutants.
- Initiatives will be taken to remove as many of the exotic species as possible and replace them with comparable native species.
- Provide fish habitat by adding Christmas trees or other brush to the lakes and ponds. Sink the trees with rocks or heavy stumps. Avoid using concrete blocks to sink the trees. The trees will provide cover to fish, such as crappie (*Pomoxis* spp.), bass, and other Centrarchids.
- Create overhanging banks on the outside bends of the river channel by using a log or plank platform covered with rock, grasses and sedge. Native shrubs and trees such as alder and willow can be planted 6.5 to 16 feet behind the stream bank to prevent excessive shading. In areas of slow-moving water, wetland emergent vegetation such as bulrushes, cattails (*Typha* spp.), and sedges can be planted with root clumps of ten square inches anchored to secure areas until they become established (Payne, 1992).

- Monitor aquatic vegetation to prevent overgrowth in ponds. Control plants only when plants cover more than 20 percent of the lake or pond. Some aquatic vegetation is beneficial. Aquatic plants can decrease or prevent shoreline erosion by minimizing wave action and by holding the soil with their roots. They provide food, shelter, and nesting habitat for fish and other aquatic organisms. Waterfowl eat their seeds and foliage. The plants also produce oxygen that is used by aquatic animal life, and they absorb excess nutrients to prevent algal blooms.
- Mow only areas of heavy recreational use surrounding ponds to control poison ivy, snakes, and ticks. In other areas, restrict mowing within 30 feet of the shoreline of impoundments. Plant a 30-foot buffer strip of eastern gamma grass (*Tripsacum dactyloides*), switch grass, Indian grass, and big bluestem around the circumference of all ponds. Remember the location of the high water mark to avoid drowning the grasses you have drilled. Mowing grass down to the edge of the water leaves the shore vulnerable to erosion especially under windy conditions when wind and waves can erode the shoreline. The edges of impoundments are often wetlands. The wetland vegetation provides habitat for wildlife and protects the banks from erosion.
- Plant scattered trees along the banks of ponds, such as pin oak (*Quercus palustris*), American sycamore, and northern red oak. Be careful not to shade out native grasses planted along the circumference.
- Plant a windbreak (**Chart 2**) 60 to 100 feet on the south side of the ponds. The windbreak should include at least two rows of trees and at least one row of shrubs. The southern winds cause waves to lap at the shore knocking away soil from the shore into the lake. Use riprap to armor the shoreline if necessary. Windbreaks also can make fishing pleasant and provide wildlife habitat close to the lake.

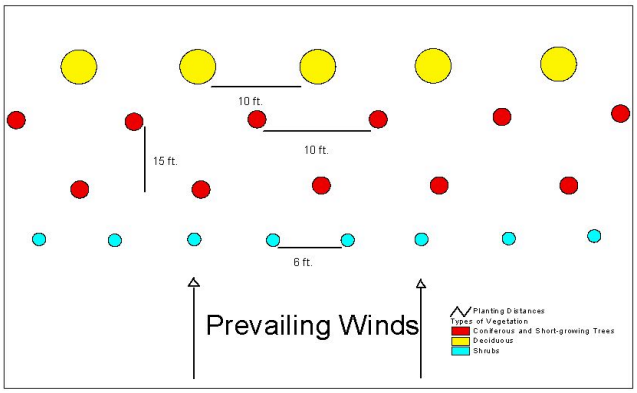


Chart 2. Suggested Windbreak Diagram

- Construct the ponds 30 to 40 feet across so that at least one-third of the bank has a gradual slope toward the deepest point. Make the deepest part of the ponds at least four feet. Add brush piles, logs, and rock piles along the north bank to provide cover for amphibians. Place part of each log in the water, and as much of the underside of each log directly on the ground as possible. Each pond should have five to ten logs from five to eight feet long and a minimum of six inches in diameter. Constructing these small ponds would provide engineering units with a training opportunity. They could gain experience with the heavy equipment required to do the excavation work.

Refer to Section 6.3 for additional strategies of improving wildlife habitat at the CD-ATS.

6.7 Grounds Maintenance

Lands at the CD-ATS are divided into improved, semi-improved, and unimproved grounds. Improved grounds can include residential, commercial, and industrial areas; linear infrastructure facilities; and recreational and construction sites. Approximately 330 acres of the CD-ATS is comprised of developed land and the majority of this land is found within the Cantonment Area east of the Cheat River (Camp Dawson Proper) (Vanderhorst and Streets, 2006). Semi-improved grounds can include altered lands, road shoulders, and other land use areas that require little maintenance. Only about two percent of land would be classified as semi-improved grounds. These areas need routine or periodic grounds maintenance. Natural resources management related to grounds maintenance and landscaping focuses on land and water management issues, such as storm water and water quality and pest management. Unimproved areas, which make up the majority of the CD-ATS include streams, ponds, wetlands, forests, and grasslands. See Figures 6a, b, and c (Appendix D) for general locations of improved, semi-improved, and unimproved grounds in the four land tracts.

Laws and regulations that are associated with grounds maintenance activities include:

- EO 13148, Greening the Government through Leadership in Environmental Management;
- Presidential Memorandum (April 1994), Environmentally and Economically Beneficial Practices on Federal Landscaped Grounds;
- MBTA, as amended (16 USC §703-712);
- Federal Insecticide, Fungicide, and Rodenticide Act (7 USC §136).

These laws and regulations are described in Appendix G.

A Presidential Memorandum, dated 26 April 1994, directs Federal executive departments and agencies to use regionally native plants in landscaping for Federal grounds and Federally-funded projects. Native species generally provide better habitat for wildlife and have relatively low irrigation requirements. In addition, the use of native species generally reduces the need for pesticides and fertilizers. Landscaping often involves urban forestry. Urban forestry is the maintenance of individual trees or groupings of trees in an urban environment or between dominant land uses. Urban forests are valued for non-consumptive uses such as providing shade, aesthetic value, and habitat for wildlife.

During landscaping and grounds maintenance activities, specific natural resources management includes:

- Using native species in any new landscaping;
- Ensuring that BMPs for spill prevention and pollution prevention are followed to protect surface water and aquatic habitats;
- Ensuring that use of herbicides and pesticides are minimized in accordance with Invasive Species and Noxious Weed Control and IPM strategies;
- Mow grasslands before 15 April and/or after 15 August in areas where possible to minimize disturbance on ground-nesting birds;
- Native coniferous tree species will be planted on lawns where larger coniferous trees already exist (for example, adjacent to the snack bar). This will provide additional nesting locations for birds that already exist in these areas and potentially create habitat for species that are not currently found in the existing habitat;

- Plant windbreaks or shelter belts of trees around the borders of parking lots and buildings to provide a barrier against winter winds and in turn reduce heating costs. Native shrubs and trees that provide food and cover for wildlife will be used, such as American holly (Ilex opaca), eastern red cedar (Juniperus virginiana), sweetgum (Liquidambar styraciflua), American hazelnut (Corylus americana), dogwood, and redbud (Celtis canadensis). Shrubs should be spaced about four to six feet apart; and trees approximately ten feet apart. To create shelter belts, plant several rows of larger trees, smaller trees, and shrubs with rows about 15 feet apart.

Grounds maintenance and landscaping is performed in accordance with federal and state laws and regulations. The CD-ATS also carries out these activities in accordance with the statewide *Integrated Pest Management Plan (IPMP) for the West Virginia Army National Guard* dated 2019 and the *WVARNG Regulated Waste Management Plan (RWMP) and Pollution Prevention (P2) Plan* dated February 2020.

The IPMP describes the installation's pest management requirements, outlines the resources necessary for surveillance and control, and describes the administrative, safety, and environmental requirements of the program. Refer to **Section 6.9** for more information pertaining to pest management.

The RWMP and P2 Plan is required by AR 200-1 to ensure compliance with applicable military, federal, state and local rules and regulations pertaining to hazardous material (HAZMAT) and hazardous waste (HW).

Federal agencies and facilities are required to implement pollution prevention measures as a result of EO 12856 (*Federal Compliance with Right to Know Laws and Pollution Prevention Requirements*). The purpose of the Pollution Prevention Plan is to prevent, whenever possible, releases of pollutants to the land, air, and water by means of source reduction or elimination.

6.8 Forest, Grassland, and Fire Management

In order to maintain the moderate biodiversity that exists, the full range of natural plant communities will be maintained. A total of 17 plant communities have been classified, characterized, and mapped on the CD-ATS (Vanderhorst and Streets, 2006). Thirteen (13) of the 17 plant communities are forest communities (approximately 3,080 acres), and the remaining are grassland (approximately 310 acres) and herbaceous wetland communities. Refer to Section 5.2 for a complete list of these communities and a description of each.

In general, the WVARNG plans to manage the land to promote native vegetation, while maintaining lands appropriate for required military training. This chapter of the INRMP Update specifies management strategies for grassland, forest, and fire management. A *CD-ATS Forest Resource Inventory and Management Plan* (Hicks and Jones, 2002) and a *Native Grass Restoration Plan* (WVARNG, 2002) have been developed for the CD-ATS. The forest inventory assessed the health and composition of timber within the Cantonment Area and Briery Mountain TA, which enabled Hicks and Jones (2002) to create specific management prescriptions. Management goals and recommendations from these Plans are summarized in the following sections.

Laws and regulations pertaining to terrestrial habitat management include:

- Federal Insecticide, Fungicide, and Rodenticide Act (6 USC §136);
- Forest and Rangeland Renewable Resources Planning Act (16 USC §1601 *et seq*.)
- NEPA (42 USC §4321);

- Sale of Certain Interests in Land, Logs (10 USC §2665);
- Sikes Act Improvement Act (16 U.S.C 660 *et seq*.);
- MBTA, as amended (16 USC §603-612);
- CSR § 61-9, West Virginia Seed Law;
- WVC §19-1B-1, Logging Sediment Control Act;
- WVC §20-2, Wildlife Resources;
- WVC §20-3, Forests and Wildlife Areas;
- WVC §20-3-5, Forest Fire Seasons; Permits for Fires, Prohibited Fires; Closure of forests;
- West Virginia Reform Law of 1909.

These laws and regulations are described in Appendix G.

6.8.1 Forest Management

AWP currently holds the timber rights to CD-ATS's state-owned land (Briery Mountain TA and Camp Dawson Proper). In addition, they have the timber rights on the Pringle Tract, which they own (Appendix E). The USACE – Baltimore District owns the timber rights on the Volkstone TA. The entire Briery Mountain TA and Camp Dawson Proper have undergone repeated, harvests, thus tree compositions of all forest communities on the tract have been significantly altered by the selective harvests. The primary goal of resources management planning for the CD-ATS will be to promote and sustain a productive, healthy, and diverse forest ecosystem. Management efforts will be geared toward improving forest stands to better suit wildlife needs, such as food, nesting, and cover habitat.

A *Forest Resource Inventory and Management Plan* was developed in 2002 for Camp Dawson Proper, the Volkstone TA, and the Briery Mountain TA. In order to provide for the wise use of forest resources, this Plan will be the basis for policies and objectives pertaining to the coordination of resource use and military development and activities. For specific details on management prescriptions for a specific forest tract, a copy of the Plan can be obtained in the CD-ATS Environmental Office. While this Plan includes recommendations for harvests for each specific forest tract, no forest activities, such as timber harvests, thinning, or replanting, are planned at this time because of the cooperative agreements established. The following general forest management guidelines will be implemented from this Plan when they do not interfere with the cooperative use agreements or the WVARNG military mission.

Implement the CD-ATS *Forest Resource Inventory and Management Plan* (Hicks and Jones, 2002).

- Ensure forest management activities adhere to BMPs described in the WVDOF's *West Virginia Silvicultural Best Management Practices for Controlling Soil Erosion and Sedimentation from Logging Operations* (Appendix J).
- Avoid habitat fragmentation;
- Avoid pesticide use as much as possible;
- Restore forests along streams and in areas where forests have been removed by planting native tree seedlings or by encouraging or allowing trees to grow. Suggested upland species include eastern white pine, eastern hemlock, northern red oak, and quaking aspen (*Populus tremuloides*).

Suggested bottomland species include black willow, American sycamore, river birch, and brookside alder.

- Leave snags and den trees undisturbed except when they are safety hazards. Snags are standing dead trees that provide essential habitat for wildlife species. Many birds that live in snags eat insects, which help prevent serious insect and disease problems in other living trees. Den trees are live trees with cavities used by birds, mammals, and reptiles for nesting or protection.
- Contact the CD-ATS-ENV prior to cutting any trees. The CD-ATS-ENV will determine if consultation with the USFWS is necessary. Suitable habitat for the Indiana bat and northern long-eared bat is located throughout CD-ATS per the ESMP (De La Cruz & Schroder, 2016)(**Appendix I**). If desirable trees are present and must be cut, cutting of trees will be avoided between 1 April and 15 November.
- Avoid off-road or trail vehicle use when possible.
- Promote native species growth and control invasive species spread (see **Section 6.9** for more details) to encourage healthy diverse forest stands.
- Avoid cutting within 80 feet of the water's edge and any harvesting within the buffer strip will be careful not to reduce overall canopy cover of the stand.
- Leave uncut buffer strips to encourage growth of more mature stands on areas that have been intensively harvested. This will increase the amount of available habitat for wildlife associated with older growth forests.
- Establish additional wildlife habitat by creating brush piles, snags, den trees, and coarse woody debris. For example, timbering has left several openings among the forest canopy, limiting the amount of natural cover available for wildlife. Creating brush piles within the forest and along forest edges is an easy way to provide security, thermal, and loafing cover for wildlife species.

Consult **Section 6.3.2** for details on creating and maintaining snags, nest boxes, brush piles, and other forest wildlife habitat.

Pests and Chemical Treatments. Tree loss from disease can be subtle, but occasionally significant. Diseases can weaken the trees and increase the chances of damage caused by winds. Tree disease can be especially prevalent where diversity is low and/or where tree density is higher than natural. Chemical treatments generally are not recommended for use at the CD-ATS. Mortality or decline of trees caused by insects or pathogens was not a problem at the CD-ATS until the recent appearance of the emerald ash borer (EAB) which has decimated the local population of mature ash tree species. CD-ATS has stands of American white ash and black ash that have been affected by the EAB.

6.8.2 Grassland Management

Because Camp Dawson has an abundance of old-field/mine reclamation areas within the training lands, it is the perfect arena for restoring native prairie grasses. The *Camp Dawson Native Grass Restoration Plan* was developed and implemented in 2002 by the WVARNG to optimize the use of military training lands while promoting the utilization and expansion of native grass communities. The plan focuses on restoring as many open areas back to prairie grasses as possible, which not only supports the military mission, but is also a sound management tool.

Native warm season grasses have an extensive root system, which provides excellent soil holding capabilities. They also typically recover from land disturbances, such as military training, quicker than

non-native cool season grasses. Because of these characteristics, they often improve both surface and ground water quality. Economically, native grasses are also an excellent choice for re-vegetation because they require no soil additives or black dirt for establishment. Since they are adapted to the climate and conditions already, native grasses will grow with no added fertilizer. The need for brush cutting is decreased immensely because they grow densely and suffocate domestic weeds. Additionally, the introduction of native warm season grasses will enhance habitat quality at the CD-ATS for a variety of organisms, including rare state-listed bird species.

The *Camp Dawson Native Grass Restoration Plan* establishes a 5-year work plan (2019-2024) that outlines several projects, which include clearing, grubbing, liming, herbicide, seedbed preparation, planting and maintenance

The long-term goals and objectives of the native grass plan are summarized below:

- Use native warm season grasses when replanting disturbed areas.
- Create an inventory of the existing grasslands within the CD-ATS, and identify areas on the CD-ATS that have the ability to be managed. The following areas would be excluded: firing ranges, wetlands, and areas of special concern, such as endangered species locations, historical or archeologically significant locations.
- Identify which plants are more tolerant to military training maneuvers. Design and establish trail plots to determine which species withstand tracked and wheeled vehicle traffic. Based on this research create planting recommendations that will ensure the ability to support military training indefinitely.
- Implement a monitoring program for seedling establishment.
- Incorporate native grasses into land rehabilitation and maintenance.
- Develop and implement a long-term native grass restoration program.
- Consider the effects of native grass management activities, such as planting, burning, and tree removal, near or on important cultural and natural resource areas. For example, mow grasslands before 15 April and/or after 15 August in areas, where possible, to minimize disturbance on ground-nesting birds.

Distribute and present information regarding the results of the planted areas, burns, and trial plots at appropriate conferences and to other interested groups and students.

- Provide training managers with the information they need to make decisions regarding the impact of training maneuvers on natural resources.

The WVARNG has received aid from the Monongahalia District State Conservation Service and the WVDNR. The Monongahalia District State Conservation Service helped the CD-ATS Natural Resource Staff test the soils on different TAs and recommended a lime ratio to establish optimum pH for planting. The WVDNR and NRCS provided no-till drill and tractor support.

6.8.3 Fire Management

Camp Dawson operates under the approved 2007 Integrated Wildland Fire Management Plan. Camp Dawson was one of the first installations to have a plan approved by NGB. Camp Dawson personnel involved in fire activities meet the NWCG qualifications for prescribed burning at the minimum. Prescribed burning is the purposeful application of fire in a controlled, knowledgeable manner that may be used as an

effective land management tool. The occurrence of fire is a natural component of many ecosystems (including both forests and grasslands) and prescribed burning can be a desirable and economically sound management practice. Prescribed fire may be used to accomplish the following:

- *Reduce hazardous fuels* - Periodically burning accumulated dead fuels can significantly decrease the chance of a forest fire, range and training area fires.
- *Prepare sites for seeding or planting* - Prescribed burns often expose adequate mineral soil and can control competing vegetation.
- *Improve wildlife habitat* - Prescribed burning can improve wildlife habitat and increase forage by keeping hardwood sprouts short, tender, palatable, and abundant. Deer, dove, quail, and turkey generally benefit from prescribed burns. In addition, grassland habitat is improved by the removal of undesirable grassland species.
- *Manage competing vegetation* - Prescribed burning can be used to control invasive vegetation.
- *Control insects and disease* - Prescribed burns may be used to control some insects and diseases.
- *Enhance appearance* - Prescribed burns often enhance recreation and aesthetic values of a forest and native grasslands by removing understory brush.
- *Perpetuate fire-dependent species* - Prescribed burning may be used to perpetuate many fire-dependent species. However, it is imperative to understand the ecology of the species to know which months will be ideal for a burn (Wade and Lunsford, 1988).

In addition, prescribed fire in grasslands can increase grass nutritive quality, palatability, availability, and yield, reduce hazardous fuels, suppress unwanted plants, and improve wildlife habitat. Grass quality, palatability, and availability are improved because the fire removes dead plant material and improves access to new growth. If soil moisture is adequate, grass yields increase because baring and darkening the soil surface allows it to warm more quickly and stimulate earlier growth, and because competing weeds are suppressed (Ortmann et al., 1998).

Prescribed burns may also be administered to improve wildlife habitat. To enhance wildlife habitat, prescribed burns will be administered from January to March to prevent the killing of new spring growth and enhance the growth of hardwood sprouts and herbaceous growth. Burns during January to March should not interfere with the nesting season; however, some areas will remain unburned to provide sufficient cover for nesting. Woodcock, ruffed grouse, turkey, and small game generally benefit from prescribed burns every two years, while deer benefit from a prescribed burn rotation of two to four years (NRCS, 1999).

The WVARNG has used and will continue to use prescribed burning as a management tool at the CD-ATS to enhance native vegetation and to control invasive species. The CD-ATS has nine prescribed burn units, which include two in the Volkstone TA, three in the Pringle Tract TA, and three in the Briery Mountain TA (see **Figure 9**, Appendix D). The Integrated Wildland Fire Plan and an example of a prescribed burn plan is provided in **Appendix K**.

Recommendations concerning prescribed burning at the CD-ATS include:

- Use prescribed fire to enhance native grassland species and control invasive species.
- Use trained WVARNG staff to conduct all prescribed burns.

- Evaluate weather conditions and the proximity of the burn to roads and built-up areas prior to each burn. Smoke management has become an important factor in scheduling prescribed burns.
- Avoid burning from April through August to the extent feasible to prevent impacts to ground nesting birds.
- Avoid burns located in the vicinity of forested habitat when wind conditions would result in smoke entering the forested area to prevent impacts to forest nesting birds and roosting bats.

6.8.3.1 Firebreaks

Firebreaks are an essential management tool for both prescribed burning and wildfire prevention. Wildfires could result from the use of pyrotechnic devices or tracer fire. In an active effort to confine fires to the smallest area possible, firebreaks will surround active impact areas and ranges where these activities might occur. However, natural firebreaks currently occur within the CD-ATS. Natural firebreaks include 20 miles of intermittent and perennial streams, including Pringle, Morgan, and Stamping Ground Creeks, and roadways within and along the boundaries of the site. Implementation of prescribed burns and the natural firebreaks within the property boundary will reduce the likelihood of wildfires to spread into nearby residences and farms. It is recommended that activities that have a high potential to create wildfires be conducted near natural firebreaks.

Photo 8. Implementation of Prescribed Burning at the CD-ATS. *Photo by Rick Chaney.*

Photo 9. Prescribed Burning at the CD-ATS. *Photo by Rick Chaney.*

Photo 10. Prescribed Fire Crew and Equipment. *Photo by Rick Chaney.*

6.8.3.2 Fire Prevention and Reporting

Abundant vegetation at the CD-ATS provides ample fuel for forest fires. Wildfires can quickly destroy entire TAs. Responsible use of incendiaries and pyrotechnics can prevent wildfires. Fire protection procedures for troops using the CTDTA are specified in the *Soldier Environmental Handbook*, which is available in the CD-ATS-ENV. All fires observed will be reported to Range Operations or the CD-ATS-ENV immediately with grid coordinates if possible. If it is safe to do so, units are encouraged to extinguish any fires seen in their areas or provide assistance to the fire crews.

6.8.3.3 Training Activities and Fire Hazards

Some training exercises pose fire hazards. These exercises include range firing and use of pyrotechnic devices. Training site personnel will determine when and how training with fire hazards will be restricted. Training site personnel will furnish fire control equipment. The Unit Commander will ensure troop compliance with training site requirements.

- Determine the potential for fire hazard prior to using pyrotechnics, or any other source of fire. Upcoming weather fronts can cause changes in wind direction making burning dangerous.
- Minimize the risk of an extensive fire during weapons qualification/familiarization exercises by using prescribed burns to lessen the fuel load.
- Conduct exercises with a high potential for fire away from buildings and in areas surrounded with firebreaks such as roads or mowed areas. Conduct these exercises when humidity is relatively high and wind speeds are relatively low. Extinguish all sources of fire, including cigarette butts and spent pyrotechnics. Have fire control equipment ready for use when pyrotechnic training is occurring.

6.9 Integrated Pest Management Program

The WVARNG revised the statewide IPMP in 2019. This Plan describes the installation's pest management requirements, outlines the resources necessary for surveillance and control, and describes the administrative, safety, and environmental requirements of the program. The plan outlines a list of pests, including invasive and exotic species or noxious weeds that are of concern on the WVARNG installations and how they will be managed. Pesticide use reports, DD Form 1532-1 and the CD-ATS Daily Pest Control Report, are completed daily as applications are conducted. A copy of the IPMP and any pest control reports are kept in the CD-ATS-ENV office.

Invasive and exotic species may include plants, insects, or animals. An **invasive** species is defined as "an alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health." An alien (or **exotic**) species is defined in EO 13112 as a "species including its seeds, eggs, spores, or other biological material capable of propagating that species that is not native to that ecosystem". Because of their invasive capacity, many exotic species have the ability to spread rapidly through ecosystems since their natural predators are often not present. Such species often retard natural succession and reforestation and generally cause a reduction of biological diversity in natural ecosystems.

Noxious weeds are defined within the Federal Noxious Weed Act of 1974 as "any living stage (including but not limited to, seeds and reproductive parts) of any parasitic or other plant of a kind, or subdivision of a kind, which is of foreign origin, is new to or not widely prevalent in the United States, and can directly or indirectly injure crops, other useful plants, livestock, or poultry or other interests of agriculture, including irrigation, or navigation or the fish and wildlife resources of the United States or the public health."

Several plant species were designated noxious weeds in the State of West Virginia under CSR § 61-9-13 of the West Virginia Seed Law. Noxious weed seeds are divided into two classes – "Prohibited Noxious Weed Seeds" and "Restricted Noxious Weed Seeds". Prohibited noxious weed seeds in this state are the seeds of quack grass (*Agropyrons repens*), Johnson grass (*Sorghum halapense*), Canada thistle (*Carduus arvensis*), perennial sow thistle (*Sonchus arvensis*), serrated tussock (*Nassella trichotoma*). Restricted noxious weed seeds in this state are the seed of wild onion (*Allium vineale*), hawk weed (*Hieracum* spp.), buckhorn (Plantago lanceolata), English charlock or wild mustard (*Brassica arvensis*), corn cockle (*Agrostemma gilthago*), oxeye daisy, Indian mustard (*Brassica juncea*), star thistle (*Centurea solstitialis*), wild carrot, horse nettle (*Solanum carolinas*), field pepper grass (*lepidium compestre*), wild morning glory (*lpomea purpurea*), bindweed (*Convolvulus arvensis*), dodder (*Cuscuta* spp).

Laws and regulations pertaining to invasive and exotic species and pest control include the following:

- Federal Noxious Weed Act of 1974 (7 USC §2801 et seq.);
- Federal Insecticide, Fungicide, and Rodenticide Act (7 USC §136);
- Federal Pest Plant Act (7 USC §150a et seq.);
- EO 12865, Reduction of Pesticide Application by 50 percent by Fiscal Year (FY) 2000;
- EO 13112, Invasive Species;
- National Aquatic Invasive Species Act (NAISA) of 2003;
- CSR § 61-9, West Virginia Seed Law;
- CSR § 61-9-13, Noxious Weed Seeds.

These laws are discussed in Appendix G**.**

6.9.1 Goals and Objectives

It is the goal of the WVARNG to sustain and enhance, when possible, realistic training lands and native natural resources by managing nuisance wildlife and invasive species. To help accomplish this goal, the WVARNG will take actions to detect, control, and/or eliminate to the extent possible invasive and exotic species at the CD-ATS. It is the also a goal of the WVARNG to eliminate pests using environmentally and economically sound means. Whenever possible, the goal of IPM is to utilize non-chemical procedures to control pests, including both invasive and exotic plant and animal species.

The WVARNG management objective is to use IPM methods and strategies. Typically, a combination of the following IPM techniques is required to resolve a problem on a sustained basis:

- *mechanical control*, which alters environments in which pests live, traps or removes pests from where they are not wanted, or excludes pests from where they are not wanted (for example, screening);
- *cultural control*, which manipulates environmental conditions to suppress or eliminate pests (for example, removal of food scraps or spreading manure on fields);
- *biological control*, which uses predators, parasites, or disease organisms to control pests (for example, *Gambusia* fish to eat mosquitoes or triploid grass carp to remove aquatic weeds);
- *chemical control*, which relies on pesticides and/or herbicides to kill pest and/or undesirable species of plants.

The WVARNG will use mechanical, biological and cultural control methods whenever feasible. Chemical control methods, such as pesticides or herbicides, will be used only when other methods are not successful or prohibitively expensive.

6.9.2 Management Strategies

The task of controlling invasive and exotic species and noxious weeds is often expensive, lengthy, and risky because total eradication is required to prevent reestablishment. However, in accordance with laws and regulations pertaining to the management of these species, the WVARNG will work to prevent the introduction of these species and take measures to control them in an economically and environmentally sound manner. General management strategies include:

- Prohibit the use of invasive and exotic plants for landscaping or other purposes.
- Implement BMPs to minimize land disturbances that promote invasion, and re-vegetate disturbed areas with native species.

1) Increase biodiversity to properly compete with invasive species.
2) Control invasive and exotic species and noxious weeds through early detection, isolation of infested areas, and control of individual plants with physical, chemical or mechanical means, depending on the species. Once established, an integrated approach to control will be necessary to minimize the damage.
3) Use pesticides in compliance with AR 420-76 and the WVARNG IPMP.

- Avoid aerial or broadcast application of herbicides and pesticides to prevent adverse impacts native plants and wildlife. Use basal application and spot treatment instead. Consult the CD-ATS-ENV before spraying pesticides aerially on the training site; an aerial application validation statement is required from the NGB.
- Use rapidly degrading pesticides and herbicides, which are less likely to contaminate soil and groundwater, if chemical control methods are applied. Avoid spraying chemicals in riparian zones and CD-ATS water bodies. If chemicals must be sprayed in these areas, use a glyphosate herbicide (for example, Rodeo, Aqua Neat, and Eagre) that is labeled for use near sensitive aquatic areas is recommended. Rodeo has been approved by the USEPA for controlling undesirable plants near sensitive aquatic sites.
- Apply chemicals at a time when they will be most effective against the pest. Pest cycles are influenced by temperature and moisture conditions. In many cases, pests under dormant or stressed conditions may not be susceptible to pesticide treatments. Avoid pesticide applications during adverse weather, especially under windy, wet conditions. Do not apply volatile chemicals under high temperature conditions.

The use of chemicals to control invasive and exotic species can hinder an installation's efforts to reduce usage of herbicides and pesticides. Therefore, it is important to prevent the initial spread of invasive and exotic species and address the spread of such species as early as possible to reduce the amount of required herbicide and pesticide applications. The Natural Resources Manager will evaluate the threat of invasive species as well as the environmental impacts of herbicide usage (if required) to the environment prior to implementing any eradication and/or control program.

6.9.3 Pesticide Application Requirements

Only certified pesticide applicators are authorized to purchase and spray pesticides. All applicators will become certified and remain current in new pest management developments and methods. By law, all pesticides must be applied according to label specifications. Never exceed the manufacturer's recommended dosage for pesticides, apply only to the target pests identified on the label, and wear required safety clothing. Apply the lowest labeled pesticide rate that adequately controls pests. Lower rates reduce the total amount of chemical in the environment. Rotate pesticides among chemical families to minimize pest resistance. IPM does not rely on continuous use of a single pesticide or pesticide family.

By law, the WVARNG must maintain records of all restricted use pesticides maintained by operators for at least two years. Keeping accurate records of all chemicals applied on the site will help the WVARNG make informed management decisions. Records of nonrestricted chemicals will also be maintained at this time.

6.9.4 Invasive and Exotic Species and Noxious Weeds

Over 16 percent of the flora identified from CD-ATS (Streets, 2006) is either exotic or introduced. Some of these species are invasive to the natural plant habitats found on the CD-ATS. One of the most prevalent species is the tree of heaven. The repeated logging that has occurred on all tracts may have played a significant role in the introductions and spread of invasive species. Numerous logging roads and trails have created access corridors through which invasive species may have been introduced. Often, the hay and seed mixes applied to reclaim logging roads and landing sites inadvertently distribute seeds of invasive species. This pattern of invasive species introductions associated with vehicular traffic on existing and new roads has been observed on other lands.

The WVDNR – Wildlife Diversity Program completed an *Invasive Plant Inventory, Assessment, and Management Plan* (Grafton, 2004) for the CD-ATS, which marked the onset of the Camp Dawson Invasive Species Program. Prior to this, the CD-ATS-ENV Staff worked to control multiflora (rambler) rose on the bottomlands of the training site, specifically on the Volkstone TA. The primary goal of the WVDNR study was to complete an on the ground inventory to determine which invasive species exist in the training areas and to generate a map showing the range and abundance of those species. The results of the inventory were used to develop long-term management and monitoring programs for species considered to pose long-term threats to the ecological integrity of the natural resources on the training lands, while at the same time benefiting military training.

Immediately following the development of the *Invasive Plant Inventory, Assessment, and Management Plan* by Grafton (2004), the Volkstone TA river bottom received the first eradication treatment. During the past two INRMP cycles, three control methods have been applied. Multiflora rose, autumn olive, and Japanese barberry (*Berberis thunbergii*) were first physically removed using an 873 Bobcat with a five-foot brush hog and industrial grapple, and a foliar herbicide application followed. Finally, areas with heavy concentrations of these species were prescribed burned. Additionally, since 2004, CD-ATS-ENV has produced an annual Invasive Species Eradication Plan that outlines treatment areas and techniques to be implemented on CD-ATS. These annual treatments include contractor applications as well as applications by CD-ATS-ENV staff.

WVDNR Natural Heritage Program has assigned the Invasive Plant Species of West Virginia (Version Mar 2009) the following Invasiveness rankings:

1 Highly invasive species exhibit the most invasive tendencies in natural areas and native plant habitats. They may disrupt ecosystem processes and cause

major alterations in plant community composition and structure. They establish readily in natural systems and spread rapidly.

2 Moderately invasive species may have minor influence on ecosystem processes, alter plant community composition, and affect community structure in at least on layer. They may become dominant in the understory layer without threatening all species found in the community. These species usually require a minor disturbance to become established.

3 Occasionally invasive species generally do not affect ecosystem processes but may alter plant community composition by outcompeting one or more native plant species. They often establish in severely disturbed areas. The disturbance may be natural or human origin, such as icestorms damage, windrow, or road construction. These species spread slowly or not at all from disturbed sites.

Invasive species found within the four tracts and their priority levels within them are summarized in **Table 9**. Management recommendations for the species of greatest concern at the CD-ATS are summarized below. For more detailed information a full copy of the CD-ATS *Invasive Plant Inventory, Assessment, and Management Plan* (Grafton, 2004) as well as recent versions of the annual Invasive Species Eradication Plan can be obtained in the CD-ATS-ENV office. Several projects are planned within the four tracts to control invasive species within the next implementation period (2021-2025). A schedule of these projects and herbicide information is provided in **Appendix L**.

Table 9. Invasive Species and their Priority Levels within the CD-ATS tracts.							
Common Name	**Scientific Name**	**Briery Mountain TA**	**Volkstone TA**			**Pringle Tract TA**	**Camp Dawson Proper**
			Morris Island	**RBAF***	**Slopes**		
Autumn olive	*Elaegnus umbellata*	1	1		1	1	1
Canada thistle	*Cirsium arvense*	2				2	2
Chinese silvergrass	*Miscanthus sinensis*					3	
Common burdock	*Arctium minus*	2					
Common thistle	*Cirsium vulgare*	2				2	2
Crown vetch	*Coronilla varia*		1	1			1
European privet	*Ligustrum vulgare*		1	1			1
Garlic mustard	*Alliaria petiolata*	1	1	1		1	1
Giant knotweed	*Polygonum sachalinense*			2		2	
Japanese barberry	*Berberis thunbergii*	1	1	1	1	1	1
Japanese honeysuckle	*Lonicera japonica*		1	1		1	1
Japanese knotweed	*Polygonum cuspidatum*		1	1	1	1	1
Japanese spiraea	*Spiraea japonica*	2				2	2
Japanese stilt grass	*Microstegium viminium*	1	1	1			1
Morrow's honeysuckle	*Lonicera morrowii*				1		
Multiflora rose	*Rosa multiflora*	1	1	1	1	1	1
Oriental bittersweet	*Celastrus orbiculata*				1		
Reed canary grass	*Phalaris arundinacea*		1	1			1
Spotted knapweed	*Centaurea stoebe spp. micranthos*		1	1			
Tree of heaven	*Ailanthus altissima*	1	1	1	1	1	1
Wineberry	*Rubus phoenocolasius*	1	1				
* The Volkstone TA is comprised of three separate and ecologically distinct areas, Morris Island, a floodplain between the Cheat River and SR 72 (RBAF) and a two-mile long steep slope that rises above Rt. 72 (Slopes).							

Source: Grafton, 2004 and WVDNR, 2009

6.9.4.1 Autumn Olive

Several isolated patches of autumn olive (*Elaegnus umbellate*) occur along the main road traversing through the Briery Mountain TA and the demolition area. These shrubs are not currently invading the forest understory within this tract. Within Camp Dawson Proper, autumn olive occurs in localized patches throughout the floodplain habitat. Several of the shrubs growing in the floodplain are mature, reaching heights of 15 feet. Controlling autumn olive on the Pringle Tract may be the most challenging exotic and invasive species removal project on the CD-ATS.

Autumn olive was widely planted on the plateau region over twenty years ago. Due to its prolific seed production and rapid establishment of root suckers and stem sprouting, it has become one of the most

widespread invasive plants. Autumn olive occurs in every plant community type and is the dominant shrub species in most shrub habitats within the Pringle Tract TA.

Recommended Management: Burning and cutting alone are not recommended because these methods greatly stimulate root suckering and stem sprouts. The cut stump method is a good management alternative for trees with a diameter of an inch or more, thus the shrubs located on Camp Dawson Proper would benefit best from this strategy. The cut stump method entails cutting every visible plant during flowering (May through June) and before seed production. Application of a 20 percent glyphosate on the cut stumps has been found to have good results. Herbicide applications work very well in late August or September when plants are translocating sugars to the roots (see Appendix L for additional herbicide information).

Basal applications of herbicide may be more efficient and effective; however this method is most useful for areas of low density, such as the Briery Mountain TA. Kuhns (1986) reported that March dormant season basal applications (stem injections) of triclopyr alone or in combination with 2,4-D provided excellent control of autumn olive at very low concentrations (down to one percent triclopyr in diesel oil). Kuhns (1986) also reported that basal bark applications in mid-June resulted in a 100 percent control.

Despite the presence of non-target species, foliar applications of herbicides are the best solution for managing autumn olive on the Pringle Tract TA. A foliar application of a two percent solution of triclopyr and water plus a 0.5 percent concentration of a non-ionic surfactant applied heavily enough to wet all leaves has been found to work well. Select a day as late in the fall as possible when air temperatures are above 50 °F, and there is no wind and no chance of rain for 48 hours. Triclopyr is a selective herbicide for broadleaf species. It will not impact grasses, and if applied late enough in the season, many desirable perennial forbs will be dormant.

6.9.4.2 Canada Thistle

Canada thistle (*Cirsium arvense*) is a perennial herb with a creeping horizontal root system that lives up to five years underground. It produces a dense colonial growth**,** spreading primarily by vegetative growth, secondly by seeds. The tiniest root fragment may generate a plant in as few as five days. Once established in a field, it can displace all native vegetation.

Canada thistle has invaded and destroyed thousands of acres of western grasslands and prairie habitats of the mid-west. Control and eradication of Canada thistle is costing the federal government millions of dollars annually.

Seed or other plant parts from the few existing plants established along the Briery Mountain TA loop road could be inadvertently spread to the high meadow and other established grasslands. Only one small patch of Canada thistle was mapped on the Pringle Tract TA. It is located approximately one mile above the hunting check-in station on the side of the road. Most likely, one or two other plants may occur along the North Pringle Road. Canada thistle occurs in fewer than six small patches along the edge of the riverbank within the Cantonment Area.

Recommended Management: While Canada thistle is not abundant currently on the CD-ATS, taking the time to eliminate it now may prevent the possible spread of this species and the associated costs. Repeated cutting of Canada thistle just before seed-set will stop its spread and will weaken the plants. Canada thistle produces an extremely deep taproot (up to four feet deep); consequently the most desired approach is a combination of cutting and herbicide application. Researchers have found that two foliar applications of a two percent solution of glyphosate in the fall and spring are most effective. It will not impact grasses. A single cut in late July or early August between the two foliar applications of glyphosate further weakens

the plant making it more susceptible to the fall application. To ensure roots do not survive, monitor the treated area for at least one year.

6.9.4.3 Chinese Silvergrass

Mature Chinese silvergrass (*Miscanthus sinensis*) is not easily overlooked because of its great height (reaches up to seven feet in height) and showy nature. Chinese silvergrass occurs on three sites on the Pringle Tract TA; the largest population is growing on a roadside and the other two in fields. Each site is within a few hundred yards of the others. Chinese silvergrass spreads rapidly through underground rhizomes. This species thrives in disturbed soils, which are abundant within the Pringle Tract TA.

Recommended Management: Because Chinese silvergrass is highly flammable and its growth is actually enhanced by fire, prescribed fire will not be used to control this plant. A foliar application of a two percent solution of glyphosate (eight ounces per three gallon mix) has been found effective, particularly in the fall while the plants are actively transporting reserves to their roots. Spring applications when the plants are young may also be successful. To ensure roots do not sprout, monitor the treated area for a few years.

6.9.4.4 Common Thistle

Unlike Canada thistle, common thistle (*Cirsium vulgare*) is a biennial and reproduces by producing large numbers of seeds. It does well in nutrient poor, disturbed soils. These plants produce a large, flat rosettes the first year and a tall, spreading, seed-producing stalk the second year. Consequently, preventing seed production and dispersal, along with containing the existing populations will be a high priority.

Common thistle occurs abundantly in the lower warm season grass/perennial wildflower meadow near the Briery Mountain TA kiosk, along the loop road, and in scattered patches along the Demolition Area roads. Common thistle occurs along road banks and in the edges of fields on the Pringle Tract TA. Its range is restricted within two widely separated sites. Common thistle occurs in a few scattered patches around the old manganese plant and open areas of the adjacent floodplain within the Volkstone TA. Common thistle occurs in isolated patches and less commonly as individual plants in sunny, open areas of the floodplain, particularly on the Cantonment area. There is one very large patch in a wet ditch between buildings E and F. This patch may be one of the main sources of seeds since it is so large (120 feet long by 30 feet wide).

Recommended Management: Specific management techniques for Common thistle were not found in the research literature surveyed. However, management strategies have been developed for controlling musk thistle (*Carduus nutans)*, also a biennial. U.S. Forest Service (USFS) recommendations include a combination of mechanical and chemical treatments.

One strategy is to mow second-year plants at intervals throughout the growing season to weaken them weaken them considerably, preventing flowering. Another approach is to cut second-year stems one or two inches below the ground at the beginning of flowering. One of the most effective approaches, which may have the least impact to non-targets, is spraying first-year rosettes with 2,4-D ester or picloram in the fall.

6.9.4.5 Crown Vetch

Crown vetch (*Coronilla* varia) was designated as both Level I and Level II populations in the floodplain areas of the Volkstone TA and Camp Dawson Proper. In several locations, it was planted on the banks of the Cheat River for soil erosion control. It has spread from there to Morris Island. In the riverscour prairie community, crown vetch occurs primarily on the upstream end of Morris Island.

Recommended Management: Crown vetch is a prolific seed producer with a seed viability of up to 15 years. Preventing seed production will be the highest priority. This may be achieved by hand pulling populations prior to seed set. An annual regimen of pulling will contain the spread of the existing population. Removal of all vegetation after pulling is advised because even a tiny piece of a stem can regenerate. This technique is practical only if a pool of volunteer labor is available or the population is small.

For full control, a foliar application of glyphosate or 2-4, D amine works best. Complete coverage (spray until wet) of all stems and leaves is essential for complete control. The most effective approach is to cut or burn the vegetation a month prior to spraying. Subsequent growth will be less dense making full coverage of the plant material more likely. The herbicide 2-4,D amine does not affect grasses or other monocots. Only formulations approved for use near water will be appropriate in the riverscour prairie community.

6.9.4.6 European Privet

European privet (*Ligustrum vulgare*), a sprawling, thicket-forming shrub, occurs widely scattered throughout the understory of forested areas of the floodplain, particularly on Morris Island of the Volkstone TA. Overall, the plants observed varied in size from three to eight feet tall and were widely dispersed. Within Camp Dawson Proper, it appears largely as individual scattered shrubs, primarily under the forest canopy on the stream bank. Fewer than six large (greater than four feet tall) shrubs were observed in the floodplain area.

Recommended Management: Repeated cutting or mowing will contain most populations, but considering how widespread they are, this effort alone would not be sufficient for control. The most efficient control strategy is the cut stump treatment when the plants are in flower or in the fall. Cut the stems at or near the ground level and then liberally brush the cut surface with a 25 percent solution of glyphosate or triclopyr mixed with water. The basal bark method is also effective on older shrubs. Young seedlings old enough to identify can be hand pulled on days when the soil is moist and loose. This works best in late fall or early winter, as the leaves persist on European privet longer than on native vegetation.

6.9.4.7 Garlic Mustard

Garlic mustard (*Allaria petiolate*) was observed in wet ditches along the main road leading into the Briery Mountain demolition area. Individual patches are restricted to narrow strips on the roadside. Garlic mustard is spreading on the road banks along the south Pringle road from its juncture with SR 72 to where the road levels out on top. Several clumps of garlic mustard occur on the banks of Pringle Run near its juncture with SR 72. It poses a significant threat to the riparian ground cover along Pringle Run, overtaking the native wildflowers and ferns. Very few plants of garlic mustard were found on the floodplain and only a few at the edge of the forested hillside within Camp Dawson Proper; however Morris Island has been heavily infested.

This one to four-foot tall biennial herb is an aggressive invader of riparian soils and mesic woodlands. A garlic mustard population includes both 2nd year flowering stems and 1st year rosettes. Garlic mustard seeds can be dispersed by water and have most likely been deposited during Cheat River flood events. Garlic mustard grows interspersed among native wildflowers and ferns and displacing ephemeral spring wildflowers including three species of toothwoort (*Dentaria spp.)* that serve as the primary host plant for the rare West Virginia white butterfly (*Artogeia virginiensis*).

Recommended Management: Small patches can be managed most efficiently by hand pulling them in early spring during or just before flowering (April). Pick a day when the soils are saturated after a spring rain in order to remove the plants with their complete root system. If plants are hand pulled, all plant parts must be bagged and disposed of properly. A less intensive containment strategy is to mow the plants while they

are in flower, prior to seed set. Unfortunately, long-term control and eradication of this plant requires repeated work every year until the seed bank is depleted.

The most effective treatment is the use of a foliar application to first year rosettes and second year plants with a glyphosate herbicide. Apply the herbicide to second year plants soon after the plants have emerged and begun to produce leaves. Treat the plants as early in the season as possible to prevent losses to desirable native plants. First year rosettes can be spot treated with glyphosate in late fall.

6.9.4.8 Giant Knotweed and Japanese Knotweed

Giant knotweed (*Polygonum sachalinense*) has become widespread throughout all plant communities on the Pringle Tract. It is most abundant on the plateau in wet soils along roads, stream banks, the edges of fields and seeps. Japanese knotweed (*Polygonum cuspidatum*) occurs in only a few isolated patches. Japanese knotweed is one of the most widespread invasive species on Volkstone, second only to multiflora rose. It occurs in unbroken patches on the banks of the Cheat River and Morris Island, and in all other floodplain plant communities. Giant knotweed appears sporadically in a few locations. Within the CD-ATS, Japanese knotweed is widely abundant on the banks of the Cheat River and in floodplain areas not maintained as lawn. Several patches are growing in the cobble area. The habitat conditions will make it challenging to reach the plants on the steeper banks.

Both species reproduce readily by vegetative means through the expansion of stout rhizomes. Once established, a thick mat of interlocking rhizomes makes eradication difficult. Just a small fragment of a rhizome may give rise to a new plant. Within a few years, a single plant can multiply to an expansive colony. Both species grow rapidly, up to two to four inches per day. Established populations of the knotweeds will be extremely expensive and time consuming to suppress, though possible to achieve. In some areas, control measure will need to be followed by establishing native willows, warm season grasses and wetland shrubs.

Recommended Management: Mechanical control alone is generally not reliable and may enhance the spread. The use of a combination of mechanical and chemical controls have been found to work best for controlling large populations of Japanese and giant knotweed. The USFWS Ohio River Islands Wildlife Refuge has been working to eradicate both Japanese knotweed and giant knotweed. Control of both species has been successful when plants are sprayed twice within the same growing season. The first application of a two percent solution of glyphosate on the foliage will be done in early May just after the leaves have opened. The stands of knotweed are so dense on the islands that spraying before the foliage gets too mature allows for better coverage. The second application of glyphosate will be made in September.

6.9.4.9 Japanese Barberry

Japanese Barberry *(Berberis* thunbergii) is shade tolerant and drought resistant. Plants occur primarily along deer paths and man-made trails. Japanese barberry produces bright red fruits eaten by birds and a few small mammals. A single plant of Japanese barberry was observed and mapped near the Briery Mountain demolition area. This species occurs primarily as widely scattered individual plants throughout the forested plant communities on the Pringle Tract and on the banks of the Cheat River and wooded hillside on Camp Dawson Proper. Two very large populations of Japanese barberry have invaded the understory on the steep, wooded hillside above SR 72. This species poses a significant threat to native plant communities on the Volkstone TA because it has become well established.

Recommended Management: Shrubs can be removed mechanically in the spring when the soil is loose and moist from spring rains. Digging or hoeing can remove young, individual plants. The root system is shallow making it very easy to pull from the ground, especially younger plants, but it is important to get

the full root system. The key is to pull when the soils is damp and loose. Care must be taken to protect your skin from the spines. One of the most useful tools for removing whole plants of any species is the weed wrench. Smaller plants (less than two feet high) can be hand pulled. Mowing or cutting a large population to prevent seed production is advisable if time does not permit full removal in one season.

Where infestations are too large for hand pulling, as may be the situation in the large patch on the Volkstone TA, a foliar herbicide treatment with a two percent solution of glyphosate is effective. This non-selective herbicide will be used with care to avoid impacting non-target native plants. Application early in the season before native vegetation has matured may minimize impacts. However, application in late summer during flowering may be more effective. Triclopyr may be used with the cut stump treatment on plants with a main stem diameter of one inch or greater.

6.9.4.10 Japanese Honeysuckle

Japanese honeysuckle (*Lonicera japonica*) occurs only sporadically in edge habitat along roads and fields within the Pringle Tract TA, and is most prevalent on the North Pringle Road. Within Camp Dawson Proper, Japanese honeysuckle occurs in isolated colonies throughout the riparian habitat along the Cheat River and the edges of logging roads on the steep hillside above the floodplain.

Recommended Management: Hand pulling is an effective means of control for small patches of Japanese honeysuckle. Plan to pull honeysuckle in early or late winter when other vegetation is dormant and the plants are more visible. Also, select a day when the soils are loose and moist. Wear heavy gloves and take cutting tools along to cut vines growing up into trees. This method often requires follow-up treatment the following year. This is a great activity in which to involve youth groups such as the MCA or the Girl Scouts and Boy Scouts.

Japanese honeysuckle leaves continue to photosynthesize long after most other plants have lost their leaves. This makes it possible to apply herbicides after most non-target species are dormant. Effective control with herbicides requires the presence of healthy green leaves, and temperatures above 50°F. Apply a 2.5 percent solution of glyphosate (e.g. Rodeo for wetlands; Roundup for uplands) mixed with water and a non-ionic surfactant, preferably in late fall. Alternatively, apply a two percent concentration of triclopyr (e.g., Garlon 3A) plus water and non-ionic surfactant to foliage, thoroughly wetting leaves but not to the point of drip-off. A coarse, low-pressure spray will be used. Repeat applications may be needed. A 25 percent glyphosate or triclopyr solution mixed with water can be applied to cut stem surfaces any time of year as long as the ground is not frozen. Continued monitoring for a few years will be necessary to pull any fragments that regenerate.

6.9.4.11 Japanese Spiraea

Japanese spiraea (*Spiraea japonica*) is a beautiful ornamental shrub introduced for home and business landscaping. It has become a prolific invader of riparian corridors, roadsides and edge habitat at the interface of woodlands and fields. Two expanding populations of Japanese spiraea are found on the Briery Mountain TA, which could easily be eliminated. Only one location of Japanese spiraea was noted on the Pringle Tract TA. Two plants of Japanese spiraea were observed in the floodplain behind buildings overlooking the Cheat River on Camp Dawson Proper.

Recommended Management: Simply cutting Japanese spiraea will enhance root sprouting and increase spread. The most effective control strategy is the cut stump method. Cut the stem close to the ground and brush a 25 percent solution of glyphosate mixed with water liberally onto the stem. This method can be applied when air temperatures are above 65°F. It would be advisable to cut the plants during flowering (June and July) for two reasons: (1) plants will have used up most of their energy reserves to produce

flowers, and (2) to prevent seed set. Monitor the following season to see if any stumps may require another application of herbicide, and for the next three years for new seedlings.

6.9.4.12 Japanese Stilt Grass

Japanese stilt grass (*Microstegium viminium*) has severely invaded the interior woodlands on Morris Island. It also occurs in a ring on the high water banks around the island and in scattered patches on the banks of the Cheat River. Japanese stilt grass is restricted on the floodplain to low lying areas subjected to flooding in Camp Dawson Proper. One patch, approximately a-hundred square feet in size, is spreading around the obstacle course behind the army barracks. Most of this area is mowed close to the ground on a weekly or bi-weekly basis throughout the growing season. However, this particular patch will be eliminated, as it will continue to spread into the forested riparian areas.

Recommended Management: Small, isolated patches can be managed by pulling. Where feasible, plants may be cut with a weed whacker. Cutting or pulling plants in flower, contributes to weakening the plant more so than cutting before flowers develop. However, Japanese stilt grass should be cut before cleistogamous flowers have produced seed. Whether cutting or pulling, all plant parts will be bagged and removed from the site, and the site will be monitored for a few years for newly emerging plants.

The most efficient and effective control strategy of Japanese stilt grass involves applying a broad-spectrum herbicide to the cut plants in late August while in flower. Glyphosate has the most significant impacts to desirable non-target species.

6.9.4.13 Morrow's Honeysuckle

Morrow's honeysuckle (*Lonicera morrow*) is an aggressive invader of open areas and adjacent forest understory. One Morrow's honeysuckle shrub was observed on the Volkstone TA.

Recommended Management: Use the cut-stump treatment on stumps one-half inch or larger. Young seedlings can be hand pulled and disposed of. Small shrubs (less than four feet tall) can be spot treated with a foliar application of a one percent solution of glyphosate, applied in the fall as surrounding vegetation is going dormant. The herbicide will be applied before the leaves have died in order to get full transfer of the herbicide to the roots.

6.9.4.14 Multiflora Rose

Sporadic patches and isolated small plants of multiflora rose (*Rosa multiflora*) occur along the various major roadways throughout the Briery Mountain TA. However, it is widespread and abundant within portions of Camp Dawson Proper, Pringle Tract and the Volkstone TA. This species is the most abundant invasive on the Volkstone TA, and occurs in exceptionally dense colonies on the floodplain just north of the abandoned manganese plant. Prior to multiflora rose control work implemented by the CD-ATS Natural Resources Staff, multiflora rose composed nearly impenetrable thickets covering much of the open floodplain not historically kept open for day-to-day training activities.

Recommended Management: To minimize its spread on the Briery Mountain TA weed whack, cut, or mow the plants to the ground once a year to prevent future spread by birds and other wildlife that heavily browse the fruits.

Several multiflora rose plants on the CD-ATS showed evidence of Rose Rosette Disease (RRD). A combination of cutting and monitoring for the spread of RRD is recommended. RRD is a viral infection transmitted to plants through an eriophyd mite. Monitoring could be achieved by establishing permanent

plots around a 10 x 10-foot plot or 15 feet long linear patch of multiflora rose that shows signs of RRD infection. Count the number of stems that show any indicator signs of RRD. Infected plants usually die within two years.

RRD may be transmitted by grafting infected stems on to other plants. Grafting infected stems onto plants in a dense stand could result in a significant increase in the spread of RRD in each of the four tracts. Another possible means of increasing the rate of infection within a population would be to cut all of the plants in a mature stand of multiflora rose back to their crowns. As these plants begin to produce healthy young shoots, they will disseminate infected stems into the stand.

Other land managers have found success with a spring and fall foliar application of a two percent solution of glyphosate in water and a non-ionic surfactant to be very effective. The spring application could be made in late March or early April before most of the non-target herbaceous species are up because multiflora rose is one of the first plants to sprout leaves. A fall application could be made in late September as some native species are going dormant.

6.9.4.15 Oriental Bittersweet (*Celastrus orbiculata*)

Only one, large, sprawling colony of oriental bittersweet (*Celastrus orbiculata*) was observed. It is located on a road bank adjacent to SR 72 on the Volkstone Tract. Oriental or Asian bittersweet is a perennial, highly aggressive invader, over-topping trees, shrubs and ground cover in edge habitat and forest interior habitat throughout West Virginia. The single vine observed in this study has produced a stout stem with multiple branches splayed in an arbor-like mass nearly 30 feet high.

Recommended Management: Cutting and treating the vine stump with a triclopyr-containing herbicide is a successful strategy for treating large vines. Cut and treat the stump in the fall when plants are translocating material to the roots. In autumn, the bright yellow leaves of oriental bittersweet persist on the vine long after most native vegetation has gone dormant. Consequently, spotting oriental bittersweet may be accomplished easily. Young shoots can be pulled, though care must be taken to remove all plant parts as this species propagates readily from root suckers and broken pieces of stem.

6.9.4.16 Reed Canary Grass

Reed canary grass (*Phalaris arundinacea*) grows abundantly in scattered clumps throughout low, open sites throughout the floodplain. It occurs in the natural wetland behind the natural resources storage building, and is well established in the riparian corridor of the Cantonment area, posing a long-term threat primarily to the riverscour prairie plant community. Reed canary grass also occurs in sporadic patches in wetlands, riparian corridors and wet ditches throughout the Volkstone Tract, particularly north of the defunct manganese plant.

Wetlands are currently populated with several native obligate wetland sedges, rushes, shrubs and herbaceous species. However, the reed canary grass is well established in these areas. It will continue to spread, completely filling in the wetlands and displacing most native plants. Reed canary grass spreads primarily through vegetative means. The roots produce an extensive network of rhizomes from which new shoots arise. Seed germination rates are low; however seeds are probably responsible for invasions at new sites.

Recommended Management: Fire can help control the spread of reed canary grass and keep it out of high quality wetlands. Repeated late autumn or late spring burning for several years can control this species. Annual burning may be needed for five to six years before good control is apparent. Burning is most

effective where other species are present or in the seed bank, since fire allows native, fire-adapted species to compete successfully.

6.9.4.17 Sericea Lespedeza

Sericea lespedeza (*Lespedeza cuneate*) occurs in isolated, dense patches throughout the floodplain within the Volkstone TA and Camp Dawson Proper. This species has invaded the riverscour prairie plant community. Most likely, sericea lespedeza was planted along with crown vetch for bank stabilization. Sericea lespedeza can withstand the scouring floods and periodic droughts associated with the cobble bars.

Recommended Management: The most effective means of control is a combination of mowing and herbicide application. The plants can be cut with a weed whacker soon after the plants have reached at least a foot tall (May). Sericea Lespedeza blooms from July to October. A foliar application of a two percent solution of glyphosate can be applied as plants begin to produce flowers, but before seed set. It will be very important to use a spray shield on the backpack sprayer to avoid spraying non-target plants.

6.9.4.18 Spotted Knapweed (*Centaurea biebersteinii*)

Spotted knapweed (*Centaurea stoebe spp. miranthos*) occurs primarily in the riverscour prairie plant community on Morris Island. Spotted knapweed was also found growing on the cobble bars, primarily in the riverscour prairie plant community on Camp Dawson Proper. The population abundance and distribution is very similar to the population occurring on Morris Island. Most likely, spotted knapweed arrived via the Cheat River. The population along the Cantonment Area riverbank is in the early stages of establishment and distributed within a narrow range.

Recommended Management: Although the spotted knapweed population in this community was designated as a Level I population (fewer than ten sites), it is essentially established in the riverscour prairie community. However, the extent of its range is limited enough that slowing the spread and significant reduction of existing populations could be achieved in one growing season. Unfortunately, complete eradication of this species will take several years as plants germinate from the seed bank. Additionally, eliminating the existing population may not fully protect this area because new seeds may be deposited periodically from annual floods. Annual monitoring for a minimum of five years and spot treating any new growth will be required for sustained protection of the riverscour prairie plant community.

6.9.4.19 Tree of heaven

The occurrence of tree of heaven (*Ailanthus altissima*) is rare on the Briery Mountain TA. Only one tree was observed. Sapling-sized tree of heaven occurs infrequently on logging trails in the mixed mesophytic forest on the steep slopes of the Pringle Tract. In addition to the severe infestation of tree of heaven on the wooded hillside above SR 72, a copse of mature trees occurs near the defunct manganese plant, and another larger copse is established on Morris Island. Tree of heaven appears abundantly in scattered groupings across the wooded hillside above the floodplain. Populations of tree of heaven occur on and near logging roads. In some locations as many as 30 trees with a diameter over six inches are found within Camp Dawson Proper.

Recommended Management: The Briery Mountain tree of heaven could easily be killed by using the cut stump treatment or basal bark application of glyphosate in the fall. The treatment may need to be repeated the following year.

On disturbed soil where there is adequate sunlight, tree of heaven may spread aggressively and it would be prudent to eliminate every tree observed. Trees with a DBH of six inches or less can be treated with a basal

bark application of glyphosate (a two percent solution mixed in water). Larger trees will be treated with the hack and squirt method of applying a chemical herbicide. Never cut a tree of heaven without applying an herbicide. They produce stump sprouts and root sprouts quite aggressively soon after they are cut. Treated sites will be monitored for one to three years. Any new shoots can be sprayed with a two percent solution of glyphosate in the spring.

6.9.4.20 Wineberry (*Rubus phoenocolasius*)

Wineberry (*Rubus phoenocolasius*) occurs in long dense patches at forest edges on several roads in the Briery Mountain demolition area. Additionally, a large thicket of wineberry has invaded the downstream end of Morris Island. Currently, the population is restricted to open brushy areas and the edges of forested areas.

Recommended Management: Because this plant has the potential of out-competing all native grasses, perennials and shrubs growing in this edge habitat, the most effective approach for management will be a foliar application of herbicide. Triclopyr, which is effective against dicots will not harm grasses or other monocots. This would be the best choice as several native grasses occur along the roadways.

Mechanical controls may be used to diminish and contain existing populations. Hand pulling or grubbing works best in the spring, when plants are smaller and when the soils are moist for easier removal. The sites will need to be monitored for several years for new sprouting plants. A combination of mechanical and chemical control may be required due to the size of the infestation.

6.9.5 Other Pests

Currently, the CD-ATS does not manage or monitor any nuisance pests other than invasive plants. Beavers do cause some visible damage to riverbank trees at the CD-ATS; however, they are not currently a serious problem to the developed areas of the post, and are not causing riverbank erosion or altered hydrology.

Feral (wild) dogs were a problem a few years ago. The CD-ATS-ENV established a feral dog eradication program using feeding stations to bait the dogs, but this program was unsuccessful. However, populations have stabilized and are no longer a problem.

Each summer the CD-ATS-ENV receives a request to eradicate skunks, groundhogs, and feral cats. The CD-ATS-ENV establishes a two to three week trapping program, when this problem arises, within the developed areas of Camp Dawson Proper.

The hemlock adelgid (*Aldegis tsugae)* is a soft bodied exotic insect pest that is infesting and killing hemlocks throughout West Virginia. This species has not been observed to date in the hemlock ravines found on the Pringle Tract TA. No monitoring program is in place at this time.

6.10 Outdoor Recreation

Hunting and fishing activities are permitted on the CD-ATS unless suspended by the TSC. The public is restricted to the Pringle Tract TA. Hunting and fishing at the CD-ATS is discussed in greater detail below.

Laws and regulations pertaining to outdoor recreation include the following:

- Sikes Act Improvement Act (16 U.S.C 670 *et seq*.);
- EO 12960, Recreational Fisheries;

- CSR § 58-49, General Hunting
- CSR § 58-50, Deer Hunting Rule
- CSR § 58-60, Fishing Regulations

These laws are discussed in Appendix G**.**

6.10.1 Public Access

AR 200-1 provides guidance for access to military lands and waters by recreational users by stating that "such access will be within manageable quotas, subject to safety, military security, threatened or endangered species restrictions, and the capability of the natural resources to support such use; and at times as such can be granted without bona fide impairment of the military mission, as determined by the installation commander."

At the CD-ATS, outdoor recreation will be limited due to the primary mission of the training site, limited range access, limited range operations, and lack of law enforcement personnel. Additional limitations on public access have been set due to the presence of hazards related to training activities and ongoing construction activities. Some possible threats to public safety related to training activities include: small arms firing, training residue (for example, fox holes and concertina wire), and training mechanisms (for example, moving targets). All of these are potential hazards to outdoor recreationists on foot or in a vehicle. For this reason, public access to portions of the TAs is controlled by secured gates.

Any person entering the training site for any purpose prohibited by law or lawful regulation is trespassing. Trespassing may endanger the life of the person entering the training site as well as potentially endangering lives of WVARNG troops and interfering with training.

6.10.2 Hunting

The CD-ATS has approximately 1,592 acres available on the Pringle Tract for public hunting when training does not present a conflict. Guardsman and employees of the WVARNG also have the opportunity to hunt archery on Camp Dawson Proper and the Volkstone TA.

All persons requesting hunting privileges on CD-ATS lands are required to apply for a free permit and comply with State hunting regulations. All information is entered into an informational database. Window decals and permits are issued and all hunters are required to sign in at the front security gate and display the window decal and permit while hunting on CD-ATS training lands. On average, 250 public and 50 guardsman permits are issued on a yearly basis.

CD-ATS-ENV in coordination with WVU recently completed a remote camera population survey of large game animals on all CD-ATS lands. This survey suggested that our average deer populations were around (20 deer/square mile), with Briery TA significantly higher (42.1 deer/square mile) when separated from the other tracts. Population and sex ratio data will provide guidelines in the management of our deer herd. Fifteen years of survey data collected from the hunter, combined with our deer herd survey and active land management techniques will be analyzed to address game management and human dimension issues.

Camp Dawson hunting permit applications are issued beginning July 1st, annually and are allocated as shown in **Table 10**.

Table 10. Camp Dawson Hunting Permit Applications		
Type of Permit	**Hunting Privilege**	**Fee**
PUBLIC		
Pringle	By Application only	Free
Briery Mountain	Closed to all hunting	
Cantonment Area*	Closed to the public	
GUARDSMEN		
Pringle	By Application only	Free
Briery Mountain	Closed to all hunting	
Cantonment Area*	50 permits, first come first serve (*Archery only)*	Free
**This includes the Volkstone TA and Camp Dawson Proper*		

The following methods are used to inform the public when the training areas are closed for training maneuvers:

- Signage at training site entrances and new gates;
- Informational letters from the Camp Dawson CD-ATS-ENV to permitted hunters;
- 24-hour public informational phone number;
- Public radio and newspaper announcements.

With the planned expansion of training facilities on the CD-ATS lands, public use of training areas may decrease. As current plans continue to take shape, there will be increased machinery present, designated sensitive areas during construction of ranges, as well as an increased number of Surface Danger Zones (SDZ) post–implementation. For the safety of all involved, the WVARNG, the public, and the WVDNR will have to resolve compatible use issues in the near future.

6.10.3 Fishing

Camp Dawson has a number fishing opportunities within the CD-ATS lands and also along the Cheat River which is adjacent to much of the property. Pierce Lake is a 5-acre impoundment that contains a fishable native bass-bluegill (*Lepomis macrochirus*) population. Channel catfish (*Ictalurus punctatus*) are stocked every spring by the WVDNR to support the annual youth fish for fun day. The Volkstone TA supports a small bass-bluegill pond directly past the entrance gate. There are two small ponds that have limited bass-bluegill fishing potential on the Pringle Tract TA. The Calvert Pond on the Briery TA was stocked with largemouth bass, bluegill, yellow perch, channel catfish, and fathead minnows in 2016.

The Cheat River runs along Camp Dawson Proper and along a small portion of the Pringle Tract TA. The upper sections of the Cheat offer a moderate smallmouth bass (*Micropterus dolomieu*) fishery. In 2003, a local Sportsman's club began to stock rainbow trout (*Oncorhynchus mykiss*) approximately four times annually in the Cheat River. Stocking will continue as funding is available. Military personnel who are on current active leave are not required to obtain a West Virginia fishing license. Those who are not active military personnel must obtain a valid West Virginia fishing license to fish any public water body within CD-ATS.

6.11 Native American Consultation

Native American Consultation has been on ongoing process. Based on information provided in the ICRMP, the WVARNG contacted the United South and Eastern Tribes, Inc. (USET), which is a non-profit inter-tribal organization that collectively represents its member Tribes at the regional and national level, to see if any USET tribes have interests in the area of Camp Dawson or other WVARNG facilities. No Federally-recognized tribes expressed an interest at that time. The State Historic Preservation Office (SHPO) was also consulted for advice on which tribes to contact.

The WVARNG has made a strong effort to be proactive in its consultation efforts with Native Americans. Through written correspondence, telephone calls, and Native American consultation workshops,the WVARNG has made a concerted effort to keep interested parties involved with the consultation process. Continual effort to maintain these relationships will help to ensure effective resolution to any concerns that may arise in the future. To date, there are no known Traditional Cultural Properties (TCPs) that have been identified at Camp Dawson, the Volkstone TA, the Pringle Tract TA, or the Briery Mountain TA. If concerns regarding TCPs arise, the WVARNG will undertake inventories as needed.

6.12 Natural Resource Law Enforcement

Many aspects of integrating the training mission with natural resources management require effective enforcement if they are to be successful. Such programs as hunting/fishing harvest controls, protection of wetlands, water pollution prevention, rare species protection, and others are very dependent on law enforcement. If any natural resources law enforcement actions or suspected violations have occurred, the CD-ATS staff must notify the CD-ATS Environmental Office.

Public safety and enforcement of laws and regulations is provided primarily by WVDNR Natural Resource Police Officers with assistance by Post Operations and camp security. WVDNR Natural Resource Police Officers have offices and other resources available within CD-ATS at Building 305. The RTI also provides this service when staff is present, which is usually only during selected training events.

Local law enforcement within the vicinity of the CD-ATS includes the Kingwood Police Department and the Preston County Sheriff's Department. Emergency 911 services are administered through the Preston County Sheriff's Department. The Kingwood Voluntary Fire Department supplies local emergency support for the general area and has a sub-station located on Camp Dawson Proper that is manned by qualified CD-ATS personnel.

6.13 Public Outreach

The CD-ATS continues to strive toward greater public outreach and environmental awareness. Youth fishing events have been conducted at the CD-ATS in the past, it is recommended that these events are continued to enhance the environmental image of Camp Dawson. Local civic groups, such as the Boy Scouts or Girl Scouts, have used the CD-ATS for projects in the past. The CD-ATS-ENV partnered with a local Eagle Scout group to rehabilitate a cemetery on the Pringle Tract Training Site. Water Quality data is shared with a local non-profit group Friends of the Cheat (FOC) whose mission is to restore, protect and preserve the local watershed. The National Public Lands Day funded WVARNG Wetland Interpretive Boardwalk was completed using volunteer help from the community. The boardwalk is open to the public and CD-ATS-ENV provides an interpretive guide to school groups and local civic organizations for tours of the local flora and fauna. The CD-ATS welcomes future projects as well. For example, the construction of nest boxes may be good projects for local Boy Scouts or Girl Scouts. Some possibilities are squirrel boxes, bat boxes, butterfly boxes, and bluebird boxes. For project plans, stop by the CD-ATS-ENV to obtain the publications *Woodworking for Wildlife* and/or *Woodlands and Wildlife*.

The CD-ATS-ENV developed a *Soldier Environmental Handbook* and a Leader and *Soldier Field Card* to educate soldiers using the CD-ATS about environmentally sensitive locations, rare wildlife and plants, nuisance wildlife and plants, petroleum, oil, lubricants and hazardous handling, training area maintenance, vehicle maneuvers, wildfires, and who to call in the event of an emergency.

The CD-ATS will implement the following objectives pertaining to public outreach and environmental awareness:

- Work with the WVDNR Wildlife Biologists to afford access whenever possible to the forest so that the wildlife can be enjoyed and managed in cooperation with the WVDNR;
- Consider the recreational needs of the handicapped and facilitate their utilization of new or existing facilities when possible;
- Determine the propriety of utilizing WVARNG forestlands for new and/or expanding recreational pursuits; and if acceptable, integrating and coordinating them with existing forest uses;
- To inform the public about recreational opportunities on the WVARNG forest lands including the laws and regulations covering such use;
- To coordinate the management of all forest resources to protect and enhance the aesthetic and recreational values of the forest.

7.0 NATURAL RESOURCES PROGRAM IMPLEMENTATION

The WVARNG depends on natural resources for the sustainability of many training programs and will manage natural resources to ensure sustainable use. The updated INRMP is not intended to impair the ability of the WVARNG to perform its mission. However, the updated INRMP does identify usage restrictions on sensitive attributes such as wetlands and threatened and endangered species.

Implementation of this updated INRMP will be realized through the accomplishment of specific goals and objectives as measured by the completion of projects described within this INRMP. An INRMP is considered implemented if an installation:

- Actively requests, receives, and uses funds for "must fund" projects and activities;
- Ensures that sufficient numbers of professionally trained natural resources management staff are available to perform the tasks required by the INRMP;
- Coordinates annually with cooperating agencies;
- Documents specific INRMP action accomplishments undertaken each year.

7.1 Annual Work Plans

7.1.1 Work Plans

The implementation schedule, funding requirements, and legal drivers for these projects for this updated INRMP are detailed in Appendix A.

7.1.2 Funding

Implementation of this updated INRMP is subject to the availability of annual funding. The installation requests project validation and funding through the Status Tool for the Environmental Program (STEP), completed by the CD-ATS-ENV. Funding for the CD-ATS-ENV staff and standard supplies comes from direct funding sources. Funding sources for specific projects can be grouped into three main categories by source: Federal NGB Funds, Other Federal Funds, and Non-Federal Funds. Each is discussed in the following subsections. Estimated funding requirements for implementing specific INRMP goals and programs are presented in Appendix A.

Where projects identified in the plan are not implemented due to lack of funding, or other compelling circumstances, the installation will review the goals and objectives of this updated INRMP to determine whether adjustments are necessary.

The following discussion of funding options is not all-inclusive of funding sources. Since many funding sources rely on a variety of grant programs, award criteria and amounts can change considerably from one year to another. Funding through grant programs can occur on a one-time award, annually or in multiples of years.

7.1.2.1 NGB/WVARNG Funding

Funding from the following NGB and WVARNG sources will be required to implement the updated INRMP over the next five years:

The NGB is the primary source of funding to support the management of natural resources at the CD-ATS through a master cooperative agreement with the WVARNG. This budget is managed by the CD-ATS-ENV. The NGB provides funding for natural resource surveys, environmental monitoring projects, and compliance-related projects.

The NGB provides funding for the personnel, equipment and supplies in support of the CD-ATS Facility Engineer's office. This office is involved in planning, scheduling and oversight of training, maintenance of roads and trails, vegetation management and pest management, facilities infrastructure, and military construction planning, all of which are critical to the natural resources management program.

7.1.2.2 Other Federal Funds

Cooperative agreements may be entered with states, local governments, non-governmental organizations, and individuals for the improvement of natural resources or to benefit natural and historical research on Federally-owned training sites. Upon written concurrence of the updated CD-ATS INRMP by the USFWS and the WVDNR, these agencies become signatory cooperators of this plan. As such, the potential for access to matching funds programs and services offered by these agencies will be available. WVARNG will provide NGB with an opportunity to review and comment on any agreement to receive funds or services from these agencies.

Program initiatives under the CWA provide funding through several sources. The USEPA's Office of Water sponsors those projects related to the CWA. Available funding may support programs such as cost-sharing for overall water-quality management (e.g., monitoring, permitting, and enforcement), lake water quality assessments and mitigation measures, and implementation of non-point source pollution control measures. Refer to the USEPA's Office of Water website for potential sources of funding https://www.epa.gov/aboutepa/about-office-water.

The Legacy Resource Management Program provides financial assistance to DoD efforts to conserve natural and cultural resources on Federal lands. Legacy projects could include regional ecosystem management initiatives, habitat preservation efforts, archeological investigations, invasive species control, and/or flora or fauna surveys. Legacy funds are awarded based on national visibility. Project proposals are submitted to the program.

7.1.2.3 Non-Federal Funds

Other funding sources that could be considered include The National Public Lands Day Program, which coordinates volunteers to improve the public lands they use for recreation, education, and enjoyment, and the National Environmental Education & Training Foundation, which manages, coordinates, and generates financial support for the program.

7.1.2.4 Soil and Plant Conservation Funding

The NRCS manages the Federal Domestic Assistance Program (Plant Materials for Conservation) that assembles, evaluates, selects, releases, and introduces into commerce and promotes the use of new and improved plant materials for soil, water, and related resource conservation and environmental improvement programs.

7.1.3 Priorities and Scheduling

The STEP database will be used to validate projects and determine funding priority. Projects need to be funded consistent with timely execution to meet future deadlines. Projects are generally prioritized with respect to compliance. Highest priority projects are projects related to recurring or current compliance, and these are generally scheduled earliest. The CD-ATS projects and schedules are listed in Appendix A.

Recurring requirements include 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 EOs, and DoD policies) or which are in direct support of the military mission. Recurring costs include manpower, training, 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; and, compliance self-assessments.

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 (historical and archaeological sites);
- Biological assessments, surveys, or habitat protection for a specific listed species;
- Mitigation to meet existing regulatory permit conditions or written agreements;
- Wetland delineations in support of subsequent jurisdictional determinations and consequent permitting;
- Efforts to achieve compliance with requirements that have deadlines that have already passed;
- Initial documenting and cataloging of archaeological materials.

Maintenance requirements include those projects and activities needed that are not currently out of compliance but would 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 GIS 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;
- Public education programs that educate the public on the importance of protecting archaeological and natural resources.

Lower priority projects include those that enhance conservation resources of the installation mission, or are needed to address overall environmental goals and objectives, but are not specifically required under regulation or EO and are not of an immediate nature. These projects are generally funded after those of higher priority. Examples of lower priority projects include:

- Community outreach activities, such as "Earth Day" and "Historic Preservation Week" activities;
- Educational and public awareness projects, such as interpretive displays, oral histories, "Watchable Wildlife" areas, nature trails, wildlife checklists, and conservation teaching materials;
- Biological assessments, surveys, or habitat protection for a species;
- Restoration or enhancement of cultural or natural resources when no specific compliance requirement dictates a course or timing of action;
- Re-interment of Native American remains on DoD managed or controlled land;
- Management and execution of volunteer and partnership programs.

7.2 Natural Resources Management Staffing

Natural resources program oversight and INRMP implementation is conducted through the CD-ATS-ENV office. Training for WVARNG personnel, as well as others participating in the management of natural resources, will be practical and job-related. All training programs will involve at minimum a review of 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:

- North American Wildlife and Natural Resources Conference https://wildlifemanagement.institute/conference
- DDoD Environment, Safety and Occupational Health Network and Information Exchange (DENIX) https://www.denix.osd.mil/;

- Army Training Support Center – https://www.atsc.army.mil/;
- National Military Fish and Wildlife Association – https://www.nmfwa.org/;
- USACE Wetland Delineation Courses – https://www.usace.army.mil/ ;
- Locally available training through the Cooperative Extension Service, universities, professional and trade organizations, State government, and commercial businesses.

Conferences and workshops will be evaluated for their usefulness, and decisions will be made based on appropriateness to ongoing projects and funding availability. Personnel will be trained in related environmental fields, as appropriate. NEPA training will be required of all supervisory personnel and those who review or prepare NEPA documents.

7.3 Review and Coordination Requirements

The DoD Supplemental Guidance states that each INRMP "must be reviewed as to operation and effect by the parties thereto on a regular basis, but not less than every five years" according to 101(b)(2) of the Sikes Act. The updated INRMP is effective from the date of approval for a period of five years. This updated INRMP was developed in cooperation with the USFWS and the WVDNR. Developed using an interdisciplinary approach, information has been gathered from the CD-ATS-ENV and training site staff, as well as other Federal, State and local agencies and special interest groups with an interest in the management of natural resources at the CD-ATS. Agency comments were reviewed and addressed in the final INRMP. A distribution list for the draft INRMP, as well as initial agency and previous tribal coordination and response letters, have been included in Appendix B.

The Sikes Act Improvement Act requires annual review of the INRMP to keep the plan current. Per DoD policy, the WVARNG reviews the INRMP annually in cooperation with the USFWS and WVDNR. The WVARNG will converse with the agencies annually to determine if changes or issues indicate the need for a meeting. If warranted, a meeting will be held at the CD-ATS with the USFWS and the WVDNR and documented by meeting minutes. If a meeting is not necessary, the conversation will be documented via email correspondence or record of conversation. According to the *Army National Guard (ARNG) Installations and Environment (I&E) Directorate Policy for Integrated Natural Resource Management Plans (INRMP),* dated 20 March 2019, annual reviews shall, at a minimum, address the following considerations:

1) INRMP Project Implementation
    i) Are INRMP Projects, including follow-up inventorying and monitoring work, properly identified, developed, and submitted for funding?
    ii) Has project funding been received, obligated, and expended?
    iii) What projects have been completed and do they meet expected objectives?
    iv) What new projects are proposed?
2) Federal ESA Listed Species and Critical Habitat
    i) Are conservation efforts effective?
    ii) Does the INRMP provide conservation benefits necessary to preclude USFWS Critical Habitat designation?

iii) Are Species at Risk identified and are steps being undertaken to preclude listing?

3) Partnerships Effectiveness

   i) Has the INRMP review team (WVARNG, USFWS, ARNG I&E, and WVDNR) been effective in ensuring the INRMP's implementation?

   ii) Are other partnerships needed to meet the INRMP goals?

   iii) Have other partnerships been effectively used to meet INRMP goals?

   iv) Are internal stakeholders (training, facilities, etc.) effectively coordinating projects?

4) Fish and Wildlife Management and Public Use

   i) Are public recreational opportunities such as hunting, fishing, and wildlife viewing available to soldiers and employees?

   ii) Are public recreational opportunities such as hunting, fishing, and wildlife viewing available to the public?

   iii) Does the INRMP and site offer opportunities or facilities for disabled sportsmen?

5) Team Adequacy

   i) Is the WVARNG's natural resources team adequately resourced to fully implement the INRMP?

   ii) Is the WVARNG's natural resources team adequately trained to fully implement the INRMP?

One source of information for these annual reviews is the Army's Environmental Quality Report (EQR) system. The EQR is the automated system used to collect installation environmental information for reporting to Department of Defense and Congress. The EQR system moved to the Army Environmental Reporting Online (AERO) portal in February 2005, creating a day-to-day management tool. In 2015 the Army began the transition to the Headquarters Army Environmental System (HQAES). This system is focused on environmental program and project management and is the authoritative system of record to prepare the Defense Environmental Programs Annual Report to Congress.

7.4 Monitoring INRMP Implementation

The *Integrated Natural Resources Management Plan Implementation Manual* (DoDM 4715.03, November 25, 2013) provides procedures to prepare, review, update, and implement INRMPs in compliance with the Sikes Act. The DoD Components implement INRMPs by:

- Actively Requesting and using funds for natural resources management projects, activities and other requirements in support of goals, and objectives identified in the INRMP.
- Ensuring that sufficient numbers of professionally trained natural resources management personnel are available to perform the tasks required by the INRMP.
- Inviting annual feedback from the appropriate USFWS and State fish and wildlife agency offices on the effectiveness of its INRMP.

- Documenting specific INRMP action accomplishments undertaken each year.
- Evaluating the effectiveness of past and current management activities and adapting those activities as needed to implement future actions.

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