McCrady Training Center
Integrated Natural Resources Management Plan
September 2022

South Carolina Military Department
and South Carolina Army National Guard
1 National Guard Road
Columbia, SC 29201

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UPDATED
INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN
MCCRADY TRAINING CENTER
SOUTH CAROLINA

SIGNATURE PAGES

This Integrated Natural Resources Management Plan (INRMP) is an update of the 2002-2006 McCrady Training Center (MTC) INRMP that has been reviewed for operation and effect and recommended for update and continued implementation (in 2013 and again in 2019). It meets the requirements for INRMPs as specified in the Sikes Act, as amended (16 US Code [USC] §670a *et seq.*). It has set appropriate and adequate guidelines for conserving and protecting the natural resources of MTC.

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EXECUTIVE SUMMARY

McCrady Training Center (MTC) is a National Guard training facility located in the Midlands region of South Carolina. While the primary purpose is military training, natural resources are managed for conservation and to support the military mission across the approximately 15,200-acre site in Richland County. MTC provides habitat for multiple breeding pairs of federally endangered red-cockaded woodpecker (*Leuconotopicus borealis*). The intent of the INRMP is to support the military mission at MTC using scientifically-proven land management practices in compliance with relevant laws, regulations, and applicable state and federal guidance, while ensuring no net loss in the capability to support the military mission of the installation. The INRMP is based on an adaptive, ecosystem management approach and integrates natural resources management with the military mission and other stakeholders associated with MTC.

An INRMP was first developed for MTC in 2001, and a review for operation and effect for MTC was completed in 2011. This updated INRMP is the result of a review for operation and effect done by the US Fish and Wildlife Service (USFWS), the South Carolina Army National Guard (SCARNG), and the South Carolina Department of Natural Resources (SCDNR). The review resulted in agreement to update and continue implementing the existing INRMP. No substantive changes were made to the management programs and philosophies or the goals, objectives, and implementation projects. An INRMP is required for MTC by the Department of Defense (DoD) and Army National Guard Policy because the military training requires conservation measures to minimize impacts (e.g. federally listed species management, prescribed burning, invasive species control) and to provide conditions suitable for military training.

MTC is contained within Fort Jackson and there is a cooperative relationship between the two organizations. The MTC INRMP reflects the natural resource management goals for Fort Jackson. Fort Jackson currently assists the SCARNG in the management of natural resources on MTC and participates in the development and implementation of this INRMP. The goals in the INRMP are supported by objectives, projects, and tasks to achieve these goals. Implementation tables are maintained in a database but summarized in Appendix C.

As required by National Environmental Policy Act (NEPA), an Environmental Assessment (EA) was completed in conjunction with the 2001 INRMP. The previously completed EA concluded with the issuance of a Finding of No Significant Impact (FNSI; signed in 2005) and found implementation to result in net positive effects by sustaining and enhancing the natural resources, while providing for no net loss in training lands and having no significant adverse environmental or socioeconomic impacts.

The updated INRMP reflects changes in current guidance on INRMP structure and recent data relating to natural resources, but there have been no substantive changes to the overall scope or priorities of natural resources management. Implementation of the updated INRMP will be a continuation of the Preferred Action Alternative identified in the EA for the 2001 INRMP. As such, the EA for the 2001 INRMP and the FNSI are valid for the updated INRMP and a new detailed NEPA analysis is not necessary. An Environmental Checklist and Record of Environmental Consideration (REC) have been included as Appendix I.

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1 INRMP OVERVIEW

1.1 PURPOSE AND SCOPE

The purpose of this updated Integrated Natural Resources Management Plan (INRMP) is to guide natural resources management at McCrady Training Center (MTC) for the South Carolina Army National Guard (SCARNG), based on the original INRMP approved in 2001. MTC consists of approximately 15,200 acres in Richland County in South Carolina. Land ownership is federal property licensed to the South Carolina Military Department (SCMD) through the US Department of Army (DA). General management responsibilities are specified within this license. Elements of the natural resources management are done cooperatively with Fort Jackson (US Army).

This INRMP is consistent with the *Sikes Act* (16 US Code [USC] § 670a et seq.), Army Regulation (AR) 200-1 *(Environmental Protection and Enhancement*), Department of Defense (DoD) Instruction 4715.03 (*Natural Resources Conservation Program*).

Goals and objectives provide the framework for the natural resources management programs. Goals reflect SCARNG's vision for managing MTC's natural resources. Each goal is supported by objectives that identify a management initiative or action for achieving the stated goal. The objectives then drive the development of projects and tasks to achieve those objectives. The goals and objectives in this updated INRMP are a consolidation and continuation of the goals and objectives in the 2001 INRMP and the 2011 review for operation and effect for MTC. The primary purpose of the MTC INRMP is to:

a) Support the mission,
b) Ensure good stewardship, and
c) Enhance quality of life for Army Guard personnel, and the citizens of South Carolina.

1.2 AUTHORITY AND REGULATORY COMPLIANCE

The most relevant laws, regulations, and policies with respect to natural resources management at MTC are listed below.

The **Sikes Act** (and the Sikes Act Improvement Act) requires an INRMP be written and implemented for all DoD installations having significant natural resources and developed cooperatively with USFWS and the state wildlife agency. **AR 200-1,** *Environmental Protection and Enhancement,* addresses the environmental responsibilities of all Army organizations and agencies and provides a framework for the Army Environmental Management System (EMS). This regulation provides guidance on when to develop and implement an INRMP and discusses associated coordination requirements.

The **National Environmental Policy Act** of 1969 (NEPA; 42 USC §4321 *et seq*.) requires that federal agencies consider potential environmental consequences of proposed actions. New INRMPs and major revisions of INRMPs require an Environmental Assessment (EA) to meet NEPA requirements per Army National Guard Environmental Branch (ARNG-ILE) Memorandum, 9 April 2012 and DA Memorandum, 25 May 2006. Minor updates and continued implementation of an existing INRMP do not require an EA or opportunity for public comment.

As required by NEPA and the policies described above, an EA was completed for the original 2001 INRMP to evaluate the impacts of the actions proposed in the plan on the "human environment" and the installation's natural resources. This updated INRMP is not expected to result in biophysical consequences materially different from those anticipated in the 2001 INRMP. Thus, an Environmental Checklist and a Record of Environmental Consideration (REC) were completed that tier off the EA for the 2001 INRMP. The Environmental Checklist describes the Proposed Action (update and continued implementation of the 2001 INRMP), confirms that the activities in the updated INRMP are addressed in the 2001 INRMP EA, identifies potential impacts to various environmental media, and concludes that a REC is the appropriate level of NEPA documentation. A copy of the REC is included in Appendix I.

MTC is included within the boundaries of Fort Jackson Military Reservation (FJMR), which is managed by the US Army and has its own INRMP. The MTC's INRMP is consistent with Fort Jackson's INRMP. The intent is to ensure that all natural resources management is integrated with the SCARNG's military mission and that all personnel understand their roles and responsibilities and understand Fort Jackson's responsibilities at the MTC.

1.3 RESPONSIBILITIES

Implementation of the INRMP at MTC is a shared responsibility between multiple departments within the SCMD and outside organizations.

1.3.1 SCMD

The Adjutant General

The Adjutant General is responsible for the establishment of facilities engineering and environmental services for the state and its supported installations, including implementation and enforcement of this INRMP. All department heads and their subordinates will be charged with following the standards and guidelines outlined in the plan.

Environmental/ Conservation

The Conservation section is directly responsible to ensure that the INRMP is implemented, remains current and achieves the stated management goals. This includes coordination, tracking and funding. The Conservation section is responsible for the writing and reporting of the Integrated Pest Management Plan (IPMP). The staff includes the following positions:

- Training Site Environmental Program Manager
- Conservation Manager
- Compliance Coordinator
- Geographic Information Systems (GIS) Manager
- Field Technician

Training & Operations/ Integrated Training Area Management (ITAM)

The ITAM program is responsible for ensuring the integration of training within the INRMP. They are also responsible for management of training assets across the installation. This includes the development, implementation and integration of the Range Development Plan. They are responsible for the maintenance of ranges, trails and other training assets in the training areas.

Facilities

The Construction & Facilities Management Office is responsible for the management and maintenance of all real property assets at MTC. This includes, the Site Development Plan, Master Plans, and for the implementation of the IPMP. Facilities are responsible for the management of real property, utilities, and roads at MTC.

1.3.2 Fort Jackson

The Fort Jackson Directorate of Reserve Support assists the MTC for scheduling training activities and in assigning training locations for visiting units. Natural resources specialists from Fort Jackson currently assist the SCARNG in the management of natural resources on MTC and participated in the development and implementation of this INRMP. Fort Jackson provides support to MTC in the following natural resource areas.

- Forest Management
- Fire Management
- Wildland Fire Suppression
- Wildlife Management
- T&E Management
- Law Enforcement
- Hunting and Fishing

1.3.3 Federal & State Agencies

Several agencies are involved with assisting MTC and Fort Jackson in the management of their natural resources. In addition to the ones listed below that have regulatory requirements to assist our management efforts, we also work closely with other agencies and universities to implement the INRMP and meet our management goals (See Section 4.2). Listed below are our partners that provide direct assistance during INRMP review and/or implementation.

- US Fish and Wildlife Service: The USFWS is a signatory agency to this INRMP and the Fort Jackson INRMP. USFWS cooperates with MTC on fish and wildlife management, threatened and endangered (T&E) species management, fish stocking, and waterfowl management.
- South Carolina Department of Natural Resources: The SCDNR is the primary state agency that assists MTC personnel in natural resource management and fish and wildlife management.
- US Army Corps of Engineers: USACE is the primary agency that assists MTC personnel with wetland and stream issues and management.

1.4 Review and Revision Process

In accordance with the Sikes Act, DoDI 4715.03, and AR 200-1, there are two components to the INRMP review process. An annual review process occurs so all cooperating entities receive an update regarding what has been accomplished in the last year and what is planned for the next year. The review for operation and effect (ROE) must occur at least every five years and is a more comprehensive review process involving the USFWS and SCDNR to determine whether the INRMP goals and objectives are being achieved and whether anything needs to be modified. If the natural resources management on MTC changes significantly, a major revision to the INRMP may be required.

1.4.1 Conservation Tracker Database (C-Tracker)

After the Review for Operation and Effect in 2011, SCARNG determined that the two INRMPs (MTC and Clarks Hill Training Center [CHTC]) were not truly "integrated" into the management program. The INRMPs were documents that sat on a shelf and were periodically referenced as needed. To solve this issue, SCARNG undertook an overhaul of the INRMPs and their day-to-day business practices. Part of this process also involved integrating all the programmatic elements for both MTC and CHTC.

To do this we first built an Access database around our INRMP document structure, which is referred to as the C-Tracker. The C-Tracker has four primary functions. The first function is to store and track all of our INRMP goals, objectives, projects and tasks (See Appendix C).

The second function is to incorporate this information into our daily business practices. We do this by using the C-tracker to automatically number projects and generate our server file structure. Everything saved on the server must fit into this file structure. The result is that everything we do or work on is tied to a project within our INRMP. Each of these projects are also linked to an existing STEP project, which connects the project and associated tasks to a funding source.

The third function of the C-tracker is to track and manage the Conservation budget and procurement. All proposed procurement actions are entered into the C-Tracker. All procurements must be tied to an existing project within the INRMP. The system automatically generates a tracking number, creates a file structure on the server, and generates appropriate procurement request documents based on the procurement type. Using the C-Tracker to initiate our procurement has further integrated the INRMP into our daily business practices.

The fourth function of the C-tracker is reporting. We use it to generate our annual reports and the reports for our ROE and 5-year updates. Through the C-Tracker, we are able to generate multi-year reports to look at our program from a Goals and Objective level down to individual project reports that can track time, material, and procurements for individual tasks.

The C-Tracker was developed and implemented in-house, not contracted out. The C-Tracker has met its intended purpose; the INRMP is now solidly part of our day-to-day business practice and it is updated every time we initiate a procurement action or begin a new project.

1.4.2 Annual Review and Coordination

The INRMP is reviewed annually to ensure the achievement of mission goals, verify the implementation of projects, and establish any necessary new management requirements. The SCARNG Conservation Manager will communicate annually with USFWS, SCDNR, and internal stakeholders to review the previous year's INRMP implementation and discuss implementation of upcoming programs and projects. Coordination will be done through a meeting or by letter or email. The SCARNG Conservation Manager is responsible for ensuring that annual INRMP reviews are completed, tracked, and reported. A memorandum of record detailing the annual review will be prepared and appended in Appendix I.

As part of the annual review and as a function of the INRMP, SCARNG will specifically:

1. Invite feedback from USFWS and SCDNR on the effectiveness of the INRMP;
2. Document specific INRMP action accomplishments from the previous year and discuss upcoming projects and activities.

Natural resources data and program and project information are available to cooperating agencies. They may request to see project folders or to have a site visit to view natural resources projects in progress at any time.

1.4.3 Review for Operation and Effect

Not less than every five years, the INRMP will be reviewed for operation and effect by all cooperating agencies and internal stakeholders to determine if the INRMP is being implemented, if the goals and objectives are being met, and if natural resources management is achieving necessary outcomes. The result of the review for operation and effect is a determination to continue implementation of the existing INRMP with minor updates or to proceed with a revision. The review for operation and effect may be done as part of every annual review or as a separate, more in-depth process, depending upon the parties involved and their concerns. The conclusion of the review will be documented in a jointly executed memorandum, meeting minutes, or in some other way that reflects mutual agreement.

If minor updates are needed, they will be completed by SCARNG and reviewed and approved by all parties. If it is determined that major changes are needed (i.e., sufficient to trigger a full revision), all parties will provide input and an INRMP revision and associated NEPA review.

If a review of operation and effect concludes that an INRMP must be updated or revised, there is no set time to complete the updates or revision. The existing INRMP remains in effect until the updates or revision is complete and all concurrences are received. Revisions to the INRMP will go through a more detailed review process similar to development of the initial INRMP.

1.5 Integration with Other Plans

Integration is central to the MTC INRMP. This integration takes two basic forms. The first is integration of key components of other plans into the INRMP. This is primarily accomplished through the use of the C-Tracker (described above). The second form of integration is to ensure that Natural Resources are considered in other plans and projects beyond the Conservation division (see Appendix H for a complete list). This is accomplished through the SCARNG Environmental Review program. All SCARNG projects are subject to Environmental Review Process at which time the potential effects on natural resources are evaluated.

Due to the unique co-managed nature of MTC, there are other natural resources plans that have particular relevance to the management goals and objectives identified in the MTC INRMP:

Fort Jackson

- Fort Jackson INRMP
- Red Cockaded Woodpecker (RCW) Management Plan
- Smooth Coneflower Management Plan
- Integrated Wildland Fire Management Plan for Fort Jackson
- FJMR Range Regulation 350-14 (Environmental restrictions related to range use including on MTC)

MTC/SCARNG

- Integrated Pest Management Plan

2 INSTALLATION OVERVIEW

2.1 GENERAL DESCRIPTION

The SCMD is comprised of approximately 11,000 part and fulltime service members and civilian employees including nearly 9,200 Soldiers, 930 State Guard and Joint Service Detachment members, and 500 state employees. It is headquartered at 1 National Guard Road in downtown Columbia, South Carolina and has more than 60 operational facilities throughout the state in 39 of 46 counties. The MTC provides the primary training area for these soldiers (SCMD *Fact Sheet* Feb 2019).

MTC is located within the state of South Carolina in Richland County. MTC comprises approximately 15,200 acres within the boundaries of the Fort Jackson (Figure 1 in Appendix B). MTC is located in the south eastern portion of Fort Jackson. Fort Jackson is located approximately five miles east of the business district within the city limits of Columbia, the state capital. Columbia is one of the state's largest cities, with a metropolitan area population of more than 800,000.

MTC is bounded by Leesburg Road to the south, Highway 601 to the east, Highway 268 to the northeast, and Division Road within the Fort Jackson to the northwest. Other than Fort Jackson, private land surrounds MTC.

2.2 HISTORY

MTC's history is intertwined with Fort Jackson's history. Fort Jackson was established on June 17, 1917 as Camp Jackson in anticipation of the US entering World War I. The land (1,156 acres) was purchased in part from the Wade Hampton estate by the City of Columbia and then donated to the Federal Government. The camp was completed in eight months and was established primarily as an infantry training facility, but during the war also trained an aero squadron, balloon company, telegraph battalion, 17a regiment of heavy artillery, and support units (SCARNG ICRMP 2017).

Although heavily used during the World War I, the camp was abandoned during the summer of 1922 and much of the camp either torn down or repurposed. From 1925 until 1939, the camp was turned over to the SCARNG for summer training and the Guard had to rebuild facilities.

In 1939, Camp Jackson was revived as a result of the mobilization for World War II. The camp was expanded to 53,000 acres and the cantonment area was rebuilt including construction of some 569 buildings. On August 15, 1940, Camp Jackson became Fort Jackson and it was designated as a permanent camp. Fort Jackson was heavily used during World War II, but use declined until the Korean War. Since the 1950s, Fort Jackson has maintained its primary mission of basic infantry training and specialized training. Specialized training has included radio operation, administration and supply, and a WAC basic training program. In 1968, Fort Jackson was incorporated into the City of Columbia.

Starting in approximately 1979, the 15,200 acres of Fort Jackson that comprise MTC (formerly the Leesburg Training Center) has been licensed to SCARNG from the Department of the Army. MTC is the largest of the SCARNG training centers and approximately 108 SCARNG facilities spread throughout the state. This INRMP pertains only to MTC; a separate INRMP governs CHTC.

2.3 MILITARY MISSION

The stated mission of MTC is to "*SCARNG Training Center supports readiness by providing a wide range of services and infrastructure to tenant and transient units and organizations, to include maintaining facilities, training areas, and live fire ranges, at training sites across the state to enable effective training in a safe and sustainable environment.*

Provides a wide range of Soldier and Family care and support commensurate with Active Component capabilities to foster resiliency.

O/O Conducts Joint Reception, Staging, Onward Movement and Integration (JRSOI) to rapidly support continuous state emergency operations ISO federal or state declared emergencies." (MTC Command Brief 2019)

MTC is the primary training area for the SCARNG and as such it plays an important role in meeting the dual mission of SCARNG. MTC provides training opportunities in support of the federal mission and serves as a staging site for state missions. MTC is the home of the 218th Regiment (Leadership) Total Army School. The 218th Regiment serves as the schoolhouse for the southeastern region. A Unit Training Equipment Site (UTES) is also located on MTC. MTC provides a training ground for the following equipment: M1-A1 Abrams tanks, Multiple Launch Rocket Systems, M2 Bradley fighting vehicles, and AH-64 Apache attack helicopters.

MTC Soldier-Days Trained
(provided by Range Control)

Component	FY 19	FY 20 (as of 07/13/20)
Active Component	60,438	42,132
National Guard/Reserve	73,059	84,883
Other DOD	114,483	47,537
Non-DOD	42,479	26,448
Totals	**290,459**	**201,000**

The South Carolina National Guard has deployed more than 25,000 service members since Sept. 11, 2001 in support of Operations Nobel Eagle, Iraqi Freedom, New Dawn, Enduring Freedom, Freedom's Sentinel, Inherent Resolve, Spartan Shield, Kosovo Force, and the European Deterrence Initiative, as well as other contingency training and mobilizations in support of combatant commands US Africa Command, US Central Command, US European Command, US Northern Command, US Southern Command, US Pacific Command, and US Cyber Command.

Deployment/Federal Mission: The South Carolina National Guard has deployed more than 25,000 Soldiers and Airmen in support of overseas contingency operations since September 11, 2001. As of February 2019, approximately 300 service members are mobilized in support of homeland defense and overseas missions, including rotational support of the National Capital Region and ongoing support along the Southwest Border:

- In June 2018, nearly 300 South Carolina National Guard Airmen and a dozen F-16 fighter jets deployed under the 407th Air Expeditionary Group in Southwest Asia in support of an Air Expeditionary Force rotation
- In July 2018, South Carolina National Guard Security Forces Squadron Airmen returned home from a six-month deployment to Southwest Asia

- Approximately 90 Soldiers with the 125th Cyber Protection Battalion mobilized March 2018 for a yearlong deployment to the National Capital Region under operational control of US Army Cyber Command
- Six Soldiers with 2nd Battalion, 641st Aviation Regiment mobilized November 2018 for a nine-month deployment to Afghanistan in support of Operation Freedom's Sentinel
- More than 40 Soldiers with the 678th Air Defense Artillery Brigade mobilized January 2019 for a yearlong deployment to the National Capital Region in support of Operation Noble Eagle
- Approximately 140 Soldiers with the 1221st Engineer Clearance Company mobilized January 2019 for a nine-month deployment in support of Operation Inherent Resolve
- The South Carolina National Guard provides continued support to the Southwest Border under Operation Guardian Support. Currently, approximately 15 Soldiers are mobilized to provide personnel and aviation assets in support of the Department of Homeland Security
- In September, 2019 the SCNG responded to Hurricane Dorian with more than 1,600 Soldiers and Airmen providing support to civil authorities in preparation, during, and in the aftermath of the storm. The Soldiers and Airmen provided evacuation and security support, transportation and communication assets, and provided debris clearing support.
- In Fiscal Year (FY) 2020, the South Carolina National Guard is expected to mobilize more than 1,000 service members in support of homeland defense and overseas missions. Projected deployments include aviation support to the Kosovo Force; sustainment, signal, and combined arms support to Operation Spartan Shield; engineer support to Operation Inherent Resolve and the European Deterrence Initiative; aviation medevac support to Operation Freedom's Sentinel; engineer and personnel support to Eager Lion in Jordan; as well as continued air defense artillery rotational support of the National Capital Region and ongoing aviation support along the Southwest Border
- Sixteen Soldiers in the South Carolina National Guard have paid the ultimate price in support of combat operations since September 11, 2001

State Emergency and Management Assistance Compact mission support (SCEMD Fact Sheet Feb 2019):

- The SCEMD serves as the primary point of contact, signatory, and coordinating element for the mission
- The South Carolina Air National Guard sent a contingent of support personnel to assist in command and control for Tyndall Air Force Base after Hurricane Michael, a category 4 hurricane, devastated the pan handle of Florida after making landfall Oct. 10, 2018
- At the peak of operations, more than 3,400 South Carolina National Guard Soldiers, Airmen, state employees, and members were mobilized to assist South Carolina after Hurricane Florence made landfall September 14, 2018. While Hurricane Florence had grown to a category 4 storm, the winds rated it as a category 1 when it came ashore in the southern portion of North Carolina. The slow speed of the storm brought trillions of gallons of rain to the Carolinas and caused devastating flooding in the Pee Dee region of South Carolina. Response missions included assisting with coastal evacuations, engineer support of infrastructure to include sandbag operations and aqua barriers along main coastal routes. Post-storm missions included high water evacuations, aerial reconnaissance, and road repairs
- In May 2018, SCEMD deployed two mitigation specialists in response to severe flooding in Hawaii to assist in planning and developing mitigation actions and projects

- The South Carolina National Guard responded to snow and ice that impacted York County area and Rock Hill Jan. 17, 2018 sending two Vehicle Recovery Teams (VRTs) to assist the South Carolina Highway Patrol
- The South Carolina National Guard responded to snow and ice that impacted the low country of the state, Jan. 3, 2018. Soldiers activated for three VRTs with support personnel and liaison. VRTs performed 6 missions in support of South Carolina Highway Patrol. They recovered a total of 6 vehicles at mile markers 8, 18 and 57 on I-95
- 169th Fighter Wing supported the Aerospace Control Alert mission; defends east coast air space in support of North American Aerospace Defense Command
- In September, 2019 the SCNG responded to Hurricane Dorian with more than 1,600 Soldiers and Airmen providing support to civil authorities in preparation, during, and in the aftermath of the storm. The Soldiers and Airmen provided evacuation and security support, transportation and communication assets, and provided debris clearing support.

2.4 CURRENT LAND USE

MTC is devoted to providing training lands for the men and women of the SCARNG. MTC also provides limited access to the public for outdoor recreation on the Palmetto Trail along the southern border. Within the 15,200-acre training center, there are 7,658 acres designated for maneuver training; 3,211 acres designated for heavy maneuver training; 3,819 acres limited to certain types of training; and 292 acres for cantonment.

The cantonment area contains parade grounds, the 218th Regiment (Leadership) facilities, and MTC administrative facilities, McCrady Billeting, McCrady Fire Station, fuel and wash-rack facilities, Unit Training and Equipment Site, United States Marine Corps Reserve facilities, and the Battle Simulation Complex. All maneuver-training areas on MTC are regarded as suitable for light maneuver.

There are 210 miles of roads, trails, and firebreaks. Of this total, there are 6 miles of primary roads, 87 miles of secondary roads, and 117 miles of tank trails and firebreaks (MTC GIS Data 2016). The SCARNG has the following training facilities at MTC:

- Basic weapons marksmanship ranges: 6
- Indirect fire points: 18 (17 artillery/ mortar)
- Light maneuver areas: 43
- Heavy maneuver areas: 11
- Forward Operating Bases: 2
- Mobile Operations in Urban Terrain site: 1
- Landing zones: 18
- Direct fire range: 1
- Tank/Bradley range

2.5 REGIONAL LAND USE AND REGIONAL PLANNING

2.5.1 Regional Land Use

The central Midlands of South Carolina is home to five military installations totaling 70,650 acres: Fort Jackson, MTC, Shaw Air Force Base (AFB), McEntire Joint National Guard Base, and Poinsett Range. These installations are used by personnel from the Army, Navy, Air Force and Marines. These installations have over 12,000 full time military personnel in addition to over 7,000 civilian employees. They provide training opportunities for over 65,000 soldiers, sailors, airmen, and marines annually. Our installations annually support over 2,000,000 training man-days and over 10,000 training flights. The replacement cost of these facilities is more than $6,000,000,000. This hub of high-density military training is contained within area approximately the size of Joint Base Lewis McChord.

In addition to the concentration of military training, this area has been referred to as "The Green Heart" of South Carolina. The area has some of the best agricultural, timber and recreational lands and waters in the state. The area has cultural history that dates back over 12,000 years. Post-Civil War, the region was a center for African-American settlement and remains an area of strong cultural attachment.

At the center of the Region is the confluence of the Wateree, the Congaree and Santee rivers (COWASEE Basin). The COWASEE Basin Focus Area covers over 315,000 acres in the midlands of South Carolina and includes the Congaree, Wateree and Upper Santee Rivers. This has created a unique natural area that is anchored by the Congaree National Park and Manchester State Forest.

The 26,000-acre Congaree National Park is the heart of the basin and is home to the largest old growth bottomland hardwood forest remaining in the eastern United States. The focus area is a priority waterfowl restoration area where many partners are implementing research and management to improve waterfowl habitat and populations. Staff from SCDNR and USFWS band ducks as part of a waterfowl monitoring project. To date, 45% of the COWASEE Basin Focus Area is protected either as public conservation land or through private conservation easements.

The Congaree National Park and surrounding region has been designated a United Nations Educational, Scientific and Cultural Organization (UNESCO) Man and Biosphere Reserve (MAB). The MAB program combines natural and social science with economics and education to improve human livelihoods and safeguard natural and managed ecosystems. MAB promotes innovative approaches to economic development that are socially and culturally appropriate, and environmentally sustainable. The MAB program provides a unique platform for cooperation on research and development, capacity-building and networking to share information, knowledge and experience on biodiversity, climate adaptation and sustainable development. It contributes not only to better understanding of the environment, but also promotes greater involvement of science and scientists in policy development concerning the wise use of biological diversity.

There are over a dozen public access areas dedicated to outdoor recreation, not including blue trails, hunt clubs and fish camps. Outdoor recreation within the region is significant, both economically and in quality of life. There are hiking trails along the boundary of MTC and Fort Jackson installations to provide recreational benefits to our service members, their families, school groups, and the general public. These recreational activities have not resulted in any restrictions or impacted our ability to train. In fact, they have increased public awareness and created a better understanding of our activities. Private

industry has donated labor and materials to build boardwalks and improve parking areas along these trails. Our Recreational lands face the same threats from unfocused development as our military installations, farms, timberlands and green spaces.

2.5.2 Army Compatible Use Buffer

The military installations in the Midlands, along with several partners, have been working together since 2007 forming the Midlands Area Joint Installation Consortium (MAJIC). Working together under MAJIC, the partners identified a 650-square mile focus area that incorporated all five military installations, a national park and a SCDNR focus area. Until the Eastern North Carolina Sentinel Landscape that was designated in 2016, MAJIC was the only Program that was focused on multiple installations, across multiple services.

The purpose of MAJIC is to facilitate a region–wide approach to compatible use of resources to strengthen military mission, community well-being, economic development, and to conserve the environment and natural resources. The primary goal of MAJIC is to reduce encroachment pressures on the installations through the use of conservation easements and fee-simple purchases.

To date within our focus area, we have worked with 30 separate landowners on 47 separate Protection Projects. We have encumbered over 25,000 acres at estimated fair market value of over $36.6 million.

2.5.3 Sentinel Landscape

We are currently working our way through the Readiness and Environmental Protection Integration (REPI) Sentinel Landscape application process. The MAJIC Sentinel Landscape is uniquely positioned at the nexus of several federal interests, and conservation concerns. We have a very supportive and military-friendly local government and population. This provides us with opportunities to maximize any federal investment in the region. The installations of MAJIC are taking a multi-tiered approach to protecting our training lands. To accomplish this, the different aspects of encroachment are addressed within individual

THE CENTRAL MIDLANDS SNAPSHOT

(from MAJIC Sentinel Landscape Proposal 2016)

- **Economics**
  - Low cost of living (% of national average)
    - Overall Cost: 91 %
    - Housing/Property Value: 68 %
    - Energy: 114 %
  - Thirty cents of every dollar spent is connected to military installations
- **A Supportive Community**
  - Operational military installations in the area since prior to World War I
  - 26 separate agencies and NGOs participated
- **Transportation**
  - Less than 100 miles to Port of Charleston
  - Multiple railheads
  - Intersection of major North-South & East-West transportation corridors
- **Climate Resiliency**
  - Not impacted by flooding from sea level rise
  - Quickly recovered after regional 1000-year flood event in 2015
- **Urban Centers**
  - Over 800,000 people in the metro region
  - Opportunities for servicemen and families
  - Available Installation support services
- **Outdoor Recreation**
  - Congaree National Park
  - Sesquicentennial State Park
  - Poinsett State Park
  - Wateree River Heritage Preserve
  - Congaree Bluffs Heritage Preserve
  - Manchester State Forest Palmetto Trail
  - Mill Creek Nature Center
  - Congaree and Wateree Rivers
  - Sparkleberry Landing
  - Mill Creek County Park
  - SCDNR Cooks Mountain WMA
- **Universities**
  - Technical assistance and research
  - Continuing Education opportunities
- **Conservation**
  - Congaree National Park
  - UNESCO Congaree Man and Biosphere Reserve
  - NRCS Longleaf Pine Initiative
  - Atlantic Coast Joint Venture COWASEE Basin

installation plans. They all reference back to MAJIC and its efforts to ensure regional consistency of message and goals. MAJIC is working closely with several regional partners to ensure that our goals are consistent with theirs. This includes working with the Stronger Economies Together initiative, a USDA Rural Development program. This program has identified Defense & Security as one of three key economic development clusters. The Central Midlands Council of Governments is developing an agricultural plan to help local farmers provide food to institutions in the region, like the military bases. This will provide economic incentives to maintain farmland around our installations. The goals of the MAJIC program matches well with our partners' goals to promote a Compact Urban Core and Multi-Center growth pattern that allows economic growth across the region while maintaining the rural character of our natural and cultural history.

2.5.4 State Wildlife Action Plan

Every military installation should evaluate and incorporate any applicable information from the State Wildlife Action Plan (SWAP) into their natural resources management plans and agreements (per DoDI 4715.03). Every state has one of these comprehensive plans that address species that have been determined to have the greatest conservation need. SWAPs serve as a framework for management of wildlife habitat, especially for those species that are in decline. During the INRMP update process, the SCARNG consulted the South Carolina SWAP (SCDNR 2015) to ensure INRMP goals, objectives and strategies are consistent with South Carolina's overall statewide and site-specific plans. The South Carolina SWAP is available at http://dnr.sc.gov/swap/index.html.

The South Carolina SWAP provides guidance for addressing limiting factors that negatively impact the species of greatest conservation need, or "priority species". The SWAP also includes strategies and tools that can be implemented by SCDNR and its partners and is intended to be a cooperative and proactive management plan that emphasizes partnerships in maintaining wildlife and plant resources. There are nine Conservation Action Areas (CAAs) identified in the 2015 SWAP, and these CAAs affect all priority species. MTC shares many overlapping conservation actions with these CAAs, as can be seen in **Table 1**.

Table 1. South Carolina SWAP Conservation Action Areas and MTC INRMP Management Areas

Conservation Action Areas	MTC Management Areas	INRMP Section
Education and Outreach	Outreach, Awareness, and Education	3.3
Habitat Protection	Fish and Wildlife; Threatened, Endangered and Special Status Species	3.9 & 3.10
Invasive and Non-Native Species Control	Pests	3.11
Private Land Cooperation	-	-
Public Land Management	Entire INRMP	All
Regulatory Actions	Authority and Regulatory Compliance	1.2
Survey and Research Needs	Various Natural Resource Management Topics	Chapter 3
Urban and Developing Lands	Regional Land Use and Regional Opportunities & Climate Change and Regional Growth	2.5.1 & 3.12
Climate Change (added in 2013)	Climate Change and Regional Growth	3.12

Source: SCDNR 2015

MTC lies in the Sandhills Ecoregion, which contains the fire-depended longleaf pine community. Conservation-oriented management in this region was boosted by the listing of the RCW and restoring

the longleaf pine-wiregrass community followed as a future conditions goal – this is also true for management of longleaf pine forests at MTC, as reflected in the goals and objectives in Section 3.6.

Two relatively new pressures that South Carolina is grappling with as a state, and shared by MTC, are encroachment caused by regional growth and climate change (Section 3.12). CCA number 8 – Urban and Developing Lands – is a major concern for South Carolina in the Sandhills Ecoregion where MTC lies. MTC has been working in recent years with other military installations in South Carolina to address and prevent impacts of encroachment. Climate change – CAA number 9 – will impact factors throughout South Carolina such as drought, temperature extremes, severe weather, water quantity, and sea level rise.

There are 493 animal species and 332 plant species listed as priority species in the SWAP. Several of these species have been documented on MTC. For a complete list of priority species in South Carolina, refer to Chapter 2 of the 2015 South Carolina SWAP. For a complete list of rare species documented on MTC, see Appendix E.

2.6 CONSTRAINTS AND OPPORTUNITIES

There are several constraints at MTC that may present environmental issues or constraints for existing or potential training requirements. These includes limitations due to noise, fire risk, T&E species, cultural resources, and wetlands.

2.6.1 Current Constraints

RANGE RESTRICTIONS

To minimize effects in the surrounding civilian communities, Fort Jackson has implemented the following voluntary restrictions as part of FJ Reg 350-14, which MTC follows:

- Mass fires will be limited to the minimum deemed "absolutely essential" to ensure successful attainment of the field training exercise objective.
- There will be no mass fire by units larger than a single battery between the hours of 2200 –2400 daily.
- Artillery firing will not be permitted between 2400-0630 daily and from 1000 - 1300 Sunday (Exceptions will be considered)
- Units planning to conduct mass training of more than one battalion of artillery (all calibers) must coordinate 90 days in advance of the exercise with the Installation Range Officer and Directorate of Plans, Training, Mobilization and Security, so that appropriate advance publicity of the firing can be made by the Installation Public Affairs Office.
- During extreme weather conditions, such as heavy overcast, Range Control may impose additional restrictions to reduce noise levels.
- Tank cannon live fire is restricted from 2400 to 0630 daily and between 1000-1300, Sunday.
- M28A1's will be limited to minimum deemed essential for successful attainment of training objectives and insurances of safety.
- MLRS RRPR firing is not authorized for live fire from 2400 to 0630 daily and Sunday from 1000 to 1300. Exceptions will be considered.
- Mortar firing will not be permitted between 2400-0630 daily and between 1000-1300, Sunday.

- Smoke producing materials will not be used under conditions that are dangerous to life or property outside of the training area(s). Smoke will not be released within 500 meters of the installation boundaries
- Do not conduct any smoke generator operations closer than 3,000 meters of any installation boundaries, if the wind direction is not in the opposite direction of the closest installation boundary.
- Post smoke control points no closer than 1000 meters from the installation boundaries.

THREATENED AND ENDANGERED SPECIES

MTC is home to a variety of federal and state listed species. These species, as well as others known to reside in Richland County, are listed in Table 6.4. Three federally endangered listed species, RCW, the smooth coneflower, and the rough-leaved loosestrife, have populations on MTC.

There are a total of sixty one (61) active clusters of the RCW; thirty six (36) of these are located on MTC and the remainder on the Fort Jackson. A cluster is defined as the total area encompassing cavity trees occupied or formerly occupied by a RCW group, plus a 200-foot buffer zone. There is also a 0.5-mile restrictive foraging area around each cluster. While T&E species do not impact the availability of training lands, restrictions placed on training near/around these clusters can inhibit maneuver training. Weapons firing is prohibited in the clusters and maneuver training is limited to established roads.

The habitat of the smooth coneflower is along roadsides, cleared openings, and open wooded areas. It is usually characterized by abundant sunlight and little competition by other plant life. One known occurrence of this plant is located in a fenced-in area along the Statue of Liberty Tank Trail. The rough-leaved loosestrife is located between training area 20C and Buffalo Creek. Both the smooth coneflower and rough-leaved loosestrife have minimal impact on the type of training by the SCARNG.

Through an Interagency Agreement between Fort Jackson and the USFWS, a management plan for the RCW has been developed for the Fort Jackson and MTC lands. The implementation of the MTC INRMP is consistent with the RCW management plan and other endangered species management plans.

WETLANDS

The installation has a total of 1,642 acres of wetlands (Figure 4 in Appendix B). Vehicles and mechanized equipment are only allowed to traverse wetlands on established roads and trails. Foot traffic through wetlands is not generally allowed during training periods because of its undesirable nature. A majority of training occurs in the upland environment.

CULTURAL RESOURCES

The ICRMP incorporates all SCARNG sites including MTC. Archaeological surveys have identified 242 archaeological sites and six cemeteries at MTC. Of the archaeological sites evaluated 41 have been recommended as eligible for listing in the National Register of Historic Places. Digging, excavating, removing, altering, or otherwise disturbing or damaging the area within a 50 meter radius of eligible archaeological sites and cemeteries is prohibited at MTC.

NOISE

Military installations tend to attract activity from the civilian sector. For example, sizeable new communities may grow up near an installation or existing communities may expand toward or around an installation's boundaries. This growth process can place severe limitations upon the ability of a military installation to support training and for assigned units to maintain an adequate level of readiness. As noise impacts from military activities increase upon the civilian communities, both litigation and/or political pressures, which could result in degradation of the installation's mission, also increase. Not only does the number of complaints to installation commanders increase dramatically, but also so does the number of complaints to elected officials.

Since 1993, Army Environmental Policy Institute studies have documented the potential threat that noise poses to readiness training. A survey reported that 43% of the installations surveyed experienced noise problems that required either rescheduling or moving training ranges to resolve. A reflection of this survey's results can be found in the ranking of environmental noise in the Army Environmental Compliance Pillars. In 1999, training and testing range noise control was ranked second, falling only behind particulate matter/dust control.

2.6.2 Potential Future Constraints

ENVIRONMENTAL RESOURCE MANAGEMENT ACTIVITIES

Environmental management at MTC is aimed at sustaining and maintaining range and training lands as a prime training resource. In general, management activities on MTC do not significantly hinder training activities. However, field activities to restore or rehabilitate areas may limit certain training activities temporarily.

CLIMACTIC CONDITIONS

Climate models for this area predict a general increase in extreme weather events. Specifically, there will be more intense storm and rainfall events followed by long periods of draught. Increased average summer temperatures are also predicted, which will exacerbate periods of draught. See Appendix F, Section F.4 for more details.

These conditions could result in three significant constraints:

- Reduced access to training areas, resulting from damage to the road and trail network resulting from storm water run-off and flooding.
- Loss of training time due to excessive high temperatures and thunder storms
- Increased risk of soldier death and injury resulting from extreme weather

EROSIVE SOILS

As mentioned above current climatic models predict an increase of extreme weather events in the region, specifically intense/ heavy rainfall events followed by long periods of draught. This will increase the likelihood of issues resulting from soil erosion. The primary soil association at MTC is the Vaucluse-Ailey-Pelion Association (sand/loam) which has low erodibility potential, unless disturbed or located on a steep grade subject to plentiful rainfall (Figure 3 in Appendix B). All three of these erodibility factors are common at MTC. Based on climate models, we anticipate an increase in heavy rainfall events (both frequency and intensity).

Figure 1: COL Creek Bridge after 2015 Storm (22" of rain in 48 Hours)

It can be reasonably anticipated that we will see an increase in erosion issues, specifically associated with our road and trail network. This would impact both our ability to perform management activities and impact our training capability.

Constraints could include restricted access to areas during repair, restoration and rehabilitation. MTC's small size severely limits its ability to rotate heavy maneuver areas for natural reclamation, contributing further to the soil erosion problem. These potential constraints could be mitigated by improvements to the road and trail network to allow for improved handling of storm water run-off.

2.7 ENVIRONMENT OVERVIEW

MTC is within the Sandhills Ecoregion of South Carolina, an inland habitat type characterized by rolling hills capped by deep, coarse sands. This region is wedged between the Coastal Plain and Piedmont regions. Scientists believe sand hills were formed by ice age oceans that rose and receded in response to melting and freezing of polar ice caps. Beaches formed wherever the water met the land, and the sand hills were left behind when the ocean receded.

Dominant plants in the forests on the installation are long-leaf pine (*Pinus palustrus*) and scrub oak (*Quercus laevis*), with other mixed hardwoods and pines. Disturbance and land use changes have contributed to the establishment of introduced vegetation, most notably slash pine (*Pinus elliottii*). Woodland and forests on the MTC are abundant, including major forest community types found at the installation are longleaf pine/turkey oak, scrub oak, upland hardwood, and bottomland hardwoods. There are no remaining open grasslands on the installation. Fauna are typical of the region, benefitting from the undeveloped nature of the installation.

Sandhills Plant Life

Because the sandhills contain dry, nutrient-poor soil, this habitat contains only hearty, well-adapted plants. Turkey oak and longleaf pine trees are typical because their rooting systems allow them to extract water from various soil depths. These species are also adapted to the frequent, lightning-induced fires that strike the sandhills. Longleaf pines have a thick, fire-resistant bark, and turkey oaks burned by fire will regenerate because the fire does not damage their root systems. Several fire-resistant grass species inhabit the sandhills, including sorghastrum, broomsedge and three-awn grass. Several plants on the federal and state lists of *threatened or endangered species* are found on the installations.

Sandhills Wildlife

The sandhills support many reptile and amphibian species adapted to the habitat's dry, sandy conditions. These include broad-headed skinks, oak toads, six-lined racerunner lizards, glass lizards and hog-nosed snakes. Mammals that inhabit the sandhills include white-tailed deer, opossum, gray fox, bobcat, fox squirrel and cottontail rabbit. Birds that inhabit the sandhills include the mourning dove, sparrow hawk, red-tailed hawk and wild turkey. The RCW, a federally endangered bird, is found on MTC and Fort Jackson.

The physical environment at MTC is summarized in more detail Appendix F, while the biological environment is summarized in Appendix G. Rare, threatened, and endangered species at MTC are summarized in Appendix E. There are three federally endangered species at the MTC: RCW (*Picoides borealis*), smooth coneflower (*Echinacea laevigata*), and rough-leaved loosestrife (*Lysimachia asperulaefolia*).

3 NATURAL RESOURCES MANAGEMENT

This section summarizes each technical area of natural resources management. In each section, relevant management recommendations, objectives, policies, and actions are presented. The main issues and concerns pertaining to natural resources management on MTC include managing for the various federally-listed species, control of invasive species, and soil erosion. A complete summary of all relevant laws, regulations, executive orders (EOs) and policies is provided in Appendix J.

The goals and objectives in this updated INRMP are a continuation of the goals and objectives in the 2001 INRMP, with some minor updating of language and the addition of success criteria. These goals and objectives are achieved by undertaking projects and tasks, which are summarized in the Implementation Tables in Appendix C. These supporting actions can include in-house actions undertaken by SCARNG staff or larger actions working with other state and federal partners like Fort Jackson or SCDNR, working with universities, or working with non-governmental organizations (NGOs). Other actions may be completed by working with vendors through the state contracting procedures. In addition, actions can be performed using non-DoD funds or by volunteers.

The following sections are not included in this INRMP because they do not apply to MTC:

- Bird/Wildlife Aircraft Strike Hazard (BASH) – There is no BASH program at MTC.
- Coastal/Marine Management – There is no coastal or marine habitat at MTC.

Natural resources management at MTC occurs in collaboration with Fort Jackson. Generally, Fort Jackson takes the lead on wildland fire management, hunting and fishing programs, RCW management, and timber harvesting. SCARNG and SCMD either take the lead or share implementation with Fort Jackson on all other natural resources management on MTC.

3.1 PROGRAM MANAGEMENT

Program management captures those elements that arch across the entire Conservation Program at MTC, not just for one resource topic. Consistency and coordination are essential to maximize project benefit, and programmatic success. The C-Tracker is a critical part of the program management.

Guidelines for Program Management

- Managing the ecosystem to maintain biological diversity.
- Improving the quality of wildlife habitat for game and nongame species.
- Providing special protection and management leading to endangered species recovery as identified.
- Restoring damaged training areas and maintaining training areas for optimum use.
- Cooperating with Ft. Jackson in meeting their objectives in forest management activities and endangered species management.

GOAL: OUR GOAL IS TO BE A PROACTIVE PROGRAM THAT ANTICIPATES AND MEETS THE NEEDS OF THE NATIONAL GUARD. WE STRIVE TO BE A NATIONAL LEADER IN EFFICIENCY, INNOVATION AND DIVERSITY, WHILE PROVIDING OUR STAFF AN ENVIRONMENT THAT EMPOWERS AND SUPPORTS THEIR CREATIVITY AND INITIATIVE.

Success Criteria

- **Green:** Maintain staffing levels above 80% of manning model, maintain above a 95% obligation rate, and maintain database and tracking systems.
- **Amber**: Maintain staffing levels above 60% of manning model, maintain above a 60% obligation rate, and maintain database and tracking systems.
- **Red**: Maintain staffing levels below 60% of manning model, obligation rate below 60%, and failure to maintain database and tracking systems.

Objective 1. Facilitate program implementation through the use of seasonal staff.

The Columbia Metro Area has a large population of students seeking under graduate and post graduate degrees in conservation related fields. This provides us with a unique opportunity to supplement our staff to work on seasonal projects.

Success Criteria

- **Green**: Have hiring plans and announcement paperwork completed before March. Have candidates hired by May 16th
- **Amber**: Have hiring plans and announcement paperwork completed after March. Have candidates hired after May 16th
- **Red**: Needed seasonal staff, but not hired

Objective 2. Ensure That All Planning Documents are Relevant & Current

Keep all planning documents current through annual reviews, and updates. This project also includes document revisions, and other administrative tasks to improve document management and document relevance in day to day business practices.

Success Criteria

- **Green:** 100-90% of documents filed and archived
- **Amber*:*** 80-90 of documents filed and archived
- **Red:** <80% of documents filed and archived

Objective 3. Maintain current and accurate species lists

The purpose of this objective is to have an accurate species information that is both current and in easily accessible and usable format. In the past individual surveys were in different formats and stored in in multiple locations making it difficult to access the information. Our species data has been transferred to central species tracking database. This database contains both individual occurrences recorded from Planning Level Surveys, and general presence/ absence for each of our installations. This includes both verified records and potential occurrences.

Success Criteria

- **Green:** 100-90% up time availability of database. New data entered within 90 days of survey completion
- **Amber:** 89-75% up time availability of database. New data entered within 180 days of survey completion

- **Red:** <75% up time availability of database. New data entered within >180 days of survey completion.

OBJECTIVE 4. MAINTAIN EASY AND UP TO DATE ACCESS TO ALL RELEVANT DOCUMENTS.

Maintain easy and up to date access to all records, surveys, reports, reviews and other relevant documents. This is accomplished through the use of both a document tracking database and our file management system.

SUCCESS CRITERIA

- **Green:** 100-90% up time availability of Servers. New documents entered within 90 days of survey completion
- **Amber*:*** 89-75% up time availability of Servers. New documents entered within 180 days of survey completion
- **Red:** <75% up time availability of Servers. New documents entered within >180 days of survey completion.

OBJECTIVE 5. CONTRIBUTE TO THE NATIONAL GUARD ENVIRONMENTAL PROGRAM AT A NATIONAL LEVEL

The success of the local Environmental Program is directly linked to the success of the National Program. To facilitate that success, SCARNG Conservation staff will participate in committees, review policy documents and reports, and provide general feedback and support to the National Guard Bureau (NGB) to facilitate a strong overall environmental program.

SUCCESS CRITERIA

- **Green**: All actions are recorded and tracked
- **Amber***:* 50%-99% of actions are recorded and tracked
- **Red**: <50% of actions are recorded and tracked

OBJECTIVE 6. ENSURE FISCAL SUSTAINABILITY FOR THE CONSERVATION PROGRAM

In order for the SCARNG Conservation Program to be successful, it requires sound and sustainable fiscal management. This includes programming out year requirements, managing budgets and tracking procurements.

SUCCESS CRITERIA

A consistently funded program that maintains an obligation rate above 95%, while maintaining 100% compliance with fiscal law and best management practices (BMPs).

- **Green*:*** 100-95% Obligation Rate
- **Amber*:*** 94-60% Obligation Rate
- **Red:** <60% Obligation Rate

OBJECTIVE 7. TO EMPLOY A STAFF OF SUBJECT MATTER EXPERTS THAT ARE INNOVATIVE LEADERS AND CURRENT IN THEIR FIELD.

To employ a staff of subject matter experts that are innovative leaders and current in their field. That are able to use their knowledge and experience to implement program management plans and support the mission of the SCARNG.

SUCCESS CRITERIA

Each staff member attends at least one refresher training per year and one training session that expands their current knowledge base. They also teach or present at least one class, seminar, or event each year.

- **Green**: 100-75% of Full Time Staff Meets Both Goals
- **Amber**: 74-50% of Full Time Staff Meets Only One of the Goals
- **Red**: <50% of the Full Time Staff Meets the Goals

OBJECTIVE 8. MAINTAIN STATE OF THE ART TECHNOLOGY

Conservation Management requires the analysis of complex and diverse systems. Understanding these systems is often a very data intensive undertaking that requires repackaging to communicate the information. As a result, Conservation projects often require and utilize the most current technology.

SUCCESS CRITERIA

This Success Criteria is based on the completion, implementation and maintenance of a 5-year automation plan with annual updates and the tracking of down days due to equipment failure or unavailable equipment.

- **Green**: Current and updated plans, and 100% - 75% equipment not more than 1 year past planned life
- **Amber**: Plans not updated or current, or >75% of equipment more than 1 year past planned life cycle
- **Red**: "Down Days" due to IT failure exceed 15%

OBJECTIVE 9. SUPPORT PROGRAM IMPLEMENTATION THROUGH PROVIDING STAFF THE TOOLS, EQUIPMENT, AND SUPPLIES NEEDED TO PERFORM THEIR DAY TO DAY WORK ACTIVITIES.

In order to effectively perform their duties, the staff needs the proper supplies and equipment. This objective is to ensure that they are provided these materials.

SUCCESS CRITERIA

Properly supplied and equipped staff. Valid request are filled within 30 days of submission.

- **Green**: < 30 day turn around on procurement
- **Amber:** 31-60 day turn around on procurement
- **Red:** Over 60 Day Turn around on procurement

3.2 GIS (CONSERVATION)

The Conservation GIS program maintains and updates GIS data related to natural and cultural resources, but it is shared with other groups within SCARNG and with Fort Jackson.

Guidelines for Conservation GIS

- Select suitable areas for specialized training exercises.
- Plan land rehabilitation projects.
- Provide special maps for Environmental Awareness materials.
- Ensure avoidance of cultural resources during ground disturbing projects.
- Ensure avoidance of rare species habitats and other areas of special concern during construction projects or training.
- Ensure avoidance or consideration of wetlands when planning construction projects.
- Monitor effects of wildfires and prescribed burning activities.
- Identify site options for use during NEPA evaluation of alternative sites.

GOAL: SUPPORT THE MISSION OF THE SOUTH CAROLINA MILITARY DEPARTMENT, AND SPECIFICALLY THE SCMD ENVIRONMENTAL DIVISION, THROUGH THE DEVELOPMENT AND MAINTENANCE OF AN INTEGRATED GIS PROGRAM.

SUCCESS CRITERIA

The use of GIS within the agency and specifically within the Environmental Section continues to increase and become an integrated part the SCMD business practices.

- **Green:** > 80% of the Environmental staff are fully aware of GIS and look to apply it when necessary/advantageous and the Environmental GIS program continues to expand
- **Amber:** 50-80% of the Environmental staff are aware of GIS and look to apply it when necessary/advantageous and the Environmental GIS program is sufficiently maintained
- **Red:** 0-49% of the Environmental staff are aware of GIS and look to apply it when necessary/advantageous and the Environmental GIS program regresses

OBJECTIVE 1: PROVIDE UPDATED AND ACCURATE SPATIAL DATA SETS.

The SCMD GIS program supports a diverse and complex agency with spatial interest over a large geographic range. Despite the large scale of the area of interest, analysis is often required at a minute scale. The result is the need for an extensive data collection that is accurate and up to date.

SUCCESS CRITERIA

It is vital that a strategy is in place to continually update and maintain these holdings, keeping them as current and accurate as possible.

- **Green:** 100% of vital data is updated annually or as determined necessary
- **Amber:** 80-99% of vital data is updated annually or as determined necessary
- **Red:** A detailed data maintenance plan fails to be implemented and vital data is arbitrarily updated

OBJECTIVE 2. MAINTAIN A STATE-OF-THE-ART GIS INFRASTRUCTURE.

The power of GIS comes from its ability to analyze increasingly diverse and complicated datasets through a spatial lens. This requires state of the art computer systems and software. As with all IT programs the speed of change is high, and the risk of obsolescence is even higher. To mitigate these

risks and costs the GIS infrastructure must be updated and maintained in a planned and systemic fashion.

SUCCESS CRITERIA

This Success Criteria is based on the completion, implementation and maintenance of a GIS Infrastructure plan for hardware and software.

- **Green:** A detailed hardware/software maintenance plan is implemented and 100% of vital hardware/software is updated as determined necessary
- **Amber:** A detailed hardware/software maintenance plan is implemented and 80-99% of vital hardware/software is updated as determined necessary
- **Red:** A detailed hardware/software maintenance plan fails to be implemented and vital hardware/software is arbitrarily updated

OBJECTIVE 3. PROVIDE SPATIAL ANALYSIS, DATA CREATION, AND GIS SERVICES FOR DECISION-MAKING.

The power of GIS comes from its ability to analyze diverse and complicated datasets through a spatial lens. This analysis then enables decision makers to make more an informed choice. Improved analytical capability increases our return on our GIS investment.

SUCCESS CRITERIA

The continued integration and improvement of data creation and analysis through models, web applications, or other GIS services within the Environmental department business practice.

- **Green:** Remain fully staffed and provide timely data analysis, data creation, and GIS services for Environmental staff
- **Amber:** Remain reasonably staffed and provide timely data analysis, data creation, and GIS services for Environmental staff when possible
- **Red:** Consistently under staffed and fail to provide timely data analysis, data creation, and GIS services for Environmental staff

OBJECTIVE 4. EXPLORE/RESEARCH NEW GIS TECHNOLOGIES AND PROMOTE GIS CAPABILITIES.

GIS is a quickly expanding technology that requires a knowledge of geography, computer programing, data management, web development, IT infrastructure, graphic design, and a passing knowledge of the fields your end-users plan to use the GIS system to analyze. To meet these needs and keep the program relevant staff members must be subject matter experts that are innovative leaders and current in their field. They must use their knowledge and experience to implement program management plans and support the mission of the SCARNG.

SUCCESS CRITERIA

Attend conferences, webinars, pertinent GIS classes, and research new or improved techniques to expand the Environmental GIS program and promote new capabilities within the department.

- **Green:** Continuously advance and promote Environmental GIS capabilities through attending conferences, webinars, and classes or researching various knowledge bases
- **Amber**: Periodically advance and promote Environmental GIS capabilities through attending conferences, webinars, and classes or researching various knowledge bases
- **Red:** Fail to advance and promote Environmental GIS capabilities

3.3 OUTREACH, AWARENESS AND EDUCATION

The Outreach, Awareness, and Education program has both an internal (military/SCARNG) audience and an external (public) audience. The internal training is primarily conducted through our State-Wide Environmental Compliance Officer/NCO Course.

Opportunities to provide outreach and environmental education to the public not only helps inform interested parties about what the SCARNG is doing as good stewards of the land, but also helps educate the public about issues in their 'backyard' and can create a network of people who support the National Guard and its Mission.

Guidelines for Environmental Awareness

- Make available and easily accessible all Environmental Awareness material to military personnel and interested public.
- Design and produce material professionally.
- Post material on endangered species and sensitive habitats where appropriate.
- When requested, make staff available to interested military personnel, organizations, and the public who are in need of natural resources information.
- Train staff to provide excellent customer service skills.

GOAL: PROTECT THE TRAINING MISSION OF THE SCARNG BY FOSTERING A PUBLIC UNDERSTANDING OF CONSERVATION STEWARDSHIP ON MTC AND THE CRITICAL NATURE OF THE SCARNG MISSION.

SUCCESS CRITERIA

An active program that is proactively engaging the targeted audiences.

- **Green**: 100% Entry of Engagements/Outreach Events into Tracking System
- **Amber**: 50%-99% Entry of Engagements/Outreach Events into Tracking System
- **Red**: < 50% Entry of Engagements/Outreach Events into Tracking System

OBJECTIVE 1. RAISE COMMUNITY AWARENESS.

In order to maintain the current favorable opinion that the public holds for the military mission, the SCARNG needs to actively work to inform the public of our efforts to maintain the resources that have been entrusted to us.

SUCCESS CRITERIA

To meet this Objective, SCARNG needs to consistently record/track all Outreach Activities. After 5 years of tracking, the data should be analyzed to refine this success criteria to focus more on the number and quality of the Outreach Activity.

- **Green:** All outreach efforts are recorded and tracked
- **Amber:** 50%-99% of outreach efforts are recorded and tracked
- **Red:** < 50% of outreach efforts are recorded and tracked

OBJECTIVE 2. CONTINUE EDUCATION AND TRAINING PROGRAM

Continue the implementation of the State-Wide Environmental Education & Training program.

SUCCESS CRITERIA

- **Green:** Completion of 4 State-Wide Environmental Education & Training Classes.
- **Amber:** Completion 2-3 State-Wide Environmental Education & Training Classes.
- **Red:** Completion 1 or less State-Wide Environmental Education & Training Classes.

3.4 SOIL AND WATER

The management of soil and water on MTC is driven by compliance with various laws and regulations, but also to prevent erosion and loss of soil that would impede training and impact aquatic species.

Guidelines for Protecting Soil and Water Resources

- Manage erosion control in accordance with several plans and permits including the Stormwater Pollution Prevention Plan (SWPPP), Special Use Permits, United States Forest Service (USFS) Soil and Water Conservation Handbook, and State BMPs.
- Use the specific guidance for selecting BMPs as provided by your state sources, such as Construction Site BMPs Manuals, and other proven techniques.
- Ensure incorporation of BMPs in the preliminary engineering, design, and construction of facilities involving ground disturbance.
- Prevent or minimize erosion to the maximum extent possible, utilize native plants for erosion control where possible.

GOAL: TO MAINTAIN TRAINING LANDS WHILE PROTECTING AND ENHANCING SOIL AND WATER QUALITY AND ENSURING COMPLIANCE WITH ALL APPLICABLE LAWS AND REGULATIONS.

SUCCESS CRITERIA

Acres of training lands excluded from use due to erosion or water quality issues, and numbers of regulatory enforcement actions. Acres data will be derived from range use and ITAM data while enforcement data derived from SCARNG compliance records.

- **Green:** 0-5% total acreage excluded from training (temporarily) and zero enforcement actions
- **Amber:** < 5% of total acreage excluded from training (temporarily) or 1 enforcement action
- **Red:** > 5% total acreage excluded from training (temporarily), or more than 1 enforcement action

OBJECTIVE 1. DEVELOP A SYSTEMATIC APPROACH FOR SOIL AND WATER MANAGEMENT.

The three biggest obstacles to a successful Soil and Water Management program are; communication, coordination, and resourcing (funding). The intent of this objective is to provide a structured system to facilitate coordination and communication. This in turn would allow for more targeted use of available resources. The intent is to hold a quarterly meeting between all stakeholders (Facilities Management Office, Training/ ITAM, Natural Resources and pertinent Training Center Staff). The 1st and 4th Quarter meeting would focus on review of completed work, identification and prioritization of work still needed, and the development of available budget and resourcing to execute the work. The 2nd and 3rd Quarter meeting would be to track on going work and note any problems or changes in the execution plan.

SUCCESS CRITERIA

- **Green:** All four meetings were conducted, with overall attendance from 2/3rds of the interested

parties.

- **Amber:** 2-3 Meetings were conducted, or less than 2/3rds of the interested parties attended the meetings
- **Red:** 1 meeting or less was held, less than 1/3rd of the interested parties attended.

OBJECTIVE 2. REPAIR IDENTIFIED EROSION SITES.

The purpose of this objective is to implement the Soil Management Implementation Plan & Inventory (SMPI) developed under Objective ID #6 in this database.

SUCCESS CRITERIA

- **Green:** 100%-75% Execution of the yearly plans developed during the SMPI Coordination Meeting.
- **Amber:** 74%-50% Execution of the yearly plans developed during the SMPI Coordination Meeting.
- **Red:** < 50% Execution of the yearly plans developed during the SMPI Coordination Meeting, or no execution plan is developed.

OBJECTIVE 3. EROSION REPAIR SITE MONITORING & EVALUATION.

The intent of this objective is to determine if the activities in Section 3.4, Objective 2 produce the desired results. Monitoring and project evaluation helps:

- identify what works, what did not work, and what should continue
- improves actions where they are less effective
- change actions if they are ineffective

SUCCESS CRITERIA

- **Green:** 100%-75% of repaired site are evaluated and documented annually
- **Amber:** 74% - 50% of repaired site are evaluated and documented annually
- **Red:** <50% of repaired site are evaluated and documented annually

3.5 WETLANDS

There are approximately 5,560 acres of wetlands on Fort Jackson, with 1,642 acres on MTC. The majority of these wetlands are bottomland hardwoods that occur adjacent to stream systems on the installation. A small percentage of wetlands on MTC are comprised of small bogs created by seeps.

MTC manages for wetlands by preventing impacts in these areas through soil management and ensuring proper compliance with Section 404 of the Clean Water Act. All activities must adhere to established buffer zones and caution areas unless otherwise stated in environmental documentation.

Guidelines for Wetland Management

- Follow applicable BMPs for all activities occurring in or near wetlands.
- Ensure activities adhere to established buffer zones and caution areas regulations.

- Do not apply pesticides directly to wetlands or open waters (follow all label restrictions and environmental documentation).

GOAL: A WETLANDS MANAGEMENT PROGRAM THAT PROTECTS AND ENHANCES ALL WETLAND SYSTEMS AND ENSURES COMPLIANCE WITH ALL APPLICABLE LAWS AND REGULATIONS.

SUCCESS CRITERIA

No net loss of wetland habitat, regulatory enforcement actions, training mission capability, or delays to projects.

- **Green:** No net loss of wetland habitat, regulatory enforcement actions, training mission capability, or delays to projects.
- **Amber**: No more than 1 regulatory enforcement action.
- **Red**: More than 1 regulatory enforcement action or any net loss of regulatory wetlands, training mission capability, or significant delays to projects.

OBJECTIVE 1: COLLECTION OF DATA TO SUPPORT PLANNING AND MONITORING INITIATIVES.

This objective supports the planning and check stages of our adaptive management strategy.

SUCCESS CRITERIA

The collection of a continuous data set that provides insight into the relative health of the wetland systems at MTC.

- **Green:** A complete and continues data set that easily accessible and used by resource managers and subject matter experts.
- **Amber**: Incomplete datasets, or dataset that are not curated, or checked for quality assurance & control, or dataset that are not readily accessible.
- **Red**: Nonexistent datasets, or datasets that are in such a state as to be unusable or irretrievable.

OBJECTIVE 2. SUSTAIN OR ENHANCE WETLAND SYSTEMS AT MTC.

This objective addresses the action and the analysis phases of our adaptive management strategy. It focuses on implementing projects derived from our planning process and analyzing the success of the implemented projects.

SUCCESS CRITERIA

Success criteria based on the creation of wetland health report.

- **Green:** A complete and continues data set that easily accessible and used by resource managers and subject matter experts.
- **Amber**: Incomplete datasets, or dataset that are not curated, or checked for quality assurance & control, or dataset that are not readily accessible.
- **Red**: Nonexistent datasets, or datasets that are in such a state as to be unusable or irretrievable.

3.6 FOREST MANAGEMENT

While Fort Jackson has the primary responsibility for all timber harvesting on MTC, SCARNG serves in a coordinating role in most instances and undertakes some forest management activities.

Guidelines for Forest Management on MTC

- Practice BMP's while conducting management activities
- Follow the silvicultural guidelines of the revised 2003 RCW Recovery Plan, 2007 Management Guidelines for managing RCW on Army installations, 2013 Fort Jackson RCW Management Plan, and Section 4-3 of AR 200-1.

GOAL: A FOREST THAT SUPPORTS THE MILITARY MISSION AND MAINTAINS ECOSYSTEM INTEGRITY. THIS IS A FOREST THAT IS CHARACTERIZED BY HIGH HABITAT DIVERSITY AND MANAGED FOR TARGETED TRAINING OPPORTUNITIES. TARGETED TRAINING OPPORTUNITIES REFERS TO MATCHING TRAINING MISSIONS TO LAND MANAGEMENT PRACTICES.

SUCCESS CRITERIA

No net loss of opportunities, and no overall degradation of the ecosystem health.

- **Green:** 90-100% project integration within the Conservation Tracker and periodic meetings with ITAM.
- **Amber**: 80-89% project integration within the Conservation Tracker and sporadic meetings with ITAM.
- **Red**: Less than 79% project integration within the Conservation Tracker and no meetings with ITAM.

OBJECTIVE 1. MAINTAIN OPEN FOREST MIDSTORY.

All historic accounts of longleaf pine forests described them as "open and park like" with a conspicuous lack of midstory trees and shrubs. They were also described with a high diversity plant in the ground layer. This sub-climax condition is the result of a well-established fire regime.

This open park-like condition is beneficial to both the training community and the overall health of the eco-system. The intent of this objective is to aid the wild land fire management program, to accelerate habitat restoration in targeted areas, and provide a more usable training space to meet the military mission.

SUCCESS CRITERIA

- **Green:** 100% development of a strategy for ensuring an open forest midstory.
- **Amber**: 1-99% development of a strategy for ensuring an open forest midstory.
- **Red**: No development of a strategy for ensuring an open forest midstory.

OBJECTIVE 2. LONG-TERM MONITORING OF VEGETATIVE COMMUNITIES.

Monitoring conditions and species composition of vegetative communities at MTC.

SUCCESS CRITERIA

- **Green:** 75 -100% of vegetative communities monitoring completed for that FY.
- **Amber:** 50-74% of vegetative communities monitoring completed for that FY.
- **Red:** Less than 49% of vegetative communities monitoring completed for that FY.

3.7 WILDLAND FIRE

Fort Jackson takes the lead on wildland fire, including both prescribed fire and wildfire response. SCARNG staff provides assistance on a limited basis. SCARNG reviews and provides input on annual prescribed fire plans.

3.8 GROUNDS

This section contains objectives for both buildings and grounds maintenance, and new construction activities. The SCARNG has primary responsibility for grounds maintenance and construction on MTC.

Guidelines for Grounds Maintenance

- Use regionally native plants for landscaping.
- Use construction practices that minimize adverse effects on the natural habitat.
- Reduce pollution by reducing the use of fertilizer and pesticides, using integrated pest management, recycling green waste, and minimizing runoff.
- Implement water-efficient practices.
- Minimize the use of fertilizers near water resources.

GOAL: TO MAINTAIN THE GROUNDS AT THE MTC IN A SAFE, ATTRACTIVE AND PROFESSIONAL STATE, WHILE INCORPORATING SUSTAINABILITY PRINCIPLES.

SUCCESS CRITERIA

No overall degradation of the ecosystem health and no red findings in the ISR.

- **Green:** 1 or less findings by the ISR.
- **Amber**: 2-4 Findings by the ISR.
- **Red**: More than 4 findings of the ISR.

OBJECTIVE 1. A SUSTAINABLE GROUNDS MAINTENANCE PROGRAM.

In accordance to the requirements in EO 13693: to establish a method for reducing water, energy, and vehicle fuel usages each FY via developing a comprehensive Sustainable Grounds Management Strategy.

SUCCESS CRITERIA

- **Green:** Completion of a Sustainable Grounds Management Strategy prior to the next ROE.
- **Amber**: 1-99% Completion of a Sustainable Grounds Management Strategy prior to the next ROE.
- **Red**: No comprehensive Sustainable Grounds Management Strategy prior to the next ROE completed.

3.9 FISH AND WILDLIFE

Wildlife management on Fort Jackson and MTC is designed to conserve and enhance indigenous wildlife populations and their associated habitat at optimum levels. Optimum levels are determined by considering such factors as statutory requirements and restrictions, military training needs, public health and safety, morale support needs (hunting, fishing and other outdoor recreation), aesthetics, public

relations, and public trust/stewardship responsibilities. An example of this can be found in MTC's work performed on our bird populations. Our yearly surveys such as Migratory Avian Productivity and Survivorship (MAPS) station, Breeding Bird Survey, Nightjar Survey, Raptor Survey, etc., in support of the Migratory Bird Treaty Act (MBTA) and Bald and Golden Eagle Protection Act (BGEPA), which dictates our management efforts. Using data collected with these surveys, management decisions such as timber thinnings, habitat restorations, installation of nesting boxes, etc. are performed in order to maintain a healthy population of birds both migratory and resident.

Currently, habitat quality and species diversity are high. MTC is generally forested with large contiguous blocks of forest. Overall health is good despite human activities over time. Colonel's Creek and associated wetlands provide a corridor through MTC and Fort Jackson. Corridors and other important connections are a high priority as wildlife habitat to maintain species diversity and fragmentation.

Guidelines for Fish and Wildlife Management

- Maintain habitat connectivity and management consistency with contiguous areas outside the installation, particularly for riparian zones and ridgelines.
- Minimize habitat fragmentation within the training area.
- Manage landscape areas where few mature forests persist to retain late-succession patches.
- Provide for retention of any old-growth fragments that remain in watersheds.
- Allow salvage only for safety reasons along roads, near developed and recreation facilities, and to relieve the effects of catastrophic events such as fire, insects and diseases, should this occur.

GOAL: CONSERVE AND ENHANCE WILDLIFE POPULATIONS AND THEIR ASSOCIATED HABITAT FOR OPTIMUM LEVELS OF BIODIVERSITY AND ECOSYSTEM HEALTH, WHILE MAINTAINING A REALISTIC TRAINING ENVIRONMENT.

SUCCESS CRITERIA

No overall degradation of the ecosystem health.

- **Green:** 0 to 1 NOV for habitat degradation.
- **Amber**: 2 to 4 NOV for habitat degradation.
- **Red**: > 4 NOV for habitat degradation.

OBJECTIVE 1. LONG-TERM MONITORING OF FISH AND WILDLIFE.

Initiate PLS and continue ongoing PLS to develop trend data of fish and wildlife.

SUCCESS CRITERIA

- **Green:** 76-100% of planned PLS completed.
- **Amber**: 50-75% of planned PLS completed.
- **Red**: 0-49% of planned PLS completed.

OBJECTIVE 2. MANAGE WILDLAND HABITAT TO PROMOTE SPECIES DIVERSITY.

Modification of existing wildland habitat to increase biodiversity of native flora and fauna.

SUCCESS CRITERIA

- **Green:** 76> 41 acres of modified habitat.
- **Amber**: 20-40 acres of modified habitat.

- **Red**: 0-14 acres of modified habitat.

3.10 THREATENED, ENDANGERED AND SPECIAL STATUS SPECIES

SCARNG takes the management and protection of Threatened, Endangered and Species of Concern very seriously. SCARNG strives to manage and protect both federal and state listed species, as well as special status species that have the potential to be listed in the future. Appendix E provides a description of all Threatened, Endangered and Species of Concern known or with potential to occur on MTC, including species-specific management recommendations. Tables E-1 and E-2 summarize potential and documented species status animals and plants, respectively. At present, there are two (2) federally listed plant species, rough-leaved loosestrife (*Lysimachia asperulaefolia),* and smooth coneflower *(Echinacea laevigata),* and one (1) federally listed bird species, RCW (*Picoides borealis*) documented on MTC, along with the bald eagle which is protected under the BGEPA.

Guidelines for T&E Management

- Coordinate with Fort Jackson on management activities.
- Comply with all applicable laws and regulations.
- Use prescribed fire to maintain or increase habitats as applicable.

GOAL: CONSERVE AND ENHANCE THREATENED, ENDANGERED AND SPECIAL STATUS SPECIES (SSS) POPULATIONS AND THEIR ASSOCIATED HABITAT FOR OPTIMUM LEVELS OF BIODIVERSITY AND ECOSYSTEM HEALTH.

The goal of the Threatened, Endangered and Special Status Species program is to support the military mission, while complying with all State and Federal Laws concerning these species.

SUCCESS CRITERIA

No net loss of training opportunities, and no overall degradation of the ecosystem health. No USFWS enforcement actions.

- **Green:** No net loss of training days/ activities and no USFWS findings.
- **Amber**: Less than 2 days net loss of training and 1 USFWS finding.
- **Red**: Net loss of 2 or more days of training and more than 2 USFWS findings.

OBJECTIVE 1. THREATENED, ENDANGERED AND SPECIAL STATUS SPECIES HABITAT MANAGEMENT.

Maintain and/or modify existing habitat to increase biodiversity of Threatened, Endangered and Special Status Species.

SUCCESS CRITERIA

- **Green:** Maintain staffing levels above 80% of manning model, maintain above a 95% obligation rate, and maintain database and tracking systems.
- **Amber**: Net loss of 11-20% of Threatened, Endangered and Special Status Species habitat.
- **Red**: Net loss greater than 20% of Threatened, Endangered and Special Status Species habitat.

OBJECTIVE 2. THREATENED, ENDANGERED AND SPECIAL STATUS SPECIES MONITORING.

Develop a protocol for Threatened, Endangered and Special Status Species monitoring, which will create a species list and monitoring period.

SUCCESS CRITERIA

- **Green:** 76 -100% of Threatened, Endangered and Special Status Species monitoring completed for that FY.
- **Amber**: 50-75% of Threatened, Endangered and Special Status Species monitoring completed for that FY.
- **Red**: Less than 49% of Threatened, Endangered and Special Status Species monitoring completed for that FY.

OBJECTIVE 3. THREATENED AND ENDANGERED ECOSYSTEM MANAGEMENT.

Manage ecosystems level factors that support T&E species population health and survivorship.

SUCCESS CRITERIA

- **Green:** Annual increase in T&E species populations.
- **Amber**: Annual Sustainment of T&E species populations.
- **Red**: Annual decrease in T&E species population.

3.11 PESTS

All pest management activities are performed in compliance with the Integrated Pest Management Plan (IPMP). This includes management of invasive plants and animals outside of the Cantonment Area and other buildings.

Guidelines for Pest Management

- Use only proven biological control methods whenever feasible and economical.
- Establish buffers zone adjacent to water resources.
- Apply no pest management procedures that are likely to have a negative impact on endangered, threatened or special status species, or their habitats.

GOAL: ENSURE COMPLIANCE WITH DOD INSTRUCTION 4150.07, "DOD PEST MANAGEMENT PROGRAM".

SUCCESS CRITERIA

Implementation of comprehensive pest management plan.

- **Green:** Yearly update of IPMP and subsequent reports within IPMP.
- **Amber**: N/A.
- **Red**: IPMP and subsequent reports within not updated annually.

OBJECTIVE 1. REDUCE IMPACTS TO TRAINING AND THE ENVIRONMENT FROM NUISANCE WILDLIFE.

SUCCESS CRITERIA

Reduce impacts from nuisance wildlife.

- **Green:** Successful removal of nuisance wildlife with no net loss of training days/ activities.
- **Amber**: Removal of nuisance wildlife with a net loss of less than 2 days of training.
- **Red**: Removal of nuisance wildlife with a net loss of 2 or more days of training.

OBJECTIVE 2. REDUCE THE QUANTITY OF PESTICIDES APPLIED.

This objective is intended to meet the Presidential EOs and the DOD Measure of Merit #2: to reduce the total amount of pesticide applied each year to federal military installments.

SUCCESS CRITERIA

Show reduction of annual pesticide use via tracking and analysis of pesticide application data.

- **Green:** Reduction in annual net pesticide use by 5% or more.
- **Amber**: Less than 2-4% reduction in annual net pesticide use.
- **Red**: Increase in annual net pesticide use.

OBJECTIVE 3. MANAGE INVASIVE/NOXIOUS PLANT SPECIES.

This objective is to develop a proactive program in accordance to EO 13112, to facilitate the management and control of Invasive/Noxious plants and animals. This program is managed as part of our IPMP. SCARNG will monitor both the overall health of the system as well as the success or failure of individual projects as part of this objective.

SUCCESS CRITERIA

Completion of a comprehensive Invasive strategy prior to the next ROE.

- **Green:** 100% completion of a comprehensive invasive species management strategy.
- **Amber**: 1-99% development of a comprehensive invasive species management strategy.
- **Red**: No development of a comprehensive invasive species management strategy.

3.12 RECREATION

Recreational use of the developed area and facilities are available to active and retired military and civilian employees of MTC (and their guests) provided the activities do not interfere with the military mission. MTC is home to the Harry J. Vann Trail, a one-mile interpretive loop trail that connects to the Palmetto Trail. This trail is open to the public and meanders through the black water flood plain of Colonels Creek and upland pine forest. The Environmental Office constructed this trail in part due to a grant received from National Environmental Education Foundation for National Public Lands Day. Signs posted along the trail address topics from the history of the Sandhills region to recycling. Located at the mid-point of the trail is an outdoor classroom which is used for hands-on displays and lectures during guided walking tours, but which also makes for a nice resting spot.

GOAL: PROVIDE FOR SAFE OUTDOOR RECREATION AND FITNESS OPPORTUNITIES THAT EDUCATE USERS ABOUT STEWARDSHIP ON MILITARY LANDS AND THE MISSION OF THE SCARNG.

SUCCESS CRITERIA

An active recreation program with staff engagement opportunities.

- **Green:** Recreational opportunities available <90% of the year.
- **Amber**: Recreational opportunities available 50% -89% of the year.
- **Red**: Recreational opportunities available >50% of the year.

OBJECTIVE 1. OPERATE AND MAINTAIN AN INTERPRETIVE PUBLIC TRAIL.

Working in conjunction with partnering NGOs SCARNG is maintaining and operating a section of the Palmetto Trail that runs along the south boundary of the installation. In addition, SCARNG is also maintaining a spur trail, the BG Harry J Vann Interpretive Trail.

SUCCESS CRITERIA

Maintain the trail and promote usage with zero impact to the training mission.

- **Green:** Trail open >75% of the year with no net loss of training days/ activities.
- **Amber**: Trail open 75%-%50 of the year with no net loss of training days/ activities.
- **Red**: Trail open >50% of the year or a negative impact to the training mission.

3.13 CLIMATE CHANGE AND REGIONAL GROWTH

Over the past decade, two issues have taken a more prominent role in the Conservation discussion: Climate Change and Regional Growth. Both issues are addressed in this section because they share the same goals: protecting mission capability through planning, adaptive management, and proactive innovative solutions. The scope of both of these issues are complicated and go beyond the boundaries of our installation. They require innovation, planning and a level of collaboration that exceeds any of our past efforts.

CLIMATE CHANGE

In January 2019, DoD published *Report on Effects of a Changing Climate to the Department of Defense.* The report provides an assessment of the significant vulnerabilities from climate-related events in order to identify high risks to mission effectiveness on installations and to operations. While Fort Jackson and MTC were not specifically addressed in the document, Shaw AFB was included. Shaw AFB is located approximately 13 miles from MTC. The climatic impacts anticipated at Shaw can also reasonably anticipated at MTC.

The report anticipates recurrent flooding, drought, and wildfires as the greatest impacts. These impacts are consistent with climatic model predictions of a general increase in extreme weather events. Specifically, intense storm & rainfall events followed by long periods of draught and increased average summer temperatures.

REGIONAL DEVELOPMENT

From 1970 to 2019, the population of the Central Midlands Region grew from 372,000 to over 800,000. By comparison, statewide growth during the same period was only 35%. Since the 2000 US Census, the Central Midlands region has seen notable increases in its housing stock, as well as in its commercial and industrial sectors. Overall growth for the Central Midlands region between 2020 and 2035 will follow this established trend. The region will experience an estimated 35%-65% increase in population depending on area. Several of the areas around the installations are predicted to possibly exceed the regional average.

Anticipated Effects of Future Climate Scenarios
Increased Black Flag Days
Increased Fire Hazard Days
Increased Wildfires
Reduced Number of Prescribed Burn Days
Increased Number of Endangered Species
Increased Management Requirements
Species Movement & Habitat Shifts
Increased Dust/ Decrease in Air Quality
Increased Erosion
Increased Need for Natural infrastructure Management

In 2007 we formed the MAJIC to protect our installations from threats of encroachments. From its inception, MAJIC has been a regional holistic approach to dealing with the encroachment facing the military installations in the Midlands of South Carolina. From the outset, we have understood this was an issue that we could not address individually and that it needed to be a region wide partner driven approach. In many ways, we were a precursor to many of the Sentinel Landscape ideals.

We are currently working our way through the REPI Sentinel Landscape application process. The MAJIC Sentinel Landscape is uniquely positioned at the nexus of several federal interests, and conservation concerns. We have a very supportive and military friendly local government and population.

GOAL: PROTECT THE MISSION CAPABILITY OF THE SCARNG THROUGH PLANNING, ADAPTIVE MANAGEMENT, AND PROACTIVE, INNOVATIVE SOLUTIONS.

An active program that proactively seeks to integrate innovative solutions and adaptive management strategies into our planning documents.

SUCCESS CRITERIA

- **Green:** All plans current and up to date
- **Amber**: 50% of Plans current and up to date or under revision
- **Red:** <50% of plans current and up to date or under revision

OBJECTIVE 1: INTEGRATE CLIMATE RESILIENCY INTO THE SCARNG PLANNING PROCESS.

As stated above, our primary goal is to protect the mission capability of the SCARNG. The first step in doing that is to identify and plan for potential impacts.

SUCCESS CRITERIA

- **Green:** All plans are current and address potential climatic impacts.
- **Amber**: 50% of plans are current and address potential climatic impacts.
- **Red**: < 50% of plans are current and address potential climatic impacts.

OBJECTIVE 2: ENSURE CLIMATE RESILIENCY ADAPTION AND MITIGATION OF ADVERSE IMPACTS

This Objective will be accomplished through the scientifically and data driven decision making, the establishment of achievable targets, collaborative planning, and adaptive management.

SUCCESS CRITERIA

- **Green:** Completion or adoption of a Climate Resiliency Strategy.
- **Amber**: Ad-Hoc implementation of resiliency and adaptation measures.
- **Red**: No action on Climate Resiliency & Adaptation.

OBJECTIVE 3: DEVELOP AND MAINTAIN PARTNERSHIPS.

The DoD's presence in the Midlands of South Carolina is significant. There are five military installations; three active duties and two National Guard. Active and reserve components of the Army, Navy, Air Force and Marines utilize these bases. To reduce development-related pressure, the installations are working together to leverage our presence in regional decision making. Specifically, the South Carolina Military

Department, Fort Jackson, and Shaw Air Force Base have joined together with local governments and NGOs to form the MAJIC. The purpose of the Consortium is to facilitate collaboration on projects including a region-wide Joint Land Use Study (JLUS) or the implementation of Joint Compatible Use Buffers (JCUB) program. To further leverage our local partnerships, we are also pursuing a Sentential Landscape designation.

SUCCESS CRITERIA

- **Green:** Hold biannual meetings with local and regional partners.
- **Amber**: Hold annual meetings with local and regional partners.
- **Red**: No partner meetings are held.

4 PLAN IMPLEMENTATION

4.1 PROJECT DEVELOPMENT AND PRIORITIZATION

Preparation and implementation of this INRMP is required by DoD Instruction 4715.03 and AR 200-1 and is a high funding priority. There are several programs within this INRMP that are required for compliance with other laws, especially laws related to endangered species and waters of the US/wetlands. However, it is unlikely that all programs within this INRMP will be funded immediately. Therefore, projects and programs are listed in relative importance. Estimated time schedules are provided by fiscal year.

4.2 PARTNERSHIPS

Since the inception of the program in 1992, partnerships have played a significant role to accomplish our primary goal of protecting the training mission. These partnerships have taken many forms, both formal and informal. They have been with other installations, other government agencies, and NGOs. Below are a few of the more significant and longest lasting partnerships. The entities below have been our most consistent partners, but there have been other ephemeral partnerships that provided important outcomes.

4.2.1 University Of South Carolina (USC)

Our partnership with USC was the first that we established and served as the model for several others. Our relationship with USC is a two way street, they provide us assistance on individual projects. We provide research opportunities for students. We also frequently make our staff available at classes at the University to share our experiences and expertise.

4.2.2 Midlands Area Joint Installation Consortium (MAJIC)

In 2007 we formed the MAJIC to protect our installations from threats of encroachments. From its inception, MAJIC has been a regional holistic approach to dealing with the encroachment facing the military installations in the Midlands of South Carolina. MAJIC is composed of the five installations in the Central Midlands along with twenty-one (21) other partners. From the outset, we have understood this was an issue that we could not address individually and that it needed to be a region wide partner driven approach. In many ways, we were a precursor to many of the Sentinel Landscape ideals.

4.2.3 SCDNR

SCDNR is our second longest running partnership. Over the years we have worked with them for a variety of projects and surveys. Projects with SCDNR have ranged from planning levels surveys to Summer Camp outreach programs.

4.2.4 Palmetto Conservation Foundation (PCF)

PCF is a statewide NGO that is responsible for the creation and maintenance of the Palmetto Trail. The Palmetto Trail is planned to span the entirety of the state. Its path will run from the coast to the mountains. Currently a passage of the trail runs along our southern boundary. We have worked with PCF to maintain and improve the trail, as well as hosting several public outreach events.

4.3 FUNDING

Funding for INRMP implementation can come through a variety of sources depending on the implementation task, available funding, current funding guidance, and SCARNG and MTC priorities. In addition, forestry, wildlife, prescribed burning, and recreation projects managed by Fort Jackson staff are paid for through their funding sources, separate from SCARNG and MTC funding sources.

The potential funding sources through SCARNG include ITAM, environmental, facilities management, and other Army-funded programs. In addition, some activities may be funded through grants or cost-sharing with other entities, including ACUB and Sentinel Landscape projects.

Implementation of this INRMP is subject to the availability of annual funding. MTC will make the best effort to request funding through appropriate channels and implement the INRMP based on the highest priorities using the available funding.

APPENDICES TABLE OF CONTENTS

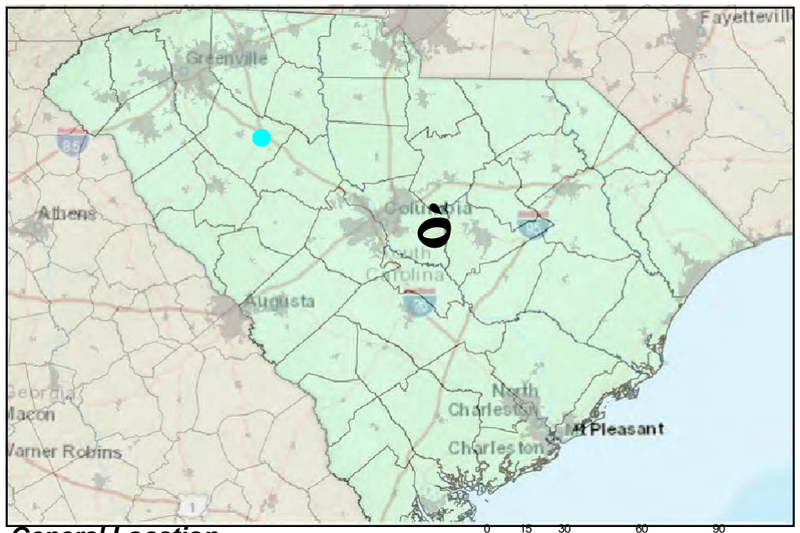
LIST OF TABLES

A. ACRONYMS

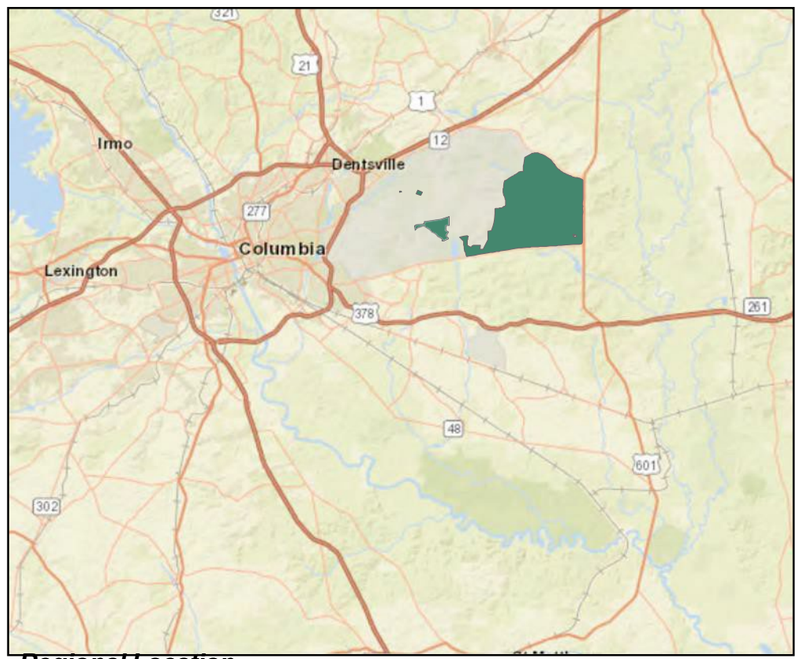
AFB	Air Force Base
AR	Army Regulation
ARNG-ILE	Army National Guard Environmental Branch
BASH	Bird Aircraft/Wildlife Strike Hazard
BGEPA	Bald and Golden Eagle Protection Act
BMPs	Best Management Practices
CAA	Conservation Action Area
CHTC	Clarks Hill Training Center
C-Tracker	Conservation Tracker Database
COWASEE Basin	Congaree, Wateree, and Santee Rivers
DA	Department of the Army
DoD	Department of Defense
EA	Environmental Assessment
EO	Executive Order
FJMR	Fort Jackson Military Reservation
FY	Fiscal Year
GIS	Geographic Information System
HUC	Hydrologic Unit Code
ICRMP	Integrated Cultural Resources Management Plan
INRMP	Integrated Natural Resources Management Plan
JRSOI	Joint Reception, Staging, Onward Movement and Integration
ITAM	Integrated Training Area Management
IPMP	Integrated Pest Management Plan
ISR	Installation Status Report
JCUB	Joint Compatible Use Buffer
JLUS	Joint Land Use Study
MAB	Man and Biosphere
MAJIC	Midlands Area Joint Installation Consortium
MAPS	Migratory Avian Productivity and Survivorship
MBTA	Migratory Bird Treaty Act
MTC	McCrady Training Center
NCO	Non-Commissioned Officer
NEPA	National Environmental Policy Act
NGB	National Guard Bureau
NGO	Non-governmental Organization
NRCS	Natural Resources Conservation Service

NWI	National Wetlands Inventory
OMS	Organizational Maintenance Shop
RCW	Red-cockaded Woodpecker
REC	Record of Environmental Consideration
REPI	Readiness and Environmental Protection Integration
ROE	Review of Operation and Effect
SCARNG	South Carolina Army National Guard
SCMD	South Carolina Military Department
SCEMD	State Emergency and Management Assistance Compact
SCDNR	South Carolina Department of Natural Resources
SMPI	Soil Management Implementation Plan and Inventory
SSS	Special Status Species
SWAP	State Wildlife Action Plan
SWPPP	Stormwater Pollution Prevention Plan
T&E	Threatened and Endangered
UNESCO	United Nations Educational, Scientific and Cultural Organization
USACE	US Army Corps of Engineers
USC	United States Code
USC	University of South Carolina
USEPA	US Environmental Protection Agency
USFS	US Forest Service
USFWS	US Fish and Wildlife Service
UXO	Unexploded Ordinance
VRT	Vehicle Recovery Team

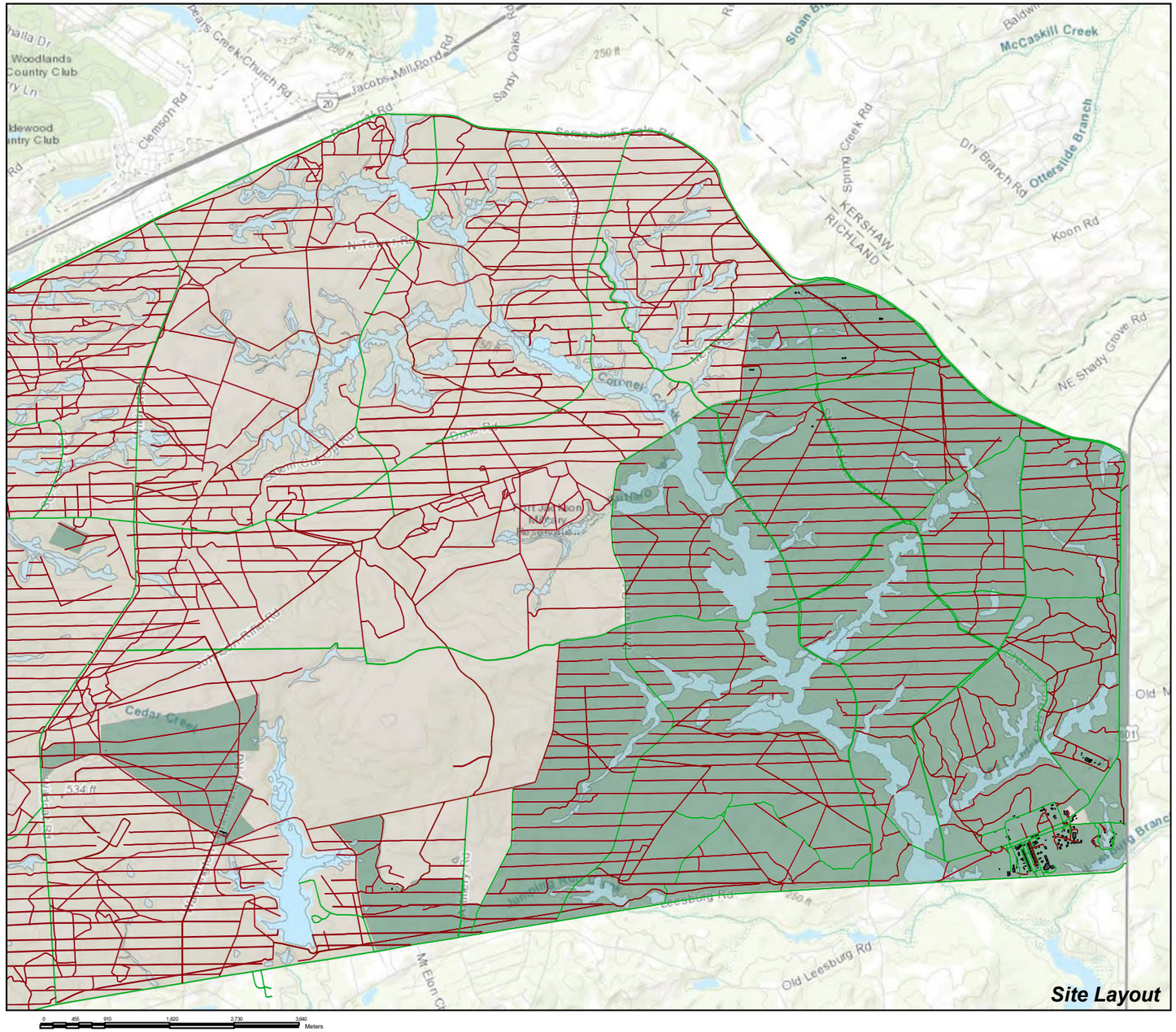
B. MAPS



General Location



Regional Location



Site Layout

McCradyTraining Center

General Location and Layout

Legend

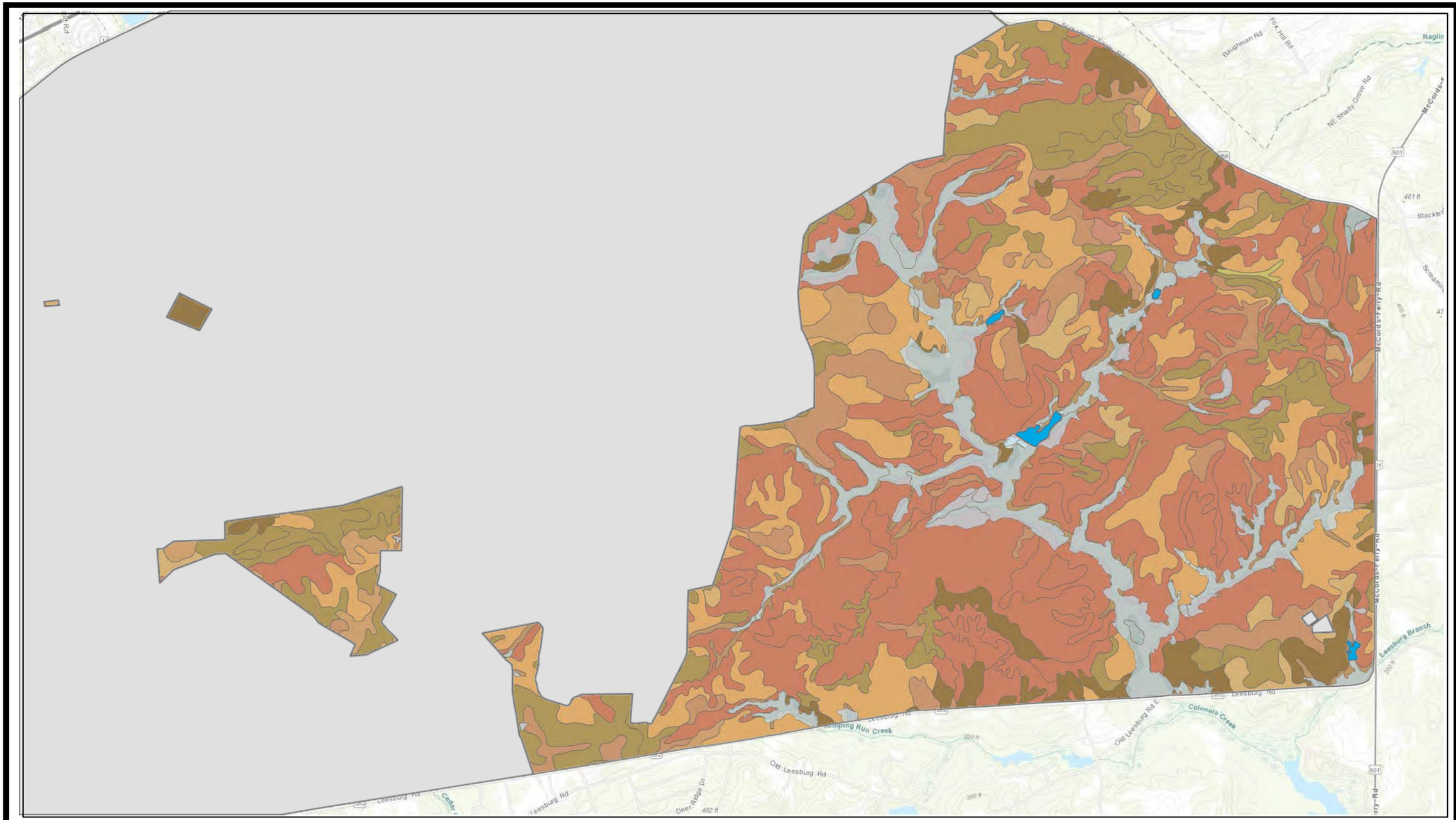
Structures Installation

Structures
McCrady Training Center
Wetlands

O	Created For MTCC INRMP
Figure Number 1	Checked by:SCARNG Conservation
	Date: 4/5/2019

McCRADY

McCRADY



Legend

- Open Water on SCARNG Property
- Wetlands

Unit Name

- Ailey coarse sand
- Blanton sand
- Dothan loamy sand
- Fuquay sand
- Johnston fine sandy loam
- Lakeland sand
- Lucy loamy sand
- Pelion coarse sand
- Pelion-Urban land complex
- Rains loamy fine sand
- Troup sand
- Vaucluse loamy sand

0 337.5 675 1,350 2,025 2,700 Meters

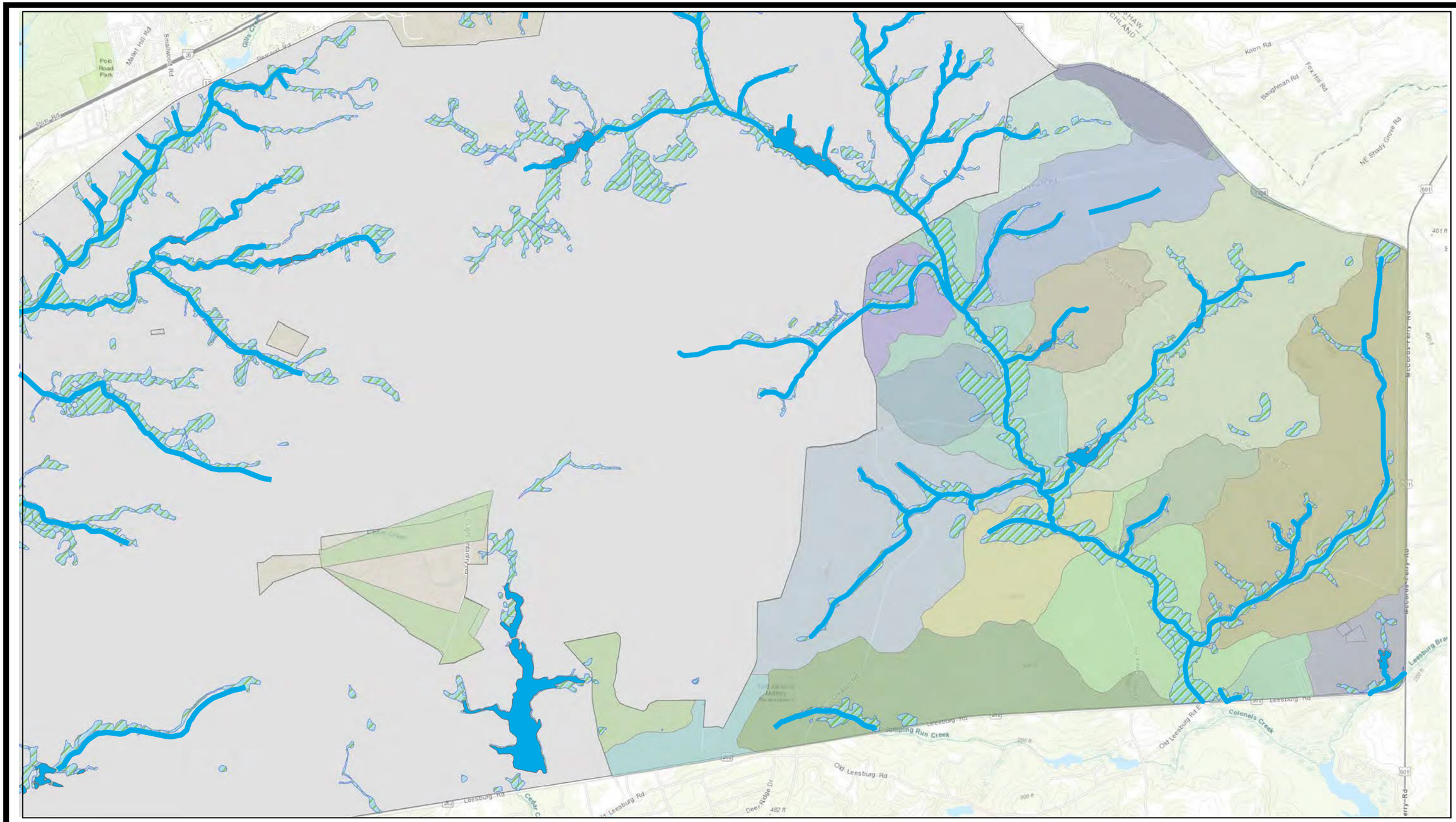
Soils

Figure Number 2

Created For MTCC INRMP

Checked by:SCARNG Conservation

Date: 4/23/2019



Legend

- Streams
- Open Water on SCARNG Property
- Wetlands

Drainage

- Bee Branch
- Buffalo Creek
- Cedar Creek
- Compound-Colonel's Creek
- Compound-Leesburg Branch
- Davis Pond
- English Pond
- Jumping Run Creek
- Lower Colonel's Creek
- McCaskill Creek
- Noah's Marsh
- North Division
- Odom Pond
- South Division
- Training 28 B & C
- Training 31 A & B
- Upper Colonel's Creek
- West Red Diamond
- Weston Lake

0 360 720 1,440 2,160 2,880 Meters

Water & Wetlands

Created For MTC INRMP

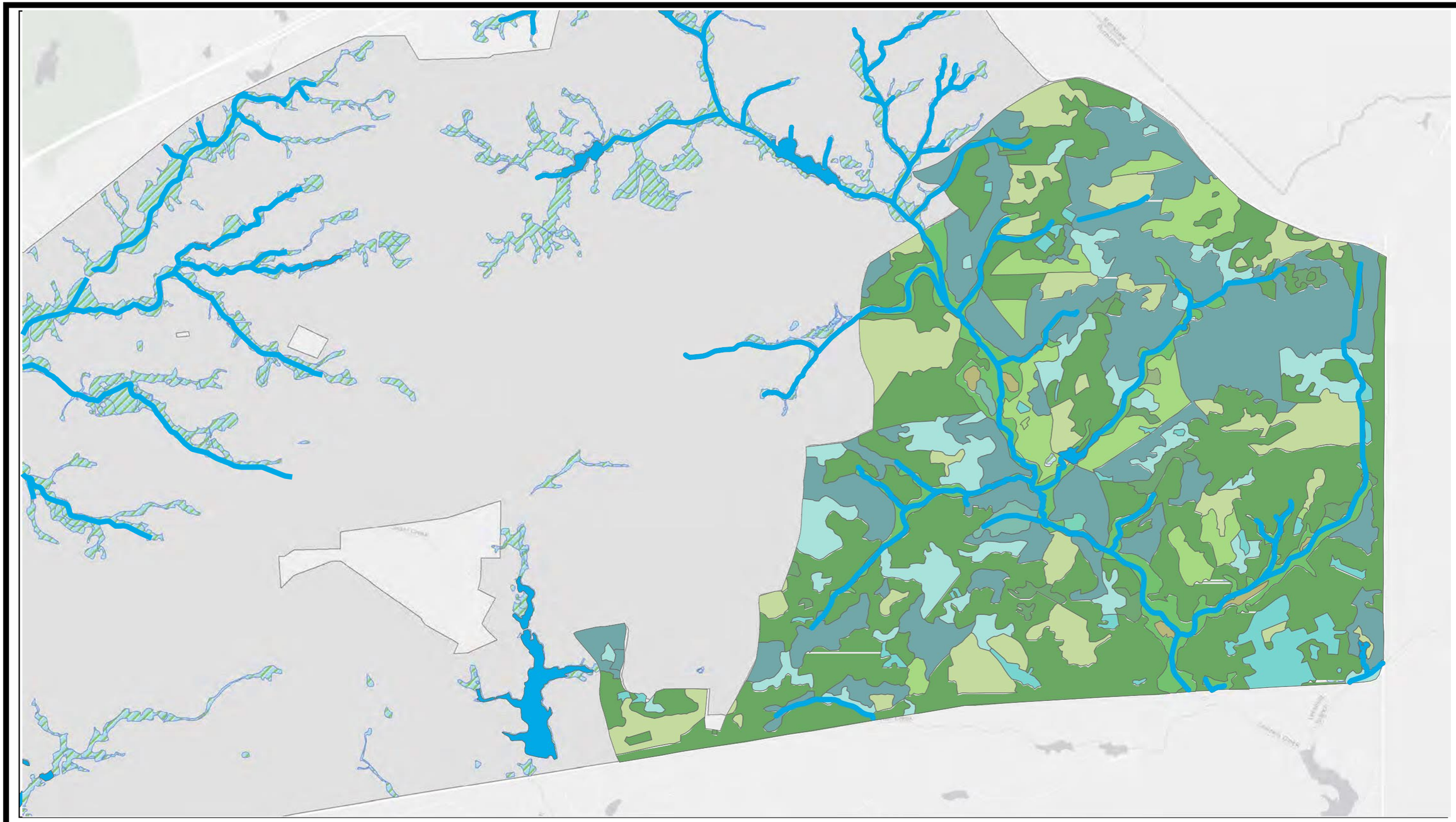
Figure Number

3

Checked by:SCARNG Conservation

Date: 4/23/2019

McCrady



Legend

Community Type

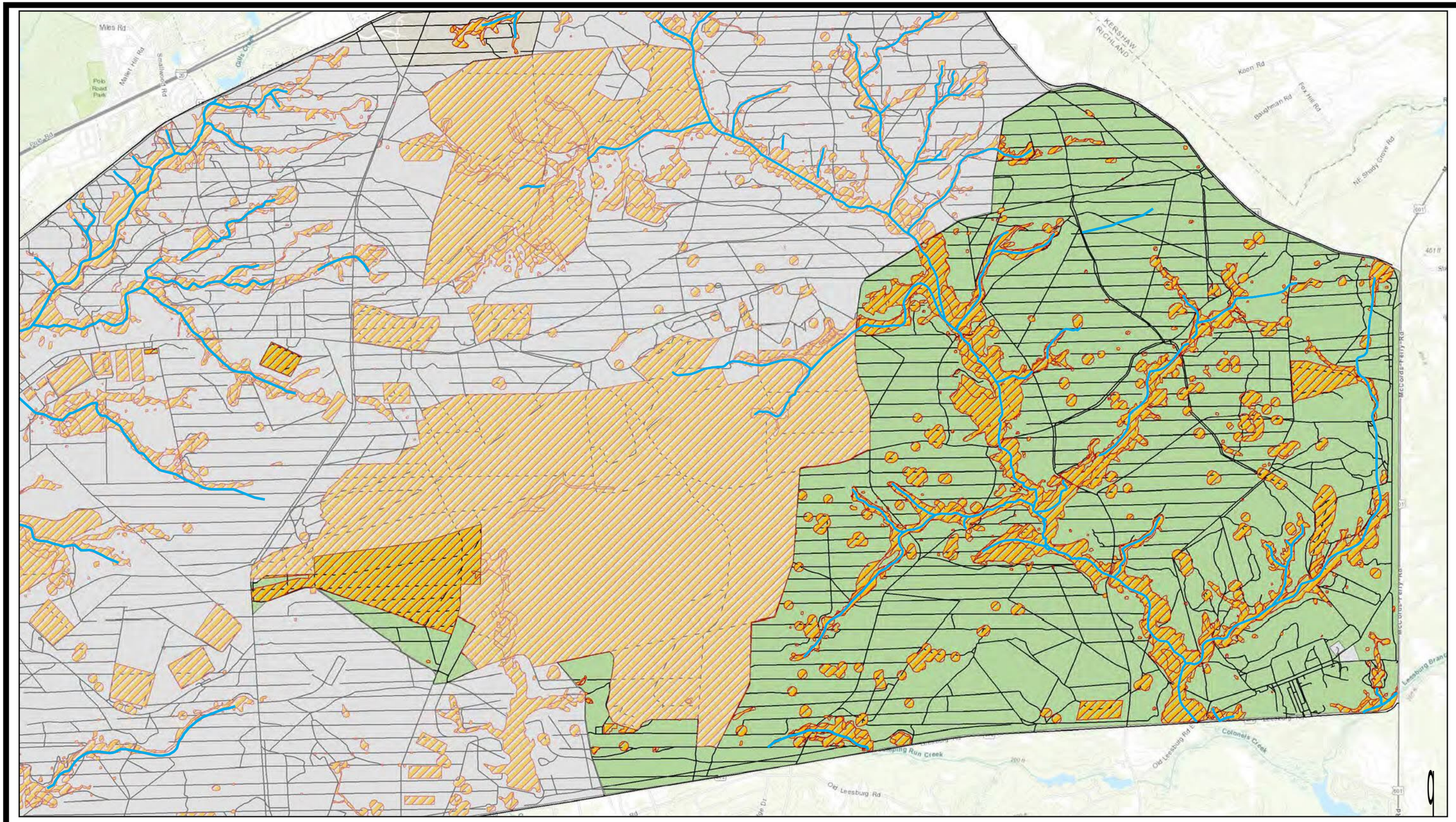
- Emergent Non-Forested Wetlands
- Mixed Hardwood-Pine
- Pine Dominated Canopy- Dense, Young Crowns
- Pine Dominated Canopy- Moderately Dense, Middle-Ag
- Pine Dominated Canopy- Open, Mature Crowns
- Pine Evergreen Shrub
- Pine-Mixed Hardwoods
- Pine-Wetland Mixed Hardwoods
- Upland Mixed Hardwoods
- Upland Non-Forested
- Wetland Mixed Hardwood- Shrub
- Wetland Mixed Hardwoods
- Wetland Mixed Hardwoods - Pine

0 375 750 1,500 2,250 3,000
Meters

Vegetation Community	**Created For MTC INRMP**
Figure Number 4	**Checked by:SCARNG Conservation**
	Date: 4/23/2019

McCrady

McCrady



Legend

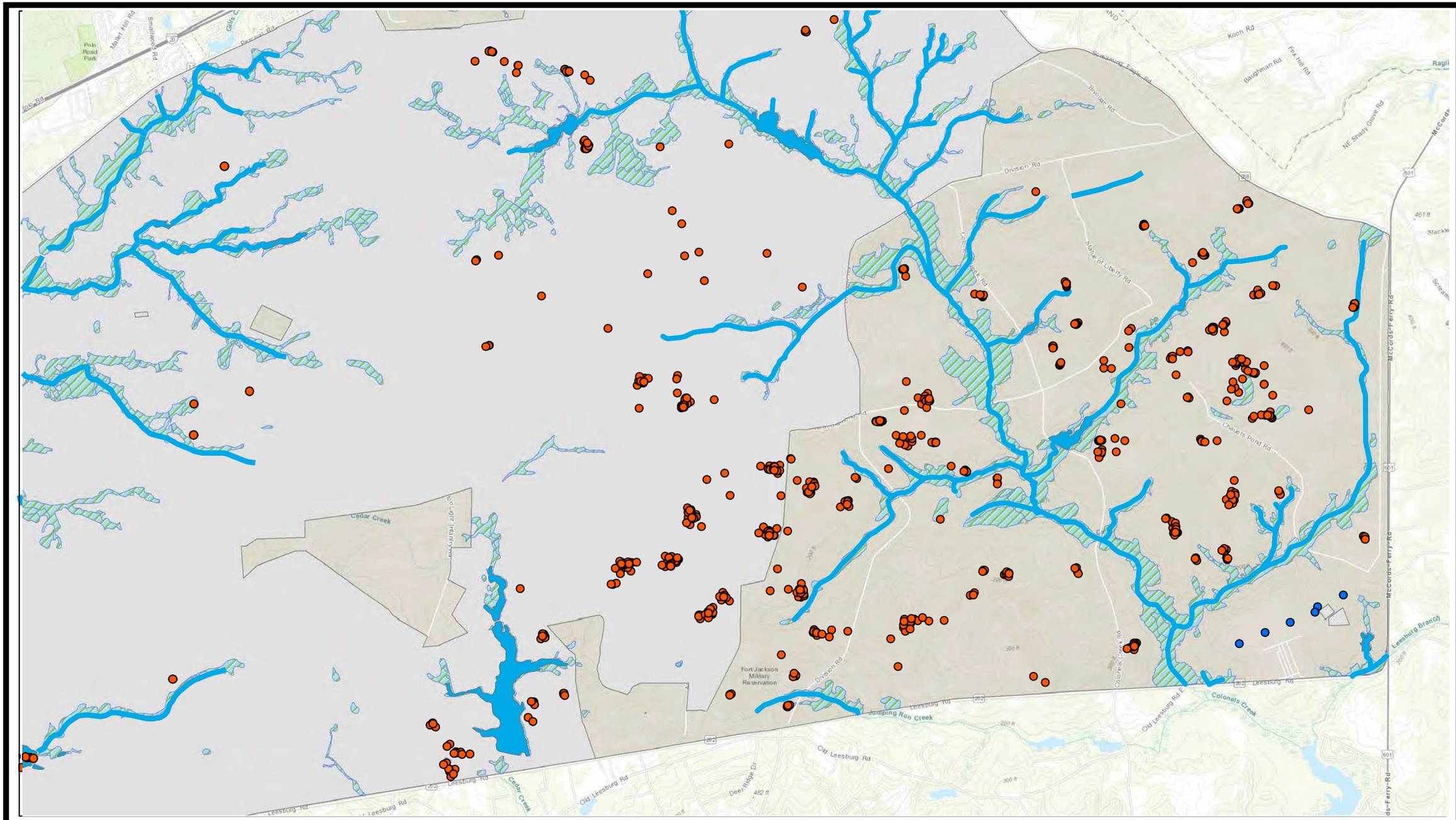
Installation

- McCrady Training Center
- Fort Jackson
- Caution Areas
- Streams
- Road

0 360 720 1,440 2,160 2,880 Meters

Note: Caution Areas are a conglomeration of limited use areas that training and access restrictions

Caution Areas	Created For MTC INRMP
Figure Number 5	Checked by:SCARNG Conservation
	Date: 4/23/2019



McCrady

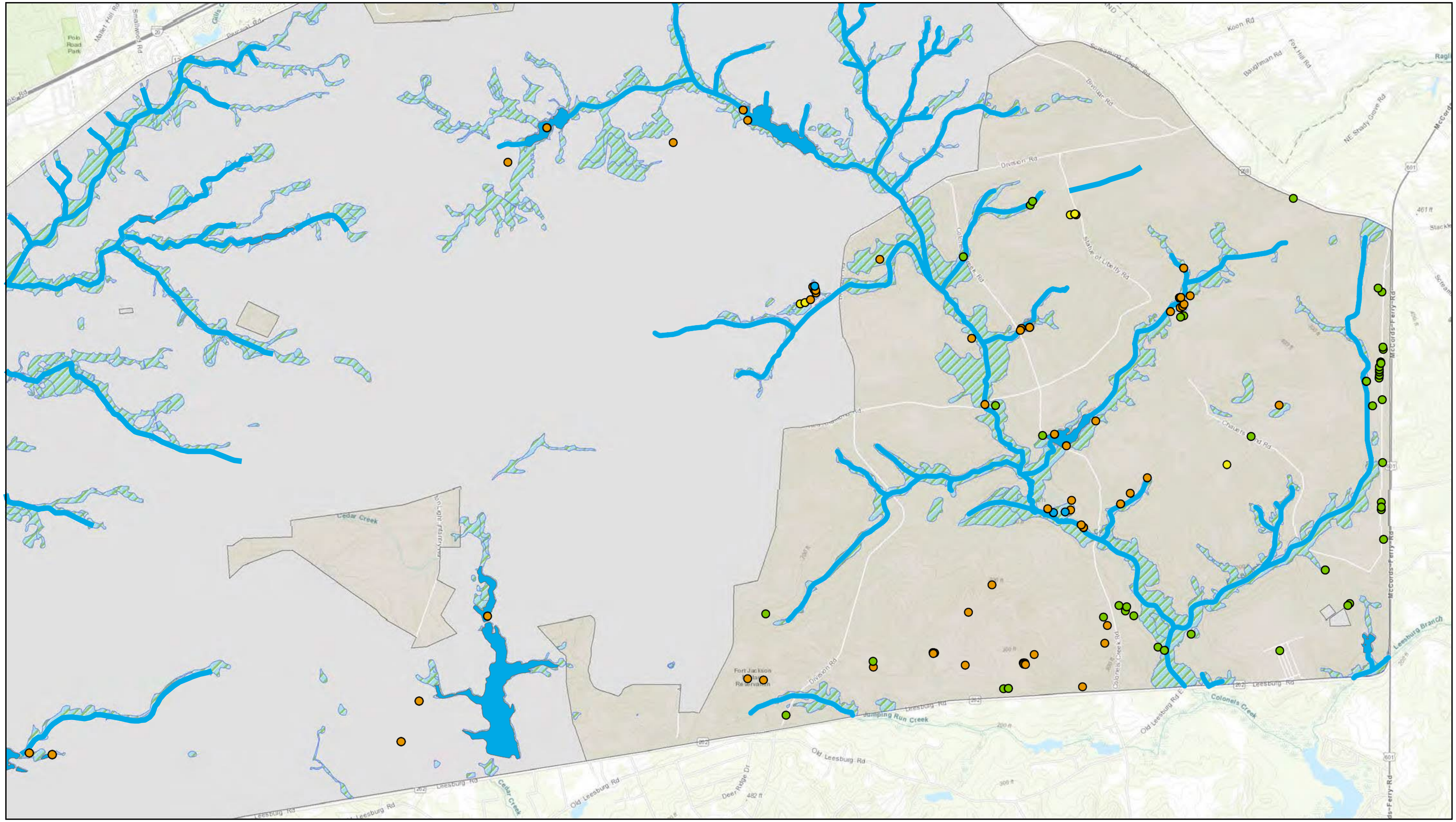
Legend

Fauna Special Status Species

Status

- Federal Listed
- State Listed

Fauna Special Status Species	**Created For MTC INRMP**
Figure Number 6	**Checked by:SCARNG Conservation**
	Date: 4/25/2019



Legend

Flora Special Status Species

Status

- Endangered.
- Invasive
- Rare.
- Sensitive.

0 360 720 1,440 2,160 2,880 Meters

Flora Special Status Species	Created For MTC INRMP
Figure Number **7**	Checked by:SCARNG Conservation Date: 08/04/2020

McCrady

C. IMPLEMENTATION TABLES

The Goals and Objectives Summary and the Project List include program-wide, as well as items specific to MTC and Clarks Hill Training Center (CHTC).

C.1 GOALS AND OBJECTIVES SUMMARY

Climate Change and Regional Growth

Goal: Protect the Mission capability of the SCARNG through planning, adaptive management, and proactive innovative solutions.

Objective: Ensure climate resiliency adaption and mitigation of adverse impacts.
This Objective will be accomplished through the scientifically and data driven decision making, the establishment of achievable targets, collaborative planning, and adaptive management.

Objective: Integrate climate resiliency into the SCARNG planning process.
Our primary goal is to protect the mission capability of the SCARNG. The first step in doing that is to identify and plan for potential impacts.

Objective: Develop and maintain partnerships
The Department of Defense's presence in the Midlands of South Carolina is significant. There are five military installations; three active duties and two National Guard. Active and reserve components of the Army, Navy, Air Force and Marines utilize these bases. To reduce development related pressure, the installations are working together to leverage our presence in regional decision-making. Specifically, the South Carolina Military Department, Fort Jackson, and Shaw Air Force Base have joined together with local governments and Non-Governmental Organizations (NGO) to form the Midlands Area Joint Installation Consortium. The purpose of the Consortium is to facilitate collaboration on projects including a region-wide Joint Land Use Study (JLUS) or the implementation of Joint Compatible Use Buffers (JCUB) program. To further leverage our local partnership, we are also pursuing a Sentential Landscape designation.

Cultural Resources Management

Goal: Our goal is to protect and preserve the cultural and historic resources entrusted to us, while maintaining and supporting the mission of the National Guard.

Objective: ICRMP update and revision
Five-year update and revision of the Integrated Cultural Resource Management Plan to ensure the SCARNG CRM continues to operate under provisions conducive to mission goals.

Objective: Public engagement
Develop and participate in community engagement initiatives to foster public understanding of the SCARNG's commitment to cultural preservation.

Objective: ARPA compliance
Conduct annual review of eligible sites and all cemeteries located on the McCrady Training Center. Ensure appropriate preservation measures are enforced at eligible sites and cemeteries.

Objective: Protect cultural resources
Routinely assess the condition of all eligible sites located on the McCrady Training Center. Ensure appropriate signage and protection of all cultural sites.

Objective: Comply with section 106 of the NHPA
Ensure that all SCARNG undertakings are reviewed by the SHPO, THPOs, and all interested parties in compliance with Section 106 of the National Historic Preservation Act.

Fish and Wildlife

Goal: Conserve and enhance wildlife populations and their associated habitat for optimum levels of biodiversity and ecosystem health, while maintaining a realistic training environment.

Objective: Manage wildland habitat to promote species diversity
Modification of existing wildland habitat to increase biodiversity of native flora and fauna.

Objective: Long term monitoring of fish and wildlife
Initiate PLS and continue ongoing PLS to develop trend data of fish and wildlife.

Forest and Vegetation

Goal: A forest that supports the military mission and maintains ecosystem integrity. This is a forest that is characterized by high habitat diversity and managed for targeted training opportunities. Targeted Training Opportunities refers to matching training missions to land management practices.

Objective: Maintain diversity of forest habitats
Historically, the forested lands at CHTS ranged from open areas of southern yellow pines with little midstory but a high diversity of plant life in the ground layer, as well as, open upland hardwoods to hardwood drainage ways with healthy midstory/ground layer of vegetation. The intent of this objective is to accelerate habitat restoration in targeted areas, assist in the fire management program and have beneficial conditions for both the training community and the overall health of the eco- system.

Objective: Maintain open forest midstory
All historic accounts of long-leaf pine forests described them as “open and park like” with a conspicuous lack of midstory trees and shrubs. They were also described with a high diversity plant in the ground layer. This sub-climax condition is the result of a well-established fire regime. This open park-like condition is beneficial to both the training community and the overall health of the eco- system. The intent of this objective is to aid the wild land fire management program, to accelerate habitat restoration in targeted areas, and provide a more usable training space to meet the military mission.

Objective: Long term monitoring of vegetative communities
Monitor condition and species composition of vegetative communities across SCARNG Training Centers.

GIS Data

Goal: Support the mission of the South Carolina Military Department, and specifically the SCMD Environmental division, through the development and maintenance of an integrated GIS program.

Objective: Provide spatial analysis and GIS services for decision-making.

The power of GIS comes from its ability to analyze diverse and complicated datasets through a spatial lens. This analysis then enables decision makers to make more an informed choice. Improved analytical capability increases our return on our GIS investment.

Objective: GIS model creation
The power of GIS comes from its ability to analyze diverse and complicated datasets through a spatial lens. This analysis then enables decision makers to make more an informed choice. The development and use of models aids in this analysis. Improved analytical capability increases our return on our GIS investment.

Objective: Develop a data maintenance/update strategy
The SCMD has an extensive collection of training and natural resources data. It is vital that a strategy is in place to continually update and maintain these holdings, keeping them as current and accurate as possible.

Grounds

Goal: To maintain the grounds at the McCrady Training Center in a safe, attractive and professional state, while incorporating sustainable principals.

Objective: Develop a sustainable ground maintenance program.
In accordance to the requirements in EO 13693: to establish a method for reducing water, energy, and vehicle fuel usages each FY via developing a comprehensive Sustainable Grounds Management Strategy.

Outreach, Awareness and Education

Goal: Protect the Training Mission of the South Carolina Army National Guard, by fostering a public understanding of the Guards efforts at conservation stewardship, and the critical nature of the Guards mission.

Objective: Develop and maintain partnerships
The Department of Defense's presence in the Midlands of South Carolina is significant. There are five military installations; three active duties and two National Guard. Active and reserve components of the Army, Navy, Air Force and Marines utilize these bases. To reduce development related pressure, the installations are working together to leverage our presence in regional decision-making. Specifically, the South Carolina Military Department, Fort Jackson, and Shaw Air Force Base have joined together with local governments and Non-Governmental Organizations (NGO) to form the Midlands Area Joint Installation Consortium. The purpose of the Consortium is to facilitate collaboration on projects including a region-wide Joint Land Use Study (JLUS) or the implementation of Joint Compatible Use Buffers (JCUB) program. To further leverage our local partnership, we are also pursuing a Sentential Landscape designation.

Objective: Raise community awareness
In order to maintain the current favorable opinion that the public holds for the military mission, the SCARNG needs to actively work to inform the public of our efforts to maintain the resources that have been entrusted to us.

Objective: Continue education & training program
Continue the implementation of the State-Wide Environmental Education & Training program

Pest

Goal: Ensure compliance with DoD Instruction 4150.07, "DoD Pest Management Program"

Objective: Reduction of pesticide use
This objective is intended to meet the Presidential Executive Order and the DOD Measure of Merit #2: to reduce the total amount of pesticide applied each year to federal military installments.

Objective: Reduce impacts to training and the environment from nuisance wildlife.
Reduce impacts of nuisance wildlife on training activities.

Objective: Manage invasive/ noxious plant species
This objective is to develop a proactive program in accordance to EO 13112, to facilitate the management and control of Invasive/Noxious plants and animals. This program is managed as part of our Integrated Pest Management Plan. SCARNG will monitor both the overall health of the system as well as the success or failure of individual projects as part of this objective.

Program Management

Goal: Our Goal is to be a proactive program that anticipates and meets the needs of the National Guard. We strive to be a national leader in efficiency, innovation and diversity, while providing our staff an environment that empowers and supports their creativity and initiative.

Objective: Facilitate program implementation through the use of seasonal staff.
The Columbia Metro Area has a large population of students seeking under graduate and post graduate degrees in conservation related fields. This provides us with a unique opportunity to supplement our staff to work on seasonal projects.

Objective: Maintain current and accurate species lists
The purpose of this objective is to have an accurate species information that is both current and in easily accessible and usable format. In the past individual surveys were in different formats and stored in in multiple locations making it difficult to access the information. Our species data has been transferred to central species tracking database. This database contains both individual occurrences recorded from Planning Level Surveys, and general presence/ absence for each of our installations. This includes both verified records and potential occurrences.

Objective: Maintain easy and up to date access to all relevant documents.
Maintain easy and up to date access to all records, surveys, reports, reviews and other relevant documents. This accomplished through the use of both a document tracking database and our file management system.

Objective: Contribute to the National Guard Environmental Program at a national level
The success of the local Environmental Program is directly linked to the success of the National Program. To facilitate that success SCARNG Conservation staff will participate in Committees, review policy documents and reports, and provide general feedback and support to NGB to facilitate a strong overall environmental program.

Objective: Ensure fiscal sustainability for the Conservation Program
In order for the SCARNG Conservation Program to be successful, it requires sound and sustainable fiscal management. This includes program out year requirements, managing budgets and tracking procurements.

Objective: To employ a staff of subject matter experts that are innovative leaders and current in their field.
To employ a staff of subject matter experts that are innovative leaders and current in their field. That are able to use their knowledge and experience to implement program management plans and support the mission of the SCARNG

Objective: Facilitate program support and implementation through state-of-the-art technology
Conservation Management requires the analysis of complex and diverse systems. Understanding these systems is often a very data intensive undertaking that then require repackaging to communicate the information. As a result, Conservation projects often require and utilize the most current technology.

Objective: Ensure that all planning documents are relevant & current
Keep all planning documents current though annual reviews, and updates. This project also includes document revisions, and other administrative task to improve document management and document relevance in day to day business practices.

Objective: Support program implementation through providing staff the tools, equipment, and supplies needed to perform their day to day work activities.
In order to effectively perform their duties, the staff needs the proper supplies and equipment. This objective is to ensure that they are provided these materials.

Soil and Water

Goal: To maintain training lands, while protecting and enhancing soil and water quality, and ensuring compliance with all applicable laws and regulations.

Objective: Erosion repair site monitoring & evaluation
The intent of this objective is to determine if the activities in Section 2.3.2 Objective 2 of the McCrady INRMP produce the desired results. Monitoring and project evaluation helps:

- Identify what works, what did not work, and what should continue
- Improves actions where they are less effective
- Change actions if they are ineffective

Objective: Facilitate the coordination, repair and identification of eroded areas across the training site.
The purpose of this objective is to aid in the execution of the Soil Management Implementation Plan & Inventory (SMPI) developed under Objective ID #6 in this database. This is done through coordination of interested parties to develop budgets, identify resourcing and aid in planning and execution.

Objective: Develop a systematic approach for Soil & Water Management
The three biggest obstacles to a successful Soil and Water Management program are; communication, coordination, and resourcing (funding). The intent of this objective is to provide a structured system to facilitate coordination and communication. This in turn would allow for more targeted use of available resources. The intent is to hold a quarterly meeting between all stakeholders (Facilities Management

Office, Training/ ITAM, Natural Resources and pertinent Training Site Staff). The 1st and 4th Quarter meeting would focus on review of completed work, identification and prioritization of work still needed, and the development of available budget and resourcing to execute the work. The 2nd and 3rd Quarter meeting would be to track on going work and note any problems or changes in the execution plan.

Objective: Repair identified erosion sites
The purpose of this objective is to implement the Soil Management Implementation Plan & Inventory (SMPI) developed under Objective ID #6 in this database

Special Status Species

Goal: Conserve and enhance Threatened, Endangered and Special Status Species (SSS) populations and their associated habitat for optimum levels of biodiversity and ecosystem health.

Objective: Special status species monitoring
Develop a protocol for monitoring SSS, which will create a species list and monitoring period.

Objective: Special status species habitat management
Maintain and/or modify existing habitat to increase biodiversity of SSS.

Objective: Threatened and endangered ecosystem management
Manage ecosystems level factors that support threatened and endangered (T&E) species population health and survivorship.

Wetlands

Goal: A Wetlands Management Program that protects and enhances all wetland systems and ensures compliance with all applicable laws and regulations.

Objective: Collection of data to support planning and monitoring initiatives.
This objective supports the planning and check stages of our adaptive management strategy.

Objective: Sustain or enhance wetland systems at MTC & CHT
This objective addresses the action and the analysis phases of our adaptive management strategy. It focuses on implementing projects derived from our planning process and analyzing the success of the implemented projects.

C.2 CURRENT PROJECT LIST

Climate Change and Regional Growth: Develop and Maintain Partnerships

Update and Maintain JCUB Program (Project # 96)

The SCARNG, in cooperation with several partners was successful in obtaining funding for a Joint Compatible Use Buffer plan in FY 08. Updating and managing this plan is an ongoing effort. This includes updating GIS data layers, developing annual funding requests, and reports. Refining parcel scoring models, attending public meetings and meeting and coordinating with our partners.

Facility:	MTC
Status:	Active
Frequency:	C-Annual
STEP Project Number:	SCONG10001
Estimated Cost:	$15,000.00/year
Proponent:	Joint
Year Proposed:	Current

SERPPAS Steering Committee (Project # 294)

Participate in the SERPPAS Steering Committee.

Facility:	Statewide / Program-wide
Status:	Active
Frequency:	C-Annual
STEP Project Number:	SC0NG150001
Estimated Cost:	$2,500.00/year
Proponent:	-
Year Proposed:	Current

Sentinel Landscape Program (Project # 319)

Development and implementation of a MAJIC Sentinel Landscape.

Facility:	Statewide / Program-wide
Status:	Active
Frequency:	C-Annual
STEP Project Number:	TBD
Estimated Cost:	$0
Proponent:	ENV
Year Proposed:	Current

Implement Climate Resiliency Plan (Project # 350)

Implement a strategy to review existing plans for climate resiliency integration and identify opportunities.

Facility:	Statewide / Program-wide
Status:	Planning
Frequency:	D-Annual
STEP Project Number:	SCC70060010

Estimated Cost:	$10,000.00/year
Proponent:	-
Year Proposed:	20

Climate Change and Regional Growth: Integrate climate resiliency into the SCARNG planning process

Develop a Climate Resiliency Integration Plan (Project # 349)

Develop a strategy to review existing plans for climate resiliency integration and identify opportunities.

Facility:	Statewide / Program-wide
Status:	Planning
Frequency:	Defined
STEP Project Number:	SCC70060010
Estimated Cost:	$10,000.00/year
Proponent:	-
Year Proposed:	20

Native American Consultation (Project # 134)

Conduct Consultation with Native American Tribes.

Facility:	Statewide / Program-wide
Status:	Active
Frequency:	C-Annual
STEP Project Number:	SC000060008
Estimated Cost:	$ 25,750.00/year
Proponent:	ENV
Year Proposed:	20

Cultural Resources Management: Comply with Section 106 of the NHPA

Mitigation for Armories (Project # 146)

Develop a program for armory mitigation that will address future adverse effects. This mitigation for an adverse effect is outlined in the signed NHPA Nationwide PA for armories, and the follow-on letter to the SHPO notifying them of the adverse effect & the proposed mitigation, as prescribed by the PA.

The SCARNG is planning a federal undertaking funded with Sustainment, Restoration and Modernization (SRM) funds. The SCARNG has determined that the project will affect historic properties and buildings that are eligible for listing in the National Register of Historic Places and that the affects will be adverse as defined in 36 CFR 800.5(a)(1). The SCARNG has developed agreement document (i.e. a Memorandum of Agreement or Programmatic Agreement) in consultation with the SHPO and other consulting parties to mitigate this adverse effect.

Facility:	Statewide / Program-wide
Status:	Active
Frequency:	Defined
STEP Project Number:	SC000060014
Estimated Cost:	$ 20,000.00/year

Proponent:	ENV
Year Proposed:	Current

Historic Armory Research Project (Project # 244)

This project is designed to identify and scan relevant materials on historic armories and other SCARNG facilities. This research will include blueprints, construction documents, photographs and unit histories.

Facility:	Statewide / Program-wide
Status:	Active
Frequency:	Multi-year
STEP Project Number:	SC000060014
Estimated Cost:	$15,000.00/year
Proponent:	-
Year Proposed:	Current

NEPA and Section 106 Review (Project # 307)

This project is for regular reoccurring aspects of NHPA and Section 106 and NEPA Review.

Facility:	Statewide / Program-wide
Status:	Active
Frequency:	C-Annual
STEP Project Number:	SC0NG160001
Estimated Cost:	$300.00/year
Proponent:	-
Year Proposed:	Current

Cultural Resources Management: Protect Cultural Resources

Monitor Cultural Sites (Project # 166)

Bringing the Integrated Cultural Resource Management Plan (ICRMP) up to date for 2014-2019.

Facility:	Statewide / Program-wide
Status:	Active
Frequency:	D-Annual
STEP Project Number:	SCC70140002
Estimated Cost:	$ 5,000.00/year
Proponent:	ENV
Year Proposed:	Current

Cultural Resource Historic GIS Mapping Project (Project # 227)

This GIS project is a long-term project designed to acquire, digitize, analyze historic cartographic sources to locate previously unidentified archaeological resources, identify the history of the various military disturbances at the MTC. Also related to this idea, is the possibility of using this locational model as part of the development of a PA with the SC SHPO that uses location of a project as one variable to determine whether the project would require external review.

Facility:	Statewide / Program-wide
Status:	Active
Frequency:	Multi-year
STEP Project Number:	SC000060014
Estimated Cost:	$ 5,000.00/year
Proponent:	-
Year Proposed:	Current

Cultural Program Management (Project # 317)

This project provides overarching support to the Cultural resources program. It supports tasks that cross project lines within the Cultural program.

Facility:	Statewide / Program-wide
Status:	Active
Frequency:	C-Annual
STEP Project Number:	SCC70140002
Estimated Cost:	$ 35,000.00/year
Proponent:	ENV
Year Proposed:	Current

Fish and Wildlife: Long-term Monitoring of Fish and Wildlife

Herpetological Monitoring (Project # 76)

Herpetological Monitoring project assess the distribution, ecology and habitat of the herpetofauna associated at MTC and CHT. Also provides table showing habitat preferences of all species native to the base. This project also generates an on-going reptile/amphibian species list.

Facility:	Statewide / Program-wide
Status:	Active
Frequency:	C-Annual
STEP Project Number:	SCC70060014
Estimated Cost:	$ 7,500.00/year
Proponent:	ENV
Year Proposed:	Current

Monitoring Neotropical Migrants (Project # 74)

The Monitoring Avian Productivity and Survivorship (MAPS) Program is a national program created by The Institute for Bird Populations to assess and monitor the vital rates and population dynamics of over 120 species of North American land birds in order to provide critical conservation and management information on their populations. The SCARNG is partnered with the SC Department of Natural Resources (SCDNR) to conduct surveys of neo-tropical migratory birds on the training lands in order to make sound biological management decisions. Other bird surveys on MTC provided by SCDNR are: The Breeding Bird Survey and Fall Bird Banding Event.

Facility:	MTC
Status:	Active

Frequency:	D-Annual
STEP Project Number:	SCC70140001
Estimated Cost:	$ 10,000.00/year
Proponent:	ENV
Year Proposed:	Current

Analyze and Plan for Pollinator Survey (Project # 78)

During this phase, the survey will be reviewed, and current status of the pollinator population discussed. If it is decided that the population requires management strategies to be implemented, then a plan will be developed.

Facility:	Statewide / Program-wide
Status:	Planning
Frequency:	Multi-year
STEP Project Number:	SCC70060014
Estimated Cost:	$ 7,500.00/total
Proponent:	ENV
Year Proposed:	21

Study on Propagation of Listed Plant Species (Project # 79)

Some state and federally listed plant species that occur on MTC do not have thriving population. This study will check on the feasibility of propagating state and federally listed plant species as well as species of cultural interest to federally recognized Native American populations.

Facility:	Statewide / Program-wide
Status:	Planning
Frequency:	Defined
STEP Project Number:	SCC70060008
Estimated Cost:	$ 20,000.00/total
Proponent:	ENV
Year Proposed:	21

PLS Birds at Clarks Hill (Project # 111)

Planning Level Survey for Birds at Clarks Hill Training Center. Includes breeding Bird Surveys and point counts. This is a multiyear project that will run from FY12-FY14.

Facility:	Clarks Hill Training Center
Status:	Active
Frequency:	Multi-year
STEP Project Number:	SC96A060003
Estimated Cost:	$ 10,433.00/Annually
Proponent:	ENV
Year Proposed:	Current

Bat Population Monitoring (Project # 129)

This project is for the long-term monitoring of Chiropteran on SCARNG managed property. This project will primarily use acoustic means to collect information about bat populations. This data will be shared with SCDNR and DoD Bat population specialists.

Facility:	Statewide / Program-wide
Status:	Active
Frequency:	D-Annual
STEP Project Number:	SCC70060008
Estimated Cost:	$ 30,000.00/Annually
Proponent:	ENV
Year Proposed:	Current

Weather Station (Project # 162)

Maintain and collect data from FTS weather station as part of the MTC Wetland Monitoring program.

Facility:	MTC
Status:	Active
Frequency:	C-Annual
STEP Project Number:	SCC70060005
Estimated Cost:	$ 1,000.00/Annually
Proponent:	ENV
Year Proposed:	Current

Large and Medium Wildlife PLS (Project # 348)

Provide baseline information concerning the abundance and diversity of medium and large mammals at the Clarks Hill Training Center near Plum Branch, SC, that will be used for management purposes at this site. Of particular interest is the presence and abundance of medium and large mammal species across the site and how these are influenced by human activities.

Facility:	Statewide / Program-wide
Status:	Active
Frequency:	Defined
STEP Project Number:	SC96A160001
Estimated Cost:	$ 55,000.00 Total
Proponent:	ENV
Year Proposed:	Current

Food Plots (Project # 139)

Planting of Food Plots to help enhance wildlife habitat.

Facility:	Statewide / Program-wide
Status:	Active
Frequency:	D-Annual
STEP Project Number:	SC96A160001
Estimated Cost:	$ 40,000.00/Year
Proponent:	ENV

Year Proposed: Current

Fish and Wildlife: Manage Wildlife Habitat to Promote Species Diversity

Herpetological PLS at CHTC (Project # 309)

This project is to conduct a PLS at CHTC in accordance with the SIKES requirements. The PLS will look at both reptile and amphibian populations across the installation. To include both terrestrial and aquatic habitats with the CHTC.

Facility:	Clarks Hill Training Center
Status:	Active
Frequency:	Defined
STEP Project Number:	SC96A160001
Estimated Cost:	$ 25,000.00 Total
Proponent:	ENV -Conservation
Year Proposed:	Current

Develop a Fire Management Plan (Project # 157)

Create a comprehensive plan that will establish firebreaks and burning regimes for the forested areas at CHTC. This will be accomplished by using data from the forest management plan and consulting with the USACE.

Facility:	Statewide / Program-wide
Status:	Planning
Frequency:	Defined
STEP Project Number:	SC96A060002
Estimated Cost:	$ 20,000.00 Total
Proponent:	ENV
Year Proposed:	21

Forest and Vegetation: Maintain Diversity of Forest Habitats

CHTC Floral PLS and Monitoring (Project # 340)

The purpose of this project is monitor and catalog floral species of concern at CHTC. This includes, wetlands species, at risk species, invasive, and threatened and endangered species. This is accomplished through the use of seasonal staff and contracted surveys.

Facility:	Clarks Hill Training Center
Status:	Planning
Frequency:	Multi-year
STEP Project Number:	SC96A060004
Estimated Cost:	$ 15,000.00/Year
Proponent:	-
Year Proposed:	21

Scrub Oak Management Plan (Project # 91)

Through use of data collected in the Hardwoods mapping project, a plan for the removal and maintenance of dense hardwood areas will be developed. This plan will describe specific stands in need of treatment and determine proponent and cost of each activity. This plan should be coordinated with Ft Jackson Forestry and the USACE Strom Thurmond Project to ensure management objectives follow their forestry objectives and should be updated every 5 years.

Facility:	Statewide / Program-wide
Status:	Planning
Frequency:	Multi-year
STEP Project Number:	SCC70060008
Estimated Cost:	$ 20,000.00 Total
Proponent:	TBD
Year Proposed:	21

Forest and Vegetation: Maintain Open Forest Inventory

Mid Story Removal (Project # 92)

Implementation of the Scrub oak management plan will consist of putting into practice the management practices described in the SOMP. This work will include mechanical thinning of sites, prescribed burning assistance, and chemical control in accordance with the recommendations of the Ft Jackson forest management plan and the USACE at the Strom Thurmond Project on Lake Clarks Hill.

Facility:	Statewide / Program-wide
Status:	Planning
Frequency:	C-Annual
STEP Project Number:	SCC70060008
Estimated Cost:	$ 10,000.00/Year
Proponent:	TBD
Year Proposed:	Current

CHT Forestry Management Plan implementation (Project # 329)

Execute projects/ task from the CHT Forestry Management Plan.

Facility:	Clarks Hill Training Center
Status:	Active
Frequency:	Multi-year
STEP Project Number:	SC96A060007
Estimated Cost:	$ 25,000.00/Year
Proponent:	ENV
Year Proposed:	Current

GIS Data: Develop a Data Maintenance/Update Strategy

Create a 5-year Data Management Plan (Project # 6)

Develop a management plan that will address the following areas plan to keep track of and schedule updates for existing data, and creation of new data. All environmental GIS data layers will have a specified schedule for updates and routine maintenance.

Facility:	Statewide / Program-wide
Status:	Active
Frequency:	Multi-year
STEP Project Number:	SC000060010
Estimated Cost:	$ 5,000.00 Total
Proponent:	ENV
Year Proposed:	21

Implement 5-year Data Plan (Project # 7)

Implement and update 5-year Data plan. This includes performing both managerial/ administrative task and actual data creation, updating and maintenance.

Facility:	Statewide / Program-wide
Status:	Active
Frequency:	Multi-year
STEP Project Number:	SC000060010
Estimated Cost:	$ 15,000.00/Year
Proponent:	ENV
Year Proposed:	22

Create SOPs for data handling (Project # 8)

Develop and implement standard operating procedures for the organization, maintenance, sharing, distribution and updating of all environmental GIS data, and ensure that all environmental staff follows these procedures.

Facility:	Statewide / Program-wide
Status:	Active
Frequency:	Multi-year
STEP Project Number:	SC000060010
Estimated Cost:	$ 5,000.00 Total
Proponent:	ENV
Year Proposed:	21

Update 5-year IT equipment plan (Project # 9)

Create and implement a plan to specify hardware and equipment maintenance and updates.

Facility:	Statewide / Program-wide
Status:	Active
Frequency:	Multi-year
STEP Project Number:	SC000060012
Estimated Cost:	$ 5,000.00 Total
Proponent:	ENV

Year Proposed: Current

SDE Management & Maintenance (Project # 257)

Create and implement a plan to specify hardware and equipment maintenance and update Manage the SCARNG enterprise GIS. Includes any common/routine/needed management of data layers, database schema/design, SQL server, services etc.…

Facility: Statewide / Program-wide
Status: Active
Frequency: C-Annual
STEP Project Number: SC000060010
Estimated Cost: $ 20,000.00/Year
Proponent: ENV
Year Proposed: Current

Create & Manage a Document Management GIS Layer (Project # 259)

Create, manage, and maintain a GIS Document Management layer linking important environmental documentation to a physical/geographic area viewable in GIS.

Facility: Statewide / Program-wide
Status: Active
Frequency: C-Annual
STEP Project Number: SC000060010
Estimated Cost: $ 5,000.00/Year
Proponent: ENV
Year Proposed: Current

Manage SCARNG ArcGIS Online Account (Project # 260)

Facility: Statewide / Program-wide
Status: Active
Frequency: C-Annual
STEP Project Number: SC000060010
Estimated Cost: $ 0
Proponent: -
Year Proposed: Current

Update and improve JCUB parcel priority model (Project # 10)

Continue to develop and fine-tune the suitability model created for the JCUB (Joint Compatible Use Buffer) program. Find new and relevant data layers to incorporate into the model.

Facility: Statewide / Program-wide
Status: Active
Frequency: Multi-year
STEP Project Number: SCONG10001
Estimated Cost: $ 10,000.00 Total
Proponent: ENV
Year Proposed: Current

Update and improve JCUB parcel priority model (Project # 10)

Continue to develop and fine-tune the suitability model created for the JCUB (Joint Compatible Use Buffer) program. Find new and relevant data layers to incorporate into the model.

Facility:	Statewide / Program-wide
Status:	Active
Frequency:	Multi-year
STEP Project Number:	SCONG10001
Estimated Cost:	$ 10,000.00 Total
Proponent:	ENV
Year Proposed:	Current

GIS Data: GIS Model Creation

Create and maintain soil erosion models (Project #11)

Create models of soil erosion for the training areas of McCrady Training center, to highlight areas that are current concerns, as well as to predict future areas of interest.

Facility:	Statewide/ Program Wide
Status:	Active
Frequency:	Multi-Year
STEP Project Number:	SCC70060009
Estimated Cost:	$10,000.00 Total
Proponent:	ENV
Year Proposed:	21

Provide cartographic products as needed (Project # 28)

Provide access to the environmental GIS data holdings in the form of maps, aerial photography, and other cartographic products, in order to assist soldiers and staff in project development, resource management, training, and decision making.

Facility:	Statewide/ Program Wide
Status:	Active
Frequency:	Multi-Year
STEP Project Number:	SCB18060001
Estimated Cost:	$5,000.00 Annual
Proponent:	ENV
Year Proposed:	Current

GIS Data: Provide Spatial Analysis and GIS Services for Decision-Making

Provide spatial analysis (Project #29)

Utilize GIS and ancillary data in spatial analysis to assist with resource management, project development, and decision making.

Facility:	Statewide/ Program Wide
Status:	Active

Frequency:	Multi-Year
STEP Project Number:	SC000060010
Estimated Cost:	$10,000.00 Annual
Proponent:	ENV
Year Proposed:	Current

Migrate Species data to GIS (Project #241)

Incorporate data from the Species Database into GIS.

Facility:	Statewide/ Program Wide
Status:	Planning
Frequency:	C-Annual
STEP Project Number:	SC000060010
Estimated Cost:	$5,000.00
Proponent:	
Year Proposed:	21

GI-STAR Support (Project # 261)

General management and maintenance for GI-STAR. Includes managing, updating, and maintaining services for GI-STAR; creating Help documentation for using GI-STAR; assisting with GI-STAR design, layout, etc.…

Facility:	Statewide/ Program Wide
Status:	Active
Frequency:	C-Annual
STEP Project Number:	SC000060010
Estimated Cost:	$5,000.00 Annual
Proponent:	-
Year Proposed:	Current

Outreach, Awareness and Education: Continue Education and Training Program

Develop ECO Training Materials (Project # 103)

Currently the SCARNG has limited materials for unit ECO's to use in their training programs. This project is for the development of a DVD that ECO's could use to train Unit Personnel

Facility:	Statewide/ Program Wide Status Planning
Frequency:	C-Annual
STEP Project Number:	SC000060018
Estimated Cost:	$15,000.00 Annual
Proponent:	ENV
Year Proposed:	Current

Conduct ECO Training Statewide (Project# 104)

Currently the SCARNG has limited materials for unit ECO's to use in their training programs. This project is for the development of a DVD that ECO's could use to train Unit Personnel

Facility:	Statewide/ Program Wide

Status:	Active
Frequency:	C-Annual
STEP Project Number:	SC000060018
Estimated Cost:	$5,000.00 Annual
Proponent:	ENV
Year Proposed:	Current

Develop Awareness Materials (Project #135)

Develop awareness materials, to include soldier cards, maps, and other handouts.

Facility:	Statewide/ Program Wide
Status:	Planning
Frequency:	C-Annual
STEP Project Number:	SCC70060007
Estimated Cost:	$13,000.00 Total
Proponent:	ENV
Year Proposed:	Current

Develop Training Aids and Materials (Project # 226)

Facility Statewide/ Program Wide	
Status:	Active
Frequency:	C-Annual
STEP Project Number:	SCB18060001
Estimated Cost:	$2,000.00 Total
Proponent:	ENV
Year Proposed:	21

Develop an Integrated Training Plan/Curriculum (Project #102)

Currently the SCARNG has no integrated curriculum for environmental training. This leads to an inconsistent message and gaps in the quality and the type of information that is disseminated. This project will develop a standard set of courses along with tools & materials to be used during training.

Facility:	Statewide/ Program Wide
Status:	Planning
Frequency:	Defined
STEP Project Number:	SC000060018
Estimated Cost:	$5,000.00 Total
Proponent:	ENV/ITAM
Year Proposed:	21

Outreach and Education: Raise Community Awareness

Maintain and Upgrade Interpretive Nature and Fitness Trail System (Project # 99)

Working under a National Public Lands Day grant from the NTF SCARNG constructed an interpretive nature trail and outdoor class room on the McCrady Training Center. The trail is a spur off of the

Palmetto Trail, a trail that runs across the breadth of South Carolina, connecting the mountains to the coast. The trail has become a center piece of our current outreach program. This project is to maintain and expand the existing trail system. This will facilitate our outreach efforts and provide increased outreach opportunities. In the past volunteers have been used to help construct and maintain the trail, this is a practice that will continue.

Facility:	MTC
Status:	Active
Frequency:	C-Annual
STEP Project Number:	GRANT
Estimated Cost:	$1,000.00 Annual
Proponent:	ENV
Year Proposed:	Current

Conduct Requested Outreach Programs (Project # 100)

The Conservation office is periodically asked throughout each year to give talks & lectures or to set up a booth. These present excellent opportunities to educate the community about the mission and activities of the South Carolina Army National Guard. At a minimum the objective of this project is to meet the current demand. The ultimate goal of the project is to increase the number of Public Outreach Opportunities.

Facility:	Statewide/ Program Wide
Status:	Active
Frequency:	C-Annual
STEP Project Number:	SC000060018
Estimated Cost:	$5,000.00 Annual
Proponent:	ENV
Year Proposed:	Current

Develop Outreach Curriculum & Materials (Project # 101)

Currently the SCARNG has no standard or base curriculum or materials for outreach programs. They are developed as needed before each opportunity. This leads to an inconsistent message and gaps in the quality and the type of information that is disseminated. The creation of unique materials and curriculum for each opportunity also increases the staff's workload. This project will develop a standard set of tools & materials to be used during outreach opportunities. This project will be completed with in-house staff and equipment.

Facility:	Statewide/ Program Wide
Status:	Active
Frequency:	C-Annual
STEP Project Number:	SC000060018
Estimated Cost:	$10,000.00 Annual
Proponent:	ENV/ITAM
Year Proposed:	21

National Public Lands Day (Project # 150)

National Public Lands Day is the nation's largest hands-on volunteer effort to improve and enhance public lands and military lands open to the public for recreation.

Facility:	Statewide/ Program Wide
Status:	Planning
Frequency:	D-Annual
STEP Project Number:	GRANT
Estimated Cost:	$6,085.00 Total
Proponent:	ENV
Year Proposed:	Current

Pest: Manage Invasive/Noxious Plant Species

Implement Management activities from Invasive and Noxious Plant Management Plan (Project # 95)

Implement management activities through use of mechanical, chemical and biological control methods to reduce or eliminate invasive and noxious plant species.

Facility:	Statewide/ Program Wide
Status	Active
Frequency	C-Annual
STEP Project Number:	SCC70060019
Estimated Cost	$30,000.00 Annual
Proponent	ENV/ITAM/ Facilities
Year Proposed	Current

Develop an Early Detection Rapid Response Plan for Invasive Species (Project # 158)

Develop an EDRR program in accordance with the National Invasive Species Councils guidelines that allows for immediate reaction to specific invasive species that have the potential to cause significant long-term impacts if not dealt with in a much-expedited timeline from when discovered.

Facility:	Statewide/ Program Wide
Status:	Planning
Frequency:	Defined
STEP Project Number:	SCC70060019
Estimated Cost:	$10,000.00 Total
Proponent:	-
Year Proposed:	22

Invasive Species Control MTC (Project # 308)

This project is for the control and eradication of invasives.

Facility:	Statewide/ Program Wide
Status:	Active
Frequency:	C-Annual
STEP Project Number:	SCC70060019
Estimated Cost:	$20,000.00 Annual

Proponent: ENV
Year Proposed: Current

Treatment of Invasive Species at the Donaldson Center (Project # 332)

Eradication of invasive/noxious species by chemical and/or manual methods.

Facility: Statewide/ Program Wide
Status: Planning
Frequency: D-Annual
STEP Project Number: SCC70060019
Estimated Cost: $5,000.00 Annual
Proponent: ENV
Year Proposed: 21

Treatment of Invasive Species at Fountain Inn (Project # 334)

Eradication of invasive/noxious species by chemical and/or manual methods.

Facility: Statewide/ Program Wide
Status: Planning
Frequency: D-Annual
STEP Project Number: SCC70060019
Estimated Cost: $1,000.00 Annual
Proponent: ENV
Year Proposed: 21

Nuisance Wildlife Pest Control (Project # 125)

Reduce Impacts from nuisance wildlife through activities such as trapping and/or relocating.

Facility: Statewide/ Program Wide
Status: Active
Frequency: C-Annual
STEP Project Number: SCC70060019
Estimated Cost: $500.00 Annual
Proponent: ENV
Year Proposed: Current

Pests: Reduce the Quantity of Pesticides Applied

Tracking Pesticide usage through the IPMP (Project # 152)

Tracking the pounds of active pesticide ingredients applied on Army National Guard Land through the IPMP.

Facility Statewide/ Program Wide
Status Active
Frequency C-Annual
STEP Project Number: SCC70060019
Estimated Cost $0.00 Total
Proponent

Year Proposed	Current

Environmental Advisory Council (Project # 201)

Participation on the EAC

Facility	Statewide/ Program Wide
Status	Active
Frequency	C-Annual
STEP Project Number:	SCB18060003
Estimated Cost	$5,000.00 Annual
Proponent	ENV
Year Proposed	Current

Program Management: Contribute to the National Guard Environmental Program at a National Level

National Awards Program (Project # 320)

Participate in the NGB & Army National Awards program

Facility	Statewide/ Program Wide
Status	Active
Frequency	D-Annual
STEP Project Number:	SCC70160002
Estimated Cost	$0.00
Proponent	Env
Year Proposed	Current

EAC Meetings (Project # 328)

Facility	Statewide/ Program Wide
Status	Active
Frequency	C-Annual
STEP Project Number:	SC0NG150001
Estimated Cost	$5,000.00 Annual
Proponent	-
Year Proposed	Current

Program Management: Ensure Fiscal Sustainability for the Conservation Program

NGB Data Calls (Project # 318)

Facility	Statewide/ Program Wide
Status	Active
Frequency	C-Annual
STEP Project Number:	SCC70060010
Estimated Cost	$0.00
Proponent	ENV
Year Proposed	Current

Program Management: Ensure That All Planning Documents are Relevant & Current

CHTS INRMP Review for Operation and Effect (Project # 117)

This project is for the update and revision of the Clarks Hill Training Site INRMP.

Facility	Clarks Hill Training Center
Status	Active
Frequency	Multi-Year
STEP Project Number:	SC96A060002
Estimated Cost	$20,000.00 Total
Proponent	ENV
Year Proposed	24

MTC INRMP Review for Operation and Effect (Project # 109)

This project is for the revision and update of the SCARNG INRMPs (McCrady & CHT).

Facility	Statewide/ Program Wide
Status	Active
Frequency	Multi-Year
STEP Project Number:	SC96A060002
Estimated Cost	$20,000.00 Total
Proponent	ENV
Year Proposed	25

Update ICRMP (Project # 140)

Maintain and update ICRMP.

Facility	Statewide/ Program Wide
Status	Planning
Frequency	C-Annual
STEP Project Number:	SC0NG160001
Estimated Cost	$7,500.00 Annual
Proponent	ENV
Year Proposed	24

Maintain and Update Tracking Database (Project # 143)

Maintain and Update Tracking Database. This includes database administration, report and query development, as well as data entry.

Facility	Statewide/ Program Wide
Status	Active
Frequency	C-Annual
STEP Project Number:	SCC70060010
Estimated Cost	$3,000.00 Annual
Proponent	ENV

Year Proposed	Current

Update INRMPs (Project # 338)

Conduct Annual Updates and 5-year Reviews for Operation and Effect.

Facility	Statewide/ Program Wide
Status	Active
Frequency	C-Annual
STEP Project Number:	SCC70060010
Estimated Cost	$27,000.00 Annual
Proponent	ENV
Year Proposed	25

Program Management: Maintain Current and Accurate Species Lists

Species Database (Project # 124)

Develop and maintain a species database. The database should be capable of housing a running species list as well as storing results from planning level surveys, monitoring activities, and incidental captures and observations.

Facility	Statewide/ Program Wide
Status	Active
Frequency	C-Annual
STEP Project Number:	SCC70060014
Estimated Cost	$7,500.00 Annual
Proponent	ENV
Year Proposed	Current

Program Management: Maintain Easy and Up-to-Date Access to All Relevant Documents

Maintain IT Systems (Project # 237)

Maintain and Upkeep of IT Systems within the Conservation office.

Facility	Statewide/ Program Wide
Status	Active
Frequency	C-Annual
STEP Project Number:	SCB18060001
Estimated Cost	$10,000.00 Annual
Proponent	-
Year Proposed	Current

State Property Inventory Tracking (Project # 274)

Facility	Statewide/ Program Wide
Status	Active
Frequency	C-Annual
STEP Project Number:	SCC70160002
Estimated Cost	$0.00
Proponent	-

Year Proposed	Current

Program Management: Maintain State-of-the-Art Technology

Implement IT maintenance & replacement plan (Project # 292)

The SCARNG Conservation Section operates under an IT replacement and maintenance plan. This plan details the distribution of IT assets and replacement schedules.

Facility	Statewide/ Program Wide
Status	Active
Frequency	C-Annual
STEP Project Number:	SCC70160002
Estimated Cost	$8,000.00 Annual
Proponent	ENV
Year Proposed	Current

Database Development and testing (Project # 169)

Facility	Statewide/ Program Wide
Status	Active
Frequency	C-Annual
STEP Project Number:	SCC70160002
Estimated Cost	$7,500.00 Annual
Proponent	ENV
Year Proposed	Current

Project Management: Provide staff the tools, equipment, and supplies needed to perform their day to day work activities.

Maintain and Repair Equipment (Project # 303)

This project is for the repair, maintenance, and general upkeep of the Conservation Teams equipment.

Facility	Statewide/ Program Wide
Status	Active
Frequency	C-Annual
STEP Project Number:	SCC70060019
Estimated Cost	$5,000.00 Annual
Proponent	ENV
Year Proposed	Current

Procurement of routine office supplies (Project # 242)

This project is for the procurement of day-to-day office supplies and equipment that the staff need to successfully complete their job.

Facility	Statewide/ Program Wide
Status	Active
Frequency	C-Annual

STEP Project Number:	SCB18060001
Estimated Cost	$5,000.00
Proponent	-
Year Proposed	Current

Routine Admin (Project # 322)

Provide tools, equipment and supplies for routine administrative functions in support of the Conservation Program

Facility	Statewide/ Program Wide
Status	Active
Frequency	C-Annual
STEP Project Number:	SCC70160002
Estimated Cost	$5,000.00 Annual
Proponent	ENV
Year Proposed	Current

Program Management: To employ a staff of subject matter experts that are innovative leaders

Staff Training (Project # 233)

This project ensures that our staff has the opportunity to receive subject matter specific training to stay current in their field and to expand their knowledge base.

Facility	Statewide/ Program Wide
Status	Active
Frequency	C-Annual
STEP Project Number:	SCB18060015
Estimated Cost	$40,000.00 Annual
Proponent	ENV
Year Proposed	Current

Staff Development Training Plan (Project # 236)

The development and maintenance of individual staff development and training plans. The intent is to link these training plans to measurable objectives that can/ will lead to salary increases.

Facility	Statewide/ Program Wide
Status	Planning
Frequency	C-Annual
STEP Project Number:	SCB18060002
Estimated Cost	$0.00
Proponent	Conservation
Year Proposed	20

Mission Travel (Project # 250)

This project supports Mission related travel. This project supports other projects with the INRMP & ICRMP with travel expenses.

Facility	Statewide/ Program Wide
Status	Active
Frequency	C-Annual
STEP Project Number:	SCB18060003
Estimated Cost	$35,000.00 Annual
Proponent	ENV
Year Proposed	Current

Yearly Performance Planning and Evaluation Reviews (Project # 252)

Conduct yearly performance planning and evaluation reviews as required by agency policy.

Facility	Statewide/ Program Wide
Status	Active
Frequency	D-Annual
STEP Project Number:	TBD
Estimated Cost	$0.00
Proponent	ENV
Year Proposed	Current

Soil and Water: Develop a Systemic Approach for Soil & Water Management

Develop and Update Soil Management Plan and Inventory (SMPI) (Project # 30)

This plan serves as the database of record for unimproved road condition and erosion sights on MTC. The plan contains site locations, descriptions, impact/ priority, root cause/ triggering impact, construction grade site designs with complete specs and cost estimates. Sites identified in the plan will be divide into three categories; Major, Moderate, and Routine. Once sights have been identified they will be added to INRMP Project List. The status of the site will be monitored in the INRMP. The plan is updated annually with subwatershed surveys for new problem areas. Sights in the inventory that have not been repaired are assessed annually for changes in condition. Sights that have been repaired are monitored annually for three years with recommendations for site maintenance.

Facility	Statewide/ Program-Wide
Status	Planning
Frequency	Multi-Year
STEP Project Number:	SCC70060009
Estimated Cost	$60,000.00 Annual
Proponent	ENV
Year Proposed	20

Conduct SMPI Planning & Coordination Meetings (Project # 32)

Stakeholders will meet bi-annually at a minimum. The purpose of the first meeting is twofold; first determine which sites from plan will be remediated and determine who will be the project proponent,

second to determine design prepotency for newly identified sites. This determination will be based on actual current year available dollars, not on projected out year budgets. The second and proceeding meetings in a given year will be to track progress and to apprise other stakeholders of any changes from the first meeting. After individual projects are selected for remediation by the stakeholders those projects will be updated in the INRMP. Based on these selections from the yearly planning meeting stakeholders will remediate the agreed to sites in accordance with the SMPI design. Stakeholders will track all remediation cost and report them back to the Environmental Conservation Office for inclusion into the yearly SMPI and INRMP updates. Implementation of the designs in the SMPI is crucial to meeting the stated goal of reduced soil loss.

Facility	Statewide/ Program Wide
Status	Active
Frequency	Multi-Year
STEP Project Number:	SCC70060009
Estimated Cost	$0.00
Proponent	Facilities, ITAM, ENV
Year Proposed	Current

Open Area Stabilization and Maintenance (Project # 247)

Stabilize and maintain open areas that area susceptible to erosion and runoff ex: right of way, fields, logging deck, etc.

Facility	Statewide/ Program Wide
Status	Active
Frequency	C-Annual
STEP Project Number:	SCC70060009
Estimated Cost	$5,000.00 Annual
Proponent	-
Year Proposed	Current

Follow up surveys for all remediated erosion sites (Project # 71)

This survey is to assess and monitor the condition of remediated erosion sites as it pertains to soil erosion and stormwater management.

Facility	Statewide/ Program Wide
Status	Active
Frequency	D-Annual
STEP Project Number:	SCC70060009
Estimated Cost	$6,500.00 Annual
Proponent	ENV
Year Proposed	Current

Soil & Water: Erosion Repair Site Monitoring & Evaluation

Soil Management Site Cataloging at CHT (Project # 339)

This plan serves as the database of record for unimproved road condition and erosion sites. The plan contains site locations, descriptions, impact/ priority, annual estimated soil loss, root cause/ triggering

impact, and cost estimates for repair. Sites identified in the plan will be divide into three categories; major, Moderate, and Routine. Once sights have been identified they will be added to INRMP Project List. The status of the site will be tracked monitored in the INRMP. The plan is updated annually with sub-watershed surveys for new problem areas. Sights in the inventory that have not been repaired are assessed annually for changes in condition. Sights that have been repaired are monitored annually for three years with recommendations.

Facility	Statewide/ Program Wide
Status	Active
Frequency	Multi-Year
STEP Project Number:	SC96A060001
Estimated Cost	$15,000.00 Annual
Proponent	ENV
Year Proposed	21

Special Status Species: Special Status Species (SSS) Habitat Management

Monitoring Interaction between Military training and T&E habitat types (Project # 82)

Develop procedure to evaluate training activities occurring in each T&E habitat type that may have an impact on protected species.

Facility	Statewide/ Program Wide
Status	Active
Frequency	Defined
STEP Project Number:	SCC70060008
Estimated Cost	$7,500.00 Annual
Proponent	ENV/ITAM
Year Proposed	Current

T & E Habitat Mapping (Project # 80)

Develop habitat maps outlining areas of potential Threatened and Endangered species occurring on MTC. This data will be used to focus future T&E surveys, and as a guide to make biologically sound management decisions. This will be part of a larger state-wide effort for SCARNG to develop habitat potential maps.

Facility	Statewide/ Program Wide
Status	Planning
Frequency	Defined
STEP Project Number:	SC000060010
Estimated Cost	$7,500.00 Total
Proponent	ENV
Year Proposed	21

T&E Species Awareness (Project # 83)

Develop training material for trainers and soldiers to educate them on the importance and the penalties associated with T&E laws and regulations as they affect MTC and the military mission.

Facility	Statewide/ Program Wide
Status	Active
Frequency	C-Annual
STEP Project Number:	SCC70060008
Estimated Cost	$20,000.00 Annual
Proponent	ENV
Year Proposed	Current

Special Status Species Habitat Mapping (Project # 85)

Develop habitat maps outlining areas of potential Special Status Species occurring on MTC. This data will be used to focus future surveys, and as a guide to make biologically sound management decisions. This will be part of a larger state-wide effort for SCARNG to develop habitat potential maps and will be incorporated into the T&E habitat mapping project if possible.

Facility	Statewide/ Program Wide
Status	Planning
Frequency	Defined
STEP Project Number:	SC000060010
Estimated Cost	$7,500.00 Total
Proponent	ENV
Year Proposed	21

Special Status Species PL Surveys (Project # 86)

Completion of Planning Surveys that identify locations of Special Status Species at the MTC. This data will be used to focus future studies, and as a guide to make biologically sound management decisions.

Facility	Statewide/ Program Wide
Status	Active
Frequency	Multi-Year
STEP Project Number:	SCC70060014
Estimated Cost	$10,700.00 Annual
Proponent	ENV
Year Proposed	Current

Special Species Habitat Management (Project # 304)

This project is for the active and adaptive management of special status species.

Facility	Statewide/ Program Wide
Status	Active
Frequency	C-Annual
STEP Project Number:	SCC70060008
Estimated Cost	$50,000.00 Annual
Proponent	Env

Year Proposed	Current

Honey Bee Management (Project # 105)

Honey bee projects on MTC are in support of two main goals. One is the support of the SCARNG Agrobusiness Unit who has a specific training task of managing honey bee populations and instructing individuals on honey bees and their use in the agricultural community. The second Goal honey bees are helping to meet is the requirements to promote biodiversity and increase the survivorship of the native vegetation in the area.

Facility	McCrady Training Center
Status	Active
Frequency	C-Annual
STEP Project Number:	SCC70060008
Estimated Cost	$1,000.00 Annual
Proponent	ENV
Year Proposed	Current

Special Status Species: Special Status Species Monitoring

Special Species Planning Level Survey Update (Project # 269)

Update of the Special Status Species at SCARNG Training Centers. This includes T&E, Candidate, state listed and invasives.

Facility	Statewide/ Program Wide
Status	Planning
Frequency	Multi-Year
STEP Project Number:	SCC70060015
Estimated Cost	$20,000.00 Total
Proponent	ENV
Year Proposed	21

Special Status Species PL Surveys CHT (Project # 311)

Completion of Planning Surveys that identify locations of Special Status Species at the CHT. This data will be used to focus future studies, and as a guide to make biologically sound management decisions.

Facility	Clarks Hill Training Center
Status	Planning
Frequency	Multi-Year
STEP Project Number:	SC96A160001
Estimated Cost	$25,000.00 Total
Proponent	ENV-Conservation
Year Proposed	21

PLS for T&E at CHT (Project # 312)

Conduct PLS at CHT for "Special Status" species to include T&E and candidate species.

Facility	Clarks Hill Training Center

Status	Planning
Frequency	Multi-Year
STEP Project Number:	SC96A160001
Estimated Cost	$25,000.00 Total
Proponent	ENV-Conservation
Year Proposed	21

Wetlands: Sustain or Enhance Wetland Systems at MTC

Develop a Wetlands Monitoring Protocol (Project # 3)

Design a monitoring protocol that will measure and track the relative health of the wetland systems on MTC. The final design will need to be one that can be implemented cost effectively and maintained with in-house staff.

Facility	Statewide/ Program Wide
Status	Planning
Frequency	Multi-Year
STEP Project Number:	SCC70060005
Estimated Cost	$15,000.00 Total
Proponent	ENV
Year Proposed	21

Routine Wetlands Management CHT (Project # 343)

Implementation of routine wetlands management projects at CHTC

Facility	Clarks Hill Training Center
Status	Planning
Frequency	C-Annual
STEP Project Number:	SC96A060006
Estimated Cost	$15,000.00 Annual
Proponent	-
Year Proposed	Current

Wetlands Flora and Fauna Guidelines (Project # 5)

Develop guidelines for management of sensitive species, including protection, propagation and research on the health and stability of the species.

Facility	Statewide/ Program Wide
Status	Planning
Frequency	Multi-Year
STEP Project Number:	SCC70060005
Estimated Cost	$15,000.00 Total
Proponent	ENV
Year Proposed	21

Colonels Creek drainage monitoring program (Project # 73)

Monitor and assess the health and biodiversity of the stream system on McCrady Training Center to aid in developing sound management decisions for military training, and to comply with all State and Federal regulation. Specific actions will include water quality monitoring, macroinvertebrate sampling, and monitoring physiographic stream characteristics.

Facility	McCrady Training Center
Status	Active
Frequency	D-Annual
STEP Project Number:	SCC70160004
Estimated Cost	$15,000.00 Annual
Proponent	ENV
Year Proposed	Current

Implementation a Wetlands Monitoring Protocol (Project # 115)

Implement the monitoring protocol developing project 3.

Facility	Statewide/ Program Wide
Status	Planning
Frequency	C-Annual
STEP Project Number:	SCC70060017
Estimated Cost	$13,000.00 Annual
Proponent	ENV
Year Proposed	22

Wetlands Flora and Fauna PLS (Project # 205)

Collect macro-invertebrates at predesignated sites in streams on McCrady Training Center. Use findings to scientifically conclude the health of the streams.

Facility	McCrady Training Center
Status	Planning
Frequency	Multi-Year
STEP Project Number:	SCC70060015
Estimated Cost	$10,000.00 Total
Proponent	ENV
Year Proposed	22

Erosion Project Design MTC (Project # 235)

Assist in funding erosion project design that help sustain or enhance MTC Wetlands.

Facility	McCrady Training Center
Status	Planning
Frequency	D-Annual
STEP Project Number:	SCC70060018
Estimated Cost	$5,000.00 Annual
Proponent	ENV
Year Proposed	22

Wetland and Wetland Plant Community Survey and Mapping (Project # 323)

All wetlands (as defined by the USACE) present on SCARNG Training Centers will be inventoried in the field and geolocated using GPS. Maps will be made of all wetland communities and an accompanying text will discuss the botanical, ecological, hydrological, and strategic value of each wetland and wetland community type. The rarity of each wetland type and the management of wetlands on the site will also be discussed in the text.

Facility	Statewide/ Program Wide
Status	Planning
Frequency	Defined
STEP Project Number:	SCC70060016
Estimated Cost	$25,000.00 Total
Proponent	Env
Year Proposed	22

Monitor Wetland Conditions (Project # 327)

Facility	Statewide/ Program Wide
Status	Active
Frequency	Multi-Year
STEP Project Number:	SCC70060005
Estimated Cost	$10,000.00
Proponent	ENV
Year Proposed	Current

D. SPECIES LISTS

The following tables present the species documented on MTC through 2022, based on multiple surveys and reports (see Appendix H for a full list of relevant reports and data). The SCARNG maintains all observations in a database and updates observations as needed.

Table D-1. Plant Species Documented on McCrady Training Center.			
GENUS	**SPECIES**	**COMMON**	**NOTES**
Acanthospermum	*australe*	paraguayan starburr	
Acer	*rubrum*	red maple	
Agalinis	*fasciculata*	beach false foxglove	
Agrostis	*hyemalis*	winter bentgrass	
Ailanthus	***altissima***	**tree-of-heaven**	**non-native**
Albizia	***julibrissin***	**silktree/ mimosa**	**non-native**
Alchemilla	*microcarpa*	cockleburr	
Alnus	*serrulata*	hazel alder	
Amelanchier	*arborea var. arborea*	common serviceberry	
Amelanchier	*canadensis*	canadian serviceberry	
Amorpha	*fruiticosa*	Indigo bush	
Amorpha	*herbacea var. herbacea*	clusterspike indigobush	
Andropogon	***gyrans var. stenophyllus***	**Elliott's bluestem**	**state species of concern**
Andropogon	*ternarius*	splitbeard bluestem	
Andropogon	*virginicus*	broomsedge bluestem	
Antennaria	*plantaginifolia*	woman's tobacco	
Anthoxanthum	*aristatum*	annual vernalgrass	
Anthoxanthum	*odoratum*	sweet vernalgrass	
Aphanes	*microcarpa*	slender parsley piert	
Apios	*americana*	groundnut	
Apocynum	*cannabinum*	indianhemp	
Arabidopsis	*thaliana*	thalecress	
Arabidopsis	*thaliana*	mouseear cress	
Aralia	*spinosa*	devil's walkingstick	
Arenaria	*caroliniana*	Carolina sandwort	
Arenaria	*serpyllifolia*	thymeleaf sandwort	
Aristida	***condensata***	**Piedmont three-awned grass**	**state species of concern**
Aristida	*lanosa*	woollysheath threeawn	
Aristida	*oligantha*	prairie threeawn	
Aristida	*tuberculosa*	seaside threeawn	
Aristolochia	*serpentaria*	virginia snakeroot	
Arundo	*donax*	giantreed	
Asclepias	*amplexicaulis*	clasping milkweed	
Asclepias	*tuberosa*	butterfly milkweed	
Aster	*dumosus*	rice button aster	
Aster	*ericoides*	heath aster	
Aster	*lateriflorus*	calico aster	

Table D-1. Plant Species Documented on McCrady Training Center.			
GENUS	**SPECIES**	**COMMON**	**NOTES**
Aster	*linariifolius*	flax-leaf white-top aster	
Aster	*paternus*	toothed white-top aster	
Aster	*solidagineus*	narrow-leaf white-top aster	
Aster	*solidagineus*	narrowleaf aster	
Aster	*tortifolius*	dixie aster	
Astragalus	***michauxii***	**sandhills milkvetch**	**state species of concern**
Athyrium	*filix-femina ssp. asplenioides*	ladyfern	
Aureolaria	*pectinata*	combleaf yellow false foxglove	
Axonopus	*fissifolius*	common carpetgrass	
Baccharis	*halimifolia*	groundseltree	
Baptisia	*alba*	white wild indigo	
Baptisia	*bracteata*	longbract wild indigo	
Baptisia	*cinerea*	grayhairy wild indigo	
Baptisia	*tinctoria*	horseflyweed	
Berchemia	*scandens*	alabama supplejack	
Berlandiera	*pumila*	soft greeneyes	
Betula	*nigra*	river birch	
Bidens	*polylepis*	Beggarticks	
Bignonia	*capreolata*	crossvine	
Brachiaria	*ramosa*	dixie signalgrass	
Brickellia	*eupatorioides*	false boneset	
Briza	*minor*	little quakinggrass	
Buddeleia	***davidii***	**butterfly bush**	**non-native**
Bulbostylis	*capillaris*	threadleaf beakseed	
Bulbostylis	*stenophylla*	sandy field hairsedge	
Burmannia	***biflora***	**northern bluethread**	**state species of concern**
Calamagrostis	*coarctata*	arctic reedgrass	
Calamovilfa	***brevipilis***	**pine-barrens reed-grass**	**state species of concern**
Callicarpa	*americana*	american beautyberry	
Calopogon	*barbatus*	bearded grasspink	
Calopogon	*tuberosus*	tuberous grass-pink	
Calopogon	*tuberosus*	tuberous grasspink	
Camellia	***spp.***	**Camellia**	**non-native**
Campsis	*radicans*	trumpet creeper	
Capsella	*bursa-pastoris*	shepherd's purse	
Carex	*alata*	broadwing sedge	
Carex	*albolutescens*	greenwhite sedge	
Carex	*debilis var. debilis*	white-edge sedge	
Carex	***elliottii***	**Elliot's sedge**	**state species of concern**
Carex	*glaucescens*	southern waxy sedge	
Carex	*leptalea*	bristlystalk sedge	
Carex	*venusta*	darkgreen sedge	
Carphephorus	*bellidifolius*	sandywoods chaffhead	

Table D-1. Plant Species Documented on McCrady Training Center.			
GENUS	**SPECIES**	**COMMON**	**NOTES**
Carya	*aquatica*	Water Hickory	
Carya	*carolinae-septentrionalis*	Southern Shagbark	
Carya	*ovata*	shag-bark hickory	
Carya	*ovata*	shagbark hickory	
Cassia	*nictitans*	Wild sensitive plant	
Castanea	*pumila*	Chinkapin	
Castanea	*pumila ashe*	Coastal chinquapin	
Catalpa	*bignonioides*	southern catalpa	
Ceanothus	*americanus*	new jersey tea	
Celtis	*laevigata*	sugarberry	
Cenchrus	*longispinus*	innocent-weed	
Centrosema	*virginianum*	spurred butterfly pea	
Cephalanthus	*occidentalis*	Button brush	
Cerastium	*glomeratum*	sticky mouse-ear chickweed	
Cerastium	*semidecandrum*	fivestamen chickweed	
Ceratiola	*ericoides*	sand heath	
Cercis	*canadensis*	eastern redbud	
Chaerophyllum	*tainturieri*	hairyfruit chervil	
Chamaecrista	*nictitans*	partridge pea	
Chamaecyparis	*thyoides*	atlantic white cedar	
Chamaedaphne	*calyculata var. angustifolia*	leatherleaf	
Chenopodium	*album*	lamb's quarters	
Chimaphila	*maculata*	striped prince's pine	
Chrysopsis	*gossypina*	cottony goldenaster	
Chrysopsis	*graminifolia*	Grass-leaved Golded Aster	
Chrysopsis	*mariana*	maryland goldenaster	
Cirsium	*repandum*	sandhill thistle	
Clethra	*alnifolia*	coastal sweetpepperbush	
Clitoria	*mariana*	atlantic pigeonwings	
Cnidoscolus	*stimulosus*	finger rot	
Collinsonia	***serotina***	**southern horse-balm**	**state species of concern**
Commelina	*erecta*	whitemouth dayflower	
Coreopsis	*gladiata*	coastalplain tickseed	
Coreopsis	*lanceolata*	lance-leaf tickseed	
Coreopsis	*major*	greater tickseed	
Coreopsis	*verticillata*	Tickseed	
Coreopsis	*X delphiniifolia*	larkspurleaf tickseed	
Cornus	*florida*	flowering dogwood	
Crataegus	*flava*	yellow-leaf hawthorn	
Crataegus	*flava*	yellowleaf hawthorn	
Crataegus	*phaenopyrum*	hawthorn	
Croptilon	*divaricatum*	slender scratchdaisy	
Crotalaria	*angulata*	Rattlebox	
Crotalaria	*spectabilis*	showy rattlebox	

Table D-1. Plant Species Documented on McCrady Training Center.			
GENUS	**SPECIES**	**COMMON**	**NOTES**
Croton	*glandulosus*	vente conmigo	
Cynodon	*dactylon*	bermudagrass	
Cyperus	*compressus*	poorland flatsedge	
Cyperus	*croceus*	baldwin's flatsedge	
Cyperus	*erythrorhizos*	redroot flatsedge	
Cyperus	*iria*	ricefield flatsedge	
Cyperus	*plukenetii*	plukenet's flatsedge	
Cyperus	*polystachyos*	manyspike flatsedge	
Cyperus	*retrofractus*	rough flatsedge	
Cyperus	*retrorsus*	pine barren flatsedge	
Cyperus	*strigosus*	strawcolored flatsedge	
Cyrilla	*racemiflora*	swamp titi	
Dactyloctenium	*aegyptium*	durban crowsfoot grass	
Danthonia	*sericea*	downy danthonia	
Danthonia	*spicata*	poverty oatgrass	
Desmodium	*ciliare*	hairy smallleaf ticktrefoil	
Desmodium	*floridanum*	florida ticktrefoil	
Desmodium	*laevigatum*	smooth ticktrefoil	
Desmodium	*lineatum*	sand ticktrefoil	
Desmodium	*paniculatum*	panicledleaf ticktrefoil	
Desmodium	*strictum*	Pine barren ticktrefoil	
Dichanthelium	*acuminatum var. fasciculatum*	western panicgrass	
Dichanthelium	*commutatum*	variable panicgrass	
Dichanthelium	*erectifolium*	erectleaf panicgrass	
Dichanthelium	*oligosanthes var. scribner*	scribner's rosette grass	
Dichanthelium	*scoparium*	velvet panicum	
Dichondra	*carolinensis*	carolina ponysfoot	
Digitaria	*ischaemum*	smooth crabgrass	
Diodia	*teres*	poorjoe	
Diospyros	*virginiana*	common persimmon	
Draba	*brachycarpa*	shortpod whitlowgrass	
Drosera	*capillaris*	Sundew	
Drosera	*intermedia*	spoon-leaf sundew	
Drosera	*intermedia*	spoonleaf sundew	
Duchesnea	*indica*	indian strawberry	
Dulichium	*arundinaceum*	threeway sedge	
Echinacea	***laevigata***	**smooth purple coneflower**	**federal threatened, state endangered**
Echinochloa	*crus-galli*	barnyardgrass	
Eleagnus	***pungens***	**silverthorn**	**non-native**
Eleocharis	*baldwinii*	baldwin's spikerush	
Eleocharis	*compressa*	flat-stem spikerush	
Eleocharis	*equisetoides*	jointed spikesedge	
Eleocharis	*melanocarpa*	black-fruit spikerush	

Table D-1. Plant Species Documented on McCrady Training Center.			
GENUS	**SPECIES**	**COMMON**	**NOTES**
Eleocharis	*microcarpa*	small-fruit spike-rush	
Eleocharis	*olivacea*	bright green spikerush	
Eleocharis	***robbinsii***	**Robbin's spicebush**	**state species of concern**
Eleocharis	*tenuis*	slender spikerush	
Eleocharis	*tortilis*	twisted spikerush	
Eleocharis	*tricostata*	three-angle spikerush	
Eleocharis	*tuberculosa*	cone-cup spikerush	
Elephantopus	*nudatus*	smooth elephantsfoot	
Elephantopus	*tomentosus*	devil's grandmother	
Elymus	*virginicus*	virginia wildrye	
Epigaea	*repens*	trailing arbutus	
Eragrostis	*curvula*	weeping lovegrass	
Eragrostis	*refracta*	coastal lovegrass	
Eragrostis	*spectabilis*	purple lovegrass	
Erigeron	*strigosus*	prairie fleabane	
Erigeron	*strigosus var. beyrichii*	beyrich's fleabane	
Eriocaulon	*compressum*	flattened pipewort	
Eriocaulon	*decangulare*	tenangle pipewort	
Eriogonum	*tomentosum*	dog-tongue wild buckwheat	
Eupatorium	*capillifolium*	dog-fennel	
Eupatorium	*hyssopifolium*	hyssop-leaf thoroughwort	
Eupatorium	*purpureum*	sweet-scented joe-pye-weed	
Eupatorium	*rotundifolium*	round-leaf thoroughwort	
Eupatorium	*X pinnatifidum*	common eupatorium	
Euphorbia	*curtisii*	curtis' spurge	
Euphorbia	*ipecacuanhae*	american-ipecac	
Fothergilla	*gardenii*	dwarf witch-alder	
Fraxinus	*americana*	white ash	
Froelichia	*floridana*	plains snake-cotton	
Galactia	*erecta*	erect milk-pea	
Galactia	*regularis*	eastern milk-pea	
Galactia	*volubilis*	downy milk-pea	
Galium	*aparine*	sticky-willy	
Gamochaeta	*purpurea*	spoon-leaf purple everlasting	
Gaura	*filipes*	slender-stalk beeblossom	
Gaylussacia	*dumosa*	dwarf huckleberry	
Gelsemium	*sempervirens*	evening trumpet-flower	
Geranium	*carolinianum*	carolina crane's-bill	
Glottidium	*vesicarium*	Bladderpod	
Gnaphalium	*obtusifolium*	rabbit-tobacco	
Goodyera	*pubescens*	downy rattlesnake plantain	
Gratiola	*aurea*	golden hedge-hyssop	
Gratiola	*pilosa*	shaggy hedge-hyssop	
Gratiola	*virginiana*	round-fruit hedge-hyssop	

Table D-1. Plant Species Documented on McCrady Training Center.			
GENUS	**SPECIES**	**COMMON**	**NOTES**
Gymnopogon	*brevifolius*	short-leaf skeleton grass	
Habenaria	*repens*	water-spider false rein orchid	
Helenium	*amarum*	yellow sneezeweed	
Helianthemum	*canadense*	long-branch frostweed	
Helianthus	*angustifolius*	swamp sunflower	
Helianthus	*atrorubens*	purpledisk sunflower	
Helianthus	*tuberosus*	Jerusalem artichoke	
Heliotropium	*amplexicaule*	clasping heliotrope	
Heliotropium	*indicum*	Turnsole	
Heterotheca	*gossypina*	Wooly Golden Aster	
Hexastylis	*arifolia*	little-brown-jug	
Hibiscus	*moscheutos*	rose mallow or wild cotton	
Holosteum	*umbellatum*	jagged-chickweed	
Houstonia	*caerulea*	Bluets	
Houstonia	*longifolia*	long-leaf summer bluet	
Hydrocotyle	*umbellata*	many-flower marsh-pennywort	
Hypericum	*canadense*	lesser canadian st. john's-wort	
Hypericum	*crux-andreae*	st. peter's-wort	
Hypericum	*denticulatum*	coppery st. john's-wort	
Hypericum	*drummondii*	nits-and-lice	
Hypericum	*fasciculatum*	peelback St. johnswort	
Hypericum	*galioides*	bedstraw st. john's-wort	
Hypericum	*gentianoides*	orange-grass	
Hypericum	*hypericoides*	st. andrew's-cross	
Hypericum	*lloydii*	sandhill st. john's-wort	
Hypericum	*mutilum*	dwarf st. john's-wort	
Hypericum	***nitidum***	**Carolina st. john's-wort**	**state species of concern**
Hypericum	*setosum*	hairy st. john's-wort	
Hypericum	*virginicum*	Virginia marsh st. johnswort	
Hypericum	*walteri*	walter's marsh St. johnswort	
Hypochoeris	*glabra*	smooth cat's-ear	
Hypochoeris	*radicata*	spotted cat's-ear	
Hypoxis	*hirsuta*	eastern yellow star-grass	
Hypoxis	*sessilis*	glossy-seed yellow star-grass	
Ilex	***amelanchier***	**sarvis holly**	**state species of concern**
Ilex	***aquifolium***	**spiny holly**	**non-native**
Ilex	*coriacea*	large gallberry	
Ilex	***cornuta***	**single-spine holly**	**non-native**
Ilex	*glabra*	inkberry	
Ilex	*opaca*	american holly	
Ipomoea	*pandurata*	man-of-the-earth	
Iris	*cristata*	Dwarf Wild Iris	
Iris	*virginica*	virginia iris	
Juncus	***abortivus***	**pine barren rush**	**state species of concern**

Table D-1. Plant Species Documented on McCrady Training Center.			
GENUS	**SPECIES**	**COMMON**	**NOTES**
Juncus	*acuminatus*	knotty-leaf rush	
Juncus	*diffusissimus*	slim-pod rush	
Juncus	*marginatus*	grass-leaf rush	
Juncus	*polycephalus*	many-head rush	
Juncus	*scirpoides*	needle-pod rush	
Juniperus	***sp.***	**creeping virginia**	**non-native**
Juniperus	*virginiana*	eastern redcedar	
Kalmia	*latifolia*	mountain-laurel	
Krigia	*cespitosa*	weedy dwarf-dandelion	
Krigia	*virginica*	virginia dwarf-dandelion	
Lachnocaulon	*anceps*	white-head bogbutton	
Lactuca	*graminifolia*	grass leaf lettuce	
Lagerstroema	***indica***	**Crape myrtle**	**non-native**
Lamium	*amplexicaule*	giraffehead	
Lechea	*minor*	thyme-leaf pinweed	
Lechea	***torreyi***	**piedmont pinweed**	**state species of concern**
Leersia	*hexandra*	southern cutgrass	
Leiophyllum	*buxifolium*	sand-myrtle	
Lepidium	*virginicum*	poorman's-pepperwort	
Lespedeza	*angustifolia*	narrow-leaf bush-clover	
Lespedeza	***bicolor***	**shrubby bush-clover**	**non-native**
Lespedeza	***cuneata***	**chinese bush-clover**	**non-native**
Lespedeza	*hirta*	hairy bush-clover	
Lespedeza	*procumbens*	trailing lespedeza	
Lespedeza	*repens*	creeping bush-clover	
Lespedeza	*stuevei*	tall bush-clover	
Liatris	*gramnifolia*	blazing star	
Liatris	***microcenphala***	**small flowered blazing star**	**state species of concern**
Liatris	*secunda*	piedmont gayfeather	
Liatris	*tenuifolia*	short-leaf gayfeather	
Ligustrum	***vulgare***	**privet**	**non-native**
Lilium	***pyrophilum***	**sandhills lily**	**state species of concern**
Linaria	*canadensis*	toad flax	
Lindera	***subcoriacea***	**bog spicebush**	**federal at-risk-species**
Lindernia	*dubia var. anagallidea*	yellow-seed false pimpernel	
Liquidambar	*styraciflua*	sweet-gum	
Lobelia	*elongata*	long-leaf lobelia	
Lobelia	*puberula*	downy lobelia	
Lonicera	*japonica*	japanese honeysuckle	
Loropetalum	***sp.***	**Chinese witch hazel**	**non-native**
Ludwigia	*alternifolia*	seedbox	
Ludwigia	*decurrens*	wing-leaf primrose-willow	
Ludwigia	*leptocarpa*	angle-stem primrose-willow	
Ludwigia	*linearis*	narrow-leaf primrose-willow	

Table D-1. Plant Species Documented on McCrady Training Center.			
GENUS	**SPECIES**	**COMMON**	**NOTES**
Ludwigia	*palustris*	marsh primrose-willow	
Ludwigia	*uruguayensis*	uruguayan primrose-willow	
Lycopodiella	*alopecuroides*	fox-tail club-moss	
Lycopodiella	*appressa*	southern bog club-moss	
Lycopodium	*digitatum*	fan ground-pine	
Lycopus	***cokeri***	**Carolina bugleweed**	**state species of concern**
Lycopus	*rubellus*	taper-leaf water-horehound	
Lycopus	*uniflorus*	northern water-horehound	
Lycopus	*virginicus*	virginia water-horehound	
Lygodium	***japonicum***	**Japanese climbing fern**	**non-native**
Lysimachia	***asperulifolia***	**rough-leaf yellow-loosestrife**	**federal endangered, state species of concern**
Lysimachia	*quadrifolia*	whorled yellow-loosestrife	
Macbridea	***caroliniana***	**Carolina's birds-in-a-nest**	**federal at-risk-species, state species of concern**
Magnolia	*virginiana*	sweet-bay	
Malus	***sp.***	**apple**	**non-native**
Marshallia	*graminifolia*	grass-leaf barbara's-buttons	
Marshallia	*obovata*	spoon-shape barbara's-buttons	
Mayaca	*fluviatilis*	stream bog-moss	
Mecardonia	*acuminata*	axil-flower	
Melia	***azedarach***	**chinaberry tree**	**non-native**
Melilotus	*officinalis*	yellow sweetclover	
Minuartia	*caroliniana*	pine-barren stitchwort	
Modiola	*caroliniana*	carolina bristle-mallow	
Monarda	*punctata*	spotted beebalm	
Monotropa	*hypopithys*	many-flower indian-pipe	
Muhlenbergia	*capillaris*	hairawn muhly	
Murdannia	*keisak*	wart-removing-herb	
Myrica	*heterophylla*	evergreen bayberry	
Myriophyllum	***laxum***	**loose water-milfoil**	**state species of concern**
Myriophyllum	*pinnatum*	cut-leaf water-milfoil	
Nandina	***domestica***	**nandina**	**non-native**
Nestronia	***umbellula***	**leechbrush**	**state species of concern**
Nuphar	*lutea*	yellow pondlily	
Nuttallanthus	*canadensis*	oldfield-toadflax	
Nymphaea	*odorata*	american white waterlily	
Nyssa	*biflora*	Black gum	
Nyssa	*sylvatica*	black tupelo	
Oenothera	*biennis*	Sundrops	
Oenothera	*fruticosa*	narrow-leaf evening-primrose	
Oenothera	*laciniata*	cut-leaf evening-primrose	
Oldenlandia	*uniflora*	clustered mille-graines	
Onosmodium	*virginianum*	wild job's-tears	

Table D-1. Plant Species Documented on McCrady Training Center.			
GENUS	**SPECIES**	**COMMON**	**NOTES**
Oplismenus	*hirtellus*	long-leaf basket grass	
Opuntia	*humifusa var. humifusa/ compressa*	eastern prickly pear	
Orbexilum	*pedunculatum var. psoralioides*	sampson's-snakeroot	
Osmathus	***sp.***	**tea olive**	**non-native**
Osmunda	*cinnamomea*	cinnamon fern	
Oxalis	*articulata ssp. rubra*	jointed wood-sorrel	
Oxalis	*corniculata*	creeping yellow wood-sorrel	
Oxalis	*dillenii*	slender yellow wood-sorrel	
Oxalis	*violacea*	Violet wood sorrel	
Oxydendrum	*arboreum*	sourwood	
Packera	*anonyma*	small's ragwort	
Panicum	*anceps*	beaked panicum	
Panicum	*dichotomiflorum*	fall panicgrass	
Panicum	*hemitomon*	maidencane	
Panicum	*verrucosum*	warty panicgrass	
Panicum	*virgatum*	switchgrass	
Parthenocissus	*quinquefolia*	virginia-creeper	
Paspalum	***bifidum***	**bead-grass**	**state species of concern**
Paspalum	*boscianum*	bull crowngrass	
Paspalum	*dilatatum*	dallasgrass	
Paspalum	*floridanum*	florida paspalum	
Paspalum	*laeve*	field paspalum	
Paspalum	*notatum var. saurae*	bahiagrass	
Paspalum	*setaceum*	thin paspalum	
Passiflora	*incarnata*	purple passion-flower	
Peltandra	*virginica*	green arrow-arum	
Pennisetum	*glaucum*	pearl millet	
Penstemon	*australis*	eustis lake beardtongue	
Penstemon	*laevigatus*	Beardtongue	
Petunia	*axillaris*	wild while petunia	
Phalaris	*caroliniana*	carolina canarygrass	
Photina	***fraseri***	**red tip**	**non-native**
Physalis	*virginiana*	virginia ground-cherry	
Pinus	*echinata*	shortleaf pine	
Pinus	*palustris*	longleaf pine	
Pinus	*taeda*	loblolly pine	
Pinus	*virginiana*	virginia pine	
Piptochaetium	*avenaceum*	black-seed spear grass	
Pittosporum	***sp.***	**pittosporum**	**non-native**
Pityopsis	*graminifolia var. graminifolia*	narrow-leaf silk-grass	
Pityopsis	***pinifolia***	**pine-leaved golden aster**	**state species of concern**
Plantago	*aristata*	large-bract plantain	

Table D-1. Plant Species Documented on McCrady Training Center.			
GENUS	**SPECIES**	**COMMON**	**NOTES**
Platanthera	*ciliaris*	yellow fringed orchid	
Pluchea	*camphorata*	plowman's-wort	
Poa	*annua*	annual bluegrass	
Poa	*chapmaniana*	chapman's bluegrass	
Pogonia	*ophioglossoides*	snake-mouth orchid	
Polygala	*grandiflora*	showy milkwort	
Polygala	*lutea*	orange milkwort	
Polygonella	*americana*	southern jointweed	
Polygonella	*polygama*	october-flower	
Polygonum	*aviculare*	White knotweed	
Polygonum	*sagittatum*	arrow-leaf tearthumb	
Polypremum	*procumbens*	juniper-leaf	
Polystichum	*acrostichoides*	christmas fern	
Potamogeton	***confervoides***	**algae-like pondweed**	**state species of concern**
Potentilla	*canadensis*	dwarf cinquefoil	
Prenanthes	*autumnalis*	slender rattlesnake-root	
Proserpinaca	*pectinata*	comb-leaf mermaidweed	
Prunus	***alabamensis***	**Alabama black cherry**	**state species of concern**
Prunus	*angustifolia*	chickasaw plum	
Prunus	*caroliniana*	carolina laurel cherry	
Pseudognaphalium	*obtusifolium*	rabbit tobacco	
Pteridium	*aquilinum*	western brackenfern	
Pueraria	***montana***	**kudzu**	**non-native**
Pycnanthemum	*flexuosum*	appalachian mountain-mint	
Pycnanthemum	*incanum*	hoary mountain-mint	
Pycnanthemum	*setosum*	awned mountain-mint	
Pycnanthemum	*tenuifolium*	narrow-leaf mountain-mint	
Pyrrhopappus	*carolinianus*	carolina desert-chicory	
Pyrus	***calleryana***	**Bradford pear**	**non-native**
Quercus	*alba*	white oak	
Quercus	*margaretta*	sand post oak	
Quercus	*phellos*	willow oak	
Ranunculus	*abortivus*	littleleaf buttercup	
Rhexia	*alifanus*	savannah meadow-beauty	
Rhexia	*mariana*	maryland meadow-beauty	
Rhexia	*petiolata*	fringed meadow-beauty	
Rhexia	*virginica*	handsome-harry	
Rhododendron	*viscosum*	clammy azalea	
Rhus	*glabra*	smooth sumac	
Rhynchosia	*tomentosa*	twining snout-bean	
Rhynchospora	*chalarocephala*	loose-head beak sedge	
Rhynchospora	***inundata***	**drowned hornedrush**	**state species of concern**
Rhynchospora	***macra***	**beak rush**	**state species of concern**
Rhynchospora	*nitens*	short-beak beak sedge	

Table D-1. Plant Species Documented on McCrady Training Center.			
GENUS	**SPECIES**	**COMMON**	**NOTES**
Rhynchospora	***oligantha***	**feather-bristle beak sedge**	**state species of concern**
Rhynchospora	***pallida***	**pale beak sedge**	**state species of concern**
Rhynchospora	*rariflora*	few-flower beak sedge	
Rhynchospora	***stenophylla***	**coastal-plain beak sedge**	**state species of concern**
Richardia	*brasiliensis*	tropical mexican-clover	
Richardia	*scabra*	rough mexican clover	
Robinia	*hispida*	bristly locust	
Robinia	*viscosa*	clammy locust	
Rosa	*wichuraiana*	memorial rose	
Rubus	*argutus*	saw-tooth blackberry	
Rudbeckia	*hirta var. pulcherrima*	black-eyed-susan	
Rumex	*acetosella*	common sheep sorrel	
Rumex	*hastatulus*	heartwing sorrel	
Sabal	*palmetto*	palmetto	
Sabal	*minor*	Dwarf Palmetto	
Sabatia	*brachiata*	narrow-leaf rose-gentian	
Sabatia	*difformis*	lance-leaf rose-gentian	
Sabatia	*quadrangula*	four-angle rose-gentian	
Saccharum	*alopecuroides*	silver plumegrass	
Saccharum	*giganteum*	sugarcane plumegrass	
Sagittaria	*latifolia*	duck-potato	
Salvia	*azurea*	azure-blue sage	
Salvia	*lyrata*	lyre-leaf sage	
Sambucus	*canadensis*	american elder	
Sanicula	*canadensis*	canadian black-snakeroot	
Sarracenia	*flava*	yellow pitcherplant	
Sarracenia	*purpurea*	purple pitcherplant	
Sarracenia	***rubra***	**sweet pitcherplant**	**state species of concern**
Saururus	*cernuus*	lizard's-tail	
Schizachyrium	*scoparium*	little bluestem	
Schizachyrium	*tenerum*	slender bluestem	
Schrankia	*microphylla var. microphylla*	little-leaf sensitive-briar	
Scirpus	*cyperinus*	woolgrass	
Scirpus	***etuberculatus***	**canby bulrush**	**state species of concern**
Scleria	*ciliata*	fringed nut-rush	
Scleria	*pauciflora*	few-flower nut-rush	
Scleria	*reticularis*	netted nut-rush	
Scleria	*triglomerata*	whip nut-rush	
Scutellaria	*integrifolia*	helmet-flower	
Scutellaria	*lateriflora*	Blue skullcap	
Selaginella	*arenicola*	sand spike-moss	
Setaria	*glauca*	yellow foxtail	
Setaria	*pumila*	yellow bristlegrass	
Setaria	*viridis*	green bristlegrass	

Table D-1. Plant Species Documented on McCrady Training Center.			
GENUS	**SPECIES**	**COMMON**	**NOTES**
Seymeria	*cassioides*	yaupon black-senna	
Sibara	*virginica*	virginia winged-rockcress	
Sisyrinchium	*angustifolium*	narrow-leaf blue-eyed-grass	
Sisyrinchium	*atlanticum*	eastern blue-eyed-grass	
Sisyrinchium	*rosulatum*	annual blue-eyed-grass	
Smilax	*herbacea*	smooth carrionflower	
Smilax	*laurifolia*	laurel greenbrier	
Smilax	*rotundifolia*	roundleaf greenbrier	
Smilax	*smallii*	lanceleaf greenbrier	
Smilax	*walteri*	coral greenbrier	
Solanum	*carolinense*	carolina horse-nettle	
Solanum	*ptychanthum*	west indian nightshade	
Solidago	*leavenworthii*	Goldenrod	
Solidago	*nemoralis*	gray goldenrod	
Solidago	*odora*	anise-scented goldenrod	
Solidago	*rugosa*	wrinkle-leaf goldenrod	
Solidago	*tortifolia*	twist-leaf goldenrod	
Sonchus	*oleraceus*	common sow-thistle	
Sorghastrum	*elliottii*	slender indiangrass	
Sorghastrum	*nutans*	yellow indiangrass	
Sorghum	***halepense***	**Johnson grass**	**non-native**
Spermolepis	*divaricata*	rough-fruit scaleseed	
Spiranthes	*praecox*	grass-leaved Ladies' tresses	
Spiranthes	*vernalis*	spring ladies'-tresses	
Sporobolus	*junceus*	pineywoods dropseed	
Sporobolus	***teretifolius***	**wire-leaved dropseed**	**federal at-risk-species, state species of concern**
Stillingia	*sylvatica*	queen's-delight	
Stipulicida	*setacea*	pineland scaly-pink	
Strophostyles	*umbellata*	pink fuzzy-bean	
Stylisma	*patens*	coastal-plain dawnflower	
Stylosanthes	*biflora*	side-beak pencil-flower	
Styrax	*americanus*	american snowbell	
Symplocus	*tinctoria*	Horse sugar	
Tamarix	*gallica*	Salt Cedar	
Tephrosia	*spicata*	spiked hoary-pea	
Tephrosia	*virginiana*	goat's-rue	
Tetragonotheca	*helianthoides*	pineland nerveray	
Thaspium	*trifoliatum*	purple meadow-parsnip	
Thuja	***occidentalis***	**arborvitae**	**non-native**
Tilia	*americana*	basswood	
Tillandsia	*usneoides*	spanish-moss	
Tofieldia	***glabra***	**white false-asphodel**	**state species of concern**
Toxicodendron	*pubescens*	atlantic poison-oak	

Table D-1. Plant Species Documented on McCrady Training Center.			
GENUS	**SPECIES**	**COMMON**	**NOTES**
Toxicodendron	*radicans*	eastern poison-ivy	
Toxicodendron	*vernix*	poison-sumac	
Tradescantia	*rosea*	Peidmont roseling	
Tragia	*urens*	wavy-leaf noseburn	
Tragia	*urticifolia*	nettle-leaf noseburn	
Trepocarpus	***aethusae***	**aethusa-like trepocarpus**	**state species of concern**
Triadenum	*virginicum*	virginia marsh-st. john's-wort	
Trichostema	*dichotomum*	forked bluecurls	
Trichostema	*setaceum*	narrow-leaf bluecurls	
Tridens	***chapmanii***	**Chapman's redtop**	**state species of concern**
Tridens	*flavus*	purpletop tridens	
Trifolium	*arvense*	rabbit-foot clover	
Trifolium	*campestre*	lesser hop clover	
Triodanis	*biflora*	clasping Venus' looking glass	
Triodanis	*perfoliata var. biflora*	clasping-leaf venus'-looking-glass	
Typha	*latifolia*	broadleaf cattail	
Ulmus	*alata*	winged elm	
Utricularia	*gibba*	humped bladderwort	
Vaccinium	*arboreum*	farkleberry	
Vaccinium	*corymbosum*	highbush blueberry	
Vaccinium	***crassifolium ssp. sempervirens***	**Rayner's blueberry**	**state species of concern**
Vaccinium	*tenellum*	small black blueberry	
Vaccinium	*virgatum*	small-flower blueberry	
Valerianella	*radiata*	beaked cornsalad	
Verbascum	*thapsus*	wooly mullein	
Verbena	*brasiliensis*	brazilian vervain	
Verbena	*carnea*	Mint	
Vernonia	*acaulis*	stemless ironweed	
Vernonia	*angustifolia*	tall ironweed	
Vicia	*angustifolia*	Vetch	
Viola	*pedata*	bird-foot violet	
Viola	*tricolor*	Johnny jumpup	
Viola	*X primulifolia*	primrose-leaved violet	
Vitis	*rotundifolia*	muscadine	
Vulpia	*myuros*	rattail fescue	
Vulpia	*octoflora*	sixweeks fescue	
Wahlenbergia	*marginata*	southern rockbell	
Warea	***cuneifolia***	**carolina pinelandcress**	**state species of concern**
Wisteria	*frutescens*	american wisteria	
Wisteria	*sinensis*	chinese wisteria	
Woodwardia	*areolata*	netted chain fern	
Xylorhiza	*tortifolia var. tortifolia*	mojave woody-aster	

Table D-1. Plant Species Documented on McCrady Training Center.			
GENUS	**SPECIES**	**COMMON**	**NOTES**
Xyris	*ambigua*	coastal-plain yellow-eyed-grass	
Xyris	*baldwiniana*	baldwin's yellow-eyed-grass	
Xyris	*caroliniana*	carolina yellow-eyed-grass	
Xyris	*elliottii*	elliott's yellow-eyed-grass	
Xyris	*fimbriata*	fringed yellow-eyed-grass	
Xyris	*jupicai*	richard's yellow-eyed-grass	
Xyris	*stricta*	pineland yellow-eyed-grass	
Youngia	*japonica*	oriental false hawk's-beard	
Zigadenus	*densus*	osceola's-plume	

Table D-2. Bird Species Documented on McCrady Training Center.			
GENUS	**SPECIES**	**COMMON NAME**	**NOTE**
Accipiter	*cooperii*	Cooper's Hawk	
Accipiter	*striatus*	Sharp-shinned Hawk	
Aimophila	*aestivalis*	Bachman's sparrow	
Anas	*platyrhynchos*	Mallard	
Archilochus	*colubris*	Ruby-throated hummingbird	
Ardea	*herodias*	Great Blue Heron	
Bombycilla	*cedrorum*	Cedar waxwing	
Branta	*canadensis*	Canada Goose	
Buteo	*jamaicensis*	Red-tailed hawk	
Buteo	*platypterus*	Broad-winged hawk	
Caprimulgus	*carolinensis*	Chuck-will's-widow	
Caprimulqus	*vociferus*	Whip-poor-will	
Cardinalis	*cardinalis*	Northern cardinal	
Carduelis	*tristis*	American goldfinch	
Carpodacus	*mexicanus*	House Finch	
Cathartes	*aura*	Turkey Vulture	
Catharus	*minimus*	Gray-cheeked thrush	
Catharus	*ustulatus*	Swainson's thrush	
Chaetura	*pelagica*	Chimney swift	
Charadrius	*vociferus*	Killdeer	
Chordeiles	*minor*	Common nighthawk	
Circus	*cyaneus*	Northen Harrier	
Coccyzus	*americanus*	Yellow-billed cuckoo	
Colaptes	*auratus*	Northern flicker	
Colinus	*virginianus*	Northern bobwhite	
Contopus	*virens*	Eastern wood-pewee	
Corvus	*brachyrhynchos*	American crow	
Corvus	*ossifragus*	Fish crow	
Cyanocitta	*cristata*	Blue jay	
Dendroica	*caerulrscens*	Black-throated Blue Warbler	
Dendroica	*discolor*	Prairie warbler	

Table D-2. Bird Species Documented on McCrady Training Center.			
GENUS	**SPECIES**	**COMMON NAME**	**NOTE**
Dendroica	*dominica*	Yellow-throated warbler	
Dendroica	*pinus*	Pine warbler	
Dolichonyx	*oryzivorus*	Bobolink	
Dryocopus	*pileatus*	Pileated woodpecker	
Dumetella	*carolinensis*	Gray Catbird	
Empidonax	*minimus*	Least flycatcher	
Empidonax	*traillii*	Traill's flycatcher	
Empidonax	*virescens*	Acadian flycatcher	
Falco	*sparverius*	American kestrel	
Geothlypis	*trichas*	Common yellowthroat	
Guiraca	*caerulea*	Blue grosbeak	
Hirundo	*rustica*	Barn swallow	
Hylocichla	*mustelina*	Wood thrush	
Icteria	*virens*	Yellow-breasted chat	
Icterus	*spurius*	Orchard oriole	
Ictinia	*mississippiensis*	Mississippi Kite	
Lanius	*ludovicianus*	Loggerhead Shrike	
Leiothlypus	*peregrina*	Tennessee warbler	
Limnothlypis	*swainsonii*	Swainson's warbler	
Melanerpes	*carolinus*	Red-bellied woodpecker	
Melanerpes	*erythrocephalus*	Red-headed woodpecker	
Meleagris	*gallopavo*	Eastern wild turkey	
Melospiza	*georgiana*	Swamp sparrow	
Mimus	*polyglottos*	Northern mockingbird	
Mniotilta	*varia*	Black-and-white warbler	
Molothrus	*ater*	Brown-headed cowbird	
Myiarchus	*crinitus*	Great crested flycatcher	
Oporornis	*formosus*	Kentucky warbler	
Otus	*asio*	Eastern screech-owl	
Pandion	*haliaetus*	Osprey	
Parus	*bicolor*	Tufted titmouse	
Parus	*carolinensis*	Carolina chickadee	
Passer	***domesticus***	**House Sparrow**	**non-native**
Passerina	*ciris*	Painted Bunting	
Passerina	*cyanea*	Indigo bunting	
Phalacrocorax	*auritus*	Double-crested Cormorant	
Pheucticus	*ludovicianus*	Rose-breasted Grosbeak	
Picoides	***borealis***	**Red-cockaded woodpecker**	**federal endangered, state endangered**
Picoides	*pubescens*	Downy woodpecker	
Picoides	*villosus*	Hairy Woodpecker	
Piranga	*olivacea*	Scarlet Tanager	
Piranga	*rubra*	Summer tanager	
Polioptila	*caerulea*	Blue-gray gnatcatcher	

Table D-2. Bird Species Documented on McCrady Training Center.			
GENUS	**SPECIES**	**COMMON NAME**	**NOTE**
Progne	*subis*	Purple martin	
Protonotaria	*citrea*	Prothonotary warbler	
Regulus	*calendula*	Ruby-crowned kinglet	
Regulus	*satrapa*	Golden-crowned kinglet	
Seiurus	*aurocapillus*	Ovenbird	
Seiurus	*motacilla*	Louisiana waterthrush	
Setophaga	*americana*	Northern parula	
Setophaga	*magnolia*	Magnolia Warbler	
Setophaga	*ruticilla*	American redstart	
Sialia	*sialis*	Eastern bluebird	
Sitta	*carolinensis*	White-breasted nuthatch	
Sitta	*pusilla*	Brown-headed nuthatch	
Sphyrapicus	*varius*	Yellow-bellied Sapsucker	
Spizella	*passerina*	Chipping sparrow	
Spizella	*pusilla*	Field Sparrow	
Thryothorus	*ludovicianus*	Carolina wren	
Toxostoma	*rufum*	Brown thrasher	
Troglodytes	*aedon*	House wren	
Turdus	*migratorius*	American robin	
Tyrannus	*tyrannus*	Eastern kingbird	
Vireo	*flavifrons*	Yellow-throated vireo	
Vireo	*griseus*	White-eyed vireo	
Vireo	*olivaceus*	Red-eyed vireo	
Wilsonia	*citrina*	Hooded warbler	
Zenaida	*macroura*	Mourning dove	

Table D-3. Mammal Species Documented on McCrady Training Center.			
GENUS	**SPECIES**	**COMMON NAME**	**NOTES**
Canis	*latrans*	Coyote	
Canis	***familiaris***	**Dog**	**non-native**
Castor	*canadensis*	Beaver	
Corynorhinus	***rafinesquii***	**Rafinesque's big-eared bat**	**state endangered**
Didelphis	*marsupialis*	opposum	
Eptesicus	*fuscus*	Big brown bat	
Felis	***catus***	**Feral cat**	**non-native**
Lasiurus	*borealis*	Eastern red bat	
Lasiurus	*seminolus*	Seminole bat	
Lynx	*rufus*	Bobcat	
Nycticeius	*humeralis*	Evening bat	
Odocoileus	*virginianus*	White-tailed Deer	
Perimyotis	***subflavus***	**Tri-colored bat**	**federal at-risk-species**
Procyon	*lotor*	Raccoon	
Sciurus	*carolinensis*	Eastern Gray Squirrel	
Sciurus	*niger*	Fox Squirrel	
Sylvilagus	*floridanus*	Eastern Cottontail	

Table D-4. Amphibian and Reptile Species Documented on McCrady Training Center.			
GENUS	**SPECIES**	**COMMON NAME**	**NOTES**
Acris	*c. crepitans*	Northern Cricket frog	
Acris	*gryllus*	Southern Cricket frog	
Agkistrodon	*c. contortrix*	Copperhead	
Agkistrodon	*p. piscivorus*	Cottonmouth	
Anaxyrus	*terrestris*	Southern toad	
Anolis	*carolinensis*	Green anole	
Bufo	*terrestris*	Southern toad	
Cnemidophorus	*s. sexlineatus*	Six-lined Racerunner	
Crotalus	*horridus*	Timber/Canebrake Rattlesnake	
Elaphe	*o. obsoleta*	Black Rat Snake	
Eumeces	*fasciatus*	Five-lined skink	
Eumeces	*inexpectatus*	Southeastern Five-lined Skink	
Gastrophryne	*carolinensis*	Eastern narrow-mouthed toad	
Heterodon	*platirhinos*	Eastern Hognose Snake	
Heterodon	***simus***	**Southern Hognose Snake**	**federal at-risk-species, state threatened**
Hyla	*chrysoscelis*	Cope's gray treefrog	
Hyla	*cinerea*	Green Treefrog	
Hyla	*femoralis*	Pinewoods Treefrog	
Kinosternon	*subrubrum*	Eastern Mud Turtle	
Lithobates	*catesbeianus*	American Bullfrog	
Lithobates	*clamitans*	Green frog	
Lithobates	*utricularia*	Southern leopard frog	

Table D-4. Amphibian and Reptile Species Documented on McCrady Training Center.			
GENUS	**SPECIES**	**COMMON NAME**	**NOTES**
Lithobates	*virgatipes*	Carpenter frog	
Scaphiopus	*h. holbrooki*	Eastern spadefoot toad	
Sceloporus	*undulatus*	Eastern fence lizard	
Scincella	*lateralis*	Ground skink	
Sistrurus	*miliarius*	Carolina Pigmy Rattlesnake	
Sternotherus	*odoratus*	Eastern Musk Turtle	
Terrapene	*c. carolina*	Eastern box turtle	
Trachemys	*s. scripta*	Yellow Bellied slider	

Table D-5. Fish Species Documented on McCrady Training Center.			
GENUS	**SPECIES**	**COMMON NAME**	**NOTES**
Acantharchus	*pomotis*	Mud Sunfish	
Ameiurus	*catus*	White Catfish	
Ameiurus	*melas*	Black Bullhead	
Ameiurus	*natalis*	Yellow Bullhead	
Aphredoderus	*sayanus*	Pirate perch	
Ctenopharyngodon	*idellus*	Grass Carp	
Enneacanthus	*chaetodon*	Black-banded Sunfish	
Enneacanthus	*gloriosus*	Bluespotted Sunfish	
Erimyzon	*oblongus*	Eastern Creek Chubsucker	
Erimyzon	*sucetta*	Lake Chubsucker	
Esox	*a. americanus*	Redfin Pickerel	
Esox	*niger*	Chain Pickerel	
Etheostoma	*fusiforme*	Swamp Darter	
Fundulus	*lineolatus*	Lined Topminnow	
Fundulus	*nottii*	Starhead Topminnow	
Gambusia	***affinis***	**Gambusia (mosquito fish)**	**non-native**
Ictalurus	***punctatus***	**Channel Catfish**	**non-native**
Lepomis	*auritus*	Redbreast Sunfish	
Lepomis	*gibbosus*	Pumpkinseed	
Lepomis	*gulosus*	Warmouth	
Lepomis	*macrochirus*	Bluegill	
Lepomis	*marginatus*	Dollar Sunfish	
Lepomis	*microlophus*	Redear Sunfish	
Micropterus	*salmoides*	Largemouth Bass	
Notemigonus	*crysoleucas*	Golden Shiner	
Notropis	*chalybaeus*	Ironcolor Shiner	
Notropis	*cummingsae*	Dusky Shiner	

Table D-6. Terrestrial Invertebrate Species Documented on McCrady Training Center.			
GENUS	**SPECIES**	**COMMON NAME**	**NOTES**
Achalarus	*lyciades*	Hoary Edge	
Agraulis	*vanillae*	Gulf Fritillary	
Amblyscirtes	*alternata*	Least Florida/ Dusky Road-side Skipper	
Ammophila	*procera*	Common thread-waisted wasp	
Ancyloxpha	*numitor*	Least Skipper	
Apis	*mellifera*	European honeybee	
Anthocharis	*midea*	Falcate Orange Tip	
Asterocampa	*celtis*	Hackberry Emperor	
Atlides	*halesus*	Great Purple Hairstreak	
Atrytone	*arogos*	Arogos Skipper	
Augochloropsis	*metallica*	Sweat bee/Metalic green bee	
Battus	*philenor*	Pipevine Swallowtail	
Bombus	*impatiens*	Common Eastern Bumblebee	
Bombus	*pennsylvanicus*	Amercian Bumblebee	
Calycopis	*cecrops*	Red-banded Hairstreak	
Celastrina	*argiolus*	Spring Azure	
Colias	*cesonia*	Dog Face	
Cyllopsis	*gemma*	Gemmed Satyr	
Danaus	***plexippus***	**Monarch Butterfly**	**federal at-risk-species**
Enodia	*creole*	Creole Pearly Eye	
Enodia	*portlandia*	Southern Pearly Eye	
Epargyreus	*clarus*	Silver-spotted Skipper	
Erynnis	*horatius*	Horace's Dusky Wing	
Erynnis	*juvenalis*	Juvenal's Dusky Wing	
Erynnis	*zarucco*	Zarucco Dusky Wing	
Euptoieta	*claudia*	Variegated Fritillary	
Eurema	*lisa*	Little Sulphur	
Eurema	*nicippe*	Sleepy Orange	
Everes	*comyntas*	Eastern Tailed Blue	
Hermeuptychia	*sosybius*	Carolina Satyr	
Hesperia	*meskei*	Meske's Skipper	
Hylephila	*phyleus*	Fiery Skipper	
Junonia	*coenia*	Buckeye	
Lerema	*accius*	Clouded Skipper	
Libytheana	*carinenta*	American Snout	
Limenitis	*a. astyanax*	Red-spotted Purple	
Megisto	*cymela*	Little Wood Satyr	
Nastra	*lherminier*	Swarthy Skipper	
Neonympha	*areolata*	Georgia Satyr	
Pieris	*rapae*	Cabbage White	
Popilia	*japonica*	Japanese beetle	
Papilio	*palamedes*	Palamedes Swallowtail	
Papilio	*troilus*	Spicebrush Swallowtail	

Table D-6. Terrestrial Invertebrate Species Documented on McCrady Training Center.			
GENUS	**SPECIES**	**COMMON NAME**	**NOTES**
Papilio	*glaucus*	Tiger Swallowtail	
Phoebus	*sennae*	Cloudless Sulphur	
Phyciodes	*tharos*	Pearl Crescent	
Poanes	*yehl*	Yehl Skipper	
Poanes	*Zabulon*	Zabulon Skipper	
Polites	*vibex*	Whirlabout	
Polistes	*carolina*	Red paper wasp	
Polistes	*exclamens*	Common paper wasp	
Pyrgus	*communis*	Common checkered skipper	
Scolia	*dubia*	Blue-winged wasp	
Strymon	*melinus*	Gray Hairstreak	
Systoechus	*spp*	Orange bee fly	
Thorybes	*bathyllus*	Southern Cloudy Wing	
Vanessa	*virginiensis*	American Painted Lady	

Table D-7. Aquatic Invertebrate Species Documented on McCrady Training Center.			
GENUS	**SPECIES**	**COMMON NAME**	**NOTES**
Ablabesmyia	*aspera*		
Ablabesmyia	*mallochi*		
Ablabesmyia	*hauberi*		
Ablabesmyia	*rhamphe_grp.*		
Acroneuria	*lycorias*		
Aedes/Ochlerotatus	*sp.*		
Agabus	*gagetes*		
Agabus	*johannsi*		
Agabus	*seriatus*		
Agarodes	*sp.*		
Alluaudomyia	*sp.*		
Amphinemoura	*nigritta*		
Anchytarsus	*bicolor*		
Ancyronyx	*variegata*		
Ancyronyx	*variegata*		
Anisocentropus	*pyraloides*		
Anopheles	*sp.*		
Apsectrotanypus	*johnsoni*		
Aquarius	*sp.*		
Argia	*sp.*		
Argia	*bipunctulata*		
Argia	*fumipennis*		
Argia	*sedula*		
Argia	*tibialis*		
Baetis	*sp.*		

Table D-7. Aquatic Invertebrate Species Documented on McCrady Training Center.			
GENUS	**SPECIES**	**COMMON NAME**	**NOTES**
Baetis	*pluto*		
Basiaeschna	*janta*		
Berosus	*sp.*		
Bezzia/Palpomyia	*cmplx*		
Bittacomorpha	*clavipes*		
Bittacomorphella	*sp.*		
Boyeria	*vinosa*		
Brachycentrus	*chelatus*		
Brillia	*flavifrons*		
Caeciodotea	*sp.*		
Caenis	*sp.*		
Callibaetis	*pretiosus*		
Calopteryx	*dimidiata*		
Calopteryx	*maculata*		
Cambarus	*sp.*		
Cambarus	*latimanus*		
Celina	*sp.*		
Celithemis	*verna*		
Centroptilum	*sp.*		
Cernotina	*sp.*		
Chaetocladius	*sp.*		
Chauliodes	*pectinicornis*		
Cheumatopsyche	*sp.*		
Chimarra	*sp.*		
Chironomus	*sp.*		
Chlorotabanus	*crepuscularis*		
Chrysops	*sp.*		
Cladotanytarsus	*sp.*		
Cladotanytarsus	*aeiparthenus*		
Cladotanytarsus	*sp.*		
Clinotanypus	*sp.*		
Corbicula	***fluminea***	**Asian clam**	**non-native**
Cordulegaster	*sp.*		
Cordulegaster	*bilineata*		
Corydalus	*cornutus*		
Corynoneura	*sp.*		
Crangonyx	*sp.*		
Cricotopus	*bicinctus*		
Cricotopus	*fugax*		
Cricotopus	*politus*		
Cricotopus	*vierriensis*		
Cricotopus	*sp._"Santa Fe"*		
Cryptochironomus	*sp.*		
Cryptotendipes	*sp.*		

Table D-7. Aquatic Invertebrate Species Documented on McCrady Training Center.			
GENUS	**SPECIES**	**COMMON NAME**	**NOTES**
Culex	*sp.*		
Culex	*territans*		
Culiciodes	*sp.*		
Cymbiodyta	*sp.*		
Cymbiodyta	*chamberlaini*		
Cyphon	*sp.*		
Demicryptochironomus	*sp.*		
Dicranota	*sp.*		
Dicrotendipes	*modestus*		
Dineutus	*sp.*		
Dineutus	*ciliatus*		
Dineutus	*discolor*		
Dineutus	*emarginatus*		
Diplectrona	*modesta*		
Djalmabatista	*pulchra_variant*		
Dromogomphus	*armatus*		
Dubiraphia	*sp.*		
Dubiraphia	*vittata*		
Enallagma	*sp.*		
Enallagma	*divagens*		
Enallagma	*signatum*		
Endochironomus	*nigricans*		
Enochrus	*sp.*		
Enochrus	*ochraceus*		
Epitheca	*princeps*		
Erioptera	*sp.*		
Eristalis	*sp.*		
Erythemis	*simplicicolis*		
Eurylophella	*sp.*		
Eurylophella	*doris*		
Ferrissia	*rivularis*		
Fissimentum	*sp.*		
Genus	*speceis*		
Glyptotendipes	*sp.*		
Glyptotendipes	*meridionalis*		
Gomphus	*sp.*		
Gomphus	*fraternus*		
Gomphus	*lividus*		
Gomphus	*minutus*		
Gomphus	*parvidens*		
Gonielmis	*dietrichi*		
Gonielmis	*dietrichi*		
Gonomyia	*sp.*		
Gymnometriocnemus	*sp.*		

Table D-7. Aquatic Invertebrate Species Documented on McCrady Training Center.			
GENUS	**SPECIES**	**COMMON NAME**	**NOTES**
Gyrinus	*sp.*		
Gyrinus	*pachysomus*		
Gyrinus	*woodruffi*		
Hagenius	*brevistylus*		
Helocordulia	*uhleri*		
Helophorus	*sp.*		
Hemerodromia	*sp.*		
Hesperocorixa	*brimleyi*		
Hesperocorixa	*nitida*		
Heteroplectron	*americanum*		
Heterotrissocladius	*marcidus*		
Hexatoma	*sp.*		
Hyalell	*azteca_cmplx*		
Hydaticus	*bimarginatus*		
Hydrobius	*sp.*		
Hydrocanthus	*iricolor*		
Hydrochus	*excavatus*		
Hydrometra	*sp.*		
Hydroporus	*sp.*		
Hydroporus	*signatus_youngi*		
Hydroporus	*sp.*		
Hydropsyche	*sp.*		
Hydropsyche	*betteni*		
Hydropsyche	*decalda*		
Hydropsyche	*elissoma*		
Hydroptila	*sp.*		
Ischnura	*sp.*		
Ischnura	*hastata*		
Ischnura	*posita*		
Labrundinia	*sp.*		
Labrundinia	*becki*		
Labrundinia	*johannseni*		
Labrundinia	*pilosella*		
Laccophilus	*f. rufus*		
Ladona	*deplanata*		
Larsia	*berneri*		
Larsia	*indistincta*		
Lepidostoma	*sp.*		
Lestes	*inaequalis*		
Leuctra	*sp.*		
Libellula	*vibrans*		
Limnophila	*sp.*		
Limnophyes	*sp.*		
Limnoporus	*canaliculatus*		

Table D-7. Aquatic Invertebrate Species Documented on McCrady Training Center.			
GENUS	**SPECIES**	**COMMON NAME**	**NOTES**
Liogma/Triogma	*sp.*		
Lype	*diversa*		
Maccaffertium	*modestum*		
Macromia	*sp.*		
Macromia	*taeniolata*		
Macronychus	*glabratus*		
Macrostemum	*carolina*		
Mayatrichia	*ayama*		
Menetus	*dilatatus*		
Meropelopia	*americana*		
Microcylloepus	*pusillus*		
Microcylloepus	*p._lodingi*		
Microcylloepus	*p._pusillus*		
Micropsectra	*sp.*		
Microtendipes	*pedellus_grp.*		
Microtendipes	*rydalensis_grp.*		
Microvelia	*sp.*		
Microvelia	*paludicola*		
Molanna	*blenda*		
Molanna	*tryphena*		
Molanna	*ulmerina*		
Mystacidae	*sepulchralis*		
Nanocladius	*balticus_grp.*		
Nanocladius	*crassicornis/rectinervus*		
Nasiaeschna	*pentacantha*		
Natarsia	*sp.*		
Neargyraticus	*sp.*		
Neoplea	*sp.*		
Neoporus	*sp.*		
Neoporus	*blanchardi*		
Neoporus	*clypealis*		
Neoporus	*lynceus*		
Neoporus	*undulatus*		
Neureclipsis	*crepuscularis*		
Neurocordulia	*sp.*		
Neurocordulia	*alabamensis*		
Nigronia	*serricornis*		
Nilotanypus	*sp.*		
Nilotanypus	*fimbriatus*		
Nilothauma	*sp.*		
Notonecta	*sp.*		
Notonecta	*irrorata*		
Notonecta	*uhleri*		
Nyctiophylax	*moestus*		

Table D-7. Aquatic Invertebrate Species Documented on McCrady Training Center.			
GENUS	**SPECIES**	**COMMON NAME**	**NOTES**
Ochterus	*sp.*		
Oecetis	*sp.*		
Oecetis	*georgia*		
Oecetis	*nocturna*		
Oecetis	*persimilis*		
Oecetis	*scala*		
Oecetis	*sp.*		
Omisus	*sp.*		
Orthocladius	*annectens*		
Orthocladius	*dubiatus*		
Orthocladius	*lignicola*		
Orthocladius	*obumbratus*		
Oxyethira	*sp.*		
Pachydiplax	*longipennis*		
Parachaetocladius	*abnobaeus*		
Parachironomus	*pectinatellae*		
Parachironomus	*tenuicaudatus_complex*		
Paracladopelma	*sp.*		
Paracloeodes	*minutus*		
Parakiefferiella	*sp.*		
Paralauterborniella	*nigrohalteralis*		
Paraleptophlebia	*sp.*		
Paramerina	*anomala*		
Parametriocnemus	*sp.*		
Paraphaenocladius	*sp.*		
Paratanytarsus	*dissimilis*		
Paratendipes	*albimanus*		
Paratendipes	*subaequalis*		
Pelocoris	*sp.*		
Pelocoris	*femoratus*		
Peltodytes	*sp.*		
Peltodytes	*bradleyi*		
Pentaneura	*inconspicua*		
Perithemis	*lydia*		
Perlesta	*sp.*		
Perlinella	*ephyre/zwicki*		
Phaenopsectra	*sp.*		
Phylocentropus	*carolinus*		
Phylocentropus	*lucidus*		
Phylocentropus	*placidus*		
Physa	*sp.*		
Pilaria	*sp.*		
Polycentropus	*sp.*		
Polypedilum	*aviceps*		

Table D-7. Aquatic Invertebrate Species Documented on McCrady Training Center.			
GENUS	**SPECIES**	**COMMON NAME**	**NOTES**
Polypedilum	*fallax*		
Polypedilum	*flavum*		
Polypedilum	*halterale_grp.*		
Polypedilum	*illinoense_grp.*		
Polypedilum	*scalaenum_grp.*		
Polypedilum	*trigonus*		
Polypedilum	*tritum*		
Polypedilum	*sp.*		
Potthastia	*longimana*		
Probezzia	*sp.*		
Procambarus	*sp.*		
Procambarus	*ancylus*		
Procladius	*sp.*		
Procloeon	*sp.*		
Progomphus	*obscurus*		
Psectrocladius	*elatus*		
Psectrotanypus	*dyari*		
Pseudochironomus	*sp.*		
Pseudocloeon	*ephippiatum*		
Pseudocloeon	*frondale*		
Pseudocloeon	*propinquum*		
Pseudolimnophila	*sp.*		
Pseudosmittia	*sp.*		
Psilotreta	*frontalis*		
Psorophora	*sp.*		
Psychoda	*alternata*		
Ptilostomus	*sp.*		
Pycnopsyche	*guttifer*		
Pycnopsyche	*luculento/sonso*		
Pycnopsyche	*scabripennis*		
Ranatra	*sp.*		
Ranatra	*kirkaldyi*		
Rhagovelia	*obesa*		
Rheocricotopus	*robacki*		
Rheocricotopus	*tuberculatus*		
Rheosmittia	*arcuata*		
Rheotanytarsus	*exiguus_grp.*		
Rheotanytarsus	*pellucidus*		
Robackia	*demeijerei*		
Saetheria	*tylus*		
Sciara	*sp.*		
Serratella	*serratoides*		
Sialis	*sp.*		
Sialis	*aequalis*		

Table D-7. Aquatic Invertebrate Species Documented on McCrady Training Center.			
GENUS	**SPECIES**	**COMMON NAME**	**NOTES**
Sialis	*vagans*		
Sigara	*sp.*		
Simulium	*sp.*		
Simulium	*jonesi*		
Simulium	*krebsorum*		
Simulium	*slossonae*		
Simulium	*tuberosum*		
Simulium	*ubiquitum*		
Simulium	*venustum/verecundum*		
Siphlonurus	*sp.*		
Siumlium	*dixiense*		
Smittia	*sp.*		
Sperchopsis	*tesselata*		
Sphaeromias	*sp.*		
Stelechomyia	*perpulchra*		
Stempellina	*sp.*		
Stempellinella	*fimbriata*		
Stempellinella	*leptocelloides*		
Stenelmis	*sp.*		
Stenelmis	*sp.*		
Stenelmis	*bicarinata*		
Stenelmis	*convexula*		
Stenelmis	*lignicola*		
Stenelmis	*musgravei*		
Stenelmis	*xylonastis*		
Stenochironomus	*sp.*		
Stenovelia	*stagnalis*		
Stictochironomus	*devinctus*		
Stylurus	*sp.*		
Stylurus	*townesi*		
Tabanus	*sp.*		
Taenioteryx	*sp.*		
Tanytarsus	*sp.*		
Telmatoscopus	*superbus*		
Thaumalea	*sp.*		
Thienemanniella	*lobapodema*		
Thienemanniella	*xena*		
Thienemannimyia_grp.	*sp.*		
Tipula	*sp.*		
Triaenodes	*sp.*		
Triaenodes	*ignitus*		
Triaenodes	*perna*		
Tribelos	*jucundum*		
Trichocorixa	*macroceps*		

Table D-7. Aquatic Invertebrate Species Documented on McCrady Training Center.			
GENUS	**SPECIES**	**COMMON NAME**	**NOTES**
Tvetenia	*paucunca*		
Tvetenia	*vitracies*		
Unniella	*multivirga*		
Wormaldia	*sp.*		
Xenochironomus	*xenolabis*		
Xylotopus	*par*		
Zalutschia	*sp.*		
Zavreliella	*marmorata*		
Zavrelimyia	*thryptica_cmplx*		
Zavrelimyia	*sp.*		

E. Special Status Species Management

E.1 Special Status Animals

This section summarizes those special status animal species that are either documented to occur or have the potential to occur on MTC. There are one federally listed species, two state listed species, and two other rare species documented on MTC. Following the review of potential and documented species presented in **Table E-1**, the management recommendations for documented and potential species are provided. The SCARNG maintains species information and management recommendations for special status species within a database.

Table E-1. Potential Special Status Animals on McCrady Training Center.

Species	Status	Comments/Habitat	Status on MTC
Mammals			
Star-nosed mole *Condylura cristata*	SC (S3)	Mesic mixed forest and mesic deciduous hardwood and bottomland or floodplain forests.	Potential-Suitable Habitat – multiple surveys have not found
Rafinesque's big-eared bat *Corynorhinus rafinesquii*	SE (S2)	In South Carolina, permanent residents of the coastal plain and hibernate in caves and similar habitats rather than move south in winter.	Documented
Tri-colored bat *Perimyotis subflavus*	ARS (S1S2)	Found state-wide and utilize T-beam bridges, buildings, mines, tunnels, caves, and hollow trees for roosts. First diagnosed case of white nose syndrome in South Carolina in this species was in 2013.	Documented
Southern fox squirrel *Sciurus niger*	SC (S3S4)	Strongly associated with mature pine forests and mature pine-hardwood forests and prefer open herbaceous understory and patchy shrub cover.	Documented
Eastern spotted skunk *Spilogale putorius*	SC (S3)	A variety of habitats but associated with preferring woodlands, semi-open farmland, and old abandoned fields.	Potential-Suitable Habitat – multiple surveys have not found
Swamp rabbit *Sylvilagus aquaticus*	SC (S2?)	Found in close proximity to water with down woody debris.	Potential-Suitable Habitat – multiple surveys have not found
Black bear *Ursus americanus*	SC (S5)		Unlikely – no habitat
Birds			
Bald eagle *Haliaeetus leucocephalus*	BGEPA ST (S2)	Wide variety of habitats that provide suitable nest sites close to open water. Nests may be placed in snags or large live trees as well as on constructed platforms or utility poles. They are	Potential – within habitat range

Table E-1. Potential Special Status Animals on McCrady Training Center.			
Species	**Status**	**Comments/Habitat**	**Status on MTC**
		resident (stay year round) as long as there is open water where they can forage. Bald eagles in South Carolina are smaller than their northern counterparts	
American wood stork *Mycteria americana*	FT SE (S1S2)	Often seen walking slowly through marshes while foraging. Nests are typically located on trees surrounded by water, such as in cypress swamps, shallow creeks, and impoundments.	Potential – suitable habitat
Red-cockaded woodpecker *Picoides borealis*	FE SE (S2)	Mature pine forests, with an age of 60 years or greater, that lack a hardwood understory. Reside in clans and dig nest cavity in living tree. Nesting occurs in spring, from late April through May.	Documented
Barn-owl *Tyto alba*	SC (S4)		Potential-Suitable Habitat – multiple surveys have not found
Herptiles			
American alligator *Alligator mississippiensis*	FE ST (S5)	Coastal marshlands and inland impoundments frequented by waterfowl.	Unlikely – no suitable habitat
Chamberlain's dwarf salamander *Eurycea chamberlaini*	ARS (SNR)	Found in seepages near small streams and other wet areas. Commonly discovered under leaf and pine straw litter or other vegetative cover. Occasionally observed at depths of 15 cm. or greater, leading to under sampling in some cases.	Potential-Suitable Habitat – multiple surveys have not found
Southern hognose snake *Heterodon simus*	ARS ST (SNR)	Sandhill, pine flatwood, and coastal dunes.	Documented
Pine barrens treefrog *Hyla andersonii*	ST (S2S3)		
Insects			
Monarch butterfly *Danaus plexippus*	ARS (SNR)	Open fields and meadows with milkweed.	Documented
Mollusks			
Gravel elimia *Elimia catenaria*	SC (SNR)	Found in freshwater rivers and streams with cobble bottoms.	Unlikely – no suitable habitat
Carolina heelsplitter	FE (CH)	Although once found in large rivers and streams, now restricted to cool, clean, shallow,	

Table E-1. Potential Special Status Animals on McCrady Training Center.			
Species	**Status**	**Comments/Habitat**	**Status on MTC**
Lasmigona decorate	SE (S1)	shaded streams with pool, riffle and run sequences.	
Eastern floater *Pyganodon cataracta*	SC (SNR)		Potential-Suitable Habitat – insufficient surveys
Creeper *Strophitus undulatus*	SC (S2)	Shallow water in both small streams and large rivers in a variety of substrates.	Potential-Suitable Habitat – insufficient surveys
Eastern creekshell *Villosa delumbis*	SC (S4)	Found in deep muddy flock but can also be found in sand and boulder fields. It is most often close to the bank of streams and rivers among tree roots.	Potential-Suitable Habitat – insufficient surveys
Fish			
Shortnose sturgeon *Acipenser brevirostrum*	FE SE (S3)	Diadromous fish that inland prefer deep water. Often found in areas with soft substrate and a vegetated bottom.	Unlikely – no suitable habitat
Atlantic sturgeon *Acipenser oxyrinchus*	FE		Unlikely – no suitable habitat
Blueback herring *Alosa aestivalis*	ARS SC (S5)	Travels upstream in the Coastal Plain to spawn. In South Carolina it spawns on the Savannah River and Thurmond reservoir.	Unlikely – no suitable habitat
Carolina darter *Etheostoma collis*	SC (SNR)		Potential-Suitable Habitat – insufficient surveys
Banded killifish *Fundulus diaphanous*	SC (S1)		Potential-Suitable Habitat – insufficient surveys
Robust redhorse *Moxostoma robustum*	ARS SC (SNR)	Inhabit large rivers and are found from the rocky reaches of the mid-Piedmont to the coast. Gravel bars required for spawning (primarily in the transition zone between the piedmont and coastal plain).	Unlikely – no suitable habitat
Redlip shiner *Notropis chiliticus*	SC (S1?)		Potential-Suitable Habitat – insufficient surveys
Blacknose dace *Rhinichthys obtusus*	SC (S1)		Potential-Suitable Habitat – insufficient surveys
Crustacean			

Table E-1. Potential Special Status Animals on McCrady Training Center.			
Species	**Status**	**Comments/Habitat**	**Status on MTC**
Broad River spiny crayfish *Cambarus spicatus*	ARS SC (S3)	Restricted to the Broad River basin. Streams in basin exhibit signs of flash flooding including sand deposits and log jams. Usually found in or beneath debris.	Potential – insufficient survey effort

Sources: USFWS Richardson County list; USFWS IPaC Report for McCrady Training Center; South Carolina Department of Natural Resources Rare, Threatened, and Endangered Species of South Carolina for Richardson County.

FE=federally endangered, FT=federally threatened; ARS = USFWS has been petitioned to list the species and a positive 90-day finding has been issued (listing may be warranted); information provided only for conservation actions as no federal protections currently exist.

SE=state endangered, ST=state threatened,
SC = state species of special concern (S1, S2, S3 all indicate state Species of Conservation Concern)

S RANK: The priority assigned by SCDNR based upon the element's status within the state.
S1 = critically imperiled in the state because of extreme rarity (5 or fewer occurrences or very few remaining individuals or acres) or because of some factor(s) making it especially vulnerable to extirpation in the state.
S2 = imperiled in state because of rarity (6 to 20 occurrences or few remaining individuals or acres) or because of some factor(s) making it very vulnerable to extirpation from the state.
S3 = rare or uncommon in state (on the order of 21 to 100 occurrences).
S4 = apparently secure in state, with many occurrences.
SNR = not ranked at state level

E.1.1 **Documented Animal Species**

The following are management recommendations for species confirmed as occurring on MTC. Species descriptions and background information is maintained by SCARNG in a centralized location.

Rafinesque's big-eared bat

1. Identify, protect, and provide new and/or existing roosts/colonies.
2. Continue population inventory and monitoring surveys.
3. Maintain and/or contribute to a bat database.
4. Monitor and mitigate threats such as WNS, pesticide contamination, anthropologic disturbance, invasive species, etc.
5. Identify, protect, and enhance bat habitat and drinking resources
6. Conduct further research into species.
7. Provide education and outreach.

Tri-colored bat

1. Identify, protect, and provide new and/or existing roosts/colonies.
2. Continue population inventory and monitoring surveys.
3. Maintain and/or contribute to a bat database.
4. Monitor and mitigate threats such as WNS, pesticide contamination, anthropologic disturbance, invasive species, etc.
5. Identify, protect, and enhance bat habitat and drinking resources
6. Conduct further research into species.
7. Provide education and outreach.

Red-Cockaded Woodpecker

1. Work in coordination with Fort Jackson to aid in the implementation of their RCW Management Plan, and follow the RCW management recommendations within the plan. (File Path: \\mtc-envsrvr5\Library\Conservation\Program Management\INRMP\FJ INRMP FY17\FTJK_RCW_ESMC.docx)
2. Manage to provide optimum foraging and nesting habitat that is contiguous with, and as close as possible to each cluster.
3. Develop and implement habitat management practices within the HMU to aid in the establishment of Good Quality Foraging Habitat (GQFH) as specified in the Recovery Plan.
4. Foraging stands should consist of no or sparse hardwood maintained below 7 feet in height.
5. Canopy hardwoods will be li mited to no more than 10 square feet (ft^2) of basal area (BA).
6. Pines which are large enough to provide foraging habitat or large/old enough for cavity trees within 50 feet of an existing cavity tree will only be removed if deemed necessary.
7. The quality of foraging stands should be maintained to control hardwood growth, eliminate dense midstory, and reduce fuel levels available to wildfires. This can be accomplished through the following methods;
    a. Mechanical Mowers- These will be either tractor-drawn mowers or tracked or rubber-tired cutters with front or rear mounted rotary drum severe duty flail cutter heads or fixed tooth mulching/cutter heads.
    b. Manual - Hand operated chainsaws and gas-powered line trimmers with saw blades.
    c. Chemical - Registered herbicides applied by broadcast and single stem techniques.

Southern hognose snake

1. Protect and restore upland, longleaf pine and wiregrass habitat utilized by this species.
2. Manage longleaf and wiregrass habitat on long rotations and with large stumps remaining after harvest for underground refugia and hibernation sites.
3. Use prescribed fire to maintain open understory characteristics.
4. Continue inventory and research of known populations.
5. Continue outreach and education efforts.

Monarch butterfly

1. Habitat restoration, maintenance, and enhancement
2. Planting of milkweed host plants and wildflower nectar sources.
3. Public education
4. Research
5. Monitoring

E.1.2 **Potential Animal Species**

The following are management recommendations for species with some potential to occur on MTC, but not yet confirmed. See Table E-1 for more information about their likelihood on MTC. Species descriptions and background information is maintained by SCARNG in a centralized location.

Bald eagle

1. Maintaining current regulations/statutes
2. Protect nest/roost/foraging sites and communal areas
3. Limit disturbance: human development; construction; timber operations/ forestry; off-road vehicle use; motorized watercraft use; non-motorized recreation and human entry; helicopters and fixed-wing aircraft; blasting other loud, intermittent noise
4. Limit disturbance at foraging sites
5. Only use federal and state approved pesticides, herbicides, fertilizers, and other chemicals
6. Monitor and minimize contaminants/pollution/hazardous waste.

American wood stork

1. Conduct aerial surveys annually to locate new Wood Stork nesting colonies and to determine which colonies should be visited from the ground.
2. Conduct complete ground counts of Wood Stork nests at colony sites in South Carolina each year.
3. Provide permitting agencies with current information on Wood Stork colonies by updating distribution maps every year.
4. Monitor a sample of nests each year to quantify nesting success.
5. Determine survivorship of fledgling, immature, and adult Wood Storks using mark and recapture (band re-sighting) and satellite telemetry.
6. Document important habitat for Wood Storks during the nonbreeding season.
7. Determine if the amount of foraging habitat limits species recovery. Study foraging ecology and habitat use in South Carolina.
8. Participate in and contribute to the regional Wood Stork working group.
9. Integrate management for Wood Storks into traditional waterfowl management of currently impounded wetlands by timing draw downs during key feeding periods (post fledging).
10. Provide technical guidance and assistance to owners and managers of land where storks nest, feed, and roost.

Chamberlain's dwarf salamander

1. Maintaining current regulations/statutes protecting wetlands and streams
2. Protection of known populations
3. Furthering taxonomic study
4. Supporting survey efforts
5. Education.

Broad River spiny crayfish

Due to limited/deficient data on this species, additional surveys are recommended to determine further management decisions.

E.2 SPECIAL STATUS PLANTS

This section summarizes those special status plant species that are either documented to occur or have the potential to occur on MTC. There are currently two federally listed plant species and 35 state species of concern and/or federal at-at-risk plant species known to occur on MTC. Following the summary

presented in **Table E-2**, a summary by species is provided regarding management recommendations for these species, if found on MTC.

Table E-2. Potential Special Status Plants on McCrady Training Center.			
Species	**Status**	**Comments/Habitat**	**Status on MTC**
Pennell's false foxglove *Agalinis tenella*	SC (SNR)		
Elliott's bluestem *Andropogon gyrans var. stenophyllus*	SC (S1)		Documented
Piedmont three-awned grass *Aristida condensata*	SC (S2)		Documented
Sandhills milkvetch *Astragalus michauxii*	SC (S3)	Longleaf pine-wiregrass sandhills, pine woodlands, turkey oak-rosemary scrub.	Documented
Purple balduina *Balduina atropurpurea*	ARS (S1)		
Northern burmannia or Northern blue threads *Burmannia biflora*	SC (S2)		Documented
Winter grape-fern *Botrychium lunarioides*	SC (S1)		
Pine-barrens reed-grass *Calamovilfa brevipilis*	SC (S1)		Documented
Cherokee sedge *Carex cherokeensis*	SC (S2)		
Colin's sedge *Carex collinsii*	SC (S2)		
Ravenfoot sedge *Carex crus-corvi*	SC (S2)		
Elliot's sedge *Carex elliottii*	SC (S1)		Documented
Social sedge *Carex socialis*	SC (S1)		
Cayaponia *Cayaponia quinqueloba*	SC (S1?)		
Southern horse-balm	SC		Documented

Table E-2. Potential Special Status Plants on McCrady Training Center.			
Species	**Status**	**Comments/Habitat**	**Status on MTC**
Collinsonia serotina	(S1)		
Whorled horse-balm *Collinsonia verticillata*	SC (S3)		
Southeastern tickseed *Coreoposis gladiata*	SC (SNR)		
Ciliate-leaf tickseed *Coreopsis integrifolia*	ARS		
Spinulose shield fern *Dryopteris carthusiana*	SC (S1)		
Smooth coneflower *Echinacea laevigata*	FE SE (S3)	Typically found in open woods, glades, cedar barrens, roadsides, clearcuts, dry limestone bluffs, and power line rights-of-way with open areas and periodic disturbances.	Documented
Robbin's spicebush *Eleocharis robbinsii*	SC (S2)		Documented
Shoals spider-lily *Hymenocallis coronaria*	SC (S2)		
Carolina St. John's-wort *Hypericum nitidum*	SC (S1)		Documented
Sarvis holly *Ilex amelanchier*	SC (S3)		Documented
Red standing-cypress *Ipomopsis rubra*	SC (S2)		
Pine barren rush *Juncus abortivus*	SC (S2)		Documented
Piedmont pinweed *Lechea torreyi*	SC (SNR)		Documented
Small-head gayfeather *Liatris microcephala*	SC (S1)		Documented
Sandhills lily *Lilium pyrophilum*	SC (S1)		Documented
Bog spicebush *Lindera subcoriacea*	ARS		Documented

Table E-2. Potential Special Status Plants on McCrady Training Center.			
Species	**Status**	**Comments/Habitat**	**Status on MTC**
Spatulate seedbox *Ludwigia spathulate*	SC (S2)		
Carolina bugleweed *Lycopus cokeri*	SC (S2)		Documented
Rough-leaved loosestrife *Lysimachia asperulaefolia*	FE SC (S1)	Occurs in edges between longleaf pine uplands and pond pine pocosins (areas of dense shrub and vine growth usually on a wet, peaty, poorly drained soil) on moist to seasonally saturated sands and on shallow organic soils overlaying sand. Habitat is fire-maintained. Several populations are known from roadsides and power line rights of way where regular maintenance mimics fire and maintains vegetation so that herbaceous species are open to sunlight.	Documented
Carolina's birds-in-a-nest *Macbridea caroliniana*	ARS SC (S3)		Documented
Bigleaf magnolia *Magnolia macrophylla*	SC (S1)		
Pyramid magnolia *Magnolia pyramidata*	SC (S1)		
Piedmont water-milfoil *Myriophyllum laxum*	SC (S2)		Documented
Nestronia or leechbush *Nestronia umbellula*	SC (S3)	Habitat varies and includes upland mixed pine and hardwood stands, pine stands, and growing with upland oaks and hickories.	Documented
Adder's-tongue *Ophioglossum vulgatum*	SC (S2)	Shaded secondary and floodplain forests and forested bottomlands.	
Canby's dropwort *Oxypolis canbyi*	FE SC (S2)	Inhabits a variety of coastal plain communities, including pond cypress savannahs, the shallows and edges of cypress/pond pine ponds, sloughs, and wet pine savannas.	
Bead-grass *Paspalum bifidum*	SC (S2)		Documented
Pine-leaved golden aster	SC		Documented

Table E-2. Potential Special Status Plants on McCrady Training Center.			
Species	**Status**	**Comments/Habitat**	**Status on MTC**
Pityopsis pinifolia	(S2)		
Green-fringe orchis *Platanthera lacera*	SC (S2)		
Algae-like pondweed *Potamogeton confervoides*	SC (S1)		Documented
Alabama black cherry *Prunus alabamensis*	SC (S1)		Documented
Whisk fern *Psilotum nudum*	SC (S1)		
Crestless plume orchid *Pteroglossaspis ecristata*	SC (S2)		
Oglethorpe's oak *Quercus oglethorpensis*	SC (S3)	Occurs marshes and stream bottoms.	
Awned meadowbeauty *Rhexia aristosa*	SC (S3)		
May white *Rhododendron eastmanii*	SC (S2)		
Michaux's sumac *Rhus michauxii*	FE SC (SX)	Grows in sandy or rocky open woods in association with basic soils. Sometimes occur on highway rights-of way, roadsides, or on the edges of artificially maintained clearings.	
Drowned hornedrush *Rhynchospora inundata*	SC (S2?)		Documented
Beak rush *Rhynchospora macra*	SC (S1)		Documented
Few-flowered beaked-rush *Rhynchospora oligantha*	SC (S2)		Documented
Pale beakrush *Rhynchospora pallida*	SC (S1)		Documented
Chapman beakrush *Rhynchospora stenophylla*	SC (S2)		Documented
Sweet pitcher-plant *Sarracenia rubra*	SC (S3S4)		Documented

Table E-2. Potential Special Status Plants on McCrady Training Center.			
Species	**Status**	**Comments/Habitat**	**Status on MTC**
Canby bulrush *Scirpus etuberculatus*	SC (SNR)		Documented
Wire-leaved dropseed *Sporobolus teretifolius*	ARS SC (S1)		Documented
Elliott's aster *Symphyotrichum elliotii*	SC (S3)		
Georgia aster *Symphyotrichum georgianum*	ARS (SNR)	Open, sunny areas, including edges and openings in rocky, upland oak-hickory-pine forests, and rights-of-way. Primary limiting factor is availability of sunlight.	
White false-asphodel *Tofieldia glabra*	SC (S1S2)		Documented
Aethusa-like trepocarpus *Trepocarpus aethusae*	SC (S1)		Documented
Chapman's redtop *Tridens chapmanii*	SC (S1)		Documented
Wateree trillium *Trillium oostingii*	SC (S1)		
Weak nettle *Urtica chamaedryoides*	SC (S2)		
Rayner's blueberry *Vaccinium crassifolium ssp. sempervirens*	SC (S1)		Documented
Nuttall warea *Warea cuneifolia*	SC (S1)		Documented

Sources: USFWS Richardson County list; USFWS IPaC Report for McCrady Training Center; South Carolina Department of Natural Resources Rare, Threatened, and Endangered Species of South Carolina for Richardson County and SCARNG reports for MTC.

FE=federally endangered, FT=federally threatened; ARS = USFWS has been petitioned to list the species and a positive 90-day finding has been issued (listing may be warranted); information provided only for conservation actions as no federal protections currently exist.

SE=state endangered, ST=state threatened,
SC = state species of special concern (S1, S2, S3 all indicate state Species of Conservation Concern)

S RANK: The priority assigned by SCDNR based upon the element's status within the state.

Table E-2. Potential Special Status Plants on McCrady Training Center.			
Species	**Status**	**Comments/Habitat**	**Status on MTC**
S1 = critically imperiled in the state because of extreme rarity (5 or fewer occurrences or very few remaining individuals or acres) or because of some factor(s) making it especially vulnerable to extirpation in the state. S2 = imperiled in state because of rarity (6 to 20 occurrences or few remaining individuals or acres) or because of some factor(s) making it very vulnerable to extirpation from the state. S3 = rare or uncommon in state (on the order of 21 to 100 occurrences). S4 = apparently secure in state, with many occurrences. SNR = not ranked at state level			

E.2.1 **Documented Plant Species**

The following are management recommendations for species confirmed as occurring on MTC. Species descriptions and background information is maintained by SCARNG in a centralized location.

Elliott's bluestem

1. Conserve current populations.
2. Maintain moist, open habitat by protecting hydrology.
3. Spread seed to propagate new and strengthen current populations.
4. Avoid off-road vehicle use, as well as dredging, and filling activities,
5. Avoid/ limit chemical herbicide use.

Piedmont three-awned grass

1. Protect current populations and habitat.
2. Spread seed to propagate new and strengthen current populations.
3. Use prescribed burning and/or hand clearing to restore open habitats.
4. Avoid mechanical clearing and logging.
5. Avoid/ limit chemical herbicide use.

Sandhills milkvetch

1. Apply prescribed fire early in the growing season every 2-3 years, before plants flower.
2. Prevent pine straw raking and other ground disturbance.
3. Protect sandhills and scrub from development and conversion to pine plantation and agriculture.

Northern burmannia or Northern bluethread

1. Protect current populations and habitat.
2. Spread seed to propagate new and strengthen current populations.
3. Use prescribed burning and/or hand clearing to restore open habitats.
4. Avoid mechanical clearing and logging.
5. Avoid/ limit chemical herbicide use.

Pine-barrens reed-grass

1. Protect current populations and habitat.
2. Use prescribed burning and/or hand clearing to restore open habitats.
3. Avoid mechanical clearing and logging.
4. Avoid/ limit chemical herbicide use.

Elliott's sedge

5. Protect current populations and habitat.
6. Use prescribed burning and/or hand clearing to restore open habitats.
7. Avoid mechanical clearing and logging.
8. Avoid/ limit chemical herbicide use.

Southern horse-balm

1. Protect current populations and habitat.
2. Use prescribed burning and/or hand clearing to restore open habitats.
3. Avoid mechanical clearing and logging.
4. Avoid/ limit chemical herbicide use.

Smooth coneflower

1. See Ft. Jackson's Endangered Species Management Plan for Smooth Coneflower and Rough-leaved Loosestrife
2. File Path: \\mtc-envsrvr5\Library\Conservation\Threatened and Endangered\ESMP coneflower loosestrife
3. Use prescribed burning and/or hand clearing to restore open habitats.
4. Avoid mechanical clearing and logging.
5. Protect roadside and right-of-way population from herbicides and poorly timed mowing.

Robbin's spicebush

1. Avoid broadcast spraying of herbicides; use care with spot spraying.
2. Avoid known individual plant locations and conduct operations elsewhere when they are least likely to cause damage.
3. Minimize disturbance to hydrology, including soil disturbance from rutting.
4. Prescribed burns and/or brushing may be beneficial (dependent on local site conditions).
5. This species is likely sensitive to water quality. Following BMPs around streams and buffering associated drainages will reduce eutrophication and prevent water quality degradation.
6. Maintain and restore open habitat through selective clearing and brushing.

Carolina St. John's-wort

1. Protect current populations and habitat.
2. Use prescribed burning and/or hand clearing to restore open habitats.
3. Avoid mechanical clearing and logging.
4. Avoid/ limit chemical herbicide use.

Sarvis holly

5. Protect current populations and habitat.
1. Protect hydrology of swamp land habitat where Sarvis holly is found.
2. Avoid mechanical clearing and logging.
3. Avoid/ limit chemical herbicide use.

Pine barren rush

1. Protect current populations and habitat.
2. Use prescribed burning and/or hand clearing to restore open habitats.
3. Avoid mechanical clearing and logging.
4. Avoid/ limit chemical herbicide use.

Piedmont pinweed

1. Protect current populations and habitat.
2. Use prescribed burning and/or hand clearing to restore open habitats.
3. Avoid mechanical clearing and logging.
4. Avoid/ limit chemical herbicide use.

Small-head gayfeather

1. Protect current populations and roadside habitat.
2. Use prescribed burning and/or hand clearing to restore open habitats.
3. Avoid mechanical clearing and logging.
4. Avoid/ limit chemical herbicide use along roadsides and right-of-way.

Sandhills lily

1. Protect current populations and habitat.
4. Protect hydrology of swamp land habitat where it is/can be found.
5. Avoid mechanical clearing and logging.
6. Avoid/ limit chemical herbicide use.

Bog spicebush

1. Identify and protect current populations of bog spicebush.
2. Protect seepage wetlands from clearing, draining, and filling.
3. Following biofuel reduction in overgrown sites, allow fires in adjacent uplands to periodically burn into and across wetlands.

Carolina bugleweed

1. Protect current populations and habitat.
7. Protect hydrology of wetland habitat where it is found, such as damp meadows, ponds, and stream banks.
8. Avoid mechanical clearing and logging.
9. Avoid/ limit chemical herbicide use.

Rough-leaved loosestrife

1. See Ft. Jackson's Endangered Species Management Plan for Smooth Coneflower and Rough-leaved Loosestrife
2. File Path: \\mtc-envsrvr5\Library\Conservation\Threatened and Endangered\ESMP coneflower loosestrife
3. Protection of public and privately owned species population sites.
4. Maintenance by periodic prescribed burning.
5. Protection from adverse habitat alteration by ditching and drainage activities.
6. Collect and store seeds and plant material for propagation, research, and restoration projects.

Carolina's birds-in-a-nest

1. Identify, survey, monitor, and protect current populations.
2. Enhance, restore, and protect wetlands.
3. Work with landowners in/near key Carolina-birds-in-a-nest habitat to discourage indiscriminate use of herbicides for right-of-way maintenance.

Piedmont water-milfoil

1. Protect natural hydrology and water levels in ponds.
2. Prevent pollution runoff and sedimentation into ponds and streams.
3. Eradicate invasive water milfoil species.
4. Maintain historic water table levels.
5. Limit motorized boat use in ponds.

Nestronia or leechbush

1. Protect current populations and habitat.
2. Avoid logging and mechanical clearing.
3. Use fire or hand-clearing to create sunny openings in woodlands.

Bead-grass

1. Protect current populations and longleaf pine/ sandhill habitat.
2. Use prescribed burning and/or hand clearing to restore open habitats.
3. Avoid mechanical clearing and logging.
4. Avoid/ limit chemical herbicide use along roadsides and right-of-way

Pine-leaved golden aster

1. Apply prescribed fire every 2 - 3 years.
2. Avoid clearcutting, pine-straw raking, and other mechanical disturbances to the ground cover.

Algae-like pondweed

1. Conserve and monitor current populations.
2. Protect hydrology and wetland habitats where it is and can be found.
3. Remove vegetation where overcrowding occurs to reduce competition.

Alabama black cherry

1. Protect current populations and habitat

Drowned hornedrush

1. Protect current populations and habitat.
2. Protect hydrology of swamp land habitat where it is/can be found.
3. Avoid mechanical clearing and logging.
4. Avoid/ limit chemical herbicide use.

Beak rush

1. Protect current populations and habitat.
2. Use prescribed burning and/or hand clearing to restore open habitats.
3. Avoid mechanical clearing and logging.
4. Avoid/ limit chemical herbicide use.

Few-flowered beaked-rush

1. Protect current populations and habitat.
2. Use prescribed burning and/or hand clearing to restore open habitats.
3. Avoid mechanical clearing and logging.
4. Avoid/ limit chemical herbicide use.

Pale beakrush

1. Protect current populations and habitat.
2. Use prescribed burning and/or hand clearing to restore open habitats.
3. Avoid mechanical clearing and logging.
4. Avoid/ limit chemical herbicide use.

Chapman beakrush

1. Protect current populations and habitat.
2. Use prescribed burning and/or hand clearing to restore open habitats.
3. Avoid mechanical clearing and logging.
4. Avoid/ limit chemical herbicide use.

Sweet pitcher-plant

1. Protect current populations for destruction and illegal take.
2. Protect wetland habitat where it is/can be found.
3. Avoid mechanical clearing and logging.
4. Avoid/ limit chemical herbicide use.

Canby bulrush

1. Protect current populations.

2. Protect wetland habitat where it is/can be found.
3. Avoid mechanical clearing and logging.
4. Avoid/ limit chemical herbicide use.

Wire-leaved dropseed

1. Burn on a 2-3 year rotation during the growing season.
2. Avoid plowing fire lines, especially streamside transition zones.
3. Prevent pine straw raking and use of herbicides in longleaf pine habitats.
4. Protect pine communities from clearing and logging.
5. Avoid altering hydrology of seepage slopes and savannas.

White false-asphodel

1. Protect current populations.
2. Protect wetland habitat where it is/can be found.
3. Avoid mechanical clearing and logging.
4. Avoid/ limit chemical herbicide use.

Aethusa-like trepocarpus

1. Protect current populations.
2. Protect wetland habitat where it is/can be found such as floodplain forests, wet ditches, and disturbed sites.
3. Avoid mechanical clearing and logging.
4. Avoid/ limit chemical herbicide use.

Chapman's redtop

1. Protect current populations and habitat.
2. Use prescribed burning, mowing, and/or hand clearing to restore open habitats.
3. Avoid mechanical clearing and logging.
4. Avoid/ limit chemical herbicide use.

Rayner's blueberry

1. Protect current populations and habitat.
2. Use prescribed burning, mowing, and/or hand clearing to restore open habitats.
3. Avoid mechanical clearing and logging.
4. Avoid/ limit chemical herbicide use.

Nuttall warea

1. Protect current populations and habitat.
2. Use prescribed burning, mowing, and/or hand clearing to restore open habitats.
3. Avoid mechanical clearing and logging.
4. Avoid/ limit chemical herbicide use.

E.2.2 **Potential Plant Species**

The following are management recommendations for species with some potential to occur on MTC, but not yet confirmed. See Table E-2 for more information about their likelihood on MTC. Species descriptions and background information is maintained by SCARNG in a centralized location.

Purple baldina

1. Burn on a 2-3 year rotation during the growing season.
2. Avoid soil disturbance, ditching, draining, firebreak construction, bedding, and mechanical clearing in wetlands

Ciliate-leaf tickseed

1. Identify and protect current populations.
2. Avoid damming and polluting streams.
3. Avoid clearcutting of floodplains and other disturbances along riverbanks.
4. Avoid the use of pesticides near streams.
5. Exclude cattle from bottomlands and streambanks.

Canby's dropwort

1. Burn on a 2-3 year rotation and allow fire in uplands to burn into edges of ponds and Carolina Bays
2. Avoid placing firebreaks in transition zones between uplands and wetlands.
3. Avoid ditching, draining, or altering hydrology of ponds, sloughs, and bays.
4. Limit ground water withdrawal.

Michaux's sumac

1. Use prescribed burning and/or hand clearing to maintain sunny conditions.
2. Avoid mechanical clearing and the use of herbicides and heavy equipment.
3. Support efforts to introduce female plants to male-only sites and vice versa.
4. Artificially pollenate female plants.

F. PHYSICAL OVERVIEW

F.1 CLIMATE

MTC is located east of the state capital and second largest city in South Carolina, Columbia. The warm Gulf Stream current moves along the long coastline in the state of South Carolina, while the Appalachian Mountains to the north and west block or delay many cold air masses approaching from those directions. The climate at MTC is classified as humid continental. The predominant climatic factors are the location in the lower latitudes and its proximity to the Appalachian Mountains to the west, which block the approach of unseasonable cold weather in the winter. These factors result in a relatively narrow annual temperature range. The Bermuda high, a maritime tropical air mass brings warm, moist air inland from the ocean, which forms localized thunderstorms and high precipitation (South Carolina State 2019).

F.1.1 Climate Summary

The climate at CHTC is classified as humid continental. The predominant climatic factors are the location in the lower latitudes and its proximity to the Appalachian Mountains to the west, which block the approach of unseasonable cold weather in the winter. These factors result in a relatively narrow annual temperature range. The most rain in the region typically occurs in the summer months July (between 5 and 6 inches) (CPPP 2019). **Table F-1** summarizes the climate near MTC over a period of 19 years, from 1981 to 2010.

Table F-1. Climate Summary for McCrady Training Center, SC: 1981-2010

Month	Temperature (°F) –Monthly Normal			Precipitation (Inches) - Average Monthly Normal
	Maximum	Minimum	Mean	
January	56.0	35.9	45.9	3.63
February	60.5	38.4	49.4	3.65
March	68.6	44.7	56.7	3.88
April	76.5	52.4	64.5	2.69
May	83.9	60.5	72.2	2.97
June	89.9	69.0	79.5	4.91
July	93.0	72.3	82.7	5.18
August	90.9	71.5	81.2	4.94
September	85.7	66.0	75.8	4.04
October	76.2	54.4	65.3	3.32
November	67.5	44.6	56.1	2.99
December	58.5	37.6	48.1	3.20

Source: (National Weather Service 2019)

MTC is located in a subtropical climate characterized by hot, humid summers and moderately cold winters. Summer temperatures are generally in the low 80°F Fahrenheit (F) range, with temperatures sometimes exceeding 100°F and falling below 50°F. Winter months average 56 F during daylight hours and 33°F at night. Average annual precipitation from 2000 to 2019 is 44.31 inches (National Weather Service 2019). With the exception of wet periods, climate conditions on MTC are ideal for training. It is

important to note that during wet periods, limitations on vehicle maneuvering will curtail training activities. About every five years an ice storm occurs, severe enough to cause some timber damage. Every few years a tropical storm will cause heavy rains for 2-3 days. In extremely rare instances, tropical storm winds come inland far enough to cause damage, such as occurred during Hurricane Hugo in 1989.

Thunderstorms during summer months can also limit training activities. Lightning strikes occur frequently at MTC from June through October. Fort Jackson Range Control is responsible for notifying all users of ranges and training areas of impending severe weather including electrical storm information in accordance with the Fort Jackson Severe Weather Emergency Action Plan. Once alerted, units are required to stop training and seek appropriate shelter for their personnel until the storm has passed. Lightning is and will continue to be a training distracter.

F.1.2 Regional Projections

It is expected that across the southwest, including South Carolina, warming will continue at an accelerated rate, with the largest temperature increases occurring in the summer months. The number of very hot days of > 100°F is projected to rise at a greater rate than the average temperature. Under the lower GHG emissions scenario, average temperatures are expected to rise by about 4.5°F over the next 70 years, while the higher scenario raises the temperature by about 9°F (SCDNR 2013). Summers by the 2080s are projected to be about 11°F hotter, with increased incidence of drought and more extreme precipitation events. Since the 1990s, changes in precipitation throughout the state have occurred, with increases in heavy downpours in many parts of the Southeast, even though much of the region has experienced moderate to severe droughts during the same period of time (SCDNR 2013). Additionally, impacts from sea level rise are anticipated to be more intense in coastal states such as South Carolina, with impacts reaching inland via streams, and lakes (SCDNR 2013).

F.1.3 DoD Climate Assessment Tool

In 2020 the DOD introduced the Army Directive 2020-08 (U.S. Army Installation Policy to Address Threats Caused by Changing Climate and Extreme Weather), requiring installations to implement the DOD Climate Assessment Tool into their INRMPS.

The DoD Climate Assessment Tool is a web-based collection of scientific climate data used to support research, analysis, and decision making regarding exposure to historical extreme weather and reasonably foreseeable climate effects. At the installation scale, the Climate Assessment Tool can be used to analyze an installation's susceptibility to climate and extreme weather events via hazard exposure assessments, inform planning and land use recommendations, and identify areas for additional climate studies. The Tool can be accessed via CAC-card at https://dodclimate.sec.usace.army.mil/ords/f?p=118:01:::::::.

As the Tool does not provide assessments for the National Guard, only the Air Force, Army, and Navy, the closest department- level assessment we can generate is the Army. Geographically, the closest Army installation that can be used as a proxy for a McCrady Training Center Hazard Assessment is Fort Jackson in Eastover, South Carolina. The following documents are an Extreme Weather and Climate Change Hazard Report and Projected Installation-Specific Hazard Details for Fort Jackson, South Carolina.

Extreme Weather and Climate Change Hazard Report

Fort Jackson

Background

RPSUID: 5017

Installation Name: Fort Jackson

Report Date: 15 September 2022

Data Version: 2.0

Location: South Carolina

Area: 52711 acres

Department: Army

Service: Army

Component: Army Active

NCA4 Region: Southeast

Historical Extreme Weather and Climate Change Exposure

Historical Extreme Weather Event Occurrence

For historical extremes, this table shows whether the installation, or the immediately surrounding region (small watershed or county, depending on the measure) has experienced this event. of this location is classified as being in the Wildland Urban Interface as defined by the USDA.

Event Type	Has Occurred
Hurricane Frequency	X
Tornado Frequency	X
Ice Storms Occurrence	X
Hurricane Wind > 50 Knots	X
Hurricane Maximum Precipitation	X
Ice Jam Occurrence	

Damaging Extreme Weather and Wildfire Events, 2000-2021

This shows the damage sustained in the county or counties (for Alaska, NOAA forecast zone) in which Fort Jackson is located. The first table shows the total damage by event type since 2000. The second table shows the largest fifteen events across all types recorded at this location since 2000. The data for these tables come from the NOAA Storm Events Database (https://www.ncdc.noaa.gov/stormevents/).

Many NWS storm event types (https://www.nws.noaa.gov/directives/sym/pd01016005curr.pdf) are broadly similar in impact, but differ along a continuum of magnitudes or geographies (marine vs. land, for instance). In order to provide a readily accessible assessment of damages by type of damage, some NWS storm event type categories are combined for presentation in the Installation Report. More information about that event types represented by the categories below, and event types that were excluded from this analysis, can be found in *Documentation of and Justification for Collapsing NOAA Storm Event Categories* located in the Manuals tab of this tool.

Damages data for ROW locations are not available at this time as the NOAA Storm Events Database does not extend to this domain. The DCAT Team is working to identify comparable data for the ROW domain.

Damages from Extreme Weather and Wildfire, 2000-2021
Administrative Unit(s): Richland, SC

Type	# of Events	Property Damage Estimate	Direct Deaths
Riverine and Lakeshore Flooding	186	$30,678,910.00	9
Wind Damage	511	$3,310,750.00	2
Heavy Rain	40	$1,124,900.00	0
Tornadoes and Waterspouts	18	$440,000.00	0
Hail	134	$17,700.00	0

Top Property Damaging Storm Events, 2000-2021
Administrative Unit(s): Richland, SC

Rank	Date	Type	Property Damage Estimate	Direct Deaths
1	10/04/2015	Flash Flood	$28,125,000.00	7
2	08/01/2016	Flash Flood	$1,074,000.00	0
3	08/01/2016	Heavy Rain	$1,000,000.00	0
4	04/05/2011	Thunderstorm Wind	$920,000.00	0
5	07/17/2013	Thunderstorm Wind	$823,000.00	0
6	09/07/2004	Tornado	$400,000.00	0
7	08/12/2004	Thunderstorm Wind	$306,000.00	0
8	07/22/2009	Flash Flood	$300,000.00	0
9	08/05/2015	Thunderstorm Wind	$210,000.00	0
10	06/04/2015	Flash Flood	$127,000.00	0
11	09/25/2011	Heavy Rain	$120,000.00	0
12	09/25/2011	Flash Flood	$104,000.00	0
13	10/10/2015	Flash Flood	$100,000.00	0
14	10/07/2015	Flash Flood	$100,000.00	2
15	09/26/2015	Flood	$78,000.00	0

Dominant Climate Change Hazards

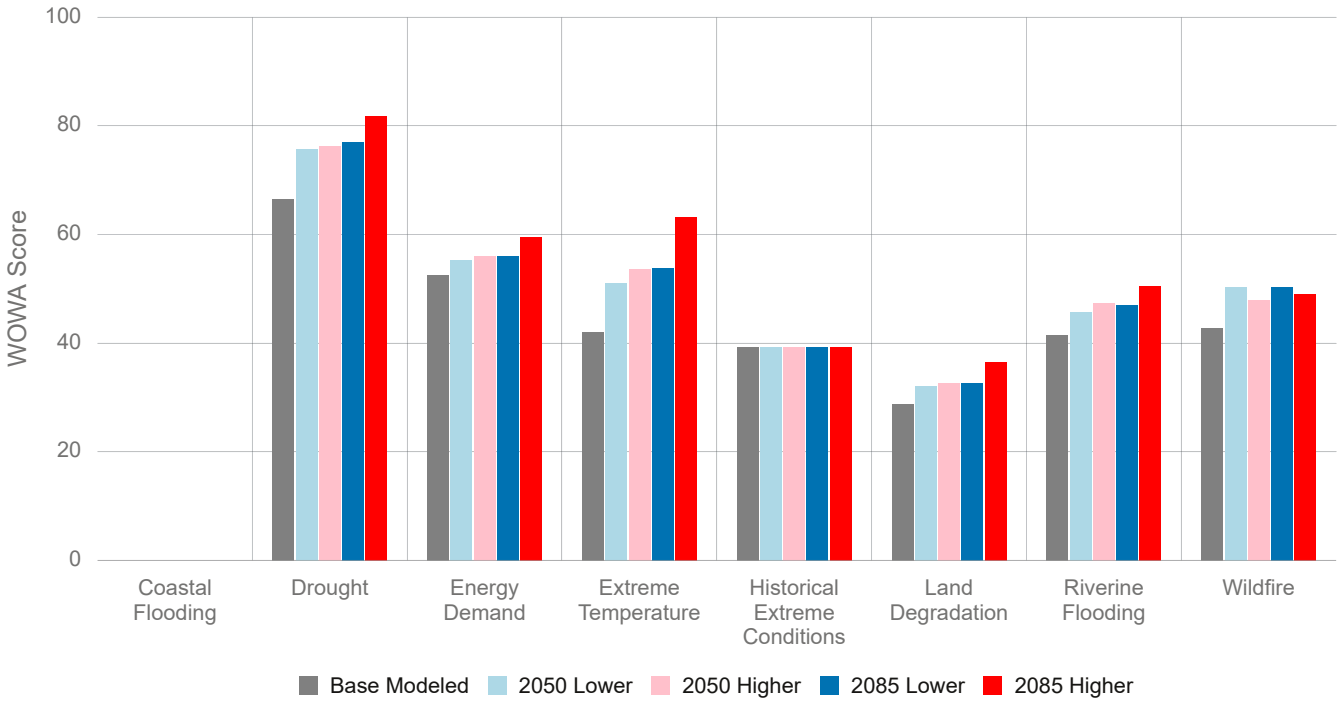
This section explores the dominant climate hazards that Fort Jackson is likely to be exposed to in the future, compared to its exposure based on the modeled historical baseline (1950-2005) data. To bracket the range of potential future conditions, the data are presented to two climate epochs (a 30-year average centered on 2050 (2035-2064) and another centered on 2085 (2070-2099). For each epoch, information for two future scenarios* is provided: a Higher emissions scenario that assumes minimal greenhouse gas mitigation and therefore higher rates of warming and a Lower emissions scenario that assumes more aggressive greenhouse gas mitigation and, therefore, lower rates of warming.

* The Higher scenario corresponds to representative concentration pathway (RCP) 8.5, the Lower to RCP 4.5 used in climate modeling studies.

Ranked Future Climate Exposure Hazards per Epoch-Emission Scenario (and the hazard's greatest contributing indicator)

Rank	2050-High	2085-High
1	Drought (Mean Annual Runoff)	Drought (Mean Annual Runoff)
2	Energy Demand (5-Day Maximum Temperature)	Extreme Temperature (5-Day Maximum Temperature)
3	Extreme Temperature (5-Day Maximum Temperature)	Energy Demand (5-Day Maximum Temperature)
4	Wildfire (Flash Drought Frequency)	Riverine Flooding (Extreme Precipitation Days)
5	Riverine Flooding (Extreme Precipitation Days)	Wildfire (Flash Drought Frequency)
6	Historical Extreme Conditions (Ice Storms Occurrence)	Historical Extreme Conditions (Ice Storms Occurrence)
7	Land Degradation (Aridity)	Land Degradation (Aridity)

The contribution of each hazard to overall exposure through time is also illustrated graphically, below. **Note that historical extreme conditions is a static hazard across the future.**



Heat Exposure Hazard

Changing temperatures are the driving force behind all climate change hazards, either directly through factors such as excess morbidity and mortality, or indirectly through changes to drought, wildfire, flooding, coastal inundation, and other hazards.

Indicator ID	Indicator Name	Base	2050 Lower	2050 Higher	2085 Lower	2085 Higher
402	5-Day Maximum Temperature (°F)	98	103	104	104	108
401	Days Above 95°F (days/year)	16	54	66	65	104
405	High Heat Index Days* (days/year)	71	114	123	122	151

* The Wet Bulb Globe Temperature, cannot be calculated with the data available from climate models, so the National Weather Service Heat Index is provided as an estimate of the combined effects of heat and humidity on people working and exercising outdoors.

Riverine Flood Inundation Hazard

Percent Installation Area Inundated

This table shows the percent of the installation boundary that is inundated at the current 1% annual exceedance probability (AEP) riverine flood event, and when freeboards of 2 ft and 3 ft are added to the 1% AEP flood elevation in accordance with 10 USC 2802 and UFC 3-201-01, Civil Engineering. If the values are 0, no part of the installation is subject to riverine flooding. Riverine floodplain maps are available on Defense Installations Spatial Data Infrastructure (DISDI) Portal.

Indicator ID	Indicator Name	1% AEP	1% AEP+2 Ft	1% AEP+3ft
301	Riverine Flood Extent	23.9%	36.8%	40.2%

Percent of Buildings Inundated Based on DISDI Data

This table shows the percent of the installation buildings likely to be inundated at the current 1% annual exceedance probability (AEP) riverine flood event, and when freeboards of 2 ft and 3 ft are added to the 1% AEP flood elevation in accordance with 10 USC 2802 and UFC 3-201-01, Civil Engineering. If the values are 0, no buildings are flooded by the event.

RPSUID	Total # of Buildings*	Base 1% AEP	1% AEP + 2Ft	1% AEP + 3Ft
5017	1965	6% (122)	18% (357)	20% (397)

* DoD Buildings from DISDI FY19 Buildings Sites Geodatabase

Coastal Flood Inundation Hazard

Percent Installation Area Inundated

This table shows the percent of the installation boundary that is inundated at the current 1% annual exceedance probability (AEP) coastal flood event, in accordance with UFC 3-201-01, Civil Engineering. Sea level elevations are based on the Defense Regional Sea Level (DRSL) Lowest and Highest sea level rise curves and a simple bathtub model of inundation. Storm surge is explicitly excluded, and would be in addition to the elevations modeled here. If the values are 0, no part of the installation is subject to coastal flooding or no data are available for the installation DRSL. Coastal inundation maps are available on Defense Installations Spatial Data Infrastructure (DISDI) Portal.

Indicator ID	Indicator Name	Base	2050 Lower	2050 Higher	2085 Lower	2085 Higher
201	Coastal Flood Extent	0%	0%	0%	0%	0%

Percent of Buildings Inundated Based on DISDI Data

This table shows the percent of the installation buildings likely to be inundated by the 1% annual exceedance probability (AEP) coastal flood event, and by this event in the future given sea level rise. Future sea levels are determined from data in the Defense Regional Sea Level (DRSL) Lowest and Highest sea level rise curves, bracketing the scenarios required by UFC 3-201-01, Civil Engineering. If the values are 0, no buildings are flooded by the event.

RPSUID	Total # of Buildings*	Base 1% AEP	2050 Low	2050 High	2085 Low	2085 High
5017	1965	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)

* DoD Buildings from DISDI FY19 Buildings Sites Geodatabase

Permafrost

Area of Installation With Permafrost Hazard Index > 0

The permafrost Hazard Index (Hjort et al. 2018) is an estimate of where permafrost co-occurs with fine, non-gravelly sediment. Permafrost thaw in these locations is likely to result in subsidence and damage to buildings and infrastructure. This indicator is the percent area of the installation where this index is greater than 0, indicating future subsidence hazard from permafrost thaw. A value of 0 indicates future thaw will not result in infrastructure damage (because the substrate, for example is gravelly) or because no permafrost is currently present (therefore there is also no hazard).

Indicator ID	Indicator Name	Base	2050 Lower	2050 Higher	2085 Lower	2085 Higher
702	Permafrost Hazard Potential	0%	0%	0%	0%	0%

Percent of Buildings With Permafrost Exposure Based on DISDI Data

The table below shows the percent of installation buildings located within areas where permafrost modeled to occur today based on USGS 50% likelihood estimate of permafrost extent (Pastick et al. 2015). If the values are 0, no buildings are anticipated to be affected by permafrost thaw. Permafrost extent maps are available on Defense Installations Spatial Data Infrastructure (DISDI) Portal.

RPSUID	Total # of Buildings*	Permafrost Likely
5017	1965	0% (0)

* DoD Buildings from DISDI FY19 Buildings Sites Geodatabase

Climate Change Exposure Overview

This section provides an overview of the key climate change concerns of the region in which Fort Jackson is located. Additional information about this region is provided in the Hazard Awareness Tab of the DCAT, and from the National Climate Assessment (https://nca2018.globalchange.gov/).

4th National Climate Assessment - Key Messages: Southeast

Southeast Key Message 1: Urban Infrastructure and Health Risks

Many southeastern cities are particularly vulnerable to climate change compared to cities in other regions, with expected impacts to infrastructure and human health. The vibrancy and viability of these metropolitan areas, including the people and critical regional resources located in them, are increasingly at risk due to heat, flooding, and vector-borne disease brought about by a changing climate. Many of these urban areas are rapidly growing and offer opportunities to adopt effective adaptation efforts to prevent future negative impacts of climate change.

Southeast Key Message 2: Increasing Flood Risks in Coastal and Low-Lying Regions

The Southeast's coastal plain and inland low-lying regions support a rapidly growing population, a tourism economy, critical industries, and important cultural resources that are highly vulnerable to climate change impacts. The combined effects of changing extreme rainfall events and sea level rise are already increasing flood frequencies, which impacts property values and infrastructure viability, particularly in coastal cities. Without significant adaptation measures, these regions are projected to experience daily high tide flooding by the end of the century.

Southeast Key Message 3: Natural Ecosystems will be Transformed

The Southeast's diverse natural systems, which provide many benefits to society, will be transformed by climate change. Changing winter temperature extremes, wildfire patterns, sea levels, hurricanes, floods, droughts, and warming ocean temperatures are expected to redistribute species and greatly modify ecosystems. As a result, the ecological resources that people depend on for livelihood, protection, and well-being are increasingly at risk, and future generations can expect to experience and interact with natural systems that are much different than those that we see today.

Southeast Key Message 4: Economic and Health Risks for Rural Communities

Rural communities are integral to the Southeast's cultural heritage and to the strong agricultural and forest products industries across the region. More frequent extreme heat episodes and changing seasonal climates are projected to increase exposure-linked health impacts and economic vulnerabilities in the agricultural, timber, and manufacturing sectors. By the end of the century, over one-half billion labor hours could be lost from extreme heat-related impacts. Such changes would negatively impact the region's labor-intensive agricultural industry and compound existing social stresses in rural areas related to limited local community capabilities and associated with rural demography, occupations, earnings, literacy, and poverty incidence. Reduction of existing stresses can increase resilience.

U.S. Caribbean Key Message 1: Freshwater

Freshwater is critical to life throughout the Caribbean. Increasing global carbon emissions are projected to reduce average rainfall in this region by the end of the century, constraining freshwater availability, while extreme rainfall events, which can increase freshwater flooding impacts, are expected to increase in intensity. Saltwater intrusion associated with sea level rise will reduce the quantity and quality of freshwater in coastal aquifers. Increasing variability in rainfall events and increasing temperatures will likely alter the distribution of ecological life zones and exacerbate existing problems in water management, planning, and infrastructure capacity.

U.S. Caribbean Key Message 2: Marine Resources

Marine ecological systems provide key ecosystem services such as commercial and recreational fisheries and coastal protection. These systems are threatened by changes in ocean surface temperature, ocean acidification, sea level rise, and changes in the frequency and intensity of storm events. Degradation of coral and other marine habitats can result in changes in the distribution of species that use these habitats and the loss of live coral cover, sponges, and other key species. These changes will likely disrupt valuable ecosystem services, producing subsequent effects on Caribbean island economies.

U.S. Caribbean Key Message 3: Coastal Systems

Coasts are a central feature of Caribbean island communities. Coastal zones dominate island economies and are home to critical infrastructure, public and private property, cultural heritage, and natural ecological systems. Sea level rise, combined with stronger wave action and higher storm surges, will worsen coastal flooding and increase coastal erosion, likely leading to diminished beach area, loss of storm surge barriers, decreased tourism, and negative effects on livelihoods and well-being. Adaptive planning and nature-based strategies, combined with active community participation and traditional knowledge, are beginning to be deployed to reduce the risks of a changing climate.

U.S. Caribbean Key Message 4: Rising Temperatures

Natural and social systems adapt to the temperatures under which they evolve and operate. Changes to average and extreme temperatures have direct and indirect effects on organisms and strong interactions with hydrological cycles, resulting in a variety of impacts. Continued increases in average temperatures will likely lead to decreases in agricultural productivity, changes in habitats and wildlife distributions, and risks to human health, especially in vulnerable populations. As maximum and minimum temperatures increase, there are likely to be fewer cool nights and more frequent hot days, which will likely affect the quality of life in the U.S. Caribbean.

U.S. Caribbean Key Message 5: Disaster Risk Response to Extreme Events

Extreme events pose significant risks to life, property, and economy in the Caribbean, and some extreme events, such as flooding and droughts, are projected to increase in frequency and intensity. Increasing hurricane intensity and associated rainfall rates will likely affect

human health and well-being, economic development, conservation, and agricultural productivity. Increased resilience will depend on collaboration and integrated planning, preparation, and responses across the region.

U.S. Caribbean Key Message 6: Increasing Adaptive Capacity through Regional Collaboration

Shared knowledge, collaborative research and monitoring, and sustainable institutional adaptive capacity can help support and speed up disaster recovery, reduce loss of life, enhance food security, and improve economic opportunity in the U.S. Caribbean. Increased regional cooperation and stronger partnerships in the Caribbean can expand the region's collective ability to achieve effective actions that build climate change resilience, reduce vulnerability to extreme events, and assist in recovery efforts.

Fort Jackson - Fort Jackson

(* = selected locations)

Hazard			Wildfire	Drought	Coastal Flooding	Riverine Flooding	Extreme Temperature	Energy Demand	Historical Extreme Conditions	Land Degradation
Modeled Historical Period (1950-2005)		314	13.6%	21.2%	0.0%	13.2%	13.4%	16.8%	12.5%	9.2%
Lower	2050	350	14.4%	21.7%	0.0%	13.1%	14.6%	15.8%	11.3%	9.2%
Lower	2085	356	14.1%	21.6%	0.0%	13.2%	15.1%	15.7%	11.0%	9.2%
Higher	2050	353	13.6%	21.6%	0.0%	13.4%	15.2%	15.9%	11.1%	9.2%
Higher	2085	380	12.9%	21.5%	0.0%	13.3%	16.6%	15.7%	10.4%	9.6%

Hazards

- Wildfire
- Drought
- Coastal Flooding
- Riverine Flooding
- Extreme Temperature
- Energy Demand
- Historical Extreme Conditions
- Land Degradation

Wildfire	Drought	Coastal Flooding	Riverine Flooding	Extreme Temperature	Energy Demand	Historical Extreme Conditions	Land Degradation
101	101	201	301	401	402	801	105
601	102	202	302C	402	501	802	202
602	105		303	403	502	803	604
604	106		304	404	503	804	701
	108C		305	405		805	702
						806	
						807	
						808	

ORness: 0.70
Using National Standard? Yes

Dataset: DoD Climate Assessment Tool 2.0
Climate Data Source: CMIP5 GCM - LOCA dataset (CONUS); BCSD dataset (AK, HI); Globus dataset (ROW)

F.2 GEOLOGY

Fort Jackson is on the northwestern edge of the Atlantic Coastal Plain Province, a region of low to moderate relief and gently rolling plains, known as the Sandhills. The Fall Line, a zone that mark the boundary between younger softer sediments of the province and ancient crystalline rocks the Piedmont Plateau Province, is about 4 miles west of the cantonment area (Gene Stout and Associates 2004).

The principal geologic formation in the Sandhills is the Tuscaloosa, which consists of marine deposits of light-colored sands and kaolin clays. Most soils at Fort Jackson are formed from Tuscaloosa sediment. A Quaternary sand terrace layer overlies the Tuscaloosa formation, which lies on a complex of old metamorphic and igneous rock. The Tuscaloosa complex general consists of clay strata overlying unconsolidated sands. The Upper Cretaceous-age Tuscaloos formation outcrops over most of Fort Jackson and consists of unconsolidated, cross bedded, kaolinitic, and arkosic sands. It lies uncomformably on the peneplained surface of crystalline rocks. Near the northern boundary of the installation, older crystalline rocks of the Carolina SlaGroup outcrop at the surface. In the northwest portions of Fort Jackson, Pleistocene sands and gravel are at the ground surface (Gene Stout and Associates 2004).

The MTC is in the upper cretaceous geologic map unit of South Carolina (SCDNR 2018). The upper cretaceous is mostly coarse to fine-grained sands, with lenses of clay of variable thickness, representing fluvial or upper delta-plain environments (SCDNR 2018). The sandhills are often characterized by soils

that are highly permeable, and in upland, interfluvial; vegetation is often well adapted to dry, even arid, conditions. Soils are classed as Entisols, which are generally low in nutrients and organics due to rapid leaching. They include the excessively drained Lakeland soils, the Vaucluse-Ailey-Pelion series, the Fuquay-Troup-Vaucluse series, and the Pelion Johnston-Vaucluse series (Lawrence 1978). Because of the areas shallow aquifers and high sand component, soil productivity tends to be low.

F.3 TOPOGRAPHY

Gently to moderately rolling, moderately dissected high plains occupy most of Fort Jackson. These high plains are interrupted by the nearly flat alluvial plains of Gills, Cedar, and Colonels creeks and their tributaries and an irregularly distributed, gently sloping, low relief area in the central portion of the installation near the headwaters of Cedar Creek. Local relief in the high plains is largely 165-250 feet. Slopes are predominately 3-8%; however, along narrow stream valleys, slopes commonly exceed 15%.

The landscape on MTC within Fort Jackson is made up of rolling coarse-grained, pine-dominated sand hills and lowlands, including three old Sandhill ponds, a large shrub-marsh complex (formerly a pond), and extensive black gum and mixed hardwood swamps along streams. The main ridges are mostly gentle slopes with elevations ranging from 350 to 500 feet above mean sea level. Intersecting side slopes and smaller ridges give rise to elevations of 300 to 400 feet. The majority of slopes are gentle and the few moderately steep slopes that do occur on the installation are short in length. Intermittent sandstone outcroppings can be found along various ridge tops. Elevations along streams range from 200 to 300 feet. The highest point is approximately 500 feet and is found near the center of the installation.

Colonel's Creek is the primary drainages on the installation (see Water Resources below). Colonel's Creek flows southeast across the installation. Colonel's Creek has a relatively deep valley.

F.4 SOILS

A description of the soils at MTC can be found in the Soil Survey of Richland County South Carolina (via the NRCS Soil Mapper and associated GIS data). Within the nine soils series (**Table F-2**), there are ten different soils located on MTC (**Appendix B**, **Figure 2**). Nine of these soils are sand or sand/loam combinations. The Colonel's Creek basin is dominated by well drained and semi well drained loamy sands.

The major soil association at the MTC is the Vaucluse loamy sand is well drained and has high erodibility potential, especially on a steep slope with rainfall. The MTC's relatively small vehicle maneuver area severely limits its ability to rotate heavy maneuver areas for natural reclamation, contributing to soil erosion.

A number of physical and chemical factors contribute to the susceptibility of a soil to damage. These include texture, organic matter content, permeability, clay mineralogy, structure, and depth. There are several indices that incorporate the physical and chemical factors into numeric scales or broad categories that are more easily related to the potential effects of tracked vehicle training: K-factor, T-factor, hydrologic soil groups, and land use capability class. A listing of these indices and links to their descriptions can be found at https://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/survey/office/ssr10/tr/?cid=nrcs144p2_074835 and an overview of soils and characteristics in South Carolina can be found at

https://www.nrcs.usda.gov/wps/portal/nrcs/main/sc/soils/. An in-depth review of these factors as they relate to each soil type can be found in the Soil Survey of Richland County, South Carolina (https://efotg.sc.egov.usda.gov/references/public/SC/Richland_Soils_eFOTG.pdf).

Interpretation of the data found in the soil survey reveals that soil erosion is a major management concern on steep slopes and heavily disturbed areas. Due to slopes and other soil conditions, 15 percent of the surveyed acres contain highly erodible soils if vegetation cover is removed. In total, approximately 1 to 2 percent of all soils on the training center would require special treatment and consideration when planning for land rehabilitation. Furthermore, the capability class/subclass from the soil survey reveal that 8 percent of all soils on the center require special conservation practices due to wetness.

Table F-2. Soils Information for McCrady Training Center, SC

Soil Series	% Slope	Drainage	Erodibility (T-Factor)	Acres
Ailey loamy sand	2 to 10	Well-drained	Potentially high (4)	624
Blanton sand	0 to 6	Moderate	Not highly erodible (5)	300
Fuquay sand	2 to 6	Well-drained	Not highly erodible (5)	228
Johnston loam	N/A	Very poorly drained	Not highly erodible (5)	31
Lakeland sand	2 to 6	Excessive	Not highly erodible (5)	381
Lakeland sand	6 to 15	Excessive	High (5)	392
Pelion loamy sand	2 to 6	Moderately well-drained	Potentially high (4)	80
Pelion loamy sand	6 to 15	Moderately well-drained	Potentially high (4)	113
Vaucluse loamy sand	6 to 10	Well-drained	High (3)	2972
Vaucluse loamy sand	10 to 15	Well-drained	High (3)	871
Source: (NRCS 2019)				

F.5 WATER RESOURCES

F.5.1 **Watersheds and Streams**

MTC is located in the Catawba River Basin, which encompasses 11 sub-watersheds and 1,487,114 acres that flow from the Piedmont region of the state to the Sandhills and Upper Coastal Plain regions. The Catawba Basin includes the South Carolina portion of the Catawba River Basin (Hydrologic Unit Code (HUC) 03050101, 03050103) and the Wateree River Basin (HUC 03050104), where MTC is located. The Wateree River Basin is subdivided into 4 watersheds that include the Catawba River, Wateree River, and Lake Wateree. MTC is located in the Wateree River subwatershed (SCDHEC 2019).

The waters flowing near MTC include Bee Branch, a stream that drains the areas north of MTC in a southwesterly direction and which drains into Colonel's Creek east of MTC (USEPA 2019a). Colonel's Creek drains the eastern portion of MTC. Leesburg Branch drains the majority of MTC and flows southwest to its confluence with Colonel's Creek – downstream and off installation, Colonel's Creek follows an artificial path terminating at Murray's Pond (USEPA 2019a). Pertinent data relative to surface waters at MTC are given in **Table F-3** and in **Figure 4** in **Appendix B**.

Colonel's Creek (HUC# 030501040403) is the primary drainage on MTC. Colonel's Creek flows southeast across the installation. Colonel's Creek has a relatively deeper valley.

Table F-3. Surface Waters on McCrady Training Center, SC			
Watershed	**Drainage Area (acres)**	**Stream Length (miles)**	**Lake/Pond Surface Area (acres)**
Colonel's Creek	90,079	25	311
Bee Branch	54,303	30	37*
Leesburg Branch	2,979	0	0.1
Varn Lake	?	?	?
Total	*147,361*	*185*	*348*
Source: (USEPA 2019a, 2019b)			

F.5.2 **Water Quality**

MTC has its own drinking water system that is fed through five underground wells. These wells are about 300 feet deep. The drinking water at the MTC is iron rich and is not in short supply.

Water quality management, water quality monitoring, drinking water and wastewater are monitored weekly and monthly as required by existing MTC and SCARNG permits. Currently, drinking water is treated with sodium hydroxide to neutralize the pH. An oil-water separator treats wastewater from the wash rack.

F.5.3 **Wetlands**

Wetlands usually occur in conjunction with the hydric soils along the surface drainage systems. Logging, clearing for firebreaks, vehicular traffic, and sedimentation resulting from erosion has historically impacted on-site wetlands through siltation.

By the definition of "jurisdictional wetland" under Section 404 of the Clean Water Act, an area must display three characteristics: (1) hydrophytic vegetation, (2) hydric soil, and (3) wetland hydrology. Areas that are periodically wet but do not meet all three criteria are not jurisdictional wetlands.

Wetlands were first mapped on MTC in 1998, when the USACE created a wetland map for Fort Jackson (Minikin et al. 1998). Vegetation studies on MTC occurred in 2003, 2016, and 2018, which provided some details on wetland plant communities but did not provide geospatial and wetland delineation details for wetlands or any other waters of the US (SCARNG 2003; Gaddy 2018). An even more detailed wetland vegetation study was completed in 2018, but did not include wetland delineation details. Six notable wetlands were identified as part of this project (Gaddy 2018) (see **Figure 4** in **Appendix B**). The installation has a total of 1,642 acres of potential waters of the US: 1,609 acres of seasonal wetlands, 33 acres of ponds, plus intermittent and perennial streams.

Table F-4. Wetland Types Present on McCrady Training Center	
Wetland Description	**Acres**
Palustrine Forested/Broadleaf Deciduous Needle Leaf Evergreen	368.88
Palustrine Forested	1,162.16
Palustrine Scrub-Shrub	6.30
Palustrine Open Water	39.24
Palustrine Scrub-Shrub/Broadleaf Deciduous	2.18
Palustrine Forested/Broadleaf Deciduous/Scrub-Shrub	9.92
Palustrine Forested/Needle Leaf Evergreen/Scrub-Shrub	7.44
Palustrine Emergent	6.36
Palustrine Scrub-Shrub/Broadleaf Evergreen	33.46
Palustrine Scrub-Shrub Emergent	3.50

Palustrine Open Water/Scrub-Shrub/Broadleaf Deciduous	1.48
Palustrine Scrub-Shrub/Broadleaf Deciduous	0.78
Palustrine Forested/Needle Leaf Evergreen/Scrub-Shrub/Broadleaf Deciduous	0.30
Total	1,642.00
Source: McCrady GIS and NWI	

G. BIOLOGICAL OVERVIEW

G.1 ECOREGION

Following the USEPA ecoregion hierarchy, MTC is located in the Southeastern Plains (Level III Ecoregion) in the Upper Coastal Plain known as the Sandhills (Level IV Ecoregion) in central South Carolina. The Sand Hills are unique to the Southeast United States (Griffin et al. 2002). Major rivers include the Lynches, Wateree, Congaree and Savannah Rivers, and flow in streams is consistent due to the large infiltration capacity of the sandy soil and the great ground-water storage capability of the sand aquifer (Griffith et al. 2002). This is area is rolling to hilly region composed primarily of Cretaceous-age marine sands and clays, capped in places with Tertiary sands, deposited over the crystalline and metamorphic rocks of the Piedmont with soils that are droughty, low-nutrient soils formed in thick beds of sand (Griffin et al. 2002). Many areas are in woodland, and some areas are used for pasture. Portions of the region are also known for its peach orchards, golf courses, and horse farms.

G.2 VEGETATIVE COMMUNITIES

On-site vegetation is primarily composed of long-leaf pine (*Pinus palustris*) and scrub oak (*Quercus laevis*) with other mixed hardwoods and pines. Geographic areas range from almost xeric barrens to permanent streams, saturated wetlands, mesophytic forests, and man-made impoundments. Most plant communities at MTC are forest communities. There have been several studies conducted at MTC over the years to assess vegetative communities, with recent studies in 2003, 2016 and 2018.

Plant community diversity at MTC has a high number of upland mixed hardwood communities, including 30 plant community types and 11 subtypes (SCARNG 2003). The community types are based on the US National Vegetation Classification (NVC) Associations and details about these are available at http://usnvc.org. This high diversity included the presence of several rare plant communities. A relatively rare plant community, the Sandstone Gravel Longleaf Pine Woodland, was found on the high ridges of MTC. This is a dry, open longleaf pine-turkey oak community that is only found in South Carolina. For a summary of vegetative communities, refer to **Table G-1**.

Table G-1. Vegetative Communities of McCrady Training Center, SC.

DOMINANT SPECIES (Plot Number)	NVC ASSOCIATION(S)*	NVC CEGL CODE*	GLOBAL RANK
Wetland Mixed Hardwoods (and Pines and/or Shrubs)			
TULIP POPLAR (001, 013, 060)	Sandhills Black Gum-Pine Streamhead Swamp (Tulip Tree Phase);	4734b	G3
SWAMP TUPELO (003, 005, 006, 032, 054, 056, 065, 089; 031; 100, 103, 104)	Sandhills Black Gum-Pine Streamhead Swamp (Black Gum Phase); Sandhills Swamp Black Gum Hillside Seepage Forest; Sandhills Black Gum-Pine Streamhead Swamp (Pond Pine Phase)	4734a; 4645; 4734d	G4; G3; G4?
CAROLINA MAPLE (007, 081, 095)	Sandhills Swamp Black Gum Hillside Seepage Forest	4645	G3
SWEET GUM (038)	Loblolly Pine-Sweet Gum-Red Maple Saturated Forest	7560	G?

Table G-1. Vegetative Communities of McCrady Training Center, SC.			
DOMINANT SPECIES (Plot Number)	**NVC ASSOCIATION(S)***	**NVC CEGL CODE***	**GLOBAL RANK**
TULIP POPLAR (051); SWAMP TUPELO (078), CAROLINA MAPLE (077)	Sandhills Black Gum-Pine Streamhead Swamp (Tulip Tree Phase); Sandhills Black Gum Hillside Seepage Forest	4734b; 4645	G3?; G3
POND PINE (083)	Pond Pine-Fetterbush-Pepperbush-Gallberry Woodland	4435	G?
LOBLOLLY PINE (042)	Loblolly Pine-Sweet Gum-Black Gum Successional Swamp Forest	4606	G4
Upland Mixed Hardwoods			
POST OAK (002, 029, 036)	Dry Acid Eastern Coastal Plain Oak-Hickory Forest (Post Oak Phase)	7246b	G4?
SAND POST OAK (057; 086)	Sandhill Ravine Oak Forest; Carolina Longleaf Pine-Mixed Shrub Oak Sandhills	7766; 3591	G2?; G3
SOUTHERN RED OAK (004, 066, 093)	Dry Acid Eastern Coastal Plain Oak-Hickory Forest (Southern Red Oak Phase)	7246a;	G4?
BLACKJACK OAK (025)	Dry Acid Eastern Coastal Plain Oak-Hickory Forest	7246c	G4
WHITE OAK (019, 024)	White Oak-Black Oak Inner Coastal Plain Mesic Slope Forest	7278	G3G4
MOCKERNUT HICKORY (012)	Fire Suppressed Longleaf Sandhills	7511	G4
BLACK OAK (017)	Sandhills Sandy Fire-Suppressed Black Oak-Sparkleberry Forest	8553	G3G4
Pine (and Shrubs)			
LONGLEAF PINE (008, 062; 015, 044; 018; 010, 034; 092)	Longleaf Pine-Turkey Oak-Dwarf Huckleberry-Carolina Wiregrass Woodland; Longleaf Pine Plantation; South Carolina Central Longleaf Woodland; Fire Suppressed Longleaf Sandhills; Atlantic Coastal Plain Mesic Longleaf Woodland	3586; 7176; 3593; 7511; 3569	G3?; G5; G2; G4; G2G3
LOBLOLLY PINE (009, 022; 027)	Loblolly Pine-Shortleaf Pine Forest; Loblolly Pine Plantation	8403; 7179	G4; G5
POND PINE (046, 079, 099)	Pond Pine-Fetterbush-Sweet Pepperbush-Gallberry Woodland	4435	G?
LOBLOLLY PINE (084)	Sandhills Black Gum-Pine Streamhead Swamp (Lobolly Pine Phase)	4734c	G4
Pine-Mixed Hardwoods			
LONGLEAF PINE (014, 033, 059, 067; 064; 070; 073, 091, 074)	Fire Suppressed Longleaf Sandhills; South Carolina Central Longleaf Woodland; Longleaf Pine-Turkey Oak-Dwarf Huckleberry-Carolina Wiregrass Woodland; Sandstone Gravel Longleaf Pine Woodland; Atlantic Coastal Plain Mesic Longleaf Woodland	7511; 3593; 3586; 7767; 3569	G4; G2; G3?; G1; G2G3
LOBOLLY PINE (011, 026, 049, 050, 053; 030; 035; 040; 063)	Loblolly Pine-Oak Forest (Southern Red Oak Phase); Loblolly Pine-Oak Forest (Blackjack Oak Phase); Loblolly Pine Oak Forest (Water Oak Phase); Loblolly Pine Plantation; Loblolly Pine-Oak Forest (Hickory Phase)	4766b; 4766d; 4766e; 7179; 4766f	G?; G4

Table G-1. Vegetative Communities of McCrady Training Center, SC.			
DOMINANT SPECIES (Plot Number)	**NVC ASSOCIATION(S)***	**NVC CEGL CODE***	**GLOBAL RANK**
SHORTLEAF PINE (048)	Coastal Plain Shortleaf-Loblolly Pine Mixed Oak Dry-Mesic Forest	4713	G2G3
Mixed Hardwoods-Pine			
PIGNUT HICKORY (094)	Loblolly Pine-Oak Forest (Southern Red Oak Phase)	4766b	G?
SOUTHERN RED OAK (058, 082, 090)	Loblolly Pine-Oak Forest (Southern Red Oak Phase)	4766b	G?
TURKEY OAK (043, 045, 061, 075, 076)	Longleaf Pine-Turkey Oak-Dwarf Huckleberry-Carolina Wiregrass Woodland	3586	G3?
BLACKJACK OAK (020)	Atlantic Longleaf Pine-Blackjack Oak Woodland	3595	G2G3
WATER OAK (021; 052)	Loblolly Pine-Water Oak Shrub Mixed Herbs; Coastal Plain Shortleaf-Loblolly Pine Mixed Oak Dry-Mesic Forest	7533; 4713	G2G3; G2G3
SOURWOOD (047)	Atlantic Coastal Plain Sweet Bay-Black Gum (Sourwood) Seepage Forest	8552	G3
BLUEJACK OAK (096)	Fire Suppressed Longleaf Sandhills	7511?	G4
Shrublands			
LONGLEAF PINE (016; 072)	Fire Suppressed Longleaf Sandhills; Longleaf Pine-Turkey Oak-Dwarf Huckleberry-Carolina Wiregrass Woodland	7511; 3586	G4; G3?
TURKEY OAK (069)	Longleaf Pine Plantation	7176	G5
POND PINE (079, 080)	Evergreen High Pocosin	3846	G3
BLUEJACK OAK (097)	Fire Suppressed Longleaf Sandhills	7511	G4
Marsh			
WOOLGRASS BULRUSH-(101)	Woolgrass Bulrush Seasonally Flooded Herbaceous Vegetation	3866	G4
Floating Aquatic			
WHITE WATERLILY (102)	White Waterlily-Broadleaf Pondlily Herbaceous Vegetation	4326	G3?
WATERSHIELD (108)	Watershield Pond	4527	G4?
WHITE WATERLILY (110)	Coastal Plain Pond	6086	G2
MIXED AQUATIC (109)	White Waterlily-Broadleaf Pondlily Herbaceous Vegetation	4326	G3?

Source: (SCARNG 2003)

*NVC Associations listed here are the Colloquial Names. NVC CEGL Codes refer to the CEGL 00#### number that provides a stable connection to NVC Associations. For example, CEGL 004734 remains the same association regardless of name changes. See http://usnvc.org to find the Association descriptions.
Global Ranks are defined at http://www.natureserve.org/conservation-tools/standards-methods and are similar to state ranks included in Tables E-1 and E-2 but at a global level.

G.2.1 **Woodlands and Forests**

The four major forest community types found at the installation are longleaf pine/turkey oak, scrub oak, upland hardwoods, and bottomland hardwoods. Longleaf pine/scrub oak forests are dominated by longleaf pine (*Pinus palustris*) and occur on the upper slopes and ridges of the installation, although loblolly pine (*Pinus taeda*) also occurs on MTC. Understories are predominantly scrub oak species such as turkey oak (*Quercus laevis*), bluejack oak (*Quercus incana*), blackjack oak (*Quercus marilandica*), and dwarf post oak (*Quercus stellata* var. *margeretta*) with scattered hawthorne (*Crataegus* spp).

Although scrub oak communities usually contain a scattering of longleaf pines, they are dominated by a variety of oak species, including turkey oak, bluejack oak and dwarf post oak. Blackgum (*Nyssa sylvatica*) and persimmon (*Diospyros virginiana*) are sometimes found in association with these scrub oaks. This community type has the lowest plant diversity on MTC.

Upland hardwood communities are generally found on sandy clay loam soils on mid to lower slopes and tend to be well developed. This zone is sometimes called Xeric Sandhill Scrub. A closed canopy with a mixture of deciduous and evergreen trees, shrubs, and pines typifies this upland forest. While these forest communities are dominated by hardwoods, longleaf pine are still present in substantial numbers. A recognizable component of turkey oak, southern red oak (*Quercus falcata*), water oak (*Quercus nigra*), black oak (*Quercus velutina*), post oak (*Quercus stellata*), and blackjack oak are dominant in upland hardwood communities. Dominant hickory species on these sites include pignut hickory (*Carya glabra*) and mockernut hickory (*Carya tomentosa*). Other commonly associated species are black gum, persimmon, flowering dogwood (*Cornus florida*) and black cherry (*Prunus serotina*). The upland hardwood community has the highest plant diversity of any of the major forest types on the installation.

Bottomland hardwood communities are found in wetland and riparian areas that are typified by poorly drained soils. Species encountered in these communities include swamp tupelo (*Nyssa sylvatica* var. *biflora*), red maple (*Acer rubrum*), scattered sweetgum (*Liquidambar styraciflua*), and yellow poplar (*Liriodendron tulipifera*). Other species found in the bottomland hardwood communities include red bay (*Persea borbonia*), American holly (*Ilex opaca*), sweetbay (*Magnolia virginiana*), and swamp azalea (*Rhododendron viscosum*). Bottomland forest ecosystems are very stable requiring one hundred or more years to mature. These areas tend to be well canopied with trees very often swollen or with “knees”. Because of the wet and humid conditions, they rarely burn except during times of drought and low water levels.

G.2.2 **Wetland Communities**

Out of the associations described above, most of them are wetland communities, with 20 different associations identified in and near wetlands on MTC. These are identified in Table G-1 in the categories wetland mixed hardwood, marsh, floating aquatic vegetation and the two pond pine cover types. So they may not represent the majority of acreage on MTC, but they do capture much of the plant biodiversity on MTC. A number of rare plants are associated with these wetland plant communities (see Appendix E).

The wetland communities tend to be in transition zones between bottomland forests and aquatic plant communities. Other than road crossings, bottomland and wetland communities tend have little or no disturbance. Wetland ecosystems include floodplain forest, swamp forest, and marsh.

G.2.3 **Historic Vegetation**

Since European settlement, extensive clearing for agriculture, grazing, logging, and urban development contributed to the alteration and introduction of many types of vegetation. Most notable is the increase in slash pine (*Pinus elliottii*).

G.3 FLORA

The flora found on MTC are typical of the sand hills of South Carolina's Upper Coastal Plain physiographic province. Forty-three tree species and twenty-six shrub and vine species (69 woody plant species) were recorded in the 2003 survey, and these included four rare species (state special concern – refer to **Table E-2 in Appendix E**) identified in and near vegetative community sampling sites. These include sweet pitcher plant (*Sarracenia rubra*; Noah's Marsh), Robbins' spikerush (*Eleocharis robbinsii*; shores of Odum Pond), drowned hornedrush (*Rhynchospora inundata*; Chavis Pond), and Canby's bulrush (*Scirpus etuberculatus*; Davis Pond).

Although surveys specific to invasive plants have not been conducted on MTC to date, some incidental notations of invasive plant species have been made during other surveys. These include *Aneilema keisak* (Asiatic dayflower), *Ligustrum sinense* (Chinese privet), *Lonicera japonica* (Japanese honeysuckle), *Microstegium vimineum* (Vietnam grass), and *Prunella vulgaris* (self-heal) (Gaddy 2018).

G.4 FAUNA

The fauna found on MTC are typical of the sand hills of South Carolina's Upper Coastal Plain physiographic province. The relatively unaltered state of this unique and dynamic Sandhill environment provides a wealth of biological and ecological research opportunities. Baseline and trend studies are available for several fish and wildlife communities. Both the USC and the SCDNR have been involved in several biological studies such as bat population surveys, herpetological surveys, a raptor survey, butterfly surveys, mammal surveys, and fish population surveys.

G.4.1 **Neo-tropical Migratory Birds**

Neo-tropical migratory birds include species with at least some populations breeding in the United States and/or Canada that spend their nonbreeding months south of the US. Examples include songbirds, shorebirds, water birds, and waterfowl. Fort Jackson and MTC have an abundant and varied breeding bird resource, including both permanent residents and neo-tropical migrants (Cely 1994). Efforts to monitor and manage neo-tropical migrant birds have been ongoing for several years. In 1992 and 1993, initial survey data was collected through LCTA. Since that that time our neo-topical migrant monitoring and management program has matured. Since 2002 we have been partnering with SCDNR to run a MAPS banding station at MTC. The MAPS station provides us dual benefits. It provides us a good data set on our neo-tropical population. The station also provides us an excellent outreach opportunity. Working with SCDNR we have hosted groups ranging from students, to zoo keepers, to US Park Service volunteers. The MAPS Station at MTC has also received media coverage over the years ranging from newspaper articles to episodes of ETV programs and field pieces. These outreach opportunities provide an impactful way to share both the mission and importance of the National Guard, and our stewardship and conservation. It is MTC's intention to continue to partner with SCDNR to run the MAPS Station and manage the neo-tropical bird populations at MTC.

G.4.2 **Wildlife Game Species**

All fishing, hunting, and game management is handled by the Environmental Office at Fort Jackson. The management includes licensing and permitting, as well as monitoring of population trends. Season dates and harvest quotas are aligned with those set each year by the State of South Carolina for Richland County. Variations to the state regulations apply to the harvest of white-tailed deer (*Odocoileus*

virginianus) and game fish on Fort Jackson. Fort Jackson regulations are more restrictive than the those for the state. There is no commercial trapping allowed on Fort Jackson.

Currently, Fort Jackson performs surveys to track game species. In cooperation with SCDNR, annual surveys are performed for bobwhite quail, fox squirrels, eastern wild turkey (*Meleagris gallopavo*) and furbearer species as part of state-wide survey efforts. The results of these surveys are not adequate to make site-specific recommendations for harvest quotas. The only census data used in making harvest recommendations is that collected on fish populations in the ponds managed intensively for game fish.

H. Summary of Supporting Reports, Documents, and Datasets

CPPP. 2019. Average Monthly Precipitation by Climate Division. Carolinas Precipitation Patterns & Probabilities. Available from https://cisa.sc.edu/atlas/regions-precip-average.html [accessed 20 March 2019].

Gaddy, L.L. 2018. Inventory of the Wetlands of McCrady Training Center, Fort Jackson, Richland County, South Carolina. Richland County, SC.

Griffin, G., Omernick, J.M., Comstock, J., Glover, J., and Shelburne, V. 2002. Ecoregions of South Carolina. Corvallis, OR. Available from ftp://newftp.epa.gov/EPADataCommons/ORD/Ecoregions/sc/sc_eco.pdf.

Griffith, G.E., Omernick, J.M., and Comstock, J. 2002. Ecoregions of South Carolina. Corvallis, OR.

National Weather Service. 2019. Monthly Climate Normals for Columbia Owens Downtown AP, SC from 1981-2010. Available from https://w2.weather.gov/climate/xmacis.php?wfo=cae [accessed 13 March 2019].

NRCS. 2019. Web Soil Survey for McCrady Training Center in Richland County, SC. Available from https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx [accessed 13 March 2019].

SCARNG. 2003. Vegetation Cover Types, Plant Community Diversity, and Species Dominance: McCrady National Guard Training Center. Richland County, SC.

SCDHEC. 2019. Wateree River. Available from http://wwwprod.dhec.sc.gov/HomeAndEnvironment/Water/Watersheds/WatershedMap/CatawbaWatershed/WatereeRiver/ [accessed 22 March 2019].

SCDNR. 2013. Climate Change Impacts to Natural Resources in South Carolina. Available from http://www.dnr.sc.gov/pubs/CCINatResReport.pdf [accessed 11 March 2019].

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USEPA. 2019a. WATERS GeoViewer report for McCrady Training Center Area, SC. Available from https://epa.maps.arcgis.com/apps/webappviewer/index.html?id=ada349b90c26496ea52aab66a092593b [accessed 21 March 2019].

USEPA. 2019b. Wetlands in McCrady Training Center, SC.

I. REVIEW AND COORDINATION

Document 1. REC and Check

Document 2. NGB INRMP Comments

Document 3. JAG INRMP Correspondence and Concurrence

Document 4. G3 INRMP Correspondence and Concurrence

Document 5. State Safety Office INRMP Correspondence and Concurrence

Document 6. CFMO INRMP Correspondence and Concurrence

Document 7. Environmental Compliance INRMP Correspondence and Concurrence

Document 8. Fort Jackson INRMP Correspondence and Concurrence

Document 9. USFWS INRMP Correspondence and Concurrence

Document 10. SCDNR INRMP Correspondence and Concurrence

From: Hall, C Bryan <HallCB@tag.scmd.state.sc.us>
Sent: Tuesday, June 28, 2022 7:56 AM
To: Hanks, Dwight M Jr LTC USARMY NG SCARNG (USA) <dwight.m.hanks.mil@army.mil>; Bulwinkle, Marion A. <Marion.A.Bulwinkle3.mil@mail.mil>; Bird, Jon L. <BirdJL@tag.scmd.state.sc.us>; Gibson, Alex A MAJ USARMY NG SCARNG (US) <alex.a.gibson.mil@mail.mil>; Addis, Terry L. <Terry.L.Addis.mil@mail.mil>; Messer, Benson G (MAJ) <Benson.G.Messer.mil@mail.mil>
Cc: Stone, Christopher <StoneC@tag.scmd.state.sc.us>; Hicks, Robert M CIV NG SCARNG (USA) <robert.m.hicks.civ@mail.mil>; Boazman, Rebecca <BoazmanR@tag.scmd.state.sc.us>
Subject: [Non-DoD Source] INRMP Concurrence

Good morning,

I am Bryan Hall, the Conserva on Manager for the SC Army Na onal Guard. I need your assistance reviewing the required update to the SC Army Na onal Guard Integrated Natural resources Managment Plan (INRMP) for McCrady and Clarkshill. I have a ached the draft documents along with a concurrence/ review errata sheet. If you could please use the errata sheet for your reviews, comments and/ or concurrence it will help us address your comments.

A few things to note prior to beginning your review, This is an update of an exis ng plan. We are required to review and update our plan every 5 years. Opera onally there are no substan ve changes. Only updates to project list and revisons from our previous Review for Opera on and Effect (ROE).

Please send your reviews to Ms Rebbeca Bozeman at BoazmanR@tag.scmd.state.sc.us. If you have any ques on and or concerns please email me or call me at (803) 299-2349. I would ask that you please complete your reviews by COB Aug 1st. If you need addi onal me for your review please let us know so that we can plan accordingly.

Thank you for your assistance, and please let me know if you have any ques ons.

Bryan Hall
Conserva on Manager
SCARNG
(803) 299-2349
(803) 479-7778
hallcb@tag.scmd.state.sc.us

From: Wright, Kelvin D MAJ USARMY NG SCARNG (USA) <kelvin.d.wright2.mil@army.mil>
Sent: Tuesday, June 28, 2022 3:19 PM
To: Gibson, Alex A MAJ USARMY NG SCARNG (USA) <alex.a.gibson.mil@army.mil>
Cc: Hall, C Bryan <HallCB@tag.scmd.state.sc.us>; Stone, Christopher <StoneC@tag.scmd.state.sc.us>; Barton, Christopher E CIV NG SCANG (USA) <christopher.e.barton.civ@army.mil>
Subject: RE: INRMP Concurrence

MAJ Gibson,

I have no legal objec ons or concerns related to the Resource Management Plans for McCrady and Clarks Hill for the Environmental Management Division.

v/r

Wright

From: Gibson, Alex A MAJ USARMY NG SCARNG (USA) <alex.a.gibson.mil@army.mil>
Sent: Tuesday, June 28, 2022 9:04 AM
To: Wright, Kelvin D MAJ USARMY NG SCARNG (USA) <kelvin.d.wright2.mil@army.mil>
Cc: Bryan Hall <hallcb@tag.scmd.state.sc.us>; Christopher Stone <stonec@tag.scmd.state.sc.us>
Subject: Fw: INRMP Concurrence

Good Morning MAJ Wright,

Please review the a ached Resource Management Plans for McCrady and Clarks Hill for the Environmental Management Division for any legal ma ers that may come at us. An item that you find can be stated within the Review and Concern spreadsheets and returned to Mr. Hall and Mr. Stone for edi ng.

Thank you for your commitment and assistance.

MAJ Alex A. Gibson
Environmental Program Manager
FMO/ENV
SCARNG, MSC

INRMP Concurrence

Hall, C Bryan <HallCB@tag.scmd.state.sc.us>

Tue 6/28/2022 7:56 AM

To: LTC Dwight M. (Marty) Hanks <dwight.m.hanks.mil@army.mil>;Bulwinkle, Marion A. <Marion.A.Bulwinkle3.mil@mail.mil>;Bird, Jon L. <BirdJL@tag.scmd.state.sc.us>;Gibson, Alex A MAJ USARMY NG SCARNG (US) <alex.a.gibson.mil@mail.mil>;Addis, Terry L. <Terry.L.Addis.mil@mail.mil>;Messer, Benson G (MAJ) <Benson.G.Messer.mil@mail.mil>

Cc: Stone, Christopher <StoneC@tag.scmd.state.sc.us>;Hicks, Robert M CIV NG SCARNG (USA) <robert.m.hicks.civ@mail.mil>;Boazman, Rebecca <BoazmanR@tag.scmd.state.sc.us>

4 attachments (8 MB)

CHT INRMP review and Concurrence Errata Sheet.xlsx; MTC INRMP review and Concurrence Errata Sheet.xlsx; INRMP McCrady full final 2020.pdf; INRMP Clarks Hill_full Final.pdf;

Good morning,

I am Bryan Hall, the Conservation Manager for the SC Army National Guard. I need your assistance reviewing the required update to the SC Army National Guard Integrated Natural resources Managment Plan (INRMP) for McCrady and Clarkshill. I have attached the draft documents along with a concurrence/ review errata sheet. If you could please use the errata sheet for your reviews, comments and/ or concurrence it will help us address your comments.

A few things to note prior to beginning your review, This is an update of an existing plan. We are required to review and update our plan every 5 years. Operationally there are no substantive changes. Only updates to project list and revisons from our previous Review for Operation and Effect (ROE).

Please send your reviews to Ms Rebbeca Bozeman at BoazmanR@tag.scmd.state.sc.us. If you have any question and or concerns please email me or call me at (803) 299-2349. I would ask that you please complete your reviews by COB Aug 1st. If you need additional time for your review please let us know so that we can plan accordingly.

Thank you for your assistance, and please let me know if you have any questions.

Bryan Hall
Conservation Manager
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Clarks Hill and McCrady INRMP Review
Addis, Terry L SSG USARMY NG SCARNG (USA) <terry.l.addis.mil@army.mil>
Thu 7/7/2022 10:08 AM
To:

- Boazman, Rebecca <BoazmanR@tag.scmd.state.sc.us>

Cc:

- Mcelveen, John W COL USARMY NG SCARNG (USA) <john.w.mcelveen.mil@army.mil>

Ms. Bozeman,
I have reviewed both documents and concur with their contents. No suggestions or corrections are necessary from the State Safety Office.

Terry Addis
SSG, SCARNG
State Safety Office/ Motorcycle Safety
Office-(803)299-6641
Cell-864-364-2199

Office Email: ng.sc.scarng.list.ngscarng-safety-office@army.mil

“Safety is not expensive, it is priceless."

"To work safely simply requires a conscious decision to protect yourself by employing sound safety strategies."

INRMP Concurrence

Hall, C Bryan <HallCB@tag.scmd.state.sc.us>

Tue 6/28/2022 7:56 AM

To: LTC Dwight M. (Marty) Hanks <dwight.m.hanks.mil@army.mil>;Bulwinkle, Marion A. <Marion.A.Bulwinkle3.mil@mail.mil>;Bird, Jon L. <BirdJL@tag.scmd.state.sc.us>;Gibson, Alex A MAJ USARMY NG SCARNG (US) <alex.a.gibson.mil@mail.mil>;Addis, Terry L. <Terry.L.Addis.mil@mail.mil>;Messer, Benson G (MAJ) <Benson.G.Messer.mil@mail.mil>

Cc: Stone, Christopher <StoneC@tag.scmd.state.sc.us>;Hicks, Robert M CIV NG SCARNG (USA) <robert.m.hicks.civ@mail.mil>;Boazman, Rebecca <BoazmanR@tag.scmd.state.sc.us>

4 attachments (8 MB)

CHT INRMP review and Concurrence Errata Sheet.xlsx; MTC INRMP review and Concurrence Errata Sheet.xlsx; INRMP McCrady full final 2020.pdf; INRMP Clarks Hill_full Final.pdf;

Good morning,

I am Bryan Hall, the Conservation Manager for the SC Army National Guard. I need your assistance reviewing the required update to the SC Army National Guard Integrated Natural resources Managment Plan (INRMP) for McCrady and Clarkshill. I have attached the draft documents along with a concurrence/ review errata sheet. If you could please use the errata sheet for your reviews, comments and/ or concurrence it will help us address your comments.

A few things to note prior to beginning your review, This is an update of an existing plan. We are required to review and update our plan every 5 years. Operationally there are no substantive changes. Only updates to project list and revisons from our previous Review for Operation and Effect (ROE).

Please send your reviews to Ms Rebbeca Bozeman at BoazmanR@tag.scmd.state.sc.us. If you have any question and or concerns please email me or call me at (803) 299-2349. I would ask that you please complete your reviews by COB Aug 1st. If you need additional time for your review please let us know so that we can plan accordingly.

Thank you for your assistance, and please let me know if you have any questions.

Bryan Hall
Conservation Manager
SCARNG
(803) 299-2349
(803) 479-7778
hallcb@tag.scmd.state.sc.us

Reviewing Office	Document Title	Version
Bulwinkle	Final Draft INRMP McCrady	Jun-22

Concurrence	Select One	
Concur	x	*(Concurred with the current draft of the document)*
Concurred with Comments		*(Concurrence with the documents after the edits below are incorporated)*
Non-Concur		*(Non-concur with the document. If you have significant issues with the document please contact us so that we may work to resolve those issues)*

Comment #	The comment refers to the following location in the						Comment	Reviewer	Office of Reviewer	Action Taken to Address the Comment
	Chapter	Section	Page	Paragraph	Line	Sentence				

INRMP Concurrence

Hall, C Bryan <HallCB@tag.scmd.state.sc.us>

Tue 6/28/2022 7:56 AM

To: LTC Dwight M. (Marty) Hanks <dwight.m.hanks.mil@army.mil>;Bulwinkle, Marion A. <Marion.A.Bulwinkle3.mil@mail.mil>;Bird, Jon L. <BirdJL@tag.scmd.state.sc.us>;Gibson, Alex A MAJ USARMY NG SCARNG (US) <alex.a.gibson.mil@mail.mil>;Addis, Terry L. <Terry.L.Addis.mil@mail.mil>;Messer, Benson G (MAJ) <Benson.G.Messer.mil@mail.mil>

Cc: Stone, Christopher <StoneC@tag.scmd.state.sc.us>;Hicks, Robert M CIV NG SCARNG (USA) <robert.m.hicks.civ@mail.mil>;Boazman, Rebecca <BoazmanR@tag.scmd.state.sc.us>

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Bryan Hall
Conservation Manager
SCARNG
(803) 299-2349
(803) 479-7778
hallcb@tag.scmd.state.sc.us

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	Final Draft INRMP McCrady	Jun-22

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1	CFMO Signature Page						LTC Dwight M. Hanks is the CFMO, not COL Andrew Batten	Mark Hicks	CFMO	Concurred with suggestion with correction made.
2	1	1.3.1	2	2	20	1	Recommend sentence is rewritten. "The Adjutant General is responsible for the establishment of facilities engineering and environmental services for the state and its supported installations, including implementation and enforcement of this INRMP."	Mark Hicks	CFMO	Concurred with suggestion with correction made.
3	1	1.3.1	3	5	2	1	Recommend sentence is rewritten. "The Construction & Facilities Management Office is responsible for the management and maintenance of all real property assets at MTC"	Mark Hicks	CFMO	Concurred with suggestion with correction made.

INRMP Concurrence

Hall, C Bryan <HallCB@tag.scmd.state.sc.us>

Tue 6/28/2022 7:56 AM

To: LTC Dwight M. (Marty) Hanks <dwight.m.hanks.mil@army.mil>;Bulwinkle, Marion A. <Marion.A.Bulwinkle3.mil@mail.mil>;Bird, Jon L. <BirdJL@tag.scmd.state.sc.us>;Gibson, Alex A MAJ USARMY NG SCARNG (US) <alex.a.gibson.mil@mail.mil>;Addis, Terry L. <Terry.L.Addis.mil@mail.mil>;Messer, Benson G (MAJ) <Benson.G.Messer.mil@mail.mil>

Cc: Stone, Christopher <StoneC@tag.scmd.state.sc.us>;Hicks, Robert M CIV NG SCARNG (USA) <robert.m.hicks.civ@mail.mil>;Boazman, Rebecca <BoazmanR@tag.scmd.state.sc.us>

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Thank you for your assistance, and please let me know if you have any questions.

Bryan Hall
Conservation Manager
SCARNG
(803) 299-2349
(803) 479-7778
hallcb@tag.scmd.state.sc.us

MTC INRMP

Bird, Jon L. <BirdJL@tag.scmd.state.sc.us>

Fri 7/29/2022 9:19 AM

To: Boazman, Rebecca <BoazmanR@tag.scmd.state.sc.us>

1 attachments (31 KB)

MTC INRMP review and Concurrence Errata Sheet Environmental.xlsx;

Hi Rebecca,

I reviewed the MTC INRMP and I have no comment on it. I'll try to review the CH INRMP today.

Thanks,

Jon

Reviewing Office	Document Title	Version
	Final Draft INRMP McCrady	Jun-22

Concurrence	*Select One*	
Concur	x	***(Concurred with the current draft of the document)***
Concurred with Comments		***(Concurrence with the documents after the edits below are incorporated)***
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Comment #	*The comment refers to the*						Comment	Reviewer	Office of Reviewer	Action Taken to Address the Comment
	Chapter	Section	Page	Paragraph	Line	Sentence				
							No Comments- Jon Bird Environmental Compliance			

Good morning Mr. Morrow,

Please see the attached Cover Letter regarding our FY 2020 CHTS INRMP.

The Cover Letter contains further instructions on how to access the CHTS INRMP documents to be reviewed. If you have any comments, questions, or issues, please do not hesitate to contact me via email: boazmanr@tag.scmd.state.sc.us or by phone: (803) 299-1343.

Thank you in advance for your time on this review.

Rebecca Boazman

Natural Resource Field Technician IV

McCrady Training Center

SC Army National Guard

boazmanr@tag.scmd.state.sc.us < Caution-mailto:boazmanr@tag.scmd.state.sc.us >

Ofc: (803) 299-1343

CLASSIFICATION: UNCLASSIFIED

4 March, 2020

To: **Fort Jackson, DPW-ENV**
Mr. Doug Marrow
Building 2563 Essayons Way
Fort Jackson, SC 29207

Re: Update of Integrated Natural Resource Management Plan (INRMP), South Carolina Army National Guard (SCARNG), INRMP for McCrady Training Site, Richland County, South Carolina

The SCARNG is working on completing an update for the INRMP for McCrady Training Center (MTC) in Richland County, South Carolina. There is currently an INRMP for the site as required by the Sikes Act. The INRMP was originally approved by the U.S. Fish and Wildlife Service (USFWS) and the South Carolina Department of Natural Resources (SCDNR) in 2001 and the Review for Operation and Effect (ROE) was completed for MTC in 2019. The INRMP update and review will ensure that all cooperating partners have an opportunity to review updates for the INRMP, provide input on the update, and affirm whether they consider the INRMP is effective for the site. Given the length of time since the original signature, the SCARNG updated INRMP is intended to reflect new data, new policies, and new requirements since 2001.

For this update, we are seeking input from your agency regarding areas of the INRMP that could use improvement, as well as areas that are working well. We are seeking from your agency any new or additional information, new natural resources topics or issues of concern, updates on policies or regulations, updates on rare flora and fauna listings and nearby observations, identification of issues of regional concern, or other new information that your agency thinks should be considered during this review and subsequent updating of the INRMP.

SCARNG will be updating INRMPs for both sites, McCrady Training Center and Clarks Hill Training Sites. The updates will update content (now almost 20 years old) as well as the goals and objectives section which was completed in the 2019 Review for Operation and Effect.

We will be glad to host a meeting if it would be beneficial during the review period. Please review this and reply with any comments or concerns you may have regarding this document by **15 May 2020**. Please send correspondence or questions to me by PHONE or EMAIL.

Sincerely,

Chris Stone
Deputy Conservation Manager
SCARNG Environmental Office
5401 Leesburg Road, Building #3924
Eastover, SC 29044
803-299-2236
stonec@tag.scmd.state.sc.us

RE: [Non-DoD Source] SCARNG INRMP 2020 Update Draft Scoping and Review (UNCLASSIFIED)

Morrow, Douglas M CIV USARMY ID-TRAINING (USA) <douglas.m.morrow.civ@mail.mil>

Wed 9/9/2020 7:45 AM

To: Boazman, Rebecca <BoazmanR@tag.scmd.state.sc.us>

CLASSIFICATION: UNCLASSIFIED

Rebecca, we have comments on the INRMP, but I need a little more time to complete our review. I'll have you our comments by COB Friday.

Doug

Douglas M. Morrow
Branch Chief
DPW, ENV, Wildlife Branch
Fort Jackson, S.C.
(803) 751-4793
DSN: (31) 734-4793

We are Army's Home

IMCOM Civilian Career Planning and Development Sharepoint:
https://army.deps.mil/Army/cmds/imcom_HQ4/G1/CIVPER/C2P2/SitePages/Home.aspx

McCrady Training Center Draft INRMP 2020 Comments

Document Name	Page Number	Line Number	Figure Number	POC for Comment	Comment
Draft MTC INRMP	5	32		Morrow	change to: Endangered Species Management Component for the Red-cockaded woodpecker.
Draft MTC INRMP	5	33		Morrow	change to: endangered species management component for Smooth Coneflower and Rough-leaved Loosestrife.
Draft MTC INRMP	15	12		Morrow	rough-leaved loosestrife is not within the MTC license area.
Draft MTC INRMP	18	15-18		Morrow	I recommend referring to species lists instead of listing just a few of the herps and mammals found in the Sandhills.
Draft MTC INRMP	32	9		Morrow	rough-leaved loosestrife is not within the MTC license area.
Draft MTC INRMP	32	15		Morrow	I would not list precribed fire unless y'all plan to begin doing so. At this point of time, I'm not aware of MTC conducting prescribed burns.
Draft MTC INRMP	34	18		Morrow	I recommend inserting something about MTC's "role" in supporting Fort Jackson's Hunting and Fishing programs, such as making training lands available when not being utillized for military training, etc.
INRMP Appendix B Maps			1	Morrow	Confirm licensed area boundaries between Main Tank Range and Argentan Range. Doesn't look correct to me. All of 14-B is not yet part of the license agreement.
INRMP Appendix B Maps			5	Morrow	New coneflower population along Lundy's Ln. not depicted as a caution area. Coneflower site in 29-B is not identified either.
Draft MTC INRMP	17	31		Maitland	the word "long-leaf" is not hyphenated. It should read "longleaf"
Draft MTC INRMP	29	3-4		Maitland	In addition, it should also refer to Fort Jackson's INRMP, which has a section on Forest Management.
Draft MTC INRMP	29	22		Maitland	"wild land fire" should read "wildland fire"
Draft MTC INRMP	19	18-21		Maitland	Suggested change to the following sentences -Generally, Fort Jackson takes the lead on wildland fire management, game and fish management, hunting and fishing programs, endangered species management, and forest management. SCARNG and SCMD either take the lead or share implementation with Fort Jackson on all other natural resources management on MTC.
Draft MTC INRMP	Exec.Sum	5		Wilcox	In both the American Ornithological Society list (http://checklist.americanornithology.org/taxa/13001), the Cornell Clements list (updated 2019) and the Cornell 'Birds of the World' species account, the scientific name for RCW is *Dryobates borealis*.
Draft MTC INRMP	Exec.Sum	15		Wilcox	This sentence is awkward: "No substantive changes were made to the management programs and philosophies or the goals, objectives, and implementation projects." Maybe change the last 'and' to 'or'?
Draft MTC INRMP	18	21		Wilcox	*Dryobates* replaces *Picoides*
Draft MTC INRMP	32	9		Wilcox	*Dryobates* replaces *Picoides*
Draft MTC INRMP	7	15		Wilcox	Remove the word 'the'
Draft MTC INRMP	8	8		Wilcox	What is O/O? Or is it just part of the quote?
Draft MTC INRMP	8	10		Wilcox	Missing period at end of sentence.
Draft MTC INRMP	13	27		Wilcox	I have always seen it written as fire-dependent instead of fire-depended
Draft MTC INRMP	14	4		Wilcox	Change CCA to CAA
Draft MTC INRMP	15	13		Wilcox	Change 61 active clusters to '62 clusters'. Not all of these 62 are active. But you are right, 36 of them are on MTC.
Draft MTC INRMP	15	14		Wilcox	change 'on the Fort Jackson' to 'on Fort Jackson'
Draft MTC INRMP	15	14		Wilcox	Change this sentence to read 'A cluster is defined as the total area encompassing RCW cavity trees plus a 200-foot restrictive buffer zone.' I make this change because a 'cluster' could include a recruitment cluster, in which no RCW have yet occupied.
Draft MTC INRMP	15	16		Wilcox	Remove 'restrictive' from this sentence. The entire 1/2 mile radius foraging partition is not restricted. It should read, 'There is also a 0.5-mile radius foraging area around each cluster.'
Draft MTC INRMP	15	21		Wilcox	Add 'Another known occurrence of the smooth coneflower is along Lundy's Lane'.
Draft MTC INRMP	15	25		Wilcox	change to: Endangered Species Management Component for the Red-cockaded woodpecker.
Draft MTC INRMP	18	17		Wilcox	change 'sparrow hawk' to 'american kestrel'. Sparrow hawk is not an accepted common name for a bird in Eastern North America.
Draft MTC INRMP	30	18		Wilcox	Can you define ISR the first time it is mentioned? Although this one is in Acronym appendix, so perhaps not?
Draft MTC INRMP	31	1		Wilcox	Change 'Migratory' to 'Monitoring'
Draft MTC INRMP	31	23		Wilcox	Can you define NOV the first time it is mentioned? Not in Acronym appendix.
Draft MTC INRMP	31	27		Wilcox	Can you define PLS the first time it is mentioined. Not in Acronym appendix.
Draft MTC INRMP	31	31		Wilcox	Change 76>41 to 41-76 or similar, typically smaller number comes first
Draft MTC INRMP	31	37		Wilcox	Different font used, what if 15-19 acres are modified?
Draft MTC INRMP	32	10		Wilcox	Add '*Haliaeetus leucocephalus* ' after bald eagle, just to be consistent with the rest of the sentence, unless you are only giving latin name for endangered species.
Draft MTC INRMP	33	9		Wilcox	change 'ecosystems' to 'ecosystem-level'
INRMP Appendix B Maps	1			Wilcox	First page of Appendix B where it lists Table of Contents. Map 6 misspelled the word 'Status'
INRMP Appendix B Maps	Map #3 Water and Wetlands		3	Wilcox	I know you are probably trying to reuse previous maps instead of re-make them, but the purples, browns and greens are so similar that I can't actually tell where each drainage is located. In future could you distiguish the colors more?
INRMP Appendix B Maps	Map #4 Vegetation communities		4	Wilcox	Same issue about color differentiation trouble
INRMP Appendix B Maps	Map #4 Vegetation communities		4	Wilcox	In 'Threatened and Endangered Plant Species McCrady FY16 Final Report' Gaddy pointed out a very unique community called 'Sandstone Barrens' on the southern edge of MTC in TA 27F. This should be distinguished separately on this map. Or, perhaps add a map similar to Map 2A from above report pointing out noteworthy plant communities? Or, I perhaps this is not the place for this? Additionally, shouldn't this report be cited in section H?
INRMP Appendix C	est and Vegeta	2nd objective		Wilcox	change 'high diversity plant' to 'high diversity of plants'
INRMP Appendix C	data maintena	Project #10		Wilcox	repeated twice
INRMP Appendix C	Plant list			Wilcox	I think it is more common to see 'rough-leaf loosestrife' rather than 'rough-leaf yellow-loosestrife' but not a big deal.
INRMP Appendix C	Bird list			Wilcox	Change *Picoides borealis* to *Dryobates borealis*. I saw a juvenile Bald Eagle perched on a snag at Davis pond this year. But neglected to photograph or post on ebird, didn't realize you didn't have official record yet.
INRMP Appendix C	Mammal list			Wilcox	No Gray Fox? Rebecca Boazman has one documented on I-naturalist. I have a Southern Flying Squirrel documented with photo on McCrady posted on I-naturalist. Not sure if these count?
INRMP Appendix E	otential Plant species			Wilcox	change 'baldina' to 'balduina'
INRMP Appendix F	F.1.1.	1rst paragraph		Wilcox	change 'summer months July' to 'summer month of July'

SCARNG INRMP 2020 Update Draft Scoping and Review

Boazman, Rebecca <Rebecca.Boazman@scmd.sc.gov>

Tue 8/4/2020 3:09 PM

To: Caldwell, Mark <mark_caldwell@fws.gov>

Cc: Stone, Christopher <StoneC@tag.scmd.state.sc.us>;Anderson, Layne L. <AndersonLL@tag.scmd.state.sc.us>

Good morning Mr. Caldwell,

Please see the attached Cover Letter regarding our FY 2020 CHTS INRMP.

The Cover Letter contains further instructions on how to access the CHTS INRMP documents to be reviewed. If you have any comments, questions, or issues, please do not hesitate to contact me via email: boazmanr@tag.scmd.state.sc.us or by phone: (803) 299-1343.

Thank you in advance for your time on this review.

Rebecca Boazman
Natural Resource Field Technician IV
McCrady Training Center
SC Army National Guard
boazmanr@tag.scmd.state.sc.us
Ofc: (803) 299-1343

4 March, 2020

To: US Fish and Wildlife Service
Ecological Services Field Office
Mr. Mark Caldwell 1
76 Croghan Spur Road, Suite 200
Charleston, SC 29407-7558

Re: Update of Integrated Natural Resource Management Plan (INRMP), South Carolina Army National Guard (SCARNG), INRMP for McCrady Training Site, Richland County, South Carolina

The SCARNG is working on completing an update for the INRMP for McCrady Training Center (MTC) in Richland County, South Carolina. There is currently an INRMP for the site as required by the Sikes Act. The INRMP was originally approved by the U.S. Fish and Wildlife Service (USFWS) and the South Carolina Department of Natural Resources (SCDNR) in 2001 and the Review for Operation and Effect (ROE) was completed for MTC in 2019. The INRMP update and review will ensure that all cooperating partners have an opportunity to review updates for the INRMP, provide input on the update, and affirm whether they consider the INRMP is effective for the site. Given the length of time since the original signature, the SCARNG updated INRMP is intended to reflect new data, new policies, and new requirements since 2001.

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We will be glad to host a meeting if it would be beneficial during the review period. Please review this and reply with any comments or concerns you may have regarding this document by **15 May 2020**. Please send correspondence or questions to me by PHONE or EMAIL.

Sincerely,

Chris Stone
Deputy Conservation Manager
SCARNG Environmental Office
5401 Leesburg Road, Building #3924
Eastover, SC 29044
803-299-2236
stonec@tag.scmd.state.sc.us

From: McCoy, Thomas <thomas_mccoy@fws.gov> on behalf of Charleston Regulatory, FW4 <charleston_regulatory@fws.gov>
Sent: Monday, August 17, 2020 10:14 AM
To: Boazman, Rebecca <BoazmanR@tag.scmd.state.sc.us>
Cc: Caldwell, Mark <mark_caldwell@fws.gov>
Subject: SCARNG INRMP 2020 Update Draft Scoping and Review

Hello.
Attached is the Service's response letter for the draft scoping and review of the INRMP. If you have any questions, please let us know.
Tom

United States Department of the Interior
FISH AND WILDLIFE SERVICE
176 Croghan Spur Road, Suite 200
Charleston, South Carolina 29407

August 17, 2020

Rebecca Boazman
Natural Resource Technician IV
SCARNG Environmental Office
5401 Leesburg Road, Building #3924
Eastover, SC 29044

Re: Review of Draft INRMP, South Carolina Army National Guard, McCrady and Clarks Hill Training Sites, FWS Log No. 2019-CPA-0028

Dear Ms. Boazman:

The U.S. Fish and Wildlife Service (Service) has reviewed the South Carolina Army National Guard's (SCARNG) draft Integrated Natural Resources Management Plans (INRMP) for two training facilities in South Carolina, the McCrady Training Center in Richland County and Clarks Hill Training Center in McCormick County. The SCARNG is seeking comments to fulfill the requirements of the Sikes Act (16 U.S.C. §670a *et seq*.) regarding natural resources issues that must be addressed in the INRMPs such as, updates on policies or regulations or rare flora and fauna listings.

The Service is providing our comments separated by installation.

<u>McCrady Training Center (MTC) draft INRMP</u>

- Section 3.10, page 32, line 29 - the Green criteria has a description that does not make sense for the Success Criteria of Objective 1. It appears this is duplicate language from the Program Management Criteria of Section 3.1 (page 20, line 2). Please clarify or revise.
- This section provides for monitoring of existing populations of T&E Species. However, it is not clear whether there will be efforts to survey MTC for to locate additional individuals or populations of protected species. We recommend that new surveys be conducted periodically to locate unknown populations..
- Section 3.10 also specifies Special Status Species. Do Special Status Species include the Service's list of At-Risk species (ARS)? ARS are those species of concern that are currently under review by the Service to determine if listing under the ESA is warranted. We recommend that surveys for possible ARS at the MTC be conducted along with T&E species.
- Appendix E, Table E-1 lists the Carolina heelsplitter. While the heelsplitter is indeed a critically endangered species, it is considered extirpated from Richland County. The heelsplitter can be removed from this list.

Clark's Hill Training Center (CHTC) draft INRMP

- Recommend changing the SCDNR signatory from Alvin Taylor to Robert H. Boyles. Robert Boyles is the new director of SCDNR.
- Section 3.10, page 27, line 23 - the Green criteria has a description that does not make sense for the Success Criteria of Objective 1 (Similar to MTC INRMP). It appears this is duplicate language from the Program Management Criteria of Section 3.1 (page 14, line 1). Please clarify or revise.
- Section 3.10 also specifies Special Status Species. Do Special Status Species include the Service's list of At-Risk species (ARS)? ARS are those species of concern that are currently under review by the Service to determine if listing under the ESA is warranted. We recommend that surveys for possible ARS at the CHTC be conducted along with T&E species.

Please visit our Web site: https://www.fws.gov/southeast/pdf/fact-sheet/south-carolina-species-list-by-county.pdf for a list of species that have been petitioned for listing under the ESA, as well as Candidate Species or collectively referred to as "At-Risk Species" (ARS) for South Carolina. Although there are no Federal protections afforded to ARS, please consider including them in your project planning. Incorporating proactive measures to avoid or minimize harm to ARS may improve their status and assist with precluding the need to list these species. Additional information on ARS can be found at:

http://www.fws.gov/southeast/candidateconservation

The Service appreciates the opportunity to provide our comments for consideration in development of the two installation's INRMPs. If you have any questions on this matter, please contact Mark Caldwell at (843) 727-4707 ext. 215 or email at mark_caldwell@fws.gov and reference FWS Log No. 2019-CPA-0028.

Sincerely,

Thomas D. McCoy

Thomas D. McCoy
Field Supervisor

TDM/MAC

Re: SCARNG INRMP 2020 Update Draft Scoping and Review

Boazman, Rebecca <Rebecca.Boazman@scmd.sc.gov>

Tue 8/18/2020 8:36 AM

To: Charleston Regulatory, FW4 <charleston_regulatory@fws.gov>

Cc: Caldwell, Mark <mark_caldwell@fws.gov>

Mr. McCoy,
Good morning, we have reviewed your comments and recommendations made for our McCrady Training Center and Clarks Hill Training Site INRMPS. Below is a bulleted list addressing each comment/question you provided.

McCrady Training Center (MTC) draf t INRMP:

- Section 3.10, page 32, line 29: We have revised the Objective 1 Green Criteria to reflect the appropriate description for the Success Criteria.
- In regards to the recommendation for ARS/T&E Surveys, we are currently wrapping up a survey for currently listed ARS/T&E faunal species on McCrady. It should be completed at the end of the Federal FY for 2020.
- Section 3.10 Special Status Species: In the case of the MTC INRMP "Special Status Species" does include At-Risk Species, as listed and described by the USFWS. These species and their listing status can be found in Appendix E, Table E-1.
- We have edited the Appendix E, Table E-1, and have removed the Carolina heelsplitter from the list.

Clark's Hill Training Center (CHTC) draf t INRMP:

- We have corrected the signature block for SCDNR to display Robert H. Boyles as the correct signatory authority.
- Section 3.10, page 27, line 23: We have revised the Objective 1 Green Criteria to reflect the appropriate description for the Success Criteria.
- Just as it is for MTC, when the CTHS INRMP says "Special Status Species" this does include At-Risk Species, as listed and described by the USFWS. These species and their listing status can be found in Appendix E, Table E-1.

Again, we would like to thank you for your swift response and review, we greatly appreciate it.

The links to the documents provided in the Cover letter should still be correct and allow you to further access the documents if need be. If you have any further questions, comments, and/or concerns, please let me know.

Much obliged,
Rebecca Boazman
Natural Resource Field Technician IV
McCrady Training Center
SC Army National Guard
boazmanr@tag.scmd.state.sc.us
Ofc: (803) 299-1343

RE: [EXTERNAL] Re: SCARNG INRMP 2020 Update Draft Scoping and Review

Caldwell, Mark <mark_caldwell@fws.gov>

Tue 8/18/2020 9:06 AM

To: Boazman, Rebecca <BoazmanR@tag.scmd.state.sc.us>

Cc: McCoy, Thomas <thomas_mccoy@fws.gov>

Rebecca,

Thank you for your quick action. At this time we have no additional comments and look forward to assisting the SCANG in the future.

Mark

Mark A. Caldwell
Deputy Field Supervisor
US Fish and Wildlife Service
South Atlantic-Gulf Region
South Carolina Ecological Services
176 Croghan Spur Road, Suite 200
Charleston, SC 29407
843-300-0426 (direct line)
843-870-0041 (cell)
843-300-0189 – facsimile

SCARNG INRMP 2020 Update Draft Scoping and Review

Boazman, Rebecca <Rebecca.Boazman@scmd.sc.gov>

Tue 8/4/2020 3:09 PM

To: SimmonsW@dnr.sc.gov <SimmonsW@dnr.sc.gov>

Cc: Stone, Christopher <StoneC@tag.scmd.state.sc.us>;Anderson, Layne L. <AndersonLL@tag.scmd.state.sc.us>

Good morning Mr. Simmons,

Please see the attached Cover Letter regarding our FY 2020 CHTS INRMP.

The Cover Letter contains further instructions on how to access the CHTS INRMP documents to be reviewed. If you have any comments, questions, or issues, please do not hesitate to contact me via email: boazmanr@tag.scmd.state.sc.us or by phone: (803) 299-1343.

Thank you in advance for your time on this review.

Rebecca Boazman
Natural Resource Field Technician IV
McCrady Training Center
SC Army National Guard
boazmanr@tag.scmd.state.sc.us
Ofc: (803) 299-1343

4 March, 2020

To: South Carolina Department of Natural Resources
Alvin A. Taylor
Rembert C. Dennis Building
1000 Assembly Street
Columbia, SC 29201

Re: Update of Integrated Natural Resource Management Plan (INRMP), South Carolina Army National Guard (SCARNG), INRMP for McCrady Training Site, Richland County, South Carolina

The SCARNG is working on completing an update for the INRMP for McCrady Training Center (MTC) in Richland County, South Carolina. There is currently an INRMP for the site as required by the Sikes Act. The INRMP was originally approved by the U.S. Fish and Wildlife Service (USFWS) and the South Carolina Department of Natural Resources (SCDNR) in 2001 and the Review for Operation and Effect (ROE) was completed for MTC in 2019. The INRMP update and review will ensure that all cooperating partners have an opportunity to review updates for the INRMP, provide input on the update, and affirm whether they consider the INRMP is effective for the site. Given the length of time since the original signature, the SCARNG updated INRMP is intended to reflect new data, new policies, and new requirements since 2001.

For this update, we are seeking input from your agency regarding areas of the INRMP that could use improvement, as well as areas that are working well. We are seeking from your agency any new or additional information, new natural resources topics or issues of concern, updates on policies or regulations, updates on rare flora and fauna listings and nearby observations, identification of issues of regional concern, or other new information that your agency thinks should be considered during this review and subsequent updating of the INRMP.

SCARNG will be updating INRMPs for both sites, McCrady Training Center and Clarks Hill Training Sites. The updates will update content (now almost 20 years old) as well as the goals and objectives section which was completed in the 2019 Review for Operation and Effect.

We will be glad to host a meeting if it would be beneficial during the review period. Please review this and reply with any comments or concerns you may have regarding this document by **15 May 2020**. Please send correspondence or questions to me by PHONE or EMAIL.

Sincerely,

Chris Stone
Deputy Conservation Manager
SCARNG Environmental Office
5401 Leesburg Road, Building #3924
Eastover, SC 29044
803-299-2236
stonec@tag.scmd.state.sc.us

RE: SCARNG INRMP 2020 Update Draft Scoping and Review

Willie Simmons <SimmonsW@dnr.sc.gov>
Tue 9/8/2020 3:15 PM

To: Boazman, Rebecca <BoazmanR@tag.scmd.state.sc.us>

CAUTION: This email originated from outside your organization. Exercise caution when opening attachments or clicking links, especially from unknown senders.

Rebecca,
I have reviewed the document and I don't have any comments. Please let me know if you need anything else from me on the document.

Sincerely,

Willie

Re: SCARNG INRMP 2020 Update Draft Scoping and Review

Boazman, Rebecca <Rebecca.Boazman@scmd.sc.gov>
Wed 9/9/2020 8:56 AM

To: Willie Simmons <SimmonsW@dnr.sc.gov>

Mr. Simmons,

Thank you for your time on this review, we greatly appreciate it at this time we do not need anything else.

Obliged,
Rebecca Boazman
Natural Resource Field Technician IV
McCrady Training Center
SC Army National Guard
boazmanr@tag.scmd.state.sc.us
Ofc: (803) 299-1343

FINDING OF NO SIGNIFICANT IMPACT

For

Implementation of an
Integrated Natural Resources Management Plan at
South Carolina Army National Guard's
Mccrady Training Center

Richland County, South Carolina

The South Carolina Army National Guard (SCARNG) has prepared an Integrated Natural Resources Management Plan (INRMP) and Environmental Assessment (EA) for Mccrady Training Center (MTC), a 15,200-acre military training installation located within the boundaries of Fort Jackson in Richland County, South Carolina. The INRMP is a comprehensive management plan designed to guide natural resources management at the installation for fiscal years 2002-2006 in support of the military training mission and in accordance with applicable environmental laws and regulations. The EA was prepared in accordance with the National Environmental Policy Act, the Council on Environmental Quality (CEQ) Regulations, and Army Regulation 200-2 *Environmental Effects of Army Actions.*

A. DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

Proposed Action.-The SCARNG proposes to manage natural resources at the MTC (formerly known as the Leesburg Training Site) through the development and implementation of an INAMP. The purpose of the INRMP is to preserve, improve, and enhance natural resources system integrity and ensure that natural resources' conservation measures and Army activities on mission lands are integrated and consistent with federal stewardship requirements. The INRMP ensures that the SCARNG can meet its mission needs at MTC now and into the future, and that the natural resources that provide the training environment are ecologically sustainable over the long-term.

The Sikes Act (Title 16, United States Code 670a *et seq.)* as amended, Department of Defense Instruction 4715.3 *Environmental ConseNation Program* (03 May 96), and Army Regulation 200-3 *Natural Resources - Land, Forest and Wildlife Management* (28 Feb 95) require the development and implementation of.an INRMP. The Sikes Act provides the primary legal basis for the Secretary of Defense to carry out a program that provides for the conservation and rehabilitation of natural resources on military installations.

Alternatives Consldered.-In addition to the Proposed Action, two alternatives for implementing the INRMP at MTC were identified:

1. No-Action. In accordance with regulations promulgated by the CEQ 43 Code of Federal Regulations (CFR), Part 1500, Section 1502.14(d), a "No-Action" alternative must be evaluated. Th No-Action alternative would not immediately change MTC's management direction or the level of management intensity. Although MTC would continue to operate under existing natural resources management programs, existing programs do not currently meet the requirements of the Sikes Act, AA 200-3, or DoD Instruction 4715.3. The No-Action alternative would not provide an integrated approach to natural resources management in the immediate future, but would, for the most part, continue traditional management of individual

components of natural resources that are designed to protect selected aspects of the ecosystem.

2. *Limited Implementation of the fNRMP:* This alternative would develop an INRMP that meets requirements of the Sikes Act and Army policy, but does not provide an integrated approach to natural resources management. It would be implemented on an extended schedule. The Limited Implementation alternative did not meet the needs of natural resources management at MTC in a timely manner nor did it adopt an integrated approach to management; therefore, the Limited Implementation Alternative was not carried forth for analysis in the Environmental Assessment.

B. ENVIRONMENTAL IMPACT ANALYSIS

The EA indicates that implementation of the INRMP would result in beneficial effects or no significant adverse effects to the following resources: land use, air quality, noise, geology and soils, water resources, biological resources, cultural resources, facilities, socioeconomics, environmental justice, protection of children, and hazardous wastes/materials. Although no significant impacts are expected from implementing the No Action alternative, continuation of existing management procedures has the potential to result in adverse effects over the long-term from not establishing a comprehensive approach for natural resources management and evaluation. The No Action alternative would also res-ult in violating the Sikes Act requirements.

C. MITIGATION

No mitigation measures will be required as a result of implementing the INRMP at the MTC. Implementation of the INRMP is predominantly a management decision that will not of itself cause any negative impacts to MTC's natural resources, and will result in better protective measures for those natural resources. Individual projects undertaken at a later date in compliance with the procedures outlined in the INRMP may result in actions that could require mitigation measures. Appropriate mitigation measures will be identified and implemented at that time, as warranted.

D. REGULATIONS

There are no indications that implementation of the proposal will violate any federal, state, or local environmental laws or regulations. The proposed action would not violate the National Environmental Policy Act (42 USC § 4321 to 4370e), its regulations as promulgated by the Council on Environmental Quality (40 CFR Parts 1500-1508), Army Regulation 200-2, *Environmental Effects of Army Actions* or any other federal, state, or..local environmental laws or regulations. The EA documents the status of project compliance with applicable federal environmental statutes and executive orders.

E. PUBLIC REVIEW

The draft INRMP and EA were made available for public review from September·11-October 2, 2001. No public comments were received.

The final INRMP, EA and FNSI are available for review at Richland County Public Library, 1431 Assembly Street, Columbia, South Carolina, 29201 [Tel. (803) 799-9084) during normal business hours.

Written comments on the final INRMP, EA and this Finding of No Significant Impact by any interested party may be submitted within 15 days of the Notice of Availability's publication. Send comments to: South Carolina Army National Guard, Adjutant General's Office (Attn: Bryan Hall), 1 National Guard Road, Columbia, South Carolina, 29210.

F. FINDING OF NO SIGNIFICANT IMPACT

Careful review of the EA has indicated that implementation of an INRMP at the MTC will not have any adverse significant impact on the quality of the existing natural or human environment. The Proposed Action will allow SCARNG to achieve its primary mission of maintaining military readiness while balancing the sustainability of desired military training area conditions and ecosystem viability at MTC. The requirements of the National Environmental Policy Act and the Council on Environmental Quality regulations have been satisfied, and an Environmental Impact Statement will not be prepared.

Date: 7 IV!It' 0 /

AVIO.BARNO
Brigadier General, US ARMY
Commanding

Date: 30 (l:.:r DI

DO:MUR ,7,
Colonel, NGB
Chief, Environmental Programs
Division

REC and Check: To be inserted once scoping of draft is complete

J. RELEVANT LAWS, REGULATIONS, AND GUIDANCE

J.1 FEDERAL LAWS

American Indian Religious Freedom Act of 1978 (Public Law 95-341; 42 United States Code [USC] §1196) – requires the US, where appropriate, to protect and preserve religious rights of the American Indian, Eskimo, Aleut, and Native Hawaiians, including but not limited to access to sites, use and possession of sacred objects, and the freedom to worship through ceremonials and traditional rites.

Animal Damage Control Act of 1931 (7 USC §426 *et seq*.) – provides broad authority for investigation, demonstrations and control of mammalian predators, rodents and birds.

Anti-Deficiency Act of 1982 (31 USC §1341 *et seq.*) - provides that no federal official or employee may obligate the government for the expenditure of funds before funds have been authorized and appropriated by Congress for that purpose.

American Antiquities Act of 1906 (Public Law 59-209; 16 USC §431-433) – authorizes the President to designate historic and natural resources of national significance, located on federal lands, as National Monuments for the purpose of protecting items of archeological significance.

Archeological and Historical Preservation Act of 1974 (Public Law 95-96; 16 USC §469 *et seq*.) – provides for the preservation of historical and archeological data, including relics and specimens, threatened by federally funded or assisted construction projects.

Archeological Resources Protection Act of 1979 (16 USC §470 *et seq*.) – prohibits the excavation or removal from federal or Indian lands any archeological resources without a permit.

Bald Eagle Protection Act of 1940 (Public Law 87-884; 16 USC §668a-d) – prohibits the taking or harming (i.e. harassment, sale, or transportation) of bald eagles or golden eagles, including their eggs, nests, or young, without appropriate permit.

Clean Air Act of 1970 (42 USC §7401 *et seq*.) – regulates air emissions from stationary, area, and mobile sources. This law authorizes the US Environmental Protection Agency (USEPA) to establish National Ambient Air Quality Standards (NAAQS) to protect public health and the environment.

Clean Water Act of 1972 (Public Law 92-500; 33 USC §1251 *et seq*.) – aims to restore and maintain the chemical, physical, and biological integrity of the Nation's waters. Under Section 401, states have authority to review federal permits that may result in a discharge to wetlands or water bodies under state jurisdiction. Under section 404, a program is established to regulate the discharge of dredged or fill material into the Nation's waters, including wetlands.

Coastal Zone Management Act of 1972 (Public Law 92-583; 16 USC §1451 *et seq.*) – provides incentives for coastal states to develop coastal zone management programs. Federal actions that impact the coastal zone must be consistent to the maximum extent practicable with the state program.

Conservation and Rehabilitation Program on Military and Public Lands (Public Law 93-452; 16 USC §670 *et seq*.) – provides for fish and wildlife habitat improvements, range rehabilitation, and control of off-road vehicles on federal lands.

Conservation Programs on Military Reservations (Public Law 90-465; 16 USC §670 *et seq.*) – Requires each military department to manage natural resources and to ensure that services are provided which are necessary for management of fish and wildlife resources on each installation; to provide their personnel

with professional training in fish and wildlife management; and to give priority to contracting work with federal and state agencies that have responsibility for conservation or management of fish and wildlife. In addition, it authorizes cooperative agreements (with states, local governments, non-governmental organizations, and individuals) which call for each party to provide matching funds or services to carry out natural resources projects or initiatives.

Defense Appropriations Act of 1991 (Legacy Program) – establishes the "Legacy Resource Management Program" for natural and cultural resources with emphasis is on inventory and stewardship responsibilities.

Emergency Wetlands Resources Act of 1986 (16 USC §3901-3932) – requires reporting of wetland loss by the Secretary to Congress; authorizes the purchase of wetlands; requires the Secretary to establish a National Wetlands Priority Conservation Plan; and requires states to include wetlands in their Comprehensive Outdoor Recreation Plans, among others.

Endangered Species Act of 1973, as amended (16 USC §1531 *et seq.*) – provides for the identification and protection of threatened and endangered plants and animals, including their critical habitats. Requires federal agencies to conserve threatened and endangered species and cooperate with state and local authorities to resolve water resources issues in concert with the conservation of threatened and endangered species. This law establishes a consultation process involving federal agencies to facilitate avoidance of agency action that would adversely affect species or habitat. Further, it prohibits all persons subject to US jurisdiction from taking, including any harm or harassment, endangered species.

Federal Insecticide, Fungicide, and Rodenticide Act of 1947 (Public Law 92-516; 7 USC §136 *et seq*.) – governs the use and application of pesticides in natural resource management programs. This law provides the principal means for preventing environmental pollution from pesticides through product registration and applicator certification.

Federal Land Policy and Management Act of 1976 (43 USC §1701) – establishes public land policy and guidelines for its administration and provides for the management, protection, development, and enhancement of the public lands.

Fish and Wildlife Conservation Act of 1980 (Public Law 96-366; 16 USC §2901 *et seq.*) – encourages management of non-game species and provides for conservation, protection, restoration, and propagation of certain species, including migratory birds threatened with extinction.

Fish and Wildlife Coordination Act of 1934 (16 USC §661 *et seq*.) – provides a mechanism for wildlife conservation to receive equal consideration and coordinate with water-resource development programs.

Military Reservations and Facilities: Hunting, Fishing and Trapping (an update to the Military Construction Authorization Act; 10 USC §2671) – dictates that the Secretary of Defense require that all hunting, fishing, and trapping on military installations be in accordance with the fish and game laws of the State in which it is located, that license be obtained (except with respect to members of the armed forces), and that safety protocols be enacted.

Land and Water Conservation Act of 1965 (16 USC §4601 *et seq*.) – assists in preserving, developing, and assuring accessibility to outdoor recreation resources.

Migratory Bird Conservation Act of 1929 (16 USC §715 *et seq*.) – establishes a Migratory Bird Conservation Commission to approve areas recommended by the Secretary of the Interior for acquisition with Migratory Bird Conservation Funds.

Migratory Bird Treaty Act of 1918 (Public Law 65-186; 16 USC §703 *et seq.*) – provides for regulations to control taking of migratory birds, their nests, eggs, parts, or products without the appropriate permit and provides enforcement authority and penalties for violations.

National Environmental Policy Act of 1969 (Public Law 91-190; 42 USC §4321 *et seq.*) – mandates federal agencies to consider and document environmental impacts of proposed actions and legislation. In addition, it mandates preparation of comprehensive environmental impact statements where proposed action is "major" and significantly affects the quality of the human environment.

National Historic Preservation Act of 1966, as amended (PL 89-665; 16 USC §470 et seq.) – directs federal agencies to take into account the effect of any undertaking (a federally funded or assisted project) on historic properties.

Native American Graves Protection and Repatriation Act of 1990 (Public Law 101-601; 25 USC §3001-3013) – addresses the recovery, treatment, and repatriation of Native American and Native Hawaiian cultural items by federal agencies and museums. It includes provisions for data gathering, reporting, consultation, and issuance of permits.

Non-Indigenous Aquatic Nuisance Prevention and Control Act of 1990 – created the Aquatic Nuisance Species Task Force which is committed to preventing and controlling aquatic nuisance species and implementing the act.

Noxious Plant Control Act (PL 90-583) – provides for the control and management of nonindigenous weeds that injure or have the potential to injure the interests of agriculture and commerce, wildlife resources, or the public health.

Plant Protection Act of 2000[1] (7 USC §7701 et seq.) (replaces Federal Noxious Weed Act of 1973 [PL 93-629] – authorizes the USDA to prohibit or restrict the importation or interstate movement of any plant, plant product, biological control organism, noxious weed, article, or means of conveyance if the Secretary of Agriculture determines it is necessary to prevent introduction or spread of plant pests or noxious weeds.

Plant Quarantine Act (7 USC §151-167) – regulates the importation and interstate movement of nursery stock and other plants that may carry pests and diseases that are harmful to agriculture.

Readiness and Environmental Protection Initiative (within Section 2811, FY 2003 National Defense Authorization Act) (10 USC §2684a) – outlines agreements to limit encroachments and other constraints on military training, testing, and operations.

Resource Conservation and Recovery Act of 1976 (42 USC §6901 *et seq.*) – establishes a comprehensive program which manages solid and hazardous waste. Subtitle C, Hazardous Waste Management, sets up a framework for managing hazardous waste from its initial generation to its final disposal. Waste pesticides and equipment/containers contaminated by pesticides are included under hazardous waste management requirements.

Sikes Act Improvement Act of 1997 (Public Law 105-85; 16 USC §670a *et seq.*) – amends the Sikes Act of 1960 to mandate the development of an integrated natural resources management plan through cooperation with the Department of the Interior (through the US Fish and Wildlife Service [USFWS]),

[1] Replaces Federal Noxious Weed Act of 1974 (Public Law 93-629; 7 USC §2801).

Department of Defense, and each state fish and wildlife agency for each military installation supporting natural resources.

Soil Conservation Act of 1935 (16 USC §590a *et seq*.) – provides for soil conservation practices on federal lands.

Watershed Protection and Flood Prevention Act (PL 84-566; 16 USC §1001-1009) – the Soil Conservation Service at the Department of Agriculture provides planning assistance and construction funding for projects constructed by local sponsors, often in the form of flood control districts.

J.2 FEDERAL REGULATIONS

15 Code of Federal Regulations [CFR] 930 – Federal Consistency with Approved Coastal Management Programs

32 CFR 190 – Natural Resources Management Program

40 CFR 6 – USEPA Regulations on Implementation of NEPA Procedures

40 CFR 162 – USEPA Regulations on Insecticide, Fungicide, and Rodenticide Use

40 CFR 1500-1508 – Council on Environmental Quality (CEQ) Regulations on Implementing National Environmental Policy Act (NEPA) Procedures

50 CFR 17 – USFWS list of Endangered and Threatened Wildlife

50 CFR 10.13 – List of Migratory Birds

32 CFR 651 – Environmental Effects of Army Actions

J.3 FEDERAL EXECUTIVE ORDERS (EOS)

Environmental Safeguard for Activities for Animal Damage Control on Federal Lands (EO 11870) - restricts the use of chemical toxicants for mammal and bird control.

Exotic Organisms (EO 11987) – restricts federal agencies in the use of exotic plant species in any landscape and erosion control measures.

Floodplain Management (EO 11988) – specifies that agencies shall encourage and provide appropriate guidance to applicant to evaluate the effects of their proposals in floodplains prior to submitting applications. This includes wetlands that are within the 100-year floodplain and especially discourages filling.

Off-Road Vehicles on Public Lands (EO 11989[2]) – establishes criteria for designating public lands as open, limited or closed to the use of off-road vehicles (ORVs) and establishes rules for use and operation of ORVs in order to protect the resources of the public lands, to promote safety, and to minimize conflicts among various users.

Protection of Wetlands: Amends Executive Order 11990 (EO 12608) – directs all federal agencies to take action to minimize the destruction loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands. This applies to the acquisition, management, and disposal of federal lands and facilities; to construction or improvements undertaken, financed, or assisted by the

[2] Amends Executive Order 11644.

federal government; and to the conduct of federal activities and programs which affect land use.

Protection and Enhancement of Environmental Quality: Amends Executive Order 11514 (EO 11991) – provides for environmental protection of federal lands and enforces requirements of NEPA.

Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (EO 12898) – requires environmental protection for all communities by focusing federal attention on the environmental and human health effects of federal actions on minority and low-income populations.

Energy Efficiencies and Water Conservation at Federal Facilities (EO 12902) – federal agency use of energy and water resources is directed towards the goals of increased conservation and efficiency.

Indian Sacred Sites (EO 13007) – provides for the protection of and access to Indian sacred sites.

Protection of Children from Environmental Health Risks and Safety Risks (EO 13045) – requires that the USEPA evaluate the effects of a planned regulation on children and explain why the regulation is preferable to potentially effective and reasonably feasible alternatives.

Invasive Species (EO 13112) – directs federal agencies to prevent the introduction of invasive species and provide for their control and to minimize the economic, ecological, and human health impacts that invasive species cause.

Greening the Government through Leadership in Environmental Management (EO 13148) – requires the head of each federal agency to be responsible for ensuring that all necessary actions are taken to integrate environmental accountability into agency day-to-day decision making and long-term planning processes across all agency missions, activities, and functions.

Consultation and Coordination with Indian Tribal Governments (EO 13175) – ensures that all federal departments and agencies consult with Indian tribes and respect tribal sovereignty as they develop policy on issues that impact Indian communities.

Responsibilities of Federal Entities to Protect Migratory Birds (EO 13186) – directs all federal agencies taking actions that have a potential to negatively affect migratory bird populations to develop and implement a Memorandum of Understanding with the USFWS by January 2003 that shall promote the conservation of migratory bird populations.

Strengthening Federal Environmental, Energy, and Transportation Management (EO 13423) – requires federal agencies to lead by example in advancing the nation's energy security and environmental performance by establishing new and updated goals, practices, and reporting requirements for environmental, energy, and transportation performance and accountability.

Facilitation of Hunting Heritage and Wildlife Conservation (EO 13443) – directs the Department of the Interior and its component agencies, bureaus and offices facilitate the expansion and enhancement of hunting opportunities and the management of game species and their habitat.

Executive Order 13148: Greening the Government Through Leadership in Environmental Management (2000). – requires federal laboratories, testing facilities, maintenance facilities, hospitals, and others with operations that interact with the environment across all federal departments and agencies to implement an Environmental Management System (EMS) by December 31, 2005.

Presidential Memorandum, Government-to-Government Relations with Native American Tribal Governments (1994)– outlines principles that federal executive departments and agencies must follow in their interactions with Native American tribal governments such that the federal government operates within a government-to-government relationship with federally-recognized Native American Tribes.

J.4 DEPARTMENT OF DEFENSE DIRECTIVE (DODD), DEPARTMENT OF DEFENSE INSTRUCTION (DODI), ARMY REGULATION (AR), & ARMY NATIONAL GUARD REGULATION (ARNG)

DoDD 4150.7, DoD Pest Management Program

DoDD 4700.4, Natural Resources Management Program[3]

DoDD 4710.1, Archaeological and Historic Resources Management

DoDD 4715.1E, Environment, Safety, and Occupational Health

DoDD 6050.1, Environmental Effects in the US of DoD Actions

DoDD 6050.2, Use of Off-Road Vehicles on DlD Lands

DoDI 4150.07, Pest Management Program

DoDI 4165.57, Air Installations Compatible Use Zones

DoDI 4715.03, Natural Resources Conservation Program

DoDI 4715.1, Environmental Security

DoDI 4715.9, Environmental Planning and Analysis

DoDI 6055.06, Fire and Emergency Services Program

Department of Defense, American Indian and Alaska Native Policy

AR 200-1 Environmental Protection and Enhancement dated 13 December 2007

AR 210-9 – Use of Off-Road Vehicles on Army Lands

AR 215-1 – Morale, Welfare, and Recreation Activities and Non-Appropriated Fund Instrumentalities

AR 315-19 – The Army Sustainable Range Program

AR 405-80 – Management of Title and Granting Use of Real Estate

AR 420-40 – Historic Preservation

AR 420-90 – Fire and Emergency Services

ARNG Guidance for the Creation, Implementation, Review, and Revision and Update of INRMPs dated 9 April 2012

J.5 DEPARTMENT OF DEFENSE MEMORANDA

Memorandum, Assistant Deputy Under Secretary of Defense (Environment, Safety and Occupational Health), 20 Sept 11, Subject: *Interim Policy on Management of White Nose Syndrome in Bats*.

[3] Cancels DoD Directive 4700.1. Replaced by 32 CFR 190 – Natural Resources Management Program.

Memorandum, Assistant Deputy Under Secretary of Defense (Environment, Safety and Occupational Health), 3 Apr 07, Subject: *Guidance to Implement the Memorandum of Understanding to Promote the Conservation of Migratory Birds*.

Memorandum, Assistant Deputy Under Secretary of Defense (Environment, Safety and Occupational Health), 14 Aug 06, Subject: *Integrated Natural Resource Management Plan (INRMP) Template*

Memorandum, Assistant Deputy Under Secretary of Defense (Environment, Safety and Occupational Health), 17 May 05, Subject: *Implementation of Sikes Act Improvement Amendments: Supplemental Guidance concerning Leased Lands*

Memorandum, Assistant Deputy Under Secretary of Defense (Environment, Safety and Occupational Health), 1 Nov 04, Subject: *Implementation of Sikes Act Improvement Amendments: Supplemental Guidance concerning INRMP Reviews*

Memorandum, Deputy Under Secretary of Defense (Installations and Environment), 10 Oct 02, Subject: *Implementation of Sikes Act Improvement Act: Updated Guidance*

Memorandum, Assistant Deputy Under Secretary of Defense (Environment), 5 Aug 02, Subject: *Access to Outdoor Recreation Programs on Military Installations for Persons with Disabilities*.

Memorandum, Assistant Secretary of Army (Environment, Safety and Occupational Health), Deputy Assistant Secretary of the Navy (Environment), Deputy Assistant Secretary of the Air Force (Environment, Safety and Occupational Health), 20 Sep 11, *Subject: Interim Policy on Management of White Nose Syndrome in Bats*.

Memorandum, DAIM-ED Guidance for Implementation of the Sikes Act Improvement Act (SAIA) (Updated), 25 May 2006, Subject: *USFWS and State involvement in developing INRMPs; defining "mutual agreement" with the USFWS and the appropriate State agency; and coordinating INRMPs with other planning statutes.*

Memorandum, DAIM-ZA (200-3), 04 September 2002, Subject: *Army Wildland Fire Policy Guidance*.

Memorandum, US Army, 21 March 1997, Subject: *Army Goals and Implementing Guidance for Natural Resources Planning Level Surveys (PLS) and INRMP ("Army INRMP Policy")*.

Memorandum, Army National Guard Directorate, Environmental Programs Division (ARNG-ILE), 9 April 2012, Subject: *Guidance for the Creation, Implementation, Review, and Revision and Update of INRMPs*.

J.6 U.S. FISH AND WILDLIFE SERVICE (USFWS) GUIDANCE

USFWS Guidelines for Coordination on Integrated Natural Resource Management Plans (June 2015). Provides updated guidance to USFWS personnel for implementing the requirements of the Sikes Act. It replaces the following memorandum: *Guidance for Coordination of Department of Defense Sikes Act Integrated Natural Resource Management Plans (June 8, 2001).*

K. NEPA

Document 1. 2001 FONSI

FINDING OF NO SIGNIFICANT IMPACT

For

Implementation of an
Integrated Natural Resources Management Plan at
South Carolina Army National Guard's
McCrady Training Center

Richland County, South Carolina

The South Carolina Army National Guard (SCARNG) has prepared an Integrated Natural Resources Management Plan (INRMP) and Environmental Assessment (EA) for McCrady Training Center (MTC), a 15,200-acre military training installation located within the boundaries of Fort Jackson in Richland County, South Carolina. The INRMP is a comprehensive management plan designed to guide natural resources management at the installation for fiscal years 2002-2006 in support of the military training mission and in accordance with applicable environmental laws and regulations. The EA was prepared in accordance with the National Environmental Policy Act, the Council on Environmental Quality (CEQ) Regulations, and Army Regulation 200-2 *Environmental Effects of Army Actions*.

A. DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

Proposed Action.—The SCARNG proposes to manage natural resources at the MTC (formerly known as the Leesburg Training Site) through the development and implementation of an INRMP. The purpose of the INRMP is to preserve, improve, and enhance natural resources system integrity and ensure that natural resources conservation measures and Army activities on mission lands are integrated and consistent with federal stewardship requirements. The INRMP ensures that the SCARNG can meet its mission needs at MTC now and into the future, and that the natural resources that provide the training environment are ecologically sustainable over the long-term.

The Sikes Act (Title 16, United States Code 670a *et seq.*) as amended, Department of Defense Instruction 4715.3 *Environmental Conservation Program* (03 May 96), and Army Regulation 200-3 *Natural Resources – Land, Forest and Wildlife Management* (28 Feb 95) require the development and implementation of an INRMP. The Sikes Act provides the primary legal basis for the Secretary of Defense to carry out a program that provides for the conservation and rehabilitation of natural resources on military installations.

Alternatives Considered.—In addition to the Proposed Action, two alternatives for implementing the INRMP at MTC were identified:

1. No-Action. In accordance with regulations promulgated by the CEQ 43 Code of Federal Regulations (CFR), Part 1500, Section 1502.14(d), a "No-Action" alternative must be evaluated. The No-Action alternative would not immediately change MTC's management direction or the level of management intensity. Although MTC would continue to operate under existing natural resources management programs, existing programs do not currently meet the requirements of the Sikes Act, AR 200-3, or DoD Instruction 4715.3. The No-Action alternative would not provide an integrated approach to natural resources management in the immediate future, but would, for the most part, continue traditional management of individual

components of natural resources that are designed to protect selected aspects of the ecosystem.

2. *Limited Implementation of the INRMP*: This alternative would develop an INRMP that meets requirements of the Sikes Act and Army policy, but does not provide an integrated approach to natural resources management. It would be implemented on an extended schedule. The Limited Implementation alternative did not meet the needs of natural resources management at MTC in a timely manner nor did it adopt an integrated approach to management; therefore, the Limited Implementation Alternative was not carried forth for analysis in the Environmental Assessment.

B. ENVIRONMENTAL IMPACT ANALYSIS

The EA indicates that implementation of the INRMP would result in beneficial effects or no significant adverse effects to the following resources: land use, air quality, noise, geology and soils, water resources, biological resources, cultural resources, facilities, socioeconomics, environmental justice, protection of children, and hazardous wastes/materials. Although no significant impacts are expected from implementing the No Action alternative, continuation of existing management procedures has the potential to result in adverse effects over the long-term from not establishing a comprehensive approach for natural resources management and evaluation. The No Action alternative would also result in violating the Sikes Act requirements.

C. MITIGATION

No mitigation measures will be required as a result of implementing the INRMP at the MTC. Implementation of the INRMP is predominantly a management decision that will not of itself cause any negative impacts to MTC's natural resources, and will result in better protective measures for those natural resources. Individual projects undertaken at a later date in compliance with the procedures outlined in the INRMP may result in actions that could require mitigation measures. Appropriate mitigation measures will be identified and implemented at that time, as warranted.

D. REGULATIONS

There are no indications that implementation of the proposal will violate any federal, state, or local environmental laws or regulations. The proposed action would not violate the National Environmental Policy Act (42 USC § 4321 to 4370e), its regulations as promulgated by the Council on Environmental Quality (40 CFR Parts 1500-1508), Army Regulation 200-2, *Environmental Effects of Army Actions* or any other federal, state, or local environmental laws or regulations. The EA documents the status of project compliance with applicable federal environmental statutes and executive orders.

E. PUBLIC REVIEW

The draft INRMP and EA were made available for public review from September 17-October 2, 2001. No public comments were received.

The final INRMP, EA and FNSI are available for review at Richland County Public Library, 1431 Assembly Street, Columbia, South Carolina, 29201 [Tel. (803) 799-9084] during normal business hours.

Written comments on the final INRMP, EA and this Finding of No Significant Impact by any interested party may be submitted within 15 days of the Notice of Availability's publication. Send comments to: South Carolina Army National Guard, Adjutant General's Office (Attn: Bryan Hall), 1 National Guard Road, Columbia, South Carolina, 29210.

F. FINDING OF NO SIGNIFICANT IMPACT

Careful review of the EA has indicated that implementation of an INRMP at the MTC will not have any adverse significant impact on the quality of the existing natural or human environment. The Proposed Action will allow SCARNG to achieve its primary mission of maintaining military readiness while balancing the sustainability of desired military training area conditions and ecosystem viability at MTC. The requirements of the National Environmental Policy Act and the Council on Environmental Quality regulations have been satisfied, and an Environmental Impact Statement will not be prepared.

Date: 7 NOV 01

DAVID W. BARNO
Brigadier General, US ARMY
Commanding

Date: 30 OCT 01

RICHARD O. MURPHY
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