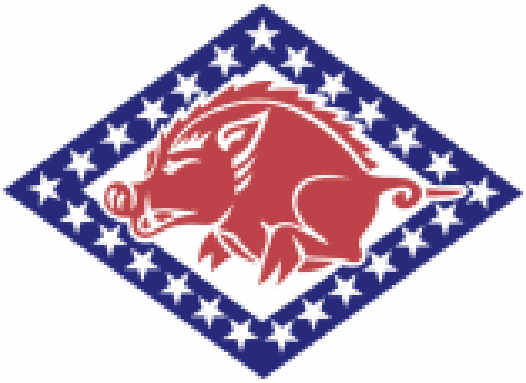
ROBINSON MANEUVER TRAINING CENTER,
NORTH LITTLE ROCK, ARKANSAS

# INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN



**Deputy Chief of Staff,**
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ROBINSON MANEUVER TRAINING CENTER
INTEGRATED NATURAL RESOURCES

MANAGEMENT PLAN

Military Department of Arkansas
Camp Joseph T. Robinson ATTN:
DCSEN-E Building 1301
North Little Rock, AR 72199-9600

March 2018

## LIST OF ACRONYMS USED IN THIS REPORT.

AASF Army Aviation Support Facility
ADEQ Arkansas Department of Environmental Quality
AFC Arkansas Forestry Commission
AGFC Arkansas Game and Fish Commission
ARNG-ILE Army National Guard Directorate, Environmental Programs Division
ARNG Army National Guard AR ARNG Arkansas Army National Guard
ANG Air National Guard
ANHC Arkansas Natural Heritage Commission
ANRC Arkansas Natural Resources Commission
ASPB Arkansas State Plant Board BIA Bureau of Indian Affairs
BMP Best Management Practice CEQ Council on Environmental Quality
CJTR Camp Joseph T. Robinson (or Camp Robinson)
cm dbh centimeter diameter breast height
CRSUA Camp Robinson Special Use Area
CRWMA Camp Robinson Wildlife Management Area
CRWMP Camp Robinson Wildlife Management Program
CSMS Combined Support Maintenance Shop
CSTP Civilian Student Training Program
DA Department of the Army
DAMO–TRS Training Support Systems Division [DA]
DCSEN Deputy Chief of Staff Engineering
DCSEN-E Deputy Chief of Staff Engineering-Environment
DoD Department of Defense
DoDD Department of Defense Directive
DoDI Department of Defense Instruction
EA Environmental Assessment
EIS Environmental Impact Statement
EO Executive Order
EPA Environmental Protection Agency
EPM Environmental Program Manager [DCSEN-E]
ERDC Engineer Research and Development Center [USACE]
ESA Endangered Species Act
FEMA Federal Emergency Management Agency
FMS Field Maintenance Shop
FONSI Finding of No Significant Impact
FRM Forest Resources Manager
FRMO Forest Resources Management Office
FRMP Forest Resources Management Plan
FWMP Fish and Wildlife Management Plan
FWS US Fish and Wildlife Service

GIS Geographic Information System
GLO General Land Office
HQDA Headquarters Department of the Army
IAD Initial Active Duty
IAFWA International Association of Fish and Wildlife Agencies
IBP Institute for Bird Populations
ICRMP Integrated Cultural Resources Management Plan
INRMP Integrate Natural Resources Management Plan
IPM Integrated Pest Management
IPMP Integrated Pest Management Plan
ISMP Invasive Species Management Program
ITAM Integrated Training Area Management
ITAM-EA ITAM Environmental Awareness (changed to SRA)
LCTA Land Condition Trend Analysis (changed to RTLA)
LRAM Land Rehabilitation and Maintenance
MACOM Major Commands
MAPS Monitoring Avian Productivity and Survivorship
MAWS Monitoring Avian Winter Survival
MDA Military Department of Arkansas
MOU Memorandum of Understanding
msl mean sea level
MTC Maneuver Training Center
NEPA National Environmental Policy Act
NGB National Guard Bureau
NHPA Natural Historic Preservation Act
NLR City of North Little Rock
NRCS Natural Resources Conservation Service
NRHP National Register of Historic Places
NRM Natural Resources Manager
NRMPG Natural Resources Management Program
NVC US National Vegetation Classification
OBS Oklahoma Biological Survey
ODCS, G–3/5/7 Office of the Deputy Chief of Staff, G–3/5/7
PCS Priority Conservation Site
PIF Partners in Flight
PLS Planning Level Survey
POW prisoner of war
RCMP Range Complex Master Plan
RDP Range Development Plan
RFMSS Range Facility Management Support System
RMTC Robinson Maneuver Training Center
RMTC-OPS RMTC Operations Officer
RMTC-TSM RMTC Training Site Manager

ROE Review for Operation and Effect
ROTC Reserve Officers' Training Corps
RTLA Range and Training Land Analysis
SAIA Sikes Act Improvement Act
SOCC Species of Conservation Concern
SPMPG Self-help Pest Management Program
SRA Sustainable Range Awareness
STARC State Area Command
STEP Status Tool for the Environmental Program
TA Training Areas
TAG The Adjutant General
TRI Training Requirements Integration
TSRIM Training Site Resource Information Management
US United States of America
USACE US Army Corps of Engineers
USAEHA US Army Environmental Hygiene Agency
USFS US Forest Service
USGS US Geological Survey
WFMP Wildland Fire Management Plan
WFMPG Wildland Fire Management Program
YCP Youth Challenge Program

## LIST OF APPENDICES

# EXECUTIVE SUMMARY

Robinson Maneuver Training Center (RMTC) is a 33,003 acre training site owned by the State of Arkansas for use by the Arkansas (AR) Army National Guard (ARNG)/Military Department of Arkansas (MDA) located in central Arkansas directly north of North Little Rock. RMTC is used primarily for military training activities by the AR ARNG, Department of Defense (DoD) Reserve and Active components, and other federal, state and civilian agencies, ranging from billeting and small arms ranges to light maneuver training. The majority of training activities are related to infantry training by the AR ARNG.

The purpose of this updated Integrated Natural Resource Management Plan (INRMP) is to document the progress and changes of natural resource programs at RMTC, to correct any changes in terminology or any clerical oversights in previous editions, and to support military training by guiding natural resources and land management at RMTC. The need for this INRMP is derived from The Sikes Act, as amended by The National Defense Authorization Act of 2012, 16 USC 670a et seq., Army Regulation (AR) 200-1 Environmental Protection and Enhancement, and Army National Guard Directorate, Environmental Programs Division (ARNG-ILE) Guidance for the Creation, Implementation, Review, and Revision and Update of INRMPs dated 9 April 2012.

This INRMP supports military training by identifying ways to support the sustainability of the training site and providing information that facilitates those activities. This plan also identifies the military mission and its effects on natural resources and vice versa; identifies resources and programs requiring natural resources management and sets goals, objectives, and actions for that management; provides guidelines for natural resources and land management to maintain biodiversity and sustainability of RMTC with no net loss to the training mission; describes the physical and biological conditions present at RMTC; and provides an avenue for public involvement and coordination and cooperation with other agencies.

In order to maintain readiness standards and achieve the primary mission of RMTC to provide military training, the AR ARNG/MDA must have lands that are capable of supporting mission objectives and other functions indefinitely into the future. Sustainable use of these lands can be achieved through management programs that integrate mission requirements for land use with sound natural resources management. Natural resources stewardship is the management of natural resources with the goal of maintaining or increasing the resource's value indefinitely. Biodiversity consists of all living elements of the natural environment, and ecosystem management is the tool that AR ARNG/MDA will use to protect biodiversity and achieve sustainable military use. This approach favors management that considers natural resources at a community or ecosystem level rather than at a single species level. The quality, integrity, and connectivity of the ecosystem are the overall goals of this approach, and it is expected that within this broad scheme individual species will prosper.

This updated INRMP has been prepared by AR ARNG/MDA in accordance with: -The Sikes Act, as amended by The National Defense Authorization Act of 2012, 16 USC 670a et

seq. -The Endangered Species Act (ESA), as amended by the National Defense Authorization Act of 2004, 16 USC 1533(b)(2) and 1533 (a)(3)(b) -AR 200-1, Environmental Protection and Enhancement (13 December 2007) -DoD Instruction (DoDI) 4715.03 Natural Resources Conservation Program (18 March 2011) -DoD Memorandum, Updated Guidance for Implementation of the Sikes Act Improvement Act (10 October 2002) -DoD Memorandum, Updated Guidance for Implementation of the Sikes Act Improvement Act-Supplemental Guidance Concerning INRMP Reviews (01 November 2004) -DoD Memorandum, INRMP Template (14 August 2006) -Department of the Army (DA) Memorandum, Guidance for Implementation of the Sikes Act Improvement Act (25 May 2006) -ARNG-ILE Memorandum, Guidance for the Creation, Implementation, Review, and Revision and Update of INRMPs (9 April 2012) As specified by the updated guidance, the INRMP has been reviewed in cooperation with US Fish and Wildlife Service (FWS) and the Arkansas Game and Fish Commission (AGFC) through coordination including correspondence and consultation. Also, included in a primary cooperator role for this INRMP, Arkansas Natural Heritage Commission (ANHC) is responsible for maintaining historical records of rare plant and animal species and high quality natural communities in Arkansas and providing this information to public and private entities. Updates to the INRMP will reflect changes of AR ARNG/MDA, FWS, AGFC and ANHC pertaining to RMTC. Table ES-1 summarizes the progress the AR ARNG/MDA has made in implementing the INRMP at RMTC. The table lists all management programs, objectives, and management actions to achieve the overall goal of INRMP implementation. Additionally, Table ES-1 provides the status of the management actions.

This update of the INRMP is not substantially different from the original INRMP version (Parsons 2001). The format of the update is different, but the management philosophy and activities are not substantially changed. The overall land management remains the same as previous versions. Consequently, cumulative effects on the environment are expected to be no different than previous editions of the INRMP. Positive effects include increased habitat heterogeneity, reduced invasive species, reduced erosion and sedimentation, and increased buffers around water resources. Temporary negative effects are associated with prescribed fires, erosion repair, timber harvest and thinning, and minor disturbance necessary for larger scale restoration, resource utilization, or habitat improvement.

**Table ES1. Summary of Status INRMP Implementation RMTC.**

| Objective | Management Action | Status |
|---|---|---|
| *Fish, Wildlife, Outdoor Recreation Management* | | |
| **1.** Maintain, protect, and enhance the RMTC fish and wildlife habitat in order to promote the biodiversity of the region, provide a sustained yield of fish and game species, and to ensure the long-term use of these habitats for training. | **1.** Maintain a species list containing all species officially documented on RMTC. To be completed through formal and informal surveys, expert consultation, and presence documentation. | In 2016 and 2017, 157 species of various plants and animals have been added to the RMTC species list. The list richness currently stands at 1,246 different species found on RMTC. |
| | **2.** Review annually the October 2000 Memorandum of Understanding (MOU) with the Arkansas Game and Fish Commission (AGFC). | The portion of RMTC including TAs north of the pipeline, but not including the Small Arms Impact Area, Mortar Impact Area, Cantonment Area, All-American Drop Zone (TA7), and TAs 1, 2, 19, 20, 21, 22, and portions of TA3 south of the pipeline, has been designated as the Camp Robinson Wildlife Management Area (CRWMA) and will be managed in cooperation between the AR ARNG/MDA and the AGFC, as detailed in the MOU. The MOU is included in this INRMP as Appendix N. |

| Objective | Management Action | Status |
|---|---|---|
| | **3.** Create and maintain a white-tailed deer management plan. Continue to conduct fall and spring white-tailed deer surveys on RMTC to maintain deer herd health information. | Deer surveys are conducted each fall and spring. As established in the MOU between AR ARNG/MDA and AGFC, both agencies' personnel participate in these surveys. The deer management policy is provided in Appendix N. |
| | **4.** Continue annual stocking of game fish species in lakes and ponds at RMTC as necessary. | In 2017, AGFC fisheries biologists sampled our lake fish communities. They determined that we have a healthy fish communities and no stocking was required. |
| **2.** Continue to provide vegetation necessary to support native wildlife species. | **1.** Annually plant a combination of grains, such as corn, millet, sunflowers, wheat, or sorghum at designated locations. Sorghum is a preferred grain because it is rich in energy, persistent on the plant, and usually available to wildlife when snow and ice cover other grains and seeds. Food plots can be planted along edge areas or in areas disturbed by training. In areas disturbed by training, a food plot can serve as a cover crop until native vegetation is restored. Avoid altering areas designated as PCSs by providing this information to pertinent personnel. | Since 2001, approximately 100 total acres have been managed as general wildlife plots and approximately 50 total acres have been managed as waterfowl plots. Approximately 15 acres are annually managed as wildlife food plots. |

| Objective | Management Action | Status |
|---|---|---|
| | **2.** Broadcast native legumes or short-lived nonnative legumes such as soybeans in disturbed areas near cover. | This is performed on a limited basis. |
| *Species of Conservation Concern Management* | | |
| **1.** Maintain, protect, and enhance the RMTC Northern Bobwhite Quail habitat in order to promote the biodiversity of the region and to ensure the long-term use of RMTC lands for training. | **1.** Conduct routine prescribed burns in Quail habitat. Prescribed fires will improve and expand habitat for these Species of Conservation Concern (SOCCs). These activities benefit a multitude of species including Bachman's sparrow, Cerulean warbler, and loggerhead shrike | Quail are good indicators of ecosystem health and function as each species' preferred habitat is indicative of ecological quality factors affecting many other ecological elements within that community. Their presence at the installation also ensures overall biodiversity is maintained or enhanced. The habitat for this species is maintained or improved primarily through prescribed burning. |
| **2.** Maintain, protect, and enhance potential threatened and endangered species' habitat at RMTC in order to promote the biodiversity of the region and to ensure the long-term use of RMTC lands for training. | **1.** Plan, conduct, and periodically update Floral and Faunal PLSs. These PLSs will identify, inventory, and delineate all species present and record their current status on the installation. This data is needed for planning purposes such as maintaining up to date information in the INRMP, analyzing potential impacts in National Environmental Policy Act (NEPA) documents, and tracking SOCCs populations. | In conjunction with ANHC personnel, ongoing efforts are presently underway to identify and collect plants at the installation that are not currently part of the RMTC collection. Additionally, in an ongoing effort to maintain current and accurate electronic records all herbarium specimens are being scanned and cataloged within the RMTC Natural Resources Management Program (NRMPG) archives. The maintenance of the RMTC species list helps to identify potential candidate species. Experts are also consulted while candidate species are under review. These experts ultimately determine whether a threatened or endangered species is present. |

| Objective | Management Action | Status |
|---|---|---|
| *Surface Waters and Wetlands Management* | | |
| **1.** Maintain and protect RMTC surface waters in order to promote the biodiversity of the region, protect water quality and aquatic species, and to ensure the long-term use of RMTC lands for training. | **1.** Monitor streambank and gully erosion along the streams within the training site boundaries. Mark erosion sites on a map and take corrective measures where appropriate. Corrective measures will consist of using seed, topsoil, riprap, geotextile cloth, and native vegetation where appropriate. Corrective measures often require contacting the UASCE and securing appropriate permits. | Twelve streams and five lakes on RMTC were previously sampled on a recurring basis (34 total samples taken) to monitor the turbidity levels and overall total water quality. Resource availability to continue this monitoring program has been limited over the last five years. These waters are also periodically monitored for erosion as necessary. |
| | **2.** Protect RMTC's water resources from pesticides, including insecticides and herbicides. Maximize the use of Integrated Pest Management (IPM) techniques. The Integrated Pest Management Plan (IPMP) describes the pest management requirements, outlines the resources necessary for surveillance and control, and describes the administrative, safety, and environmental requirements of the program. It is intended to reduce reliance on pesticides and to enhance environmental protection. | Twelve streams and five lakes on RMTC were previously sampled on a recurring basis (34 total samples taken) to monitor the turbidity levels and overall total water quality. Resource availability to continue this monitoring program has been limited over the last five years. These waters are also periodically monitored for erosion as necessary. |
| | **3.** Restrict the construction of permanent structures within the boundaries of the 100-year floodplain, thereby avoiding flood damage on RMTC lands and elsewhere. | Construction personnel verify with DCSEN-E before starting work as part of the NEPA process. |
| | **4.** Build hardened crossings where unimproved water crossings exist at RMTC to protect vehicles from damage while crossing streams and protect water quality by minimizing sedimentation and erosion. | RMTC maintenance staff construct hardened water crossings as deemed necessary based on training need. |
| | **6.** Tree growth on dams will be discouraged or removed. Monitor the activity of burrowing animals such as muskrats and beavers to protect "man-made" dams. | RMTC maintenance staff removes trees from lake levees as necessary. Beaver activity is monitored and control measures are implemented as needed. |

| Objective | Management Action | Status |
|---|---|---|
| | | |

| *Pest and Invasive Species Management* | | |
|---|---|---|
| **1.** Maintain and protect the RMTC native wildlife and vegetation communities in order to promote the biodiversity of the region, protect native species and ecosystems, and ensure the long-term use of the lands for training. | **1.** Prohibit the use of invasive plants for landscaping or other purposes. Implement BMPs to minimize land disturbances that promote invasion, and re-vegetate disturbed areas with native species. Avoidance will remain the preferred control measure. | This is accomplished through coordination with the RMTC Post Engineers Roads and Grounds crew. |
| | **2.** Monitor gypsy moth populations annually at RMTC by putting gypsy moth traps up in the spring and monitoring them until August. Give the traps to the Arkansas State Plant Board (ASPB) to examine for gypsy moths. | Traps are set and collected annually. This is conducted in cooperation with the ASPB. To date, no gypsy moths have been caught on RMTC. |
| | **3.** Monitor, and where possible control, the spread of privet (*Ligustrum* spp.), Japanese honeysuckle (*Lonicera japonica*), autumn olive (*Eleagnus umbellata*), Chinese tallow (*Triadica sebifera*), multiflora rose (*Rosa multiflora*), kudzu (*Pueraria montana* var. *lobata*), sericea lespedeza (*Lespedeza cuneata*) Chinaberrytree (*Melia azedarach*), and wisteria (*Wisteria floribunda* and *W. sinensis*) at RMTC. These plants are now invading areas vegetated with desirable native plants. | In 2017, over 250 acres were treated to prevent the spread of these species. |

| | | |
|---|---|---|
| **2.** Train RMTC personnel and users of the site on the recognition and avoidance of disease vectors and poisonous plants while participating in training activities. | **1.** Maximize the use of the IPM techniques. The IPMP provides guidance for the operation and maintenance of the pest management program at RMTC. The IPMP incorporates the prescriptive requirements of the ARNG for administering a safe and effective pest control program. The three major groups of pests addressed in the plan are invasive plants, mammals (e.g., skunks, and mice), and arthropods (e.g., mosquitoes, ticks, fire ants, and roaches). | A feral animal control and removal program is in place at RMTC. Invasive species are controlled through IPM. Non-chemical measures to control nuisance insects are emphasized. Insect repellant use is encouraged for all personnel involved in field activities on the installation and is available for procurement through the Self-help Pest Management Program (SPMPG) via the IPMP. Educational and instructional material is disseminated to RMTC personnel. |
| | **2.** Train personnel and troops on minimizing tick exposure by wearing appropriate clothing, applying tick repellent, and performing personal hygiene inspections daily, as well as avoidance of tick habitat when possible. Coordinate tick-borne disease awareness training for all troops. | Insect repellant use is encouraged for all personnel involved in field activities on the installation and is available for procurement through the SPMPG via the IPMP. Educational and instructional material is disseminated to RMTC personnel. Units conducting training at RMTC receive briefings and courses (Unit Environmental Compliance Officer and Environmental Awareness) to educate them on pest prevention and avoidance. Starting in 2016 ticks have been periodically turned in to the University of Arkansas for disease testing. |

# 1.0 INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN OVERVIEW

## 1.1 Vision, Purpose, and Need for this Integrated Natural Resources Management Plan

The *vision* for this Integrated Natural Resource Management Plan (INRMP) is to provide a single, comprehensive document to guide the sustainable management of the land and natural resources for Robinson Monuvor Training Center (RMTC). This document aims to ensure that natural resource management maintains the necessary quantity and quality of military training lands while also providing resource protection, ecosystem integrity, and multiple uses of lands. The *purpose* of this INRMP is to support military training by fulfilling a variety of natural resources management needs at RMTC for the Arkansas Army National Guard/Military Department of Arkansas (AR ARNG/MDA). The following are some of these natural resources management needs:

1. Identify military mission and its effects on natural resources and vice versa
2. Recommend guidelines for management of natural resources to maintain biodiversity and sustainability of the training site
3. Identify resources and programs requiring natural resources management and set goals, objectives, and targets for that management
4. Provide specific guidelines based on ecosystem management so that natural resources and land management results in no net loss to the training mission
5. Coordinate with other federal and state agencies involved in natural resources management
6. Summarize current physical and biological conditions at the training site
7. Suggest methods for increasing awareness of AR ARNG/MDA and the general public of natural resources management and its integration with military training
8. Identify data needed to improve natural resources management
9. Describe organization, personnel, funding and support required for INRMP implementation
10. Provide an avenue for public involvement
11. Fulfill National Environmental Policy Act (NEPA) requirements
12. Ensure compliance with all applicable federal, state, and local laws and regulations

The need for this INRMP is to fulfill AR 200-1, Environmental Protection and Enhancement and ARNG-ILE guidance requiring INRMPs consistent with The Sikes Act. Key environmental regulations guiding this INRMP are summarized below in Section 1.7 and all relevant laws, regulations, and policies are summarized in Appendix C.

## 1.2 Overall Natural Resources Program

The Adjutant General (TAG) of the AR ARNG has overall responsibility for the preparation and implementation of an INRMP that fulfills stewardship, legal, and training requirements. TAG is the head of the AR ARNG and MDA. Under the AR ARNG/MDA, the DCSEN-E EPM, in coordination with the RMTC-Training Site Manager (TSM) and RMTC-Operations Officer (OPS), has day to day responsibility to develop and coordinate implementation of the INRMP. A component of the Deputy Chief of Staff Engineering (DCSEN) Office, the EPM has oversight responsibility for the DCSEN-E which contains the RMTC Natural Resources Management Program (NRMPG). The RMTC Natural Resources Manager (NRM) currently serves as the lead representative for the RMTC NRMPG. In addition to the AR ARNG/MDA, internal and external stakeholders include the FWS, AGFC, ANHC, United States Natural Resources Conservation Service (NRCS), and adjacent landowners. These stakeholders have a vested interest in how the natural resources at AR ARNG/MDA installations are managed. As such, stakeholders are included in the natural resources planning process and have the opportunity to provide technical and/or regulatory input. Concurrence with this INRMP by these agencies represents a mutual agreement of the parties concerning conservation, protection, and management of fish and wildlife resources. The AR ARNG/MDA has coordinated the update of the INRMP with FWS, AGFC, and ANHC. Letters sent to these agencies as well as other organizations and agencies are included in Appendix J. Letters of reply and concurrence memos are also included in Appendix J.

## 1.3 Mission and Environmental Setting

The AR ARNG/MDA, and RMTC mission includes both federal and state components. The primary federal mission is to provide trained and equipped units capable of immediate expansion to war strength. These units must be available for service in time of war or national emergency, or when appropriated to augment the active Army. The primary state mission is to support civil authorities in the protection of life and property and the preservation of peace, order, and public safety under competent orders from state authorities. The subject of this INRMP, RMTC, is immediately north of the City of North Little Rock (NLR), Arkansas primarily in Pulaski County. RMTC consists of approximately 33,000 acres.

## 1.4 Natural Resource Planning

The Natural Resources Planning structure has been developed based on installation-specific management situations and is designed to facilitate issue identification and prioritization, as well as project funding, implementation, and tracking. The Management Programs addressed in this INRMP include the following:

1. Land Use and Training Lands
2. Terrestrial Systems and Native Plant Communities
3. Fish, Wildlife, and Outdoor Recreation
4. Species of Conservation Concern (SOCC) and Priority Conservation Sites (PCSs)
5. Surface Waters, Wetlands, and Watersheds
6. Pest and Invasive Species
7. Resource Information

Management goals and objectives for each program are identified and discussed in the INRMP and are the basis for the INRMP management actions.

## 1.5 Management Goals and Objectives

Objectives and management actions have been established for each of the resource-specific programs to address the identified issues. Objectives are defined as project-level activities that the AR ARNG/MDA intends to achieve during the current planning period. The management actions developed for each objective represent the specific steps that will be taken to achieve the goals. Staffing, funding, and scheduling requirements for achieving the goals have also been established.

## 1.6 Plan Implementation

RMTC intends to implement the overall management goals and project-specific objectives and management actions contained in this INRMP based on available funding and personnel. However, AR ARNG/MDA recognizes the need for an adaptive management approach to address changing land use requirements, natural resources conditions, and other unforeseen factors. Consequently, unforeseen factors might prohibit the AR ARNG/MDA from implementing some or all of the project-specific goals in accordance with the implementation schedule. In addition, implementation of project-specific objectives is contingent upon the availability of funding and other project funding priorities within the DA, National Guard Bureau (NGB), and AR ARNG/MDA. As discussed in Section 3, the INRMP will be routinely reviewed and updated to address changing conditions.

Staffing, funding, and schedule requirements have been established for each project-specific INRMP objective. Effective implementation of the INRMP will require a variety of RMTC and AR ARNG/MDA staff. Engineer components within the AR ARNG/MDA will provide vital

implementation support for the INRMP, especially within the Land Use Program. Selected goals will be implemented with assistance from contractors and cooperating agencies. Currently, funding requirements for equipment, supplies, and contractors totaling $8,470,000 have been identified for the project-specific INRMP goals.

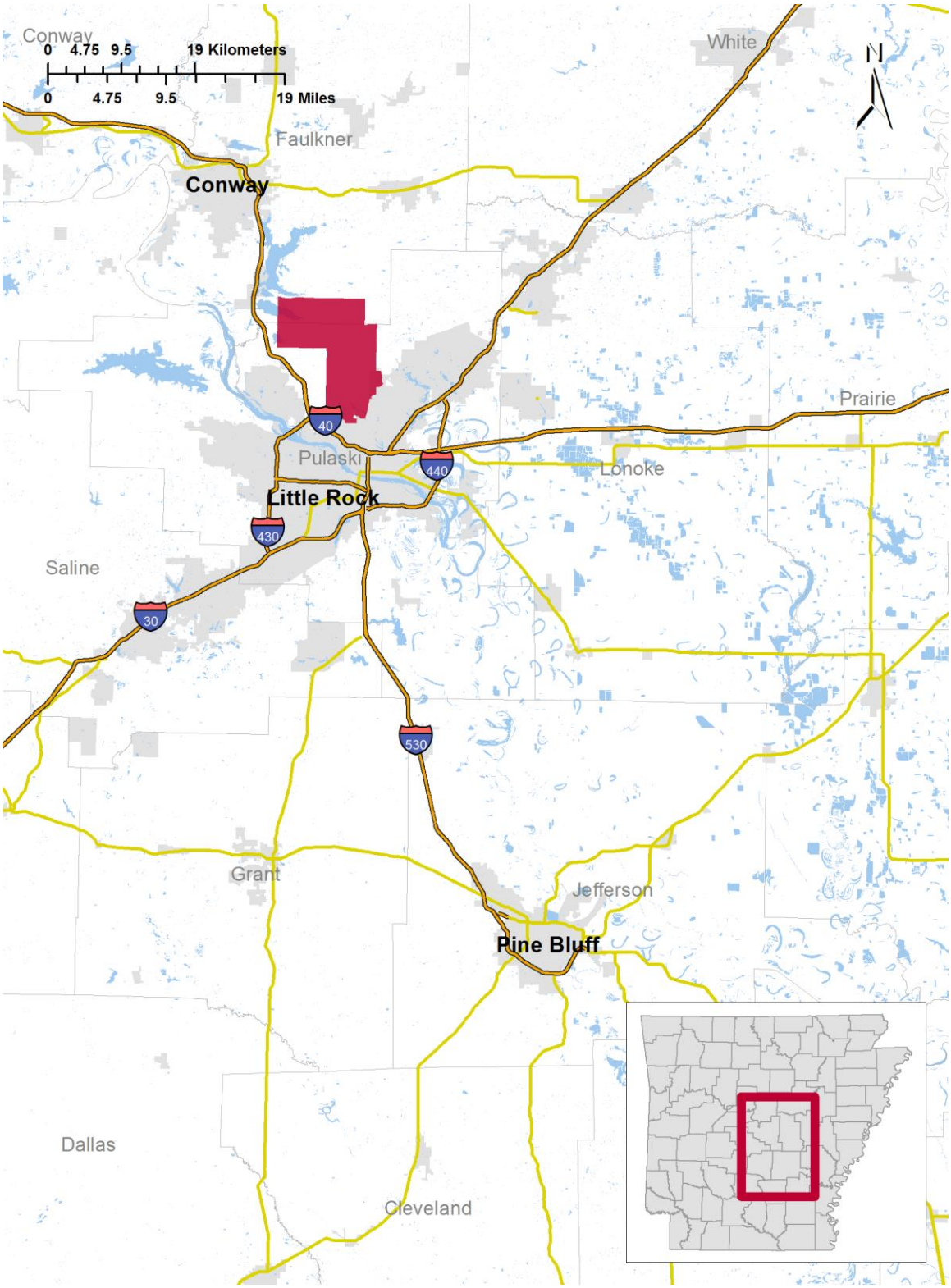


Figure 1.1 Geographic Location of RMTC.

# 1.7 Introduction

## 1.7.1 Authority

This updated INRMP for the RMTC has been prepared by the AR ARNG/MDA in accordance with the Sikes Act Improvement Act (SAIA) of 1997 (SAIA, Public Law 105-85, Div. B Title XXIX, Nov. 18, 1997, 111 Statute 2017-2019, 2020-2022) and DoDI 4715.03, Natural Resources Management Programs, AR 200-1, NGB policy, Implementation of SAIA: Updated Guidance (October 10, 2002), and the DoD Supplemental Guidance Concerning INRMP Reviews (November 1, 2004), and the Memorandum of Understanding (MOU) among DoD, FWS, and the International Association of Fish And Wildlife Agencies (IAFWA) for a Cooperative INRMP on Military Installation (January 31, 2006), and ARE-ILE guidance. Please see Appendix A for a listing of all reference documents.

SAIA guidance requires INRMPs for ARNG installations unless the lack of significant resources makes preparation of a plan inappropriate. RMTC consists of approximately 33,000 acres of which approximately 25,000 is unimproved. RMTC is owned by the State of Arkansas and is administered by the AR ARNG/MDA. Therefore, ARNG-ILE and AR ARNG/MDA have determined, under this guidance, that an INRMP is appropriate and necessary for RMTC.

In accordance with the ARNG-ILE guidance (November 1, 2004), a review of this INRMP "as to operation and effect" has been conducted. The purpose of the review is to determine whether the INRMP is being implemented to meet SAIA guidance and contribute to the conservation and rehabilitation of natural resources at RMTC. As a result of this review, some of the management actions have been updated and revised to reflect current conditions at RMTC. The updated INRMP also provides the status of RMTC's progress in achieving the management actions.

## 1.7.2 Management Philosophy

This INRMP was developed and updated under the following four concepts:

1. Sustainable use of military lands with a goal of "no net loss in the capability of military lands to support the military mission"
2. Natural resources stewardship
3. Biodiversity protection
4. A comprehensive ecosystem management approach

As stated in SAIA guidance, the INRMP should ensure sustainable use of military lands with a goal of "no net loss in the capability of military lands to support the military mission." In order to fully support and sustain its military mission at RMTC, the AR ARNG/MDA must manage, protect, and enhance the biological integrity of the training site. The AR ARNG/MDA mission includes both federal and state components. The primary federal mission of the AR ARNG/MDA is to provide trained and equipped units capable of immediate expansion to war strength. These units must be available for service in time of war or national emergency or

when appropriated to augment the active Army. The primary state mission is to support civil authorities in the protection of life and property and the preservation of peace, order, and public safety under competent orders from state authorities.

In order to accomplish these missions and train accordingly, the AR ARNG/MDA requires a sufficient area of land. According to the AR ARNG Range and Training Land Program Development Plan, the availability of training land is limited in Arkansas (ARNG 2000). Sustainable use of RMTC training lands can best be achieved through management programs that integrate mission activities with sound natural resources management of the land.

Natural resources stewardship is the management of natural resources with the goal of maintaining or increasing the resource's value indefinitely. The stewardship goal of the AR ARNG/MDA is to sustain multiple uses of natural resources over the long-term, while promoting the health of the ecosystems in which these activities occur. Multiple uses include, but are not limited to, mission activities, forestry, outdoor recreation, aesthetics, and ecosystem preservation.

Biodiversity is defined as the variety of life and its processes, including living organisms, the differences among them, and the communities and ecosystems in which they occur. Protecting and enhancing biodiversity is an overall goal of the AR ARNG/MDA. Biodiversity consists of many elements of the natural environment including indigenous ecological communities, native species, and their associations, as well as ecosystem functions such as predation, grazing, nutrient cycling, and fire. Biodiversity is best measured or defined in terms of the variety of natural communities or ecosystems and the various natural functions that occur within and among these communities or ecosystems, rather than simply by the numbers of species present. Management for maximum biodiversity helps to ensure ecosystem health, which in turn ensures sustainable use of lands to accomplish military missions.

Ecosystem management is a tool for the AR ARNG/MDA to use not only in its efforts to protect and enhance biodiversity but also to sustain the use of its military lands. This tool encourages management decisions to focus on natural resources at a community or ecosystem level rather than at a single species level. By maintaining or improving the quality, integrity, and connectivity of the ecosystem, individual species should prosper. However, individual rare species are not neglected by this management approach. Consideration must be given to rare species during project planning because these species contribute to ecosystem health and to biodiversity. In many instances, these species are provided legal protection.

In accordance with the SAIA, the major components of the INRMP include managing natural resources for multiple use and sustainable yield and to support the military mission; identifying natural resources inventory and monitoring needs; protecting, enhancing, and restoring fish and wildlife habitat, including wetlands; and enforcing natural resources laws and regulations. These components are essential to the success of an ecosystem management plan that aims to achieve sustainable use and promote biodiversity.

### 1.7.3 Purpose of Updated Plan

The purpose of this updated INRMP is to document the policies and desired future direction of AR ARNG/MDA's natural resource programs at RMTC and to document progress that has been made since the original INRMP was prepared. Specific expectations of the plan include the following:

1 Provide a comprehensive planning document that allows the AR ARNG/MDA to carry out its mission, promote ecosystem health, and maximize biodiversity at its installations and in the surrounding region
2 Document specific natural resources management goals, objectives, policies, and the desired future direction of natural resources programs
3 Establish the framework for the implementation of natural resources programs and ecosystem management
4 Provide a centralized source of information on the status of natural resources programs
5 Identify physical and legal environmental constraints to land use and the military missions, allowing the military missions to be matched to the ecosystem carrying capacity
6 Identify mission-related impacts and options for conflict resolution
7 Serve as a baseline for defensible Environmental Assessments (EAs) and Environmental Impact Statement (EISs)
8 Ensure that installations comply with environmental regulations
9 Preliminarily identification, prioritization, and scheduling of long-term budget requirements

## 1.8 Military Mission and Environmental Setting

### 1.8.1 Military Mission

The primary mission of RMTC is to provide military training site facilities to the AR ARNG. Additionally, other entities use RMTC for various purposes including training exercises by the AR Air National Guard (ANG), DoD Reserve and Active components, and to other federal, state, and civilian agencies. State-owned and federally-supported, RMTC is open year-round for active and inactive duty training. Figure 2.1 shows a map of RMTC. The following ARNG units train at RMTC: 77$^{th}$ Aviation Brigade, Joint Forces Headquarters Command, Marksmanship Training Unit, Arkansas Regional Training Institute, 87$^{th}$ Troop Command, 42$^{nd}$ Field Artillery Brigade, and 39$^{th}$ Infantry Brigade. The installation has a resident population of approximately 50 and a full-time work force of almost 900. The Cantonment Area has an average daily population of approximately 1,600, including federal and state employees, students in Professional Education Center courses, and resident students in Youth Challenge Program (YCP) and Civilian Student Training Program (CSTP).

### 1.8.1.1 RMTC Use

The transient training population ranges from 1,500 to 3,500 troops, with the number peaking in the late summer (CH2M Hill 1996). Most annual training activities occur from April through August. Approximately 360,000 people per year train at RMTC. The most frequently used portions of RMTC are the ranges. Approximately 22,500 people use one or more of the ranges at RMTC annually. The ranges that receive the greatest use are: the combat rifle qualification range, the M16 zero, the M60 machine gun, and the combat pistol range.

Approximately 47,000 people per year use the bivouac sites. The bivouac sites in Training Areas (TAs) 5, 7, 11, and 13 of RMTC experience the greatest usage.

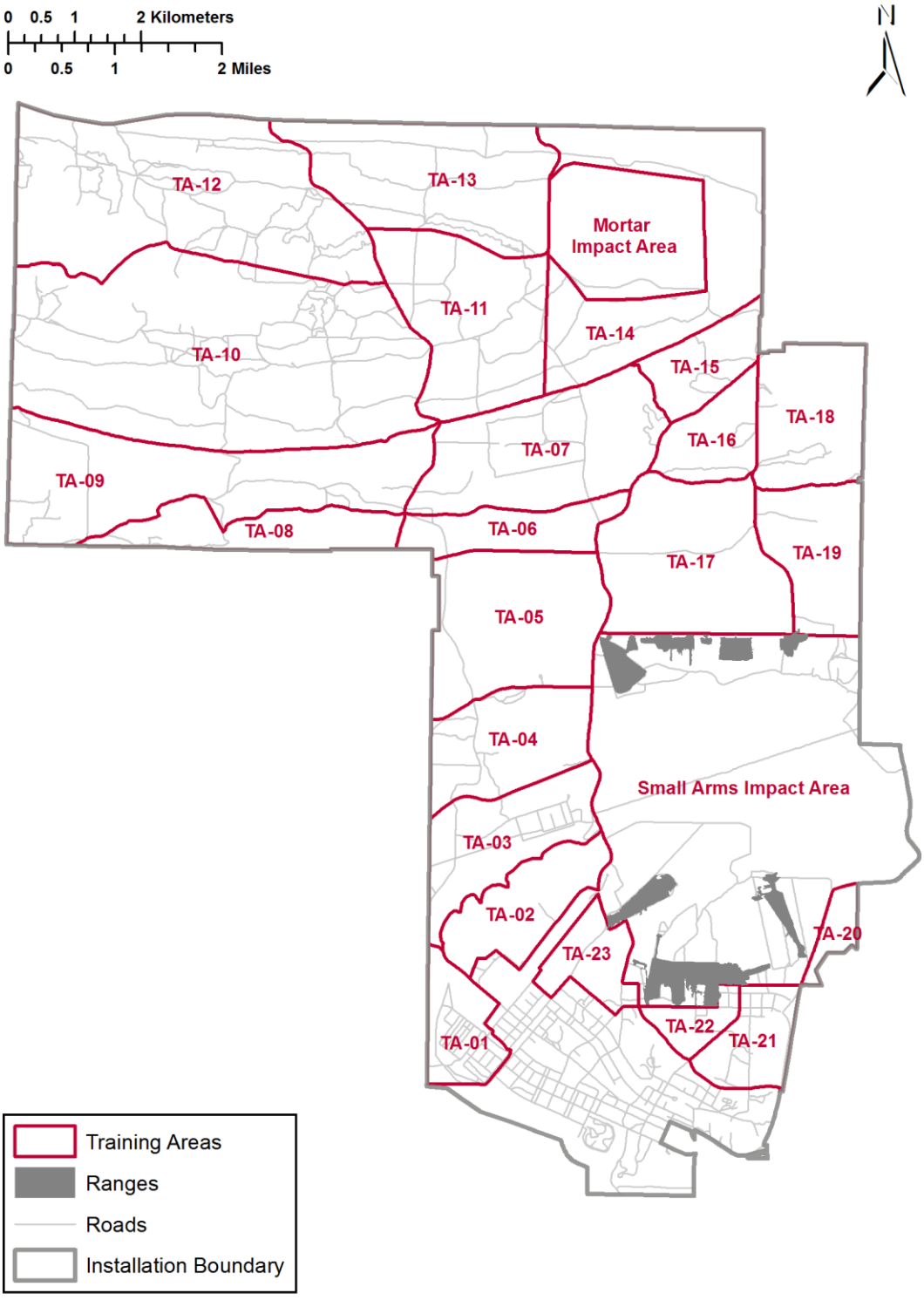


Figure 1.2 Training Area and Ranges of RMTC.

### 1.8.2 Weapons Qualification

There are 37 artillery/mortar firing points and 23 ranges for various individual and crew-served weapons. Range capabilities include all small arms through 50-caliber, an M-16, 25-meter zero/50 night firing range, M-16 record fire ranges, and firing points for grenade launcher, mortar, and 105 millimeter howitzer. Howitzers and mortars are fired into a 2-square mile impact area in the northeastern corner of the installation. The remaining arms are fired into a 7-square mile impact area in the southern half of the installation. The National Guard Marksmanship Training Unit also resides at RMTC and is the annual host to the W.P. Wilson National Guard pistol, rifle, and machine gun matches.

### 1.8.3 Tactical and Realistic Combat Training for Brigades and Small Units

Exercises in infantry movement, field navigation, and bivouacking are held in all TAs except 2 and 3.

### 1.8.4 Bombing and Drop Practice

The Air Force uses the All-American Drop Zone for low-level training flights with C-130 cargo planes and for practice with material and personnel air drops.

### 1.8.5 Aircraft Operations and Maintenance

The AASF operates an airfield for both fixed-wing and rotary aircraft. Rotary aircraft are used on-post for low-level night vision training and other activities. Fixed-wing flights are primarily for transportation of personnel.

### 1.8.6 Army Leadership Training

RMTC offers professional military education programs primarily through three tenants: the National Guard Professional Education Center, the Arkansas Military Academy, and the Arkansas Battle Skills School.

### 1.8.7 Maintenance Support

Maintenance support to these and other military combat units is provided through six FMS's, one Combined Support Maintenance Shop (CSMS), and the AASF. Units that receive service from these maintenance support units include the 39th Infantry Brigade, the 142nd Field Artillery Brigade, the State Area Command (STARC) group (consisting of 73 separate units located throughout Arkansas), and the AR ARNG. ISU is an on-post organization that provides

logistic support to troops training on RMTC. The Post Engineers group is closely allied with ISU and is responsible for post maintenance. Most of the construction and maintenance activities (not under contract) on-post are performed by these organizations.

NGB designates Camp Joseph T. Robinson (CJTR) as a MTC for the ARNG. This designation is based on size of the installation, capability to support training and usage, and the fact that CJTR is a State-Owned Mobilization Station (SOMS). There are 11 SOMS in the United States, all of which are designed to mobilize and prepare troops for combat in the event of war. The primary mission of RMTC in the event of war will be to train Army officers, and all of the resources of the post, including those tenants noted above, would be directed toward this activity.

RMTC is significant as the nucleus for weapons qualification and for tactical and realistic combat training for ARNG troops in Arkansas. The role of RMTC in these will continue to be significant as environmental regulations limit certain types of training activities in readiness centers (RCs) and Local TAs (LTAs) around the state.

There are a variety of agencies and branches of the military that use RMTC. Groups who use the site include the ARNG, ANG, Air Force Reserve, U.S. Army, U.S. Marines and Marine Reserves, U.S. Naval Reserves, Reserve Officers' Training Corps (ROTC), Military Academy, Civil Air Patrol, Boy Scouts, Department of Corrections, U.S. Federal Bureau of Investigation, and the U.S. Bureau of Alcohol, Tobacco, and Firearms, and other law enforcement agencies.

RMTC personnel expect the use of the training site to increase. The AR ARNG/MDA may increase its use of the site as funding decreases for out-of-state training. Others, including the United States Army Reserve and Marines, plan to increase their use of RMTC.

Table 1.1. Training Area acreage at RMTC

| Training Area | Area in Acres |
|---|---|
| Cantonment Area | 2281.6 |
| TA-01 | 355.6 |
| TA-02 | 1063.2 |
| TA-03 | 831.4 |
| TA-04 | 833 |
| TA-05 | 1325.3 |
| TA-06 | 502.6 |
| TA-07 | 1379.7 |
| TA-08 | 1873.8 |
| TA-09 | 620 |
| TA-10 | 3882.5 |
| TA-11 | 1335.1 |
| TA-12 | 2632.4 |
| TA-13 | 1503.4 |
| TA-14 | 463.5 |
| TA-15 | 444.9 |
| TA-16 | 843.7 |
| TA-17 | 1428.5 |
| TA-18 | 724.1 |
| TA-19 | 44.1 |
| TA-20 | 147.2 |
| TA-21 | 423.7 |
| TA-22 | 202.1 |
| TA-23 | 1539.1 |
| Mortar Impact Area | 1158.6 |
| Small Arms Impact Area | 5258.2 |
| Demolition Range | |
| All American Drop Zone | 463.9 |
| Joe Buck Drop Zone | |
| Psyam Drop Zone | 133.6 |
| **TOTAL** | **33,694.80** |

## 1.9 Geographic Location and Size

The RMTC military installation is immediately north of the metropolitan area of North Little Rock, Arkansas. It lies primarily in northern Pulaski County, with a smaller portion in southern Faulkner County. The post is generally shaped like a broad “L” (upside-down with a notched corner at top right). The "upper arm" is about 5 miles across (east to west) and the greatest depth (north to south, through the upper and lower arms) is about 7.5 miles. RMTC consists of approximately 33,000 acres. This includes a developed 2,300-acre Cantonment Area, 1,200-acre Mortar Artillery Impact Area and a 5,200-acre Small Arms Impact Area. Acreages for each of the major subdivisions of RMTC are listed in Table 2-1.

## 1.10 Installation History and Historic, Current, and Surrounding Land Use

### 1.10.1 Installation History and Land Use

RMTC was originally established in 1917 as U.S. Army Camp Pike in honor of General Zebulon M. Pike (U.S. Army), noted soldier and explorer. Thousands of officers and enlisted men were trained during WWI; a population maximum of 40,000 soldiers occupied the post during this time. At its height, Camp Pike had 2,000 buildings, 30 miles of paved roads, and 10,000 horses. From 1918-1922, a total of 6,485 acres were acquired for Camp Pike through purchase and condemnation. By the end of 1922, Camp Pike included a main reservation, rifle range, and “remount” area. The State of Arkansas was granted an easement in 1922 by the Secretary of War to use the Camp Pike reservation for its National Guard training program and it became Camp McRae. In 1937, the camp was renamed by the War Department as “Camp Joseph
T. Robinson” in honor of the late politician who had served Arkansas as a legislator and governor as well as U.S. Representative and Senator. That year, Camp Pike was dismantled as part of the RMTC construction. Everything that could be removed was sold. Except for the concrete floors and walls of old latrines and other buildings with concrete floors, little evidence remains of the old structures that housed troops at Camp Pike 20 years earlier.

When war engulfed Europe and Asia in 1940 and United States’ entry became increasingly imminent, a program of rehabilitation was launched at RMTC. RMTC was expanded between 1940-1941 to 44,000 acres, including artillery ranges and maneuver areas. “The U.S. Government owned 6,000 acres of this land, and the rest was acquired by the U.S. Army Corps of Engineers through lease and condemnation proceedings while the Camp was being built” (CQ 1941, Completion Report: p. 1; map entitled, ‘Reservation Boundaries and Leased Training Areas,’ Plan Number 6110-400). Some of the area was woodland, but evidence of past farming operations, cattle ponds and pastureland from the period of annexation can still be observed along Leopard and Tupelo Creeks and elsewhere on the installation.

Between September 9, 1940, and March 31, 1941, a “tent-barracks regimented cantonment designed for 25,000 soldiers including the classifications of fully equipped Division,

with headquarters and administration buildings, hospital, railroads and warehouses, communications, roads and all utilities" was constructed at RMTC. A narrative summary and detailed maps, drawings and plans for these construction activities are included in 1941 Completion Report. The layout of the RMTC cantonment area closely followed the original 1917 design for Camp Pike. The roads were "laid out to fit the ground and to secure minimum grades consistent with reasonable earth work" (CQ 1941, p. 260). In addition to new roads, eleven miles of old road locations were rehabilitated for RMTC.

Further additions of land to the north side of RMTC in 1942 enlarged the post to more than 48,000 acres. As part of this activity, frame hutments replaced the tents in the cantonment area. Other construction provided administration buildings, mess halls, warehouses, a laundry, hospital and various utilities. A 100-acre prisoner of war (POW) camp was established in 1943 to house German prisoners. This POW camp was located on the north side of Purdham Hill, immediately adjacent to the west side of Cato Road about 2.5 miles northwest of the current Troop Complex and Cantonment Area. Remnants of the POW camp still exist such as a network of old roads, bridge crossings, concrete slabs, and the remains of an old wastewater treatment plant.

Presently, RMTC is approximately 33,000 acres, which is considerably smaller than its maximum size of more than 48,000 acres during WWII. Areas including the NLR, the AGFC-managed Camp Robinson Special Use Area (CRSUA), a large area of privately-owned property east of the CRSUA and north of Highway 89, portions of Burns Park, and various other small tracts have since been excluded. A military hospital with numerous interconnected buildings once occupied an area on the southwest side of the post near the end of 26$^{th}$ Street. It was used during and between WWI and WWII but was abandoned after WWII. The abandoned hospital complex was private property for many years but was deeded back to the AR ARNG/MDA in a land swap.

Most WWII structures were removed from RMTC in 1955, but remnants of the old encampment can be found, including abandoned sewer lines, manholes, concrete foundations and slabs, and masonry walls. However, increasing use of post facilities in recent years has necessitated new construction and expansion of areas intensively used for training.

More recent construction in the Cantonment Area included the following: headquarters and administration building, classrooms, dormitories and other housing, armories, hangars, maintenance shop, storage buildings for pesticides and hazardous waste, buildings for handling recyclable items and solid waste, and an upgraded wastewater treatment plant. A 1995 EA considered these projects together and a Finding of No Significant Impact (FONSI) statement was submitted and approved.

### 1.10.2 Surrounding Land Use

NLR is directly south of RMTC, with smaller and less densely populated communities of Amboy, Haig, Jeffrey, Oak Grove, Blue Hill, and Morgan along the south and southwest margins. Pulaski County, which includes all of these as well as Little Rock, is the largest county by population in Arkansas (US Census 2010).

Along the southeast boundary of the post are NLR and the municipalities of Sherwood, Sylvan Hills, Gravel Ridge, and Gibson. These urban and semi-urban areas form a relatively continuous commercial and residential boundary around the southern two-thirds of the post, although there remains an area of undeveloped property held by the Metropolitan Trust Company in northern Sherwood. The majority of state and federal employees commute to RMTC from one of these population centers. Little Rock Air Force Base lies about three miles due east of RMTC. The small populace of Cato lies within the notch of the northeastern corner of the post.

The northern boundary of RMTC, which is almost perfectly straight, is demarcated by State Highway 89. Few other outside roads approach the boundary of the northern third of RMTC (the upper arm) and human population in the area is relatively sparse. A large, undeveloped, and relatively unpopulated area is contiguous with RMTC along its north-central boundary. This is privately owned land consisting of woodlands interspersed with abandoned agricultural areas, which currently is used primarily for hunting and associated recreational activities. A number of small roads approach the more southern boundaries of RMTC, but almost all of them end abruptly at the boundaries.

Continued rapid expansion of commercial and residential interests to the northwest and northeast of North Little Rock has created the need for an east-west freeway ("Northbelt") to connect these developing areas. The proposed 12.6 mile freeway would connect US 67/167 (1.5 miles north of Kiehl Avenue) on the east side of RMTC, through RMTC to the I-40 and I-430 interchange on the west side of RMTC. The freeway would pass through 4.5 miles of RMTC in a southwest to northeast direction. As currently planned, the road will be a 4-lane divided highway with full controlled access, with an average 300-foot right-of-way. Six planned underpasses on RMTC would allow movement between the cantonment area and the TAs. No interchanges would be constructed for direct access to the freeway from the installation (or vice versa), and the right-of-way would be fenced (ARNG 2001).

Within RMTC, the freeway route moves through TAs 20, 21, and 22, and along the north edge of the Cantonment Area. The route would pass slightly south of the Firing Ranges and Maryland Avenue and immediately north of the Engineers Lake complex. It would cross a tributary to Engineers Lake, then cross Maryland Avenue near the northwest tip of Lake Jewett, where it would run within 300 feet of the lakeshore. The freeway would cross between two solid waste landfill sites on the north side of Avenue H, and then go half a block above the barracks area between Avenue H and Missouri Avenue. At that point it would cross Missouri Avenue and 24$^{th}$ Street, and then exit southwest of the airfield.

Most of the area immediately outside the western boundary of RMTC is developing as residential areas, particularly on the southern two-thirds where the towns of Haig, Jeffrey, Oak Grove, Blue Hill, and Morgan are prominent. The Bell Slough State Wildlife Management Area, including the western portion of Grassy Lake, is contiguous with RMTC near the northwestern corner.

The area including NLR and to the north along Remount Road is zoned within Pulaski County for industrial purposes. The rest is largely residential area. A 1990 Comprehensive Development Plan prepared in 1968 covers Pulaski County Faulkner County does not have

a formal land use plan.

In view of the present density of commercial and residential development around the periphery of RMTC and the rapidly expanding population in this part of Arkansas, it is certain that the installation perimeter will be considerably more densely developed within the next 10 to 20 years. This is particularly true along the eastern and southern boundaries and southern two-thirds of the western boundary, where development already is significant. One AGFC WMA and one SUA protect the northwestern corner of the post, and the rest of the northern boundary also seems relatively remote, although that could change rapidly because of the easy access offered by Highway 89.

The major effects of activities within the post on peripheral communities in the next decade are likely to be noise (low level) from planes, water pollution, and military traffic on roads to and from the post, including civilian commuters in the morning and late afternoon.

Bordering the northwestern corner of RMTC are the two AGFC refuges. These are significant not only in terms of activities, but also because they are immediately adjacent to natural communities on RMTC.

The Bell Slough WMA (2,040 acres) is on the western margin of RMTC, with Grassy Lake Green Tree Reservoir divided between federal and state land. The water levels of the lake have been controlled primarily by AGFC. Under the auspices of the National Wetlands Restoration Program of the FWS, the AGFC is involved in wetland restoration in two areas of the Bell Slough WMA. For example, the AGFC is involved in bottomland reforestation (mostly species of oak) on previously farmed land and a 118-acre moist soils project (water from Palarm Creek), which involves the construction of a levee complex as water control structures for waterfowl and shorebird habitat management.

The CRSUA (formerly called Camp Robinson Wildlife Demonstration Area) includes 4,029 acres at the northwest corner of the post, north of Highway 89 and on the east side of Lake Conway. The primary functions of the SUA are to demonstrate sound wildlife management practices, provide facilities for training and development of hunting dogs, and promote sport hunting. The area is a large tract drained by several streams that were among those studied in the wetlands delineation by the United States Army Corps of Engineers (USACE) and included in the RMTC report. The area was deeded to the State of Arkansas in the 1940s through the War Asset Administrator, under and pursuant to the authority contained in Public Law 537, 80th Congress, May 10, 1948. The SUA is identified as the ‘RMTA WMA’ on the 1986 DMA Installation Map. In case of war and federalization of land, the SUA may revert to federal control; the RMTC Military Installation Map notes that it is an "area subject to recapture upon mobilization."

## 1.10.3 Climate

RMTC has a modified continental climate with exposure to all of the North American air mass types (NOAA data, 1978-1995, taken at North Little Rock Airport). Sunshine (percent of possible) averages about 87% from April through the end of October. These months of high insolation correspond to the period when temperatures are highest and have the smallest range

of daily variation. The average growing season lasts about 233 days.

Summers are hot and humid with an average daily temperature of 82°F; during July and August the average maximum temperature is 91°F. The highest recorded temperature was 114°F in August 2011.

The winters in the RMTC area are generally mild with an average daily temperature of 41°F. The coldest period of the year is December through February, when temperatures commonly drop to around 20°F. High temperatures during these months almost always reach at least 70°F for a few days, but the average high temperature is 50°F. The lowest temperature recorded in Pulaski County was minus 13°F in February 1899. First fall freezes usually occur by the end of the first week in November. The average date of the last freeze is at the end of the third week in March. Snowfall is mostly confined to January and February and it averages about 6 inches per year and ranges from less than 1 inch to (rarely) 20 inches annually. Snow rarely remains on the ground in this area for more than a few days.

Rainfall is fairly well distributed throughout the year with an average rainfall amount of about 50 inches per year, approximately one third of which falls during the spring. Thundershowers, sometimes quite severe with large hail and damaging wind, occur during the summer months. Tornadoes are also dramatic elements of the regional weather. The evaporation rate during the summer is often severe with rates as high as 1/3 inches per day. Short periods of droughts occur frequently although severe droughts are rare. The driest conditions occur in late summer (during maximum temperatures) and the wettest conditions occur in late spring (after the last freeze). In years of low precipitation, the most severely dry months typically are June through September.

Prevailing winds are usually from the south to southwest throughout the whole year. The fastest winds (mostly 25 to 30 miles per hour) are mostly from the west to southwest, but fast northeast to northwest winds occur with some frequency, mostly from April to September.

# 1.11 Topography, Geology, and Soils

## 1.11.1 Topography

RMTC is situated within the extreme northeastern portion of the Ouachita Mountain natural division of the state (Foti 1974; Robinson and Allen 1995) and, as such, lies on the southeastern edge of the Fourche Mountains immediately north of the Arkansas River. The Ouachita Mountain physiographic province is situated in central and western Arkansas, and eastern Oklahoma consists primarily of east-west trending linear ridges, commonly called hog-backs, and associated interridge valleys. The topography of RMTC is primarily hilly with numerous sharply defined features and with elevations ranging from 255 to 590 ft (80-180 meters) above sea level.

At this location, the Ouachita Mountain province borders three other physiographic regions, the Mississippi Embayment, the Arkansas River Valley, and the Gulf Coastal Plain; all of which are within less than 60 km of the installation. A particularly important element of this setting is the fact that the Arkansas River enters the Mississippi Embayment only a few

kilometers downstream from RMTC's upland location. Immediately upon entering the Mississippi Valley, the Arkansas River meanders southeastward, with the modern meander belt flanked by multiple Holocene-age meander belts, primarily to the northeast (Saucier 1995; Saucier and Snead 1989). To the northeast lies the Grand Prairie, a large terrace remnant of the Prairie Complex family of terraces. The Grand Prairie extends from the valley margin southeastward and is flanked on the northeast by the channel belt of coalesced rivers that drain eastern parts of the Ouachita Mountains north of the Arkansas River. Late Wisconsinan loess covers the Grand Prairie (Saucier 1995; Autin et al. 1991; Saucier and Snead 1989), and a belt of loess up to 10 km wide is mapped in the uplands west of the Western Lowlands, but not between the mouth of the Little Red River and Pine Bluff (Saucier and Snead 1989). An important question regarding interpretation of Holocene sediments and landscape evolution at RMTC is whether primary Late Wisconsinan loess or Holocene-age redeposited loess is present as part of the installation's effective landscape.

In October 2002, engineering-environmental Management, Inc. (e2M) conducted a topographic survey of the installation to check the horizontal and vertical accuracy of RMTC's existing digital contour data, which is a Geographical Information System (GIS) line coverage file. The purpose of this project was to determine whether the existing GIS file was sufficiently accurate to conduct more detailed geospatial analyses, such as calculation of cut and fill volumes. A differential GPS survey was conducted 7-11 October 2002. Based on evaluation of the GPS data collected and the existing GIS file, e2M concluded that the existing GIS file is sufficiently accurate to calculate cut and fill volumes for site-specific comparison checks of contractor earthwork bids. However, additional topographic survey data, such as traditional loop-closure methods, are required to calculate earthwork volumes accurately enough for guiding construction activities. (e2M 2002). A list of the RMTC GIS data layers is included in Appendix B.

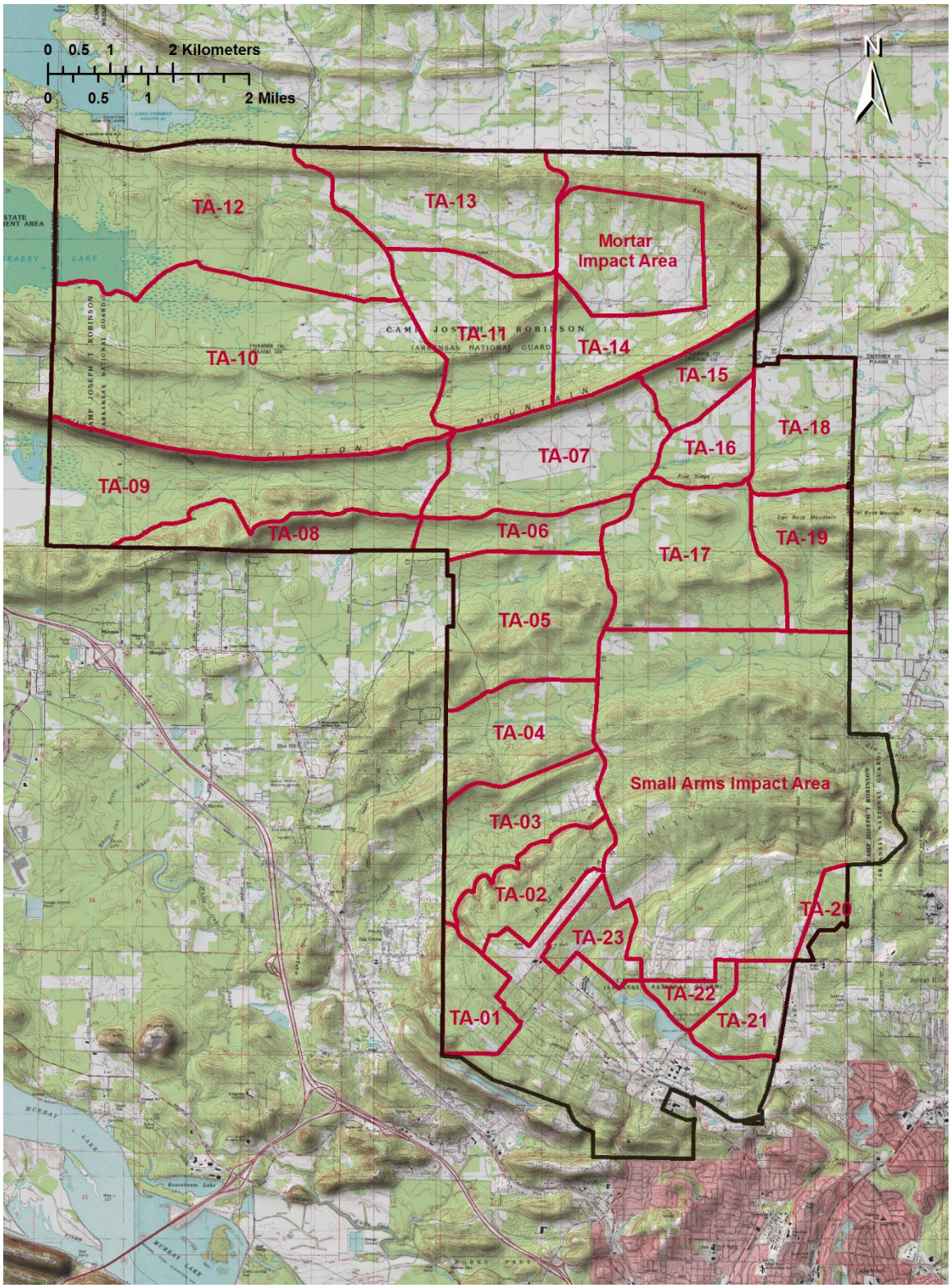

Figure 1.3. Topography of RMTC.

### 1.11.1 Geologic Setting and Formations

The Ouachita Mountains consist of east-west Fold Mountains containing thick Paleozoic formations deposited in an ocean trough, or geosyncline. Within the boundaries of RMTC, two of these Paleozoic formations are present – the Jackfork and the Atoka formations. Both formations are Pennsylvanian in age and consist primarily of sandstone and shale depositional units that are folded into doubly-plunging anticlines and synclines. Both formations are exposed in mostly east-west trending ridges of resistant sandstone overlying shale deposits. The resulting hillslopes are of steep to moderate relief. Elevations range from about 270 ft mean sea level (msl) to 580 ft msl.

The interridge valleys adjacent to these ridges within the installation are mainly a result of faulting within the formations and weathering of the less resistant shale. Because large amounts of silica are present in the Atoka and Jackfork formations, quartz and quartzite are commonly found in depositional contacts and bedrock fractures. Numerous fault areas are noted for both formations.

### 1.11.2 Atoka Formation

The Atoka formation was named after the town of Atoka, Oklahoma where approximately 7,000 ft of the faulted formation is well exposed (Stone 1968). It lies below the Jackfork formation and above the Hartshorne formation and is composed of alternating sandstone and shale beds of varying thickness (Croneis 1930). It has the greatest areal extent of any Paleozoic formation in Arkansas and is the surface rock in much of Pulaski County, Arkansas (Anderson 1942:10). The Atoka formation is divided into three members, the Lower, Middle, and Upper. All three of these members are present within RMTC.

The Lower member of the Atoka formation comprises approximately three square miles within RMTC on the eastern and western edges bordered by the Jackfork formation to the south. The Lower Atoka was deposited within an elongate remnant ocean basin (Sprague 1985) and has been described as a deep basin turbidity current deposit (Stone 1968). It consists of approximately 9,000 to 13,000 ft of alternating very thin to occasionally thick bedded, brownish gray, poorly sorted, fine to medium grained, silty, micaceous, sandstone; micaceous, sandy, often sooty gray siltstone; and silty black shale (Stone 1968). Shale is the predominant deposit in the formation, comprising approximately 40%. Sandstone makes up approximately 35%, followed by siltstone at approximately 25% (Stone 1968).

The Middle Atoka comprises approximately 1.5 square miles within RMTC and is in the east-central portion of the installation bordered by the Upper Atoka to the north. The Middle Atoka is a shallow marine deposit and is representative of a progression from deep basin to continental slope deposits (Stone 1968). The Middle Atoka consists of approximately 6,000 ft of sandstone and shale at its widest margin and typically has thick, gray-black silty shale at the base. Sandstone units in this formation are generally gray, thin bedded, fine grained, silty, and micaceous.

The Upper Atoka is in the northern portion of RMTC and comprises approximately 30%

to 40% of the installation. The Upper Atoka is approximately 6,500 ft thick at its widest margin and is composed of 90% shale (Stone 1968). The shale in this unit is generally gray-black, and the sandstone ranges from fine-grained silty to occasionally quartzose sandstone (Stone 1968). The presence of coal beds and invertebrate fossil horizons in portions of this formation indicate that cyclothemic processes with alternating continental and shallow marine environments formed the deposits (Stone 1968).

Within the Upper Atoka formation in RMTC, the sandstone ridges of a well-defined syncline named Clifton Mountain topographically rises around the younger shale deposits. This syncline was formed by uplift of the layered rock strata in association with downward folding, causing a trough appearance (Leet et al. 1982).

### 1.11.3 Jackfork Formation

The Jackfork formation is in the southern half of RMTC and comprises approximately 50 to 60% of the installation. Taff named this formation from Jackfork Mountain in Pittsburg County, Oklahoma. It is underlain by the Stanley shale and overlain by the Atoka formation, and its resistant sandstone makes up a large percentage of mountains in the Ouachita range (Croneis 1930). The lowering of sea level causing erosion of the shelf filled the Ouachita trough with clastic sediments to comprise the matrix of the Jackfork formation (Morris 1977). The Jackfork formation consists mainly of sandstone but also contains small amounts of shale and millstone grit (Purdue 1929). The total thickness of the formation ranges from approximately 3,500 ft to 6,600 ft, and the sandstone beds range from a few inches to 50 ft thick (Anderson 1942).

### 1.11.4 Soils

The most recent soil survey of the installation was completed by the US Department of Agriculture NRCS in 1999. The results of this survey are published in the *Soil Survey of Camp Joseph T. Robinson* compiled by the NRCS. The survey data were used to create detailed maps and figures. In general, Carnasaw, Pirum, Purdham, Littlefir and Zafra soils dominate the hills and ridges; and Cato, Psyam, Olmstead and Maumelle soils dominate the valleys. Soils found at RMTC are listed and described in Table 1.2.

Table 1.2. Soils at RMTC.

| Soil | Characteristics | Setting |
|---|---|---|
| Carnasaw | Deep; well drained; slow permeability. | Tops of ridges; side slopes of hills. |
| Carnasaw-Pirum | Moderately deep to deep; well drained; slow to moderate permeability. | Narrow ridge tops of mountains; north-facing side slopes of mountains. |
| Carnasaw-Zafra | Moderately deep to deep; well drained; slow to moderate permeability. | South-facing side slopes of mountains. |
| Cato | Deep; moderately well drained; moderate permeability. | Valley floors; toeslopes of hills. |
| Littlefir | Moderately deep to deep; moderately well drained; slow permeability. | Tops of ridges; side slopes of hills. |
| Olmstead | Very deep; somewhat poorly drained; moderate slow permeability. | Drainage ways and depressional areas. |
| Perry | Very deep; poorly drained; very slow permeability. | Floodplains of the Arkansas River and its tributaries. |
| Maumelle | Very deep; very poorly drained; moderate permeability. | Sloughs and backswamps on floodplains. |
| Pirum | Moderately deep to deep; well drained; moderate permeability. | Tops of ridges; side slopes of hills. |
| Psyam | Very deep; moderately well drained; moderately slow. | Valley floors; toeslopes of hills |
| Yorktown | | Backswamps, sloughs and abandoned oxbows lakes on the floodplains of the Arkansas River and its tributaries. |
| Purdham | Moderately deep; moderately well drained, slow permeability. | Tops of ridges; side slopes of hills. |
| *Source: Soil Survey of Camp Joseph T. Robinson, NRCS, 1999 and 2006* | | |

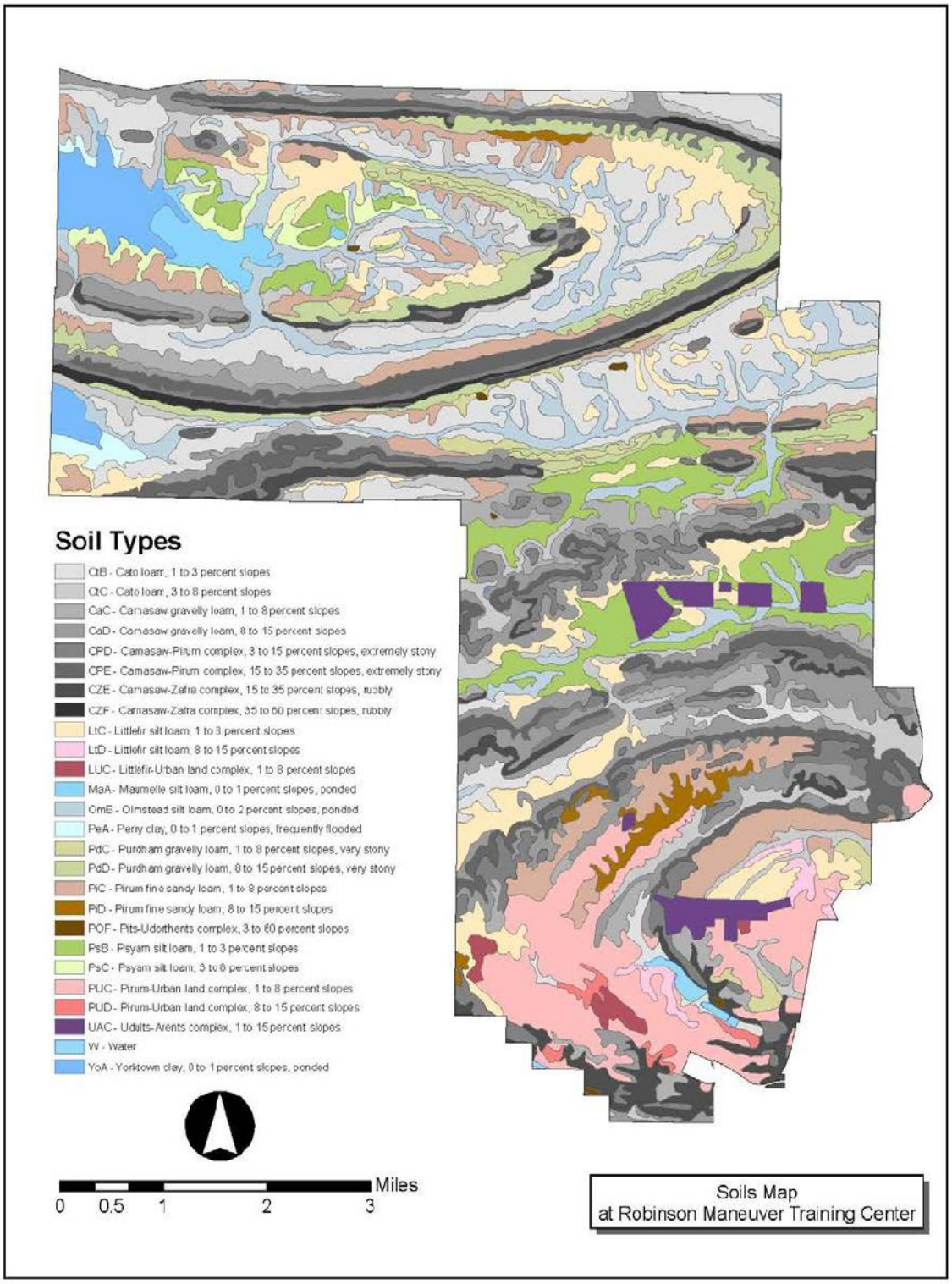


Figure 1.4. Soils of RMTC.

# 1.12 – Climate Change

Changing in climate is likely to affect multiple sectors of our society including impacts to water resources, aquatic and forested ecosystems, wildlife, and other natural resources. According to USEPA (EPA 430-F-16-006) Arkansas has warmed less than most of the United States, and some parts have cooled. However, EPA and other sources indicate that Arkansas will become warmer and will probably experience more severe floods and drought. Both annual rainfall and more rain arriving in heavy downpours have increased across much of the state in the last 50 years. Studies in the southeast region of the United States also indicate warming trends and increased rainfall. Publications in 2014 by the U.S. Global Change Research Program indicated that the number of days exceeding 95°F and nights hotter than 75°F has increased over the last half century. Additionally, daily and five-day rainfall totals have also increased for this region over the same time period.

## 1.12.1 Water Resources

In many areas of the state, climate change is likely to increase water demand while reducing water supplies. Although climate change is likely to increase the risk of flooding, droughts are also likely to become more severe. EPA sources indicate that while some areas of the southeast region may experience increased runoff or flooding, rainfall averages in Arkansas for spring and summer months are predicated to decrease. With droughts and rising temperatures, increases in evaporation will occur decreasing the amount of available runoff into receiving waterbodies. Surface water and ground water recharging each year is likely to decline by 5 percent according to the EPA.

## 1.12.2 Aquatic Ecosystems

Climate change can also harm aquatic ecosystems. Warmer water lowers dissolved oxygen levels in surface waters, which can severely limit fish and other aquatic life communities. Because fish cannot regulate their body temperatures, warmer water can make a stream uninhabitable for fish that require cooler water. Warmer temperatures can also increase the frequency of algal blooms, which can be toxic and further reduce dissolved oxygen. Summer droughts may amplify these effects, while periods of extreme rainfall can increase surface runoff and flows, soil erodibility and sedimentation, nutrient loading, and other potential impacts of water quality on streams.

## 1.12.3 Forests

Increased temperatures and variations in rainfall are unlikely to substantially reduce forest cover in Arkansas, although the composition of those forests may change (EPA 2016). However, an increase in the number of droughts and hot temperatures would reduce forest productivity and may promote an increase in invasive plant species, fires, insects, pest and disease damage. Furthermore, forest management practices may become more challenging allowing increased growth rates in some areas while endangering the survival of species and forest communities in other areas. Conversely, longer growing seasons and increased carbon dioxide concentrations could more than offset the losses from drought factors.

## 1.12.4 Wildlife

RMTC is situated within the northeastern portion of the Ouachita Mountain ecoregion of the state. Of the 37 terrestrial habitats in Arkansas, as identified in the Arkansas Wildlife Action Plan (AGFC 2017), 20 occur in the Ouachita Mountains ecoregion (Ecoregion 36). These habitats are currently threatened by many factors, including fire suppression, habitat alteration and fragmentation, invasive species, and diversion of water. Changes to climate could potentially exacerbate existing threats within many habitats.

Related to the projected warming trend, increases in the number and location of non-native plant species, loss of forest productivity, an increased number of harmful algal blooms and insect caused forest disturbances can also be expected and represent possible complications to the AR ARNG/MDA natural resources stewardship, biodiversity protection and a comprehensive ecosystem management goals.

## 1.12.5 References

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# 2.0 ECOLOGICAL COMMUNITIES, ECOSYSTEMS, AND BIOLOGICAL DIVERSITY

Communities, ecosystems, and biological diversity are interrelated ecological concepts. Communities can be defined as interrelated assemblages of plants and animals found in a given area. For example, a community is a wet prairie or a dry/mesic forest and the organisms that live there. Ecosystems are related natural communities that have similar rock substrates, levels of soil moisture, and other natural processes. Biological diversity is an index that describes the prevalence of native plants and animals within a defined ecosystem or community.

RMTC holds typical examples of ecosystems found in the Southern Division of the Oak-Hickory Forest Region (NRCS 1995). Although RMTC is situated in the Ouachita Mountains ecoregion the some of the communities, flora, and fauna present on the installation are more characteristic of adjacent ecoregions. Primarily, oak (*Quercus* spp.)-hickory (*Carya* spp.) forests constitute the ecosystems found on the installation. Other native ecosystems are composed of scattered areas of mixed pine (*Pinus* spp.)-oak forests, shortleaf pine (*P. echinata*) forests, and mixed hardwood forests.

Post oak (*Q. stellata*) and blackjack oak (*Q. marilandica*) dominate the upland and slope forest communities although other species of oak may be dominate in more mesic or shaded locations (i.e. the northface of Clifton Ridge and Rock Ridge). Bottomland and riparian forests are diverse on the installation ranging from willow oak (*Q. phellos*)-water oak (*Q. nigra*) semi-permenantly flooded to bald cypress (*Taxaodium disticum*) Tupelo gum (*Nyssa aquatica*) permenantly flooded (swamp/slough) communities. A significant amount of the RMTC forests can be regarded as mature.

In addition, other plant communities are scattered across the installation. Some of these communities are woodland versions of their corresponding forests present due to wildland fire restoration or xeric conditions such as the post oak and blackjack oak woodlands scattered throughout the installation. Others are uncommon and unique such as the hillside seeps present on Purdham Hill (TA's 2 and 3 and the Small Arms Impact Area) or remnant tallgrass prairies/oak-pine savannas. These communities create a mosaic of diverse communities which function together to create a healthy and stable ecosystem.

Large areas of note that contain a great diversity of communities within the post occur throughout the Jim Creek watershed (Mortar Impact Area, TA's 10, 11, 12, 13, Range 27, and Psyam Drop Zone), and the White Oak Bayou watershed/Purdham Hill (Small Arms Impact Area TA's 1, 2, and 3) which include oak-hickory woods with white oak and red oak in more mesic sites, post oak woods, post oak savanna, shortleaf pine savanna, hillside seeps, riparian communities, and bottomland/swamp communities. Grassy Lake/Jim Creek are unique to the installation because of its diverse bottomland communities of bald cypress (*T. disticum*)/water tupelo (*N. aquatica*) and southern red oak (*Q. falcata*)/water oak (*Q. nigra*)/willow oak (*Q. phellos*). Also noteworthy, Clifton Ridge contains the high ridge savanna/woodland communities, which contain an abundance of peculiarly stunted trees (mainly post oak and

black jack oak). Additionally, Leopard Creek and Tupelo Gum Creek contain many riparian wetlands. Loblolly pine (*P. taeda*) plantations of uneven ages are also scattered throughout the post.

## 2.1 Historical Ecological Communities

The nature of pre-settlement vegetation at RMTC remains speculative (Tucker 1990); although it is likely that at least the overall species composition was similar to that of the present. Upland forests on the post remain largely intact, although their character has likely been altered by human activity. Government Land Office (GLO) survey witness trees recorded in the 1800s were widely distributed and were not identified to species in most cases, but to the extent that the GLO data can be compared to the modern upland forests, the general distribution and relative abundance of tree species are consistent. However, based on field observations and on patterns reported elsewhere in the region, a number of significant alterations have likely occurred due to human activity at RMTC.

Historical upland forest was likely more diverse structurally and compositionally. It is probable that the European settlers differentially exploited certain tree species (such as white oak, which was used for barrel staves), which would have shifted species composition somewhat. Some very large trees would have existed, particularly in protected coves where white oak, various red oaks, and black walnut would have grown very large, and these would have been exploited for high-quality lumber.

Herbaceous communities probably differed in composition and were more diverse. Livestock (and native browsing species such as whitetail deer) favor certain food plants over others, and can completely eliminate favored species from an area. Free-ranging and feral hogs, in particular, can devastate native wildflowers and other herbaceous species because they consume entire populations of plants, including the root systems.

Wetlands were probably much more common in the pre-settlement landscape even on upland settings. RMTC has numerous spring-fed small channels on lower slopes, and where these occur elsewhere in the Ouachitas and Ozarks, they often support slope wetlands, even where the springs are active only during periods of wet-weather. Slope wetlands in good condition are tremendously diverse, and often support plant species that are very rare. These sites usually have a highly organic substrate that is very sensitive to disturbance, and requires very long periods to rebuild once disturbed. Another wetland type that may have existed in the area is the streamside fen, a very narrow zone of organic soils and sensitive plant communities occurring along creek banks that would rapidly disappear if subjected to regular livestock trampling and grazing pressure. It is clear that the stream floodplains once contained a rich community dominated by species such as cherrybark oak (*Q. pagoda*), Nuttall oak (*Q.texana*), and green ash (*Fraxinus pennsylvanica*), with giant cane (*Arundinaria gigantea*) on the low natural levees along the stream channels.

Overall, the extremes of streamflow observed now would not have been typical in the pre-settlement landscape, when both flood peaks and low-flow conditions would have been moderated by the storage capacity of numerous beaver complexes and wetlands. This also implies that the aquatic biota on the post would have been far more diverse and complex than

current conditions suggest. The removal of beaver in the 1800s certainly reduced the occurrence frequency of smaller swamps and ponds occupied by dead timber, which are becoming more common as beaver populations have rebounded in recent years. Grassy Lake in its original state evidently was a larger marsh with less open water, but it is now a semi-natural area of open water and marsh. Shown on early 19th and 20th century maps, Grassy Lake seems to have been originally impounded by aggradational and overbank sediments of Palarm Creek and possibly on a larger scale by Arkansas River overbank sediments.

Finally, many of the upland forests have obviously developed under the influence of periodic fire, which is necessary to maintain the mix of prairie and savanna within the overall forest matrix. However, there is little known either about the frequency and intensity of "natural" fire patterns or about the history of fire during periods of Native American, Euro-farmer, and military activity on the RMTC landscape. However, the observed on-going encroachment of woody species into native prairie sites and what was open woodland or savanna becoming closed forest suggests that current fire patterns differ significantly from those that have prevailed in the past.

In summary, it is likely that the pre-settlement upland forests of RMTC were generally similar to the modern forests in appearance and species dominance, but that the relative importance of secondary tree species and the structure and composition of the understory and ground cover layers were significantly different in various respects. Further, certain important forest components have been largely eliminated, such as large old-growth trees and small, species-rich wetlands.

### 2.1.1 Settlement to Present

Before the AR ARNG/MDA owned RMTC, farmers had cultivated portions of RMTC, and loggers had removed most of the timber. Farmers had cleared the floodplains for cropland and pasture. Logging, tillage, fire suppression, cultivation, and pasturing had disturbed the plant communities at RMTC.

## 2.2 Terrestrial System/Native Plant Communities

A vegetation analysis was conducted with data from 130 transects “distributed within every TA on the post, except for the small arms range and the impact area.” Unfortunately, this vegetation study did not use a methodology that permanently located the study areas so the results could be accurately compared to later studies. For the first study, transects were begun every 0.1 mile along roads that bound each TA and were allowed to vary in direction in order to remain within a general vegetation type. At “intervals of 100 meters along each transect,” plots were established, although the plots were informally delimited and variable in size. Within each plot all species observed were recorded (with trees, shrubs, and herbs recorded separately). Each tree greater than 10 inches diameter was counted in order to produce a measure approximating “relative abundance.”

With the data from this study and with the additional information from aerial photos and

satellite imagery, an attempt was made to complete a vegetation communities' map for RMTC. Foti et al. (1995) noted that remote sensing data indicate that plant communities on RMTC apparently are more complex than were defined in the original study and that future studies should provide a more refined analysis. The vegetation communities' map is an essential management tool for several of the natural resource management programs, especially forestry and fish and wildlife management. Contributions from ongoing field vegetative community surveys are expected to add refinements to the vegetation map. Vegetation communities, as updated by the Parsons survey, are depicted in Figure 2.1.

Short descriptions of the major plant community types on RMTC are presented in the report by Foti et al. (1995), Foti (1995) and Parsons (2002). A summary of these communities is provided as follows, with some modification based on 1) personal observations, 2) the wetland report by Halff Associates (1995) and 3) observations by T. Foti (pers. comm., 30 April 1996), and Parsons (2003). The first four communities (listed as follows) characteristically occur in upland regions of the Ouachita Mountains, while the moist prairies, lowland woods, and cypress swamps are more characteristic of the Mississippi Valley ecoregion.

### 2.2.1 Upland Dry Deciduous Woods

This vegetative association is the most widespread association found on RMTC. It is characteristic of the upland sites and thin soil of the Boston and Fourche Mountain region. In addition, it is oak-hickory woodland dominated by post oak, blackjack oak, black hickory, and winged elm with a locally variable mixture of shortleaf pine in more open or disturbed sites. Other common tree species are juniper, sweetgum, September elm, black oak, southern red oak, wild black cherry, black gum, and persimmon. In some areas, post oak may dominate the upland community.

Before the 1940-41 construction of RMTC, "the (Cantonment) area was covered with a dense growth of post oak, black oak, jack oak, sweetgum, and many varieties of hickory" (CQ 1941, p. 8). Sparkleberry, persimmon, winged sumac, smooth sumac, and numerous other species were common in the understory throughout the upland hardwoods.

### 2.2.2 Upland Moist Deciduous Woods

On moister upland sites (especially coves and north slopes), white oak and red oak with scattered hickory are characteristic. These sites are relatively restricted in an area on RMTC and intergraded in vegetation with the more abundant drier sites. Foti does not separate dry and moist upland vegetation types, but they are done so here to be consistent with the separation of the high ridge savanna and post oak savanna.

### 2.2.3 High Ridge, Grass-Dominated Savanna

On the ridge along the high, extended crest of Clifton Mountain, the plant community is essentially similar in woody species composition to those of oak-hickory communities on lower dry slopes. However, along the ridgetop, individuals of post oak, black hickory, winged elm, and black locust are reduced to a nearly shrub-like habit, producing a dwarf-forest effect. Black gum,

honey locust, September elm, and persimmon also are common along the ridge and reduced in stature, along with the typically more shrub-like winged sumac, smooth sumac, and red buckeye. Grasses typically dominate the understory.

Dwarf post oak (*Quercus margarettiae*), sometimes identified as *Quercus stellata* var. *margarettiae*, which is rare in central Arkansas, occurs on the post only in a single locality on the western end of Clifton Ridge (34 55'N, 92 22'W). It exists in "several stands beside the road and back toward the edge of the ridge extending for a distance of approximately 200 ft" (letter from
D. Culwell to B. Swafford, 25 October 1993).

Various species attain normal size immediately off both sides of the edge of Clifton Ridge. The peculiar growth habit of the dwarfed individuals on the ridgetop probably results from the added degree of desiccation from high insolation and constant exposure to wind.

### 2.2.4 Pine Woods

Stands dominated by shortleaf pine or in which shortleaf pine is abundant but mixed with post oak, black hickory, winged elm, and other species occur in a number of sites on the post. Loblolly pine is a recent introduction but also common, its increasing abundance in apparently native habitats is the result of reseeding from trees in the Cantonment Area and numerous local plantations presently attaining reproductive maturity. Loblolly pine is increasing to the point of becoming a dominant species in some areas (Emerick and Thompson 2003).

Prominent among these communities are young pine stands on recent burn sites where pine is among the early successional woody dominants with few other woody species in competition. Abandoned pastures and agricultural sites also may be dominated by pine in the early stages of their approach toward the mature vegetation type regionally characteristic of the site, particularly if mature pines are abundant in the surrounding area. During the construction of the RMTC Cantonment Area, an area of nearly one acre was noted as being "covered with a vigorous growth of medium sized yellow pine" (shortleaf pine) (CQ 1941, p. 266); this is probably the result of natural reseeding.

The successful establishment of a pine forest in the eastern United States, provided a seed source is available, seems dependent on large-scale disturbance (large blow downs, fires, clearings from human activity). However, frequent, low intensity fires set historically by Native Americans may have maintained pine-dominated communities as a sub climax community on drier sites. In natural canopy gaps of mature hardwood forests, regeneration of pine may be evident but pine rarely succeeds in establishing itself as a member of the overstory (Skeen et al. 1993). These observations appear to be true for RMTC, apart from the plantings of pine.

In addition to pine, dominant pioneer species on early successional sites on RMTC may include broom sedge, juniper, sweetgum, hackberry, persimmon, and various shrubs (including sumac, privet, and huckleberry). On disturbed sites not heavily seeded by pine, hardwood species characteristic of the mature regional climax association more rapidly assume dominant positions in size and coverage.

The development of a mature, multiple-layered, deciduous forest (canopy, sub canopy, shrubs, and herbs) may be expected after 50 to 60 years of undisturbed growth

(Skeen et al. 1993) on the Atlantic coastal plain piedmont (where studies of plant succession have been numerous). There are indications that early stages of succession in the more xeric forests of the Ozark region are slower, and the attainment of a mature structure and composition may require 10 to 30 years longer (Foti pers. comm.; Shugart 1968).

### 2.2.5 Post Oak Savanna

Post oak savannas on RMTC are recognized by the occurrence of widely spaced individuals of post oak in a grassland particularly characterized by big and little bluestem grasses and indiangrass as well as other herbaceous species such as wild agave, rattlesnake master, wild hyacinth, and blazing star. It is related in floristic composition to the valley floor prairie but occurs on drier sites. The open aspect of this community type has historically been fire-maintained. Post oak savannas occur relatively frequently within the Small Arms Impact Area (T. Foti, pers. comm.) and Mortar Impact Areas. Throughout the remainder of the installation these communities are more sporadic and smaller in size relative to those found in both impact areas.

### 2.2.6 Valley Floor Prairie

Large, moist, grassy fields along northern Clinton Road show prairie vegetation in various stages of succession. The most prairie-like of these, south of Loop Road, shows the greatest species diversity of all sites on the post. Particularly characteristic and conspicuous at this site are big and little bluestem grasses, indiangrass, prairie cordgrass, species of the sunflower family, sedges and rushes, mints, and numerous others. Willow oak, southern red oak, and shortleaf pine are scattered around the edges. Periodic management will be required to prevent it from being overgrown by trees. Without removal of the woody species, these areas would become lowland deciduous forest more similar to nearby sites. Fire suppression over approximately the last 50 years apparently had already allowed degradation and modification of this prairie site prior to develop of a more robust prescribed fire program.

In the context of central Arkansas, this lowland prairie is the most unusual community type on RMTC and the most significant in terms of its conservation. This site at RMTC and similar ones on Little Rock Air Force Base, are the largest and least disturbed remaining representatives of this community within Arkansas. They offer the best opportunity for restoration (T. Foti, pers. comm.).

Naturally open sites on RMTC invite various types of military use. Current use of the lowland prairie site as a helicopter landing area should be carefully monitored, and where possible, construction of openings within more abundant types of vegetation should be considered.

### 2.2.7 Lowland Deciduous Woods

At RMTC lowland deciduous woods occur in valleys along most creeks, as well as overflow bottoms around Grassy Lake and Tupelo Gum Pond. These woods are dominated by a mixture of white oak, willow oak, green ash, southern red oak, black oak, red maple, black cherry, black hickory, mockernut hickory, blackgum, and sweetgum. Characteristic shrubs include deciduous holly, dogwood, and parsley haw.

A form of this community type with reduced diversity occurs primarily in temporarily flooded flats along streams. Such communities have been referred to as "willow oak flats" because of the dominance of willow oak, but water oak, overcup oak, winged elm, sweetgum, and other species also occur in variable abundance. Water oak, particularly, may be dominant or nearly so in these low woods or creekside habitats.

### 2.2.8 Cypress Swamps

Cypress swamps occur primarily along the permanently or mostly inundated margins of Grassy Lake, Tupelo Gum Pond, and several of the larger creeks. Bald cypress, tupelo gum, and water elm are the characteristic woody dominants associated with a set of shrubs and herbaceous species that require a hydric habitat. Water stands at the surface or near it for several months of the year at these sites.

### 2.2.9 Lake and Creek Edges

A characteristic association of species occurs along the margins of lakes and creeks, such as along Hunter Lake, Mile Creek, and Spring Creek. Characteristic woody species include black willow, button bush, and alder, with sycamore, red elm, honey locust, red maple, black walnut, willow oak, and water oak often slightly further back from the water's edge. Typical herbaceous species include cattail, softrush, hydrolea, spikerush, scirpus, parrot's feather, and number of other species.

### 2.2.10 Groundwater Seep

This community was described from along Spring Creek in the east-central area of the Small Arms Impact Area and is characterized by lizard's tail, jewel weed, false nettle, sensitive fern, tall dayflower, and Virginia knotweed. Additional seeps have subsequently been discovered in TA 2 but have yet to be sufficiently described and delineated.

### 2.2.11 Cantonment Area

The lawns, parks, roadsides, vacant lots, and other weedy sites of the Cantonment Area hold a number of native tree species, primarily oaks, either remaining from native vegetation, naturally regenerated, or replanted. Other vegetation (woody and herbaceous), however, has largely been planted, and various herbaceous species typical of urban areas over a great part of the Eastern US occur in lawns and associated areas.

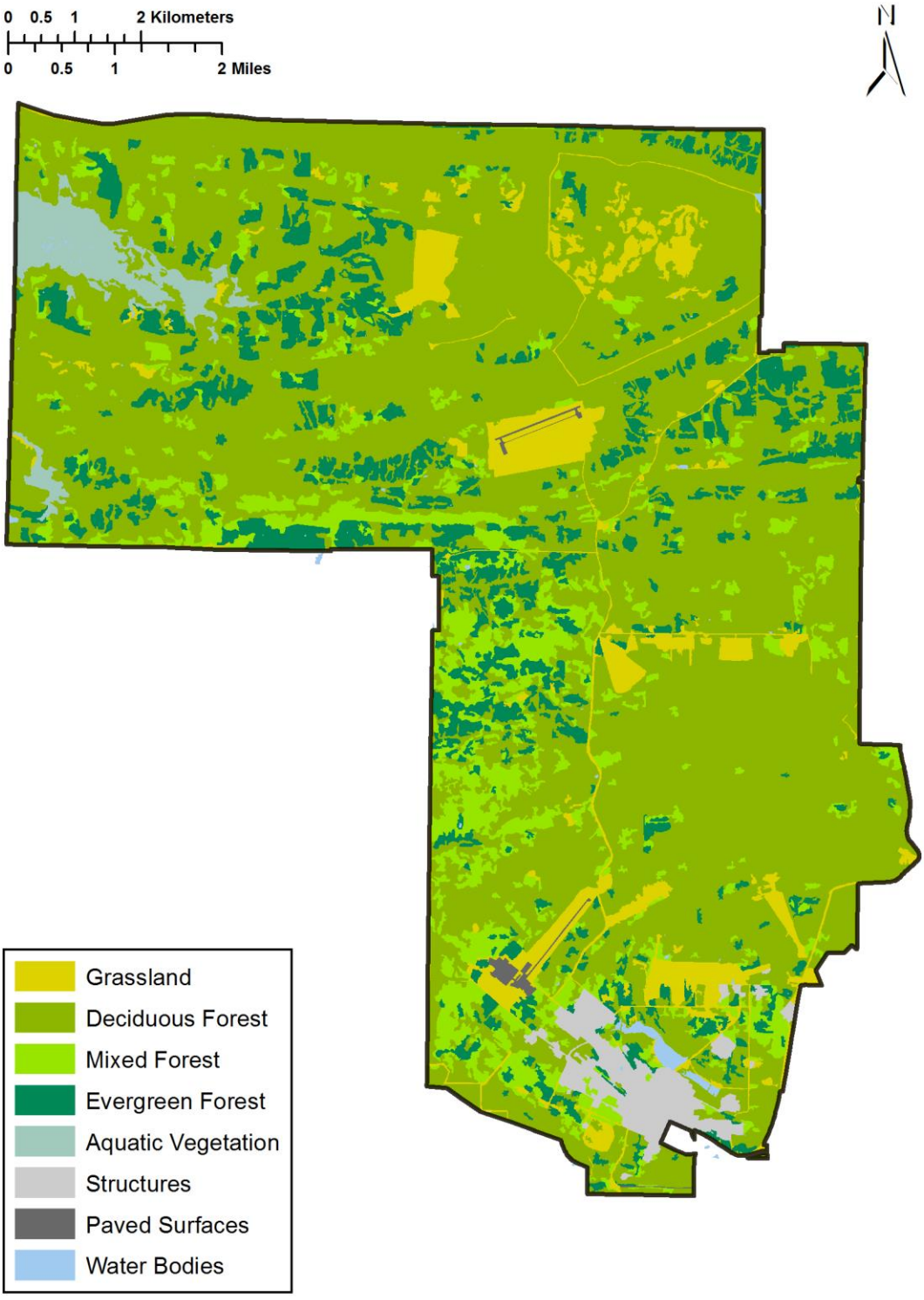


Figure 2.1 Vegetation Communities of RMTC.

## 2.3 Hydrology and Associated Subjects

### 2.3.1 Hydrology

Groundwater in the RMTC vicinity is available from saturated portions of the underlying soil and from water-bearing openings in the bedrock. However, there are no major aquifers of economic or domestic importance underlying or adjoining RMTC and the yield from groundwater wells in the Jackfork and Atoka formations is limited to generally less than 10 gallons per minute.

The bedrock aquifers on RMTC consist of widely spaced open joints, fractures, and bedding planes in the sandstones and in fine jointing in the shale and siltstone. The amount of groundwater available in a bedrock well is controlled by size, degree of connection, and number of water-bearing openings intercepted by the well (Cordova 1963). Clay or sandy gravelly clays mostly overlie the aquifers. Smaller amounts of groundwater occur in the thin veneer of soil overburden.

Rural homes, farms, small commercial establishments, and small municipalities in this part of Arkansas generally pump water from wells completed 50 to 200 ft below ground surface. Water levels measured in groundwater observation wells on RMTC vary from artesian (confined aquifer) in one well to 40 feet below ground surface. A limited amount of specific information is available regarding groundwater on RMTC. US Geological Survey (USGS) files show several wells on the northwestern part of RMTC. Groundwater in these wells is hard and contains high concentrations of iron. The United States Army Environmental Hygiene Agency (USAEHA) drilled several wells in 1992 at varying depths up to about 100 ft to test for potential groundwater contamination from seven closed post landfills along the northern edge of the Cantonment Area. Groundwater data, including depth-to-water and water quality analyses, are available for these wells.

Swamps occur on the western side of the installation where sedimentation resulting from overbank flooding of Palarm Creek and the Arkansas River has isolated depressional areas. The swamps are characterized by perennial inundation. Gently sloping swamp margins are affected by small seasonal changes in water levels, but overall have remained poorly drained.

RMTC is the location for the headwaters of several small streams that typically flow in valleys underlain by weaker shale bedrock units. Because of the configurations of the underlying geologic formations, some of the drainages are oriented east to west, while others drain west to east producing a pattern that Ricketts (1995) characterized as a dovetail pattern like clasped fingers of two hands. The main channels of the creeks and streams are within floodplains and low terraces. The surface waters of RMTC are shown in Figure 2.2.

The northern part of the post is drained by three westward-flowing drainages that empty into Grassy Lake. Jim Creek drains the internal eastern nose of this syncline, flows south of the synclinal axis, and passes through a gap to enter the head of the swamp. Mile Creek drains the internal northern arm of the syncline. An unnamed tributary of Mile Creek drains the core of the syncline. Between Clifton Mountain and the westward extension of Pine Ridge, another valley within the syncline, Tupelo Gum Creek flows westward to join Tupelo Gum Pond. Also between

these ridges, Leopard Creek flows eastward from the installation, ultimately to join Bayou Meto and the Arkansas River.

South of Pine Ridge is the headwaters and upper reaches of White Oak Bayou. This creek flows westward to join another swamp at some distance from the installation. A broad ridge separates upper reaches of eastward-flowing Kellogg Creek and westward-flowing Winifree Creek to the south from White Oak Bayou. Kellogg Creek flows through Fears Lake to Bayou Meto and the Arkansas River. Miles Creek flows eastward in the next valley south of Kellogg Creek. It joins Kellogg Creek off the post upvalley of Fears Lake. West of Miles Creek, in the same interridge valley, the headwaters of Newton Creek join White Oak Bayou. The area south of Purdham Hill is drained by headwaters of three small creeks. From north to south these are Spring Creek, Woodruff Creek, and Fivemile Creek.

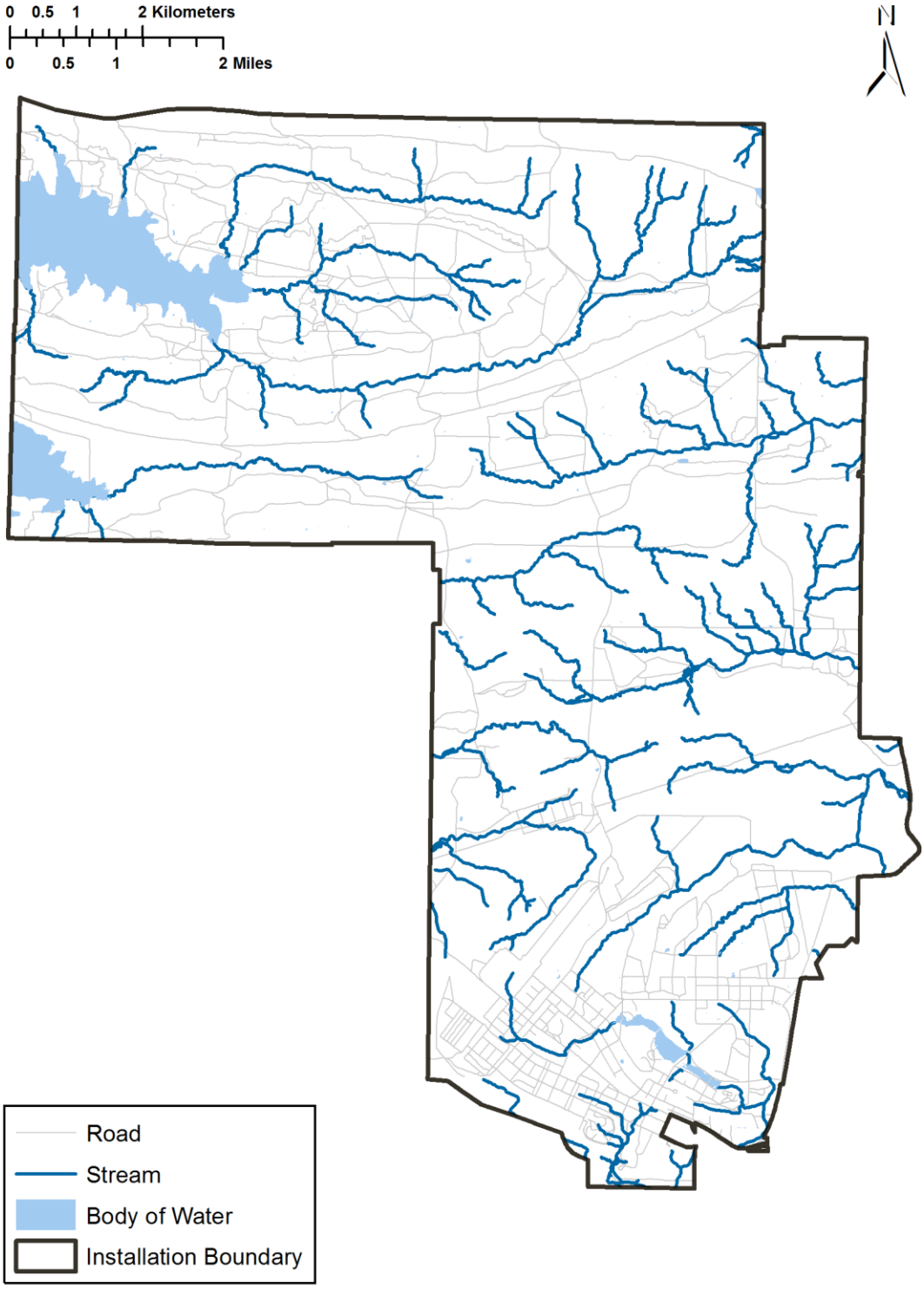


Figure 2.2. Surface Waters of RMTC.

## 2.3.2 Aquatic Environment

The water quality of RMTC streams has been studied during several efforts. These efforts are summarized below. The first study of stream water quality was conducted on August 22, 1994. Samples were taken from the water column and bottom sediments of streams crossing the Small Arms and Mortar Artillery Impact Areas. All metals tested in the water column were below Maximum Contaminant Limits set in provisions of the SDWA, Primary and Secondary Standards (40 CFR 141.11 and 143.3). Concentrations of certain metals in the sediments are appreciably higher than in solution in the water column (Swafford 1994). At this time, these are the only soils metal analyses available on post, so it is not known whether these concentrations represent natural background concentrations or some other influence such as runoff from the impact areas.

Sediment was sampled in Kellogg and Spring Creeks both upstream and downstream of the impact areas. Sediment in the other three streams was sampled only downstream from the impact areas. Lead levels in the downstream sediment samples of Kellogg Creeks were about three times higher than in upstream samples. In contrast, Spring Creek's upstream samples contained lead concentrations three times higher than the downstream samples. This discrepancy may be due to the locations of the streams within the impact area. Concentrations of other metals in the sediment were relatively uniform across sampling stations for all five streams.

A two-year program of stream monitoring supported by RMTC was conducted from 1993 to 1995 (Rickett 1995). The purpose of this study was to establish whether the streams currently draining RMTC became intermittent during the summer and fall and to document the volume of discharge during the time of flow. During both sampling years, the amount of runoff was approximately the same, approximately 15.5 million cubic meters, but this discharge was distributed differently. During the summer of 1993, flow ceased at all the sampling sites and six were dry for about five months. During the summer of 1994, only one site became dry for an extended period, while no flow was measured at random times at most sites. During these periods of low or no flow, pools within the stream courses became isolated and were found to be very turbid with high iron concentrations. Water temperature, dissolved oxygen, and pH were also measured. While some of the pools with high summer turbidity exhibited spots of uperheating and several pH readings were well below neutral, none of these measurements were thought to be threatening to the biota.

Rickett also determined that Mile Creek and Jim Creek in Clifton Basin have the highest water quality. Spring Creek (except the upper portion near the airport) and Kellogg Creek within the Small Arms Impact Area also showed minimal disturbance of water quality. Both of these drainage systems feed major wetland areas within and outside the post.

Two major natural water bodies have also been influenced by human activity. The portion of Tupelo Gum Pond that lies outside the post boundary has been the focus of reclamation activities that have involved drainage and construction of berms. The resulting effects on the swamp forests within the post are uncertain. More evident are the effects of water level management for fish and wildlife on Grassy Lake. The operation of water control structures in recent decades caused timber kills in the less flood-tolerant forest types along the lake

margin. Some of these areas were then occupied by bald cypress, resulting in a young fringe cypress forest upslope of the original mature swamp zone.

### 2.3.3 Surface Water Quality and Flow

Stream flow and water quality were studied at 11-15 sampling sites on major natural streams within the installation between May 1993 and May 1995, between May 2000 and December 2001, and between April 2003 and December 2004. Lakes and ponds were also examined in years 2001, 2003, and 2004. The 2004 study included sediment sampling. The two major concerns for water quality are silt loading from disturbed land surfaces and potential for significant ecological disruption because of low buffering capacity. A 2005 sampling concluded the surface water quality examination (no future projects are planned at this time).

Most of these streams, ponds, and lakes are subject to drying during the summer, although isolated pools often remain. The primary period of discharge is mostly from December through May. The disruption of stream flow is obviously correlated with precipitation and, for the most part, the installation streams are much like other natural waters in the region. The physical and chemical properties of the water studied serve as indicators of four main features of water quality:

1 Erosion and silt loading (sulfate, turbidity, specific conductance, iron, total dissolved solids)
2 Buffering capacity as indicated by low total alkalinity and hardness
3 Nutrient availability (nitrite-nitrogen, ortho-phosphate, sulfate)
4 Life support (temperature, dissolved oxygen, and sulfate)

To date, water quality parameters have been exceeded at several sampling points but results are inconclusive. Additionally, some sampling locations were different in years 1993, 1995, and 2000 than in subsequent years.

Dissolved copper and zinc concentrations appear to be high in some locations. However, each metal was noted as laboratory or field contaminants in separate years, which makes definitive conclusions difficult. Dissolved oxygen, dissolved phosphorus, dissolved cadmium, turbidity, and total dissolved solids have exceeded ADEQ standards in some samples but also show inconsistencies in intra-year and inter-year comparisons. The streams, lakes, and ponds monitored have low alkalinity and hardness, indicating very low buffering capacity. Low buffering capacity, however, is characteristic of the regional waters and not necessarily related to post activities. This low buffering capacity, it appears, causes consistently low pH measurements.

Bedrock and clay are generally at or close to the surface. During periods of extended rainfall, water penetrates the topsoil and clay into the shale formations and will follow this formation down to the rock formations below. This geo-hydrological regime gives rise to fluctuating groundwater levels that vary with seasons of the year and the amount of rainfall. Due to the contour of the ground, rainfall runoff is comparatively high. The clay overlying the shale or rock is relatively impervious and prevents any great amount of percolation.

### 2.3.4 Floodplains

An evaluation of flood hazards on RMTC has been conducted to investigate the potential severity of flooding along streams (USACE 1995, 1996). This information is necessary for the management of new construction on the post and for compliance with Executive Order (EO) 11988 (24 May 1977), Floodplain Management. A 100-year frequency event was used for these analyses, based on peak flow estimates developed from information from the Arkansas State Highway and Transportation Department. Precipitation in the RMTC area is relatively evenly distributed throughout the year and flooding may occur at any time.

The RMTC floodplain studies were done primarily in two phases (USACE 1995, 1996): Phase I – Fivemile Creek and Woodruff Creek, and Phase II – Kellogg Leopard, Miles, and Spring Creeks. The floodplains of these creeks were studied from the RMTC boundary to the upper limits of potential flooding. The Phase I creeks drain southeastward off the post; the Phase II creeks flow in an easterly direction, carrying the runoff from the eastern portion of RMTC, south of Clifton Mountain.

The only other flood mapping for the area is in the unpublished flood hazard evaluation of streams on the western side of the post conducted by the USACE, Little Rock District and the flood insurance studies for Sherwood, North Little Rock, and Pulaski County (FEMA 1982-94).

### 2.3.5 Wetlands

Wetlands are federally regulated and recognized as important to the ecosystem, therefore they are an important part of the installation's inventory. The Clean Water Act limits the impacts that can occur within wetlands. Additionally, EO 11990 limits the amount of wetland impact that can occur on military installations. The USACE has the regulatory authority for administering the Clean Water Act (Parsons 2003).

The USACE and the US Environmental Protection Agency (EPA) define wetlands as:

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

Wetlands store water and can function to minimize flooding. They filter sediment, excess nutrients, and other impurities from water as the water passes through the wetland and into surface and groundwater. The aquatic vegetation found in wetlands protects shorelines from erosion and provides food and cover for wildlife. Wetlands provide habitat for plants and bacteria that use or break down excess nutrients and contaminants.

Jurisdictional wetlands must have wetland hydrology, hydric soils, and hydrophytic vegetation (USACE 1987 Manuel for Wetland Delineation). Wetland hydrology means that water inundates the soils permanently or periodically or that the soil is saturated to the surface at some time during the growing season. Hydric soils show signs of reduced rather than oxidized soil conditions. Hydrophytic plants have adapted to areas having hydric soils and inundated or

saturated hydrological conditions.

Four detailed studies of RMTC wetlands were conducted in 1993, 1994, 2002 and 2006. In 1993, the Little Rock District USACE reported on Kellogg Creek, White Oak Bayou, Leopard Creek, and Tupelo Gum Creek. In 1993 and 1994, Halff Associates reported on Fivemile Creek, Newton Creek, Winifree Creek, Spring Creek, Miles Creek, Grassy Lake and its feeders (Jim Creek, Mile Creek, Grassy Lake Creek, and several smaller associated streams), and three creeks within the RMTC State Wildlife Management Area (Pierce Creek, Nursery Pond Creek, and Chadwick Creek). For each site studied, there is a description of soils, vegetation, hydrology, and wildlife, with mapped wetland limits and data points. Wetland boundaries have been mapped on USGS topographic maps and wetland delineation maps also are available in GIS format.

Parsons completed the third report in 2002. The purpose of this project was to confirm the existence, location, jurisdictional extent, and character of potential wetlands and associated areas on the RMTC and establish baseline data and a flora list for each location. The report supplements the GIS digital report with a comprehensive and descriptive coverage for wetlands and associated areas and it summarizes the methods used and results obtained (Parsons 2003).

The USACE 1987 Wetland Delineation methodology was used on 54 potential wetland areas to determine jurisdictional and non-jurisdictional requirements. Out of the 54 areas surveyed, it was found that 46 areas met jurisdictional wetland requirements and their boundaries were delineated accordingly. The exact wetland boundaries were delineated and recorded by using a hand-held GPS unit. All 54 areas were assigned a National Wetland Inventory Cowardin classification. These areas were also assigned corresponding vegetation Alliances according to The Nature Conservancy standard classification (Parsons 2003).

Results of the third report confirmed 54 individual areas displaying wetland characteristics on the RMTC. These sites vary in size from 863 acres to .02 acres. Four different National Wetland Indicator classifications (Palustrine Forested, Palustrine Emergent, Palustrine Scrub/Shrub and Lacustrine Littoral) occur on RMTC, with Palustrine Forested being the most common. Willow Oak Forest is the most common vegetative type of the nine Nature Conservancy Alliances identified at the RMTC. “Grassy Lake and Tupelo Gum Pond account for the majority of jurisdictional wetland area on the installation” (Parsons 2003). Wetlands found on RMTC are displayed on Figure 2.3.

The fourth report, conducted by e2M in 2006, used more detailed and updated GIS information along with data from the previous wetland surveys and supplemental field sampling plots to develop a more concise picture of wetlands at RMTC.

The majority of RMTC wetland sites are typically located within stream channels of variable width. Small beaver dams have been constructed across some of the creeks, creating relatively small upstream wetlands. Periodically flooded wooded “flats” also are relatively common; these are generally several hundred feet wide and long and usually occur adjacent to streams in areas with little or no topographic relief.

The most extensive wetland on RMTC is associated with the Grassy Lake area. Grassy Lake in its original state evidently was a larger marsh with less open water, but it is now a semi-natural area of open water and marsh. Until recently, AGFC controlled the water level by means

of a levee system and gated pipes connected to Bell Slough and the lake but this has been discontinued. The lake level will continue to fluctuate, however, with peaks in spring and fall. Bald cypress and tupelo gum occur in standing water along the edge of the lake, and the periodic inundation and drawdown has resulted in an additional fringe 100 to 300 ft wide with wetland characteristics.

Another large wetland on RMTC is associated with Tupelo Gum Pond. Tupelo Gum Pond and associated marshland also appear on early 19th and 20th century maps and, like Grassy Lake, may have been originally impounded by sediments of Palarm Creek, and possibly on a larger scale by Arkansas River overbank sediments. It is shown on the 1941 RMTC installation map as a relatively large lake ("Gum Pond") straddling the border of RMTC, but the observations in the USACE wetland delineation report suggest that this area has been seriously disturbed by clearing probably associated with previous agriculture.

The USACE report notes that evidence of farm and pasture activity remains conspicuous along Tupelo Gum Creek all the way to Tupelo Gum Pond. Other activity strongly influencing the biology of Tupelo Gum Pond may be water previously or currently drained (or pumped) for irrigation of rice fields on both sides of Interstate Highway 40, west of RMTC. A cleared area south of Tupelo Gum Pond with approximately 6 inches of standing water has herbaceous, but somewhat weedy, vegetation indicative of marshy conditions. The eastern edge of Tupelo Gum Pond, which is covered by water fluctuating between levels of about 6 inches to 5 ft, is dominated mainly by black willow. Near the RMTC boundary, periodically flooded areas adjacent to the marsh are observed to have mature overcup oak and pin oak.

According to Parson's Wetland Survey of RMTC conducted during 2002, 1,103.25 acres with wetland characteristics were identified. Of these, approximately 1,057.86 acres meet USACE jurisdictional wetland requirements. Nine Nature Conservancy Alliances were found within RMTC wetlands, with the most common type being Seasonally Flooded Willow Oak Forest (Parsons 2003). The 2006 Wetland Survey delineated 1,106 acres of wetland based on the *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al. 1979) methodology (e2M 2007). This survey defined fifty-five distinct wetland polygons ranging in size from 0.05 acres to approximately 870 acres. Most (73% or 40 out of 55 sites) of the individual wetlands were smaller than one acre in size and only 7% (4 out of 55 sites) were larger than 5 acres.

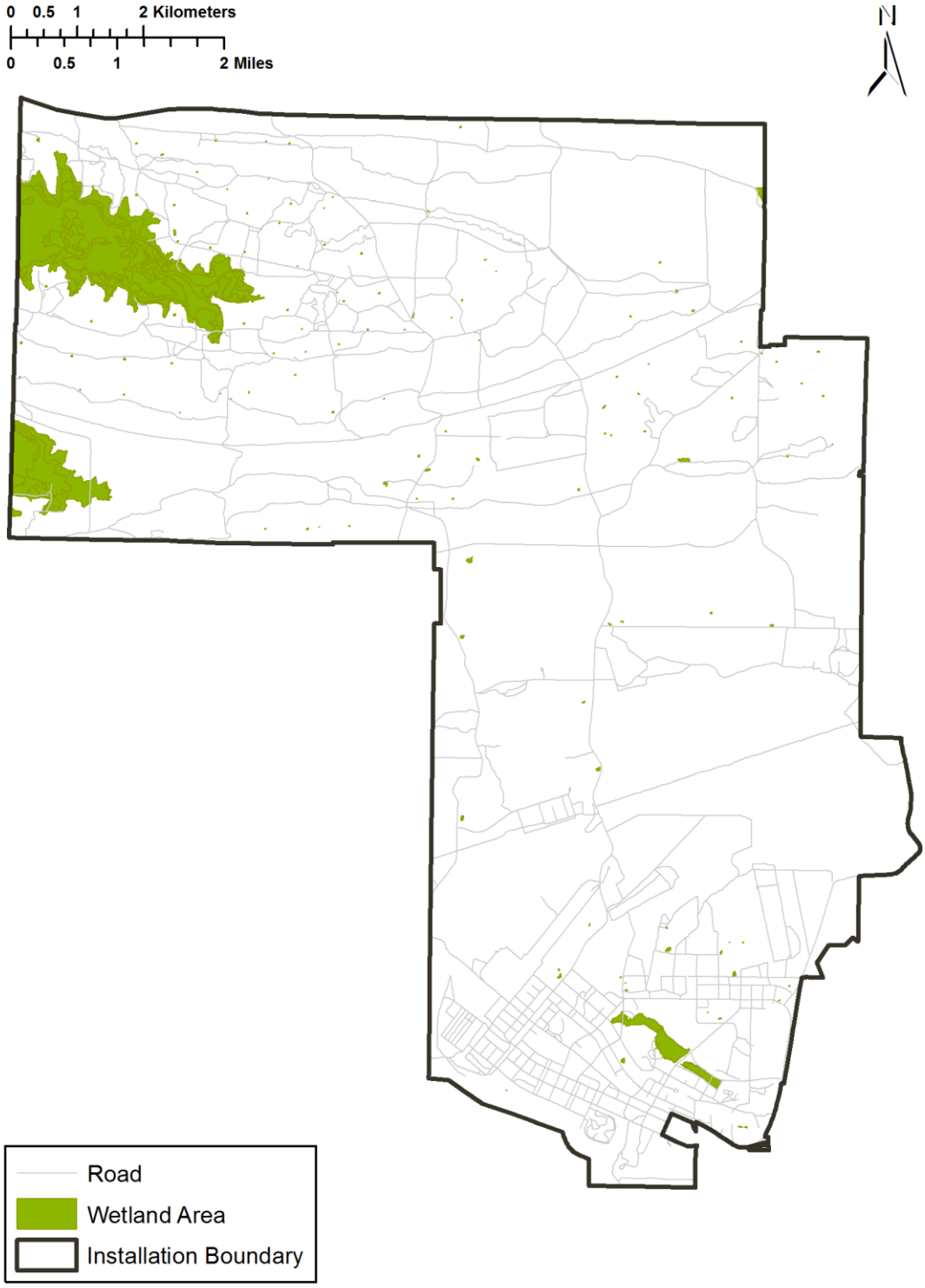


Figure 2.3. Wetlands of RMTC.

## 2.4 Flora

The floristic biodiversity and patterns of vegetative cover in RMTC have been documented in several studies (Getz 1994, Culwell 1995, and Foti et al. 1995). In the floristic survey, topographic areas with potentially diverse plant communities were selected and sampled. Eight such areas were designated for monthly follow-up observation and plant collection mainly from September 1992 through November 1994. Vegetation community GIS layers were updated in March 2006 using existing GIS data and limited field observations.

In 2003, Parsons completed a vegetative survey. This survey had no formal report, but there was an extensive mapping and layering project completed for the vegetative cover. The maps are kept at the RMTC DCSEN-E.

Also in 2003, personnel from Virginia Polytechnic Institute performed a Range and Training Land Assessment (RTLA) (previously known as an LCTA). The analysis included 71 plots previously surveyed and several new plots. The information on the vegetative make-up is comparable to the Parsons survey.

A set of laminated specimens (one per species) representing each species known from RMTC is available for reference on the post at the DCSEN-E. Another complete set of specimens (herbarium specimens representing all collections made) is deposited at the herbarium at the University of Central Arkansas in Conway.

As of June 1997, 871 species of vascular plants had been documented as occurring within RMTC; 691 of these were documented by Getz and Culwell, and the remainder was added during subsequent RTLA studies and associated investigations by RMTC staff. Pulaski County is known to harbor at least 1,140 species, Faulkner County 1,044 species (Smith 1988). Culwell (1995) considered the number for RMTC to be “relatively low” (although he did not state the basis of comparison), apparently attributing the relative lack of diversity to the “apparent xeric conditions of most sites.” This is essentially equivalent to the observation that the greatest part of the RMTC area (perhaps 70 to 80%) is covered by a relatively consistent vegetation characteristic of dry sites and dominated by post oak or pine-hardwood. Nevertheless, the recent and rapidly accrued 15% increase in number of known species suggests that the estimate of plant diversity will grow further with continued exploration of the more mesic or uncommon habitats represented on RMTC. Periodic surveys in wetter years also may bring to light additional herbaceous species.

American pillwort (*Pilularia americana*), northern tubercled-orchid (*Platanthera flava var. flava*), hyssop-leaved boneset (*Eupatorium hyssopifolium var. hyssopifolium*), shortleaf skeletongrass (*Gymnopogon brevifolius*) are some of the floral species on RMTC that receive designation of state SOCCs by the ANHC. However, other formally listed rare species are known to occur in other areas of Faulkner and Pulaski Counties, and it is possible that these might eventually be located on RMTC in mesic upland habitats (Tucker 1974): *Claytonia caroliniana* (Faulkner Co.), *Heuchera arkansana* (Faulkner Co.), and *Spiraea tomentosa* (Pulaski Co.). The distinctive type of steep bluff habitat or narrow gorge that might support these species, however, apparently does not exist on the RMTC property (D. Culwell, pers. comm., 29 April 1996).

Certain species found on the RMTC property that are of uncommon occurrence in this region of Arkansas but are not state or federally listed as rare (Foti et al. 1995). The following are species that were described as uncommon by Foti: several genera of orchids (*Spiranthes*, *Platanthera*, *Malaxis*), scrub post oak (*Quercus margarettiae*), quillwort (*Isoetes melanopoda*), adder's tongue fern (*Ophioglossum vulgatum*), and Virginia snakeroot (*Aristolochia serpentaria*).

Exotic or non-native plants often become invasive and replace native plant species. Exotics are generally the most common around the cantonment area and other areas that have experienced man-made disturbances such as right-of-ways for roads and utility corridors. Exotic plant species can be controlled by preventing soil disturbance and erosion or through the use of prescribed burning, mechanical removal or mowing, biological controls, or the selective use of herbicides. The potentially destructive invasive plant species occurring on RMTC are all of Asian origin introduced to North America for ornamental or dietary purposes. The INRMP recommends that none of these should be used in private or public landscaping. Invasive plant species present at RMTC include:

1. privet (*Ligustrum* spp.)
2. Japanese honeysuckle (*Lonicera japonica*)
3. Autumn olive (*Eleagnus umbellate*)
4. Chinese tallow (*Triadica sebifera*)
5. multiflora rose (*Rosa multiflora*)
6. kudzu (*Pueraria montana* var. *lobata*)
7. sericea lespedeza (*Lespedeza cuneata*)
8. Chinaberrytree (*Melia azedarach*)
9. wisteria (*Wisteria floribunda* and *W. sinensis*)

Other exotic and native plant species can become invasive in some areas due to fire suppression, mowing, or other anthropogenic land alteration. Some of the more prevalent species include eastern red cedar, sweetgum, and bahia grass.

# 2.5 Fauna

## 2.5.1 Mammals

A faunal assessment of RMTC was begun in 1994 (Penor et al., 1996a, 1996b) with the following objectives: (1) determine the distribution and abundance of native mammals; (2) to survey for rare and endangered species; and (3) to determine the impact of human activities on sensitive habitats and fauna. Mammals were located during 1994-1996 by direct observation, live trapping, scent stations, pitfall trapping, active hunting, spotlighting, predator calling, and mist-netting (for bats).

A total of 29 mammal species was recorded for RMTC out of a possible 54 that occur in Central Arkansas (Sealander and Heidt 1990). Two of these records were obtained from UALR museum records. Of the 25 mammalian species possible but not recorded on RMTC,

there were eight bats, nine rodents, five carnivores, two insectivores, and a lagomorph. It is likely that at least some of these may be found with more intensive sampling. None of the mammal species found on RMTC is considered rare or threatened by the ANHC (ANHC 2012).

When habitats were categorized into either “Deciduous” (hardwood) or “Mixed-Evergreen” (mixed hardwood/pine) forest, five common small mammal species were captured most often (149 captures) in hardwood communities; six common species were captured 82 times in mixed hardwood/pine communities. In total, more species were found in the deciduous forested TAs (24 species) than in the mixed-evergreen forested TAs (14 species) (Penor et al. 1996b). The red bat, eastern cottontail, coyote, and white-tailed deer were common throughout the installation.

A preliminary predator survey was conducted in 2003 using infrared digital photographic stations, scent/bait stations, and nocturnal spotlight surveys. Targeted species were large carnivores, in particular cougar and black bear. Neither of these species was found but commonly recorded species included bobcat and armadillo. Future surveys will be conducted on a limited basis in select areas.

RMTC staff and AGFC biologists conduct deer surveys on 1,232 acres during the spring and fall. This is done accomplished by identifying preselected travel routes and spotlighting deer over a period of six to ten nights conducted these surveys. These spotlight surveys will continue indefinitely and could be supplemented with scent/bait stations, infrared aerial photography or stationary infrared digital photography dependent on resources available.

Penor et al. (1996a) speculate that disturbance from human activities, present or past, may have been responsible for the absence of several species normally common in the area: mink, river otter, and least shrew. To evaluate the relationship between biodiversity and habitat conditions on RMTC, accurate information is needed regarding the type, time, intensity, and frequency of usage of TAs (Foti 1996 progress report; Heidt and Karlin 1996). The Range Facility Management Support System (RFMSS) should supply this information.

### 2.5.2 Birds

The variety of birds at RMTC reflects the mix of forest, prairie, and brushy habitats found there. Four major avifaunal studies have been conducted on RMTC. In 1996, Kenton Lohraff completed the first study under the direction of Dr. Kimberly Smith, UA-F. The George Miksch Sutton Avian Research Center of Oklahoma Biological Survey (OBS) completed the second study in 1999. The third study, by Engineer Research and Development Center (ERDC), Environmental Laboratory, Vicksburg, Mississippi, began in April 2002 and concluded in February 2003. Additionally, RMTC was included in the Institute for Bird Populations (IBP) and USACE Monitoring Avian Winter Survival (MAWS) Program on DoD Installations in the Southeastern United States. This study was completed in 2007 (Sarraco et al. 2008).

Records for birds on RMTC were previously available only from the 1993 Christmas Bird Count conducted by members of The Nature Conservancy, who observed 35 species. The 1996 study recorded the occurrence of 141 species on the post. The OBS study focused on five of these species. The ERDC study focused on the inventory of the bird communities throughout

the installation in a variety of habitats. The 2003 study recorded an occurrence of 251 species on the installation during spring, summer, fall and winter counts (Avian Community Inventories on Camp J.T. Robinson, Arkansas Fall 2003).

The 1996 Lohraff study proceeded with selection of 15 study sites to include a range of different vegetational habitats. Each site was a linear transect within an area of uniform vegetation with as many census points as possible (to a maximum of 6) at 150 meter intervals. A point count was made at each census point primarily within a 50-meter radius. Surveys were conducted at 75 census points, and the nature of the habitat and vegetation (34 variables) at each point was recorded. Each transect was visited several times during 1994-1996 (fall 1994, spring 1995, winter 94-95, winter 95-96).

Seventy-seven species were recorded at the census points (within and outside the 50-meter circles) during the breeding season surveys. Shannon diversity and evenness indices show that all transects were relatively similar in diversity and evenness of bird species. Most of the transect locations were similar in large-scale vegetational habitat characteristics. Distinctively high numbers of species, however, were observed in the Grassy Lake, White Oak Bayou, and Tupelo Creek transects, perhaps because of the greater structural heterogeneity of the vegetation. The most common species during breeding season over all transects were the blue-gray gnatcatcher and tufted titmouse.

For each of the 26 most frequently detected species, various biological features were recorded including migratory status and primary breeding habitat. Eight were classified as forest interior specialists and 18 were considered as forest or edge breeders. Among the 13 vegetational characteristics that differed significantly among the transects (characteristics of ground cover, understory, and canopy height and cover), four were most predictive of the occurrence of forest interior breeding specialists. Of these, canopy height, canopy cover, and number of conifers 8 to 23 centimeters diameter breast height (cm dbh) appear to be the most important features influencing habitat selection for the interior specialists.

The occurrence of several rare bird species on RMTC was recorded during the Lohraff study. Bachman's sparrow, loggerhead shrike, and cerulean warbler were observed during both seasons. A bald eagle was seen flying over the western boundary of the post in May 1994, and a sharp-shinned hawk was observed over the western boundary several times during both breeding seasons.

In 1999, OBS was contracted to determine if management practices needed to be implemented at RMTC for three of the rare bird species – loggerhead shrike, cerulean warbler and Bachman’s sparrow. They also studied the northern bobwhite and brown-headed cowbird populations on the post.

The following recommendations were made by OBS concerning these species:

1. Neotropical migrants and point counts
    a. Continue monitoring bird populations with point counts. Ideally, surveys would be conducted annually; however, conducting surveys approximately once every three years may be sufficient to detect population changes.
2. Brown-headed Cowbirds
    a. Present parasitism rates do not justify controlling cowbird populations. Continue monitoring parasitism rates to determine if a control program is

warranted in the future.

b. Limit forest fragmentation to prevent access to forest interiors by cowbirds.

c. Northern Bobwhite

d. Use prescribed burns to improve habitat conditions. Burns should be 5 to 10 hectares in extent and conducted during winter months. Burns will also benefit Bachman's Sparrows.

e. Continue monitoring bobwhite population sizes to measure the effectiveness of management actions in increasing bobwhite numbers.

3. Bachman's Sparrow

a. Do not mow old fields and grasslands from the 15 April to the 15 September, if possible.

b. Use prescribed burns to improve habitat conditions. Burns should be 5 to 10 hectares in extent and conducted during winter months. Burns will also benefit Northern Bobwhites.

c. Continue monitoring sparrow population sizes to measure the effectiveness of management actions in increasing sparrow numbers.

4. Loggerhead Shrike

a. Allow hedgerows to develop either naturally or with plantings near potential shrike habitat on the Cantonment Area (particularly near the golf course) and the firing ranges on the Small Arms Impact Area, if feasible.

5. Cerulean Warblers

a. Allow bottomland hardwood forests to mature. Limit forest fragmentation in this habitat.

A Breeding Bird Survey was conducted May-July of 2005 (GBMc 2005b). Eighty-three species total with eleven on Audubon Arkansas Bird of Conservation Interest list and eleven on DoD Partners in Flight (PIF) list of Birds of Conservation Concern.

During April 2002, the ERDC was contracted to inventory bird communities and to make recommendations for PIF PSC throughout the installation in a variety of habitats. The initial task was to survey the 75 point-count locations that were established during the 1999 OBS avian communities study. An additional 34 point count locations were added to increase sample size for specific habitat types. All new survey points were placed 250 meters apart and at least 250 meters away from the 1999 survey sample points (ERDC 2003). There were 10 additional survey stations established along roadsides in a variety of habitats to survey nocturnal species such as owls and nightjars (i.e., Chuck-Will's-Widow, Whip-Poor-Will, and Common Nighthawk), which were sampled during the spring and fall migration. The research team added a waterfowl count during the winter bird survey. (ERDC 2003).

Surveys were conducted once per season at sampling stations from the spring of 2002 to the winter of 2003. During the spring migration survey, 1,600 birds of 88 different species were counted. The most common occurrences were the Eastern Tufted Titmouse and Indigo Bunting. The summer breeding bird survey showed an occurrence of 1,200 birds of 71 species, with the most common being the Yellow-billed Cuckoo and Indigo Bunting. Significant numbers of the Blue-gray Gnatcatcher were also documented. The fall breeding bird survey revealed over 1,400 birds of only 48 varying species with the Blue Jay and Eastern Tufted

Titmouse being the most common species (USAR&D 2003).

The over-wintering survey conducted in 2003 revealed the most common resident birds to be the Red-winged Blackbird and the Blue Jay. One afternoon during this survey a 3-hour waterfowl survey was conducted from a canoe on Grassy Lake. Twelve bird species were detected during this count, including five species of waterfowl, with the most common being the mallard and the wood duck (USAR&D 2003).

The Final Report provided recommendations for PIF PSC in the following habitats:

1. Bottomland Hardwood and Riparian Management Areas:
   a. Protect existing bottomland hardwood forests in the Grassy Lake and Tupelo Creek areas from development, timber harvest, and/or intensive military training exercises.
   b. Limit access roads into bottomland hardwood areas.
   c. Promote restoration of bottomland forests when and where practical.
   d. Monitor and control beaver activities when appropriate.
   e. Maintain exiting riparian areas when possible, leaving wide (at least 50 meters) forested buffers on each side of streams and wetlands during any future planned silvicultural activities.
   f. Any forest alterations (e.g., cutting, burning) or disturbances (e.g., mowing) that are planned in the future should not occur during the breeding season (approximately April 15th to August 15th).
   g. Retain or encourage snags 25 cm dbh or greater.
   h. Minimize the number, length, and width of new roads in development plans.
2. Open Grassland and Early Successional Management:
   a. Protect and maintain current grassland and early successional habitats.
   b. Expand sizes of current grassland and early successional areas.
   c. Consider planting native grass and forbs species in restoration efforts.
3. Waterfowl Management:
   a. Establish Wood Duck nesting boxes throughout the Grassy Lake and Tupelo Creek Areas.
   b. Maintain or increase vegetative heterogeneity throughout Grassy Lake by planned drawdown of the water level.

The MAWS program was initiated to study temperate-wintering bird species, including sparrows and other species that prefer early successional stage habitats, are in population decline. According to Monitoring Avian Productivity and Survivorship (MAPS) Program results, low survival is cited as the main reason for the decline. Other evidence points to habitat loss and degradation as the main causes of the decline. Because DoD lands are maintained in a manner that creates early successional stage habitat, army training sites may be valuable in monitoring these bird populations.

To obtain these data, MAWS stations were set up at military installations and standardized mark-recapture methodology implemented from November to March annually for four winter seasons. A model was then applied to the survival estimates and indices of bird body conditions (indicator of habitat characteristics). The ultimate goal is formulation of management

guidelines and strategies targeting these temperate-wintering migratory landbird species.

### 2.5.3 Amphibians and Reptiles

Thirty-three species of amphibians and reptiles were documented on RMTC by Heidt and Karlin (1996) of a total of 86 herpetofaunal species whose distributions potentially are included on the post (Dowling 1957). For 51 species not documented on RMTC, most were forest-dwelling salamanders, river-dwelling turtles, and small and secretive snakes. Habitat (lowland swamp, prairie grassland, sandy soils) for the two remaining undocumented species may be the limiting factor. RMTC is not within the known distribution of any federally or locally rare, threatened, endangered, or protected species of amphibians or reptiles. It was concluded that military land use patterns have not limited the herpetofauna either in species or numbers of individuals.

### 2.5.4 Fish

Samples of fish and macrobenthos were collected from streams representative of a range of disturbance conditions on the post. Two sampling stations each were located on White Oak Bayou and Leopard Creek and two stations each were located on Spring Creek and Jim Creek (Rickett 1995; Rickett 1996; Harris and Rickett 1996). Sampling was conducted over portions of three years: 1994 (fall), 1995 (winter, spring, fall), and 1996 (spring).

Rickett collected 23 species of fish (14 genera, 10 families). Diversity indices for fish at all sites were close in value. The downstream site on each of the four streams yielded more individuals but usually slightly lower diversity indices. Five species (numbers are inconsistent) were collected at all sites; 11 of the species were found in all four streams, while another 7 were found in three streams. Nine species were collected during every seasonal sampling series and 4 species were taken during 4 of the 5 sampling series. Redfin shiners were the most abundant of all taxa present. Leopard Creek contained the greatest number of species (perhaps because sampling was easiest there), followed by Jim Creek, White Oak Bayou, and Spring Creek. Spring Creek is potentially a top quality stream but suffered badly in 1995 from silting and pollution of unknown origin (Rickett 1996).

With knowledge of habitat requirements and geographic ranges (Robison and Buchanan 1988), several additional species of fish might have been expected in the RMTC streams. However, none of the collected species warranted special concerns and none were in unexpected microhabitats. “In the absence of a fixed standard, it is [Rickett's] professional judgement that the ichthyofauna of RMTC was of marginal quality and quantity. This was probably mostly due to the unusual intermittency of the streams in the area. Considering the migrations required to recolonize all reaches of streams after re-establishment of continuous flow, it is perhaps surprising that we recorded as many as 22 species.”

In 2003, GBMc & Associates, along with Genesis Environmental Consultants, performed an aquatic life survey in nine representative streams within the RMTC boundaries to determine

the biological conditions of major stream systems within the RMTC. These nine streams were Jim Creek, Tupelo Gum Creek, White Oak Bayou, Winifree Creek, Newton Creek, Leopard Creek, Kellogg Creek, Spring Creek, and Five-Mile Creek.

The purpose of this survey was to determine water quality within perennial habitat that is adequate to support populations of fish and macroinvertebrates. Each stream was sampled separately for biotic diversity and then compared to typical Arkansas River Valley Ecoregion and the Boston Mountain Ecoregion streams of similar watershed size determined from reference material developed by ADEQ.

Study reaches of each stream were field measured and biologically sampled. Biological communities, water quality, habitat quality, and anthropogenic effects were determined through the measurements and sampling. A Sampling and Analysis Plan detailed the project and sampling methods. Biotic characteristics were determined by the two watersheds types — the Arkansas River and the Bayou Meto. The streams and creeks were divided into groups based on the characteristics of these two watersheds.

One group of creeks/streams was the lowland type streams with geophysical features more typical of the Arkansas River Valley Ecoregion, whereas the second group of creeks/streams displayed features more characteristic of upland type streams like the Boston Mountain Ecoregion. The information provided through this analysis characterizes benthic macro invertebrate communities, fish community assemblages, ancillary water quality data, and qualitative habitat potential. Sampling was performed with electrical current generation or pedal down time. Each of the nine streams was sampled between June 3 and June 6, 2003. During this time, 1,848 fish were caught, comprised of 5 dominant family groups, and an overall average of 14 taxa collected (GBMc 2003).

### 2.5.5 Aquatic Invertebrates

Aquatic macroinvertebrates were sampled in connection with the water quality studies conducted by Rickett (1995), Harris and Rickett (1996), and Rickett (1996).

Seine and dip net sampling collected aquatic invertebrates representing 108 genera in 71 families. Seven taxa were found at all sites, while 4 taxa were found at 7 of the 8 sites. Nineteen taxa were found in all four streams, while 20 taxa were found in 3 of the 4 streams. Seven taxa were collected during all sampling periods, while 56 were collected during only one series. Forty-seven taxa were collected from only one stream, and 42 taxa were from only one site.

"The aquatic macroinvertebrates were surprisingly diverse but not especially abundant, except for the occasional dense pockets of animals at certain times during their annual growth cycles. Stream intermittency theoretically would not affect macroinvertebrates as much as fishes because of the shorter generation times and multiple reproductive efforts during the warmer months by macroinvertebrates." (Rickett 1996, p. 15).

Although one of the nine streams demonstrated biotic diversity and taxonomic assemblage greater than the other eight streams, it was found that the benthic and fish communities generally were limited but could still exist as long as water is available. Within the biotic community of the streams, 28 taxa were found, with the highest composition in Jim Creek. The macroinvertebrate composition was dominated by dragon flies/damsel flies (Odonata) and

beetles (Coleoptera). The complete list of benthic macroinvertebrate species collected in all streams (study reaches) consisted of approximately 1,000 taxa collected (GBMc 2003).

### 2.5.6 Terrestrial Invertebrates

The terrestrial invertebrates have not been extensively studied on RMTC. In the summer months of 1998, OBS established 64 plots to determine if the endangered American burying beetle (*Nicrophorus americanus*) was present on the installation. No individuals of *N. americanus* were observed or trapped during this study. However, OBS documented four other *Nicrophorus* species on the installation: *N. orbicollis*, *N. tomentosus*, *N. pustulatas*, and *N. marginatus*.

In 2002, Parsons began a project to establish a baseline database of terrestrial invertebrate families that occur on RMTC. At this time, Coleoptera and Hymenoptera were the featured species. The sample sites selected for this project were chosen from previous RTLA surveys. Forty-six sites were chosen in a variety of vegetative communities at RMTC. At these locations, a variety of traps were distributed in five of the broadest vegetative communities. These included post oak/blackjack oak, mixed oak/ hickory, bottomland oak (cypress/tupelo), shortleaf pine/oak, and little bluestem/winged sumac. The sampling periods were for two weeks each in June, July, and August. During trapping, 11,666 Coleoptera were captured in three types of traps. Sixty-eight families were represented with four being the most dominate. The second trapping period resulted in the capture of 637 Hymenoptera. Three trap types were responsible for the capture of 36 families within the Hymenoptera order. Four families dominated the survey sites (Parsons 2003).

A Terrestrial Insect Survey conducted by GBMc from May-August 2005 developed a broad family-level characterization of thirteen insect orders. Ninety-one families were identified from over 38,000 individual captures.

As terrestrial invertebrates encompass a substantial part of most ecosystems and serve as excellent indicators of function, health, and overall biodiversity, it is imperative to identify, categorize, and classify them to best extent possible. As several of the previous efforts focused, in most cases, on delineating habitat affinity based on identification of individuals to family taxa, future efforts should concentrate on identification to the lowest possible taxonomic level. This is the only way to ensure a robust and thorough baseline Faunal PLS from which future monitoring and updates can occur. This will also further facilitate management planning and efforts by indicating the presence of any invertebrate SOCCs and helping to identify potential PCSs (or further describe and delineate existing PCSs). Additionally, limited volunteer “citizen-scientist” based efforts are underway to supplement the lack of current resources toward this effort (Raney et al. 2010).

## 2.6 Priority Conservation Sites

An inventory of PCSs is currently underway. The criteria for identifying each site will be based on whether the vegetation community is considered locally or regionally uncommon, the presence of rare or endemic species at the location, and the significance of the site in overall landscape heterogeneity. This survey will involve DCSEN-E personnel locating and assessing specific sites based on information from previous biological inventories, personal communication with individuals familiar with current land use practices on the installation, and recommendations from partnering agencies/organization (i.e., ANHC, Audubon Arkansas, etc.).

This information, along with GIS information on specific cultural resource sites to be protected, will enable production of a map of PCSs on RMTC. This map will be distributed to pertinent AR ARNG/MDA personnel in order to more effectively plan construction or training events and will prevent degradation to these locations. Additionally, monitoring these PCSs annually will enable DCSEN-E personnel to efficiently assess ecosystem management practices being conducted at RMTC. This will ensure robust evaluation of ecosystem health and facilitate an improved NRMPG.

Table 2.1. Priority Conservation Sites at RMTC.

| Site Name | Location | Characteristic or Rare Species | Management Needs |
|---|---|---|---|
| Psyam Prairie | TA 11 (adjacent to Psyam Drop Zone) | *Platanthera lacera, Cephalanthus occidentalis, Scleria pauciflora, Orbexillum pedunculatus, Nemastylis nuttallii, Vireo bellii* | prescribed fire frequency of one to three years; maintain hydrology and soil characteristics; prevent erosion and feral hog disturbance |
| Interridge Valley Pine Savannas | TAs 7, 11, 13, and 14, and Small Arms Impact Area (relatively well-drained soils in interridge valleys of eastern portions of Jim Creek, Leopard Creek, and Miles Creek watersheds) | *Pinus echinata, Aimophila aestivalis, Passerculus sandwichensis (*in winter and early spring*),Calcarus pictus (*in winter*), Ammodramus savannarum, Vireo bellii* | prescribed fire frequency of one to three years; maintain hydrology and soil characteristics; prevent erosion and feral hog disturbance |
| Clifton Ridge Sand Post Oak Woodland | TAs 8 and 10 (along western portion of Clifton Ridge) | *Quercus margaretta, Schizacharium scoparium, Geococcyx califonianus* | prescribed fire frequency of three to five years (relatively low intensity); caution when grading Clifton Ridge Road in vicinity |
| Newton Creek Hillside Seeps | TA 2 (headwaters of Newton Creek along northside of Purdham Hill) | *Dryopteris celsa, Onoclea sensibilis, Osmunda cinnamomea, Osmunda regalis, Rudbeckia fulgida, Sphagnum spp., Thelypteris noveboracensis* | prescribed fire frequency of five to seven years (very low intensity); maintain hydrology and soil characteristics; prevent erosion and feral hog disturbance |
| Spring Creek Hillside Seep | Small Arms Impact Area (mid-reach of Spring Creek along south side of Purdham Hill) | *Dryopteris celsa, Onoclea sensibilis, Osmunda cinnamomea, Osmunda regalis, Rudbeckia fulgida, Sphagnum spp., Thelypteris noveboracensis* | prescribed fire frequency of five to seven years (very low intensity); maintain hydrology and soil characteristics; prevent erosion and feral hog disturbance |
| Jim and Mile Creek Riparian Forest and Woodland | TAs 10 and 11 and Mortar Impact Area (not accessible in Mortar Impact Area) | *Platanthera flava, Quercus lyrata, Quercus michauxii, Speyeria diana, Callirhoe bushii* | prescribed fire frequency of five to seven years (very low intensity); maintain hydrology and soil characteristics; prevent erosion and feral hog disturbance |
| Buttonbush Pond | TA 7 (adjacent to Clinton Road near headwaters of Tupelo Gum Creek) | *Cephalanthus occidentalis, Ambystoma maculatum, Pseudacris triseriata, Acris crepetans crepetans, Acris crepetans blanchardi, Psudacris crucifer, Speyeria diana* | prescribed fire frequency of five to seven years (very low intensity); maintain hydrology and soil characteristics; prevent erosion, sedimentation from Clinton Road, and feral hog disturbance |

## 2.7 Threatened, Endangered, and Rare Species

The FWS and ANHC: the two agencies primarily responsible for identification and delineation of rare, threatened, or endangered species and their habitat within Arkansas, are considered partners in the INRMP annual review and update process. Both agencies, in addition to AGFC, have been instrumental in determining priorities of the Natural Resources Program at RMTC. No federally-listed threatened or endangered species are documented or expected to occur on RMTC. ANHC and FWS staff members have conducted limited surveillance for particular species on installation. Additionally, many biological surveys have been conducted on RMTC by subject matter experts. Supplemental information is available from various studies or inventories conducted on or adjacent to RMTC in Appendix I.

Table 2.2 shows the list of recognized SOCCs reported for RMTC from all presently available sources.

Table 2.2. Species of Conservation Concern (SOCCs) at RMTC.

| Scientific Name | Common Name | Conservation Status | Reference |
|---|---|---|---|
| Vascular Plants | | | |
| *Callirhoe bushii* | Bush's Poppymallow | G3 S3 | ANHC 2012 |
| *Eupatorium hyssopifolium var. hyssopifolium* | Hyssop-leaved Boneset | G5T5 S3 | ANHC 2012 |
| *Gymnopogon brevifolius* | Shortleaf Skeletongrass | G5 S2 | ANHC 2012 |
| *Krigia occidentalis* | Western Dwarf Dandelion | G5 S3 | Getz 1994 |
| *Nemastylis nuttallii* | Nuttall's Pleatleaf | G4 S2 | ANHC 2012 |
| *Piluria americana* | American Pillwort | G5 S2 | Getz 1994 |
| *Platanthera flava* | Southern Tubercled Orchid | G4 S2S3 | Getz 1994 |
| *Scleria pauciflora* | Fewflower Nutsedge | G5 S3 | ANHC 2012 |
| Vertebrate Animals | | | |
| *Accipiter cooperii* | Cooper's Hawk | G5 S1B, S3N | Wiedenfeld et al. 1999 |
| *Accipiter striatus* | Sharp-shinned Hawk | G5 S1S2B | Lohraff 1996 |
| *!Peucaea aestivalis* | Bachman's Sparrow | G3 S3B | Lohraff 1996 |
| **Corynorhinus rafinesquii* | Rafinesque's Big-eared Bat | G3G4 S3 | Pitts 1988 |
| *#Setophaga virens* | Black-throated Green Warbler | G5 S2B, S5N | Lohraff 1996 |
| *#Haliaeetus leucocephalus* | Bald Eagle | G4 S2B, S4N | Lohraff 1996 |
| *Macrochelys temminckii* | Alligator Snapping Turtle | G3G4 S3 | DCSEN-E 2012 |
| *Pandion halieaetus* | Osprey | G5 S1B, S4N | Lohraff 1996 |
| Invertebrate Animals | | | |
| *Problema byssus* | Byssus Skipper | G3G4 S1 | Raney et al. 2010 |
| *Utterbackia imbecillis* | Paper Pondshell | G5 S3 | ASU 2003 |
| *Somatochlora ozarkensis* | Ozark Emerald | G3 S1 | Rickett 1995 |
| *Speyeria diana* | Diana Fritillary Butterfly | G3G4 S2S3 | Moran, Baldridge 2002 |

| Scientific Name | Common Name | Conservation Status | Reference |
|---|---|---|---|
| GLOBAL RANK DEFINITIONS Basic Rank: G1 = Critically imperiled globally G2 = Imperiled globally G3 = Rare or uncommon G4 = Widespread, abundant, and apparently secure, but with cause for long-term concern G5 = Demonstrably widespread, abundant, and secure G#G# = Numeric range rank: A range between two of the ranks that denotes a range of uncertainty about the exact rarity of the species Sub rank: T = Taxonomic subdivision (trinomial) REFERENCES See Appendix A in Robinson Maneuver Training Center Integrated Natural Resource Management Plan. | | STATE (SUBNATION) RANK DEFINITIONS<br>S1 = Critically imperiled<br>S2 = Imperiled in the state<br>S3 = Rare or uncommon<br>S4 = Widespread, abundant, and apparently secure, but with cause for long-term concern<br>S5 = Demonstrably widespread, abundant, and secure<br>S#S# = Numeric range rank: A range between two of the ranks that denotes a range of uncertainty about the exact rarity of the species<br>SU = Possibly imperiled in the state, but status uncertain SX = Extirpated, or nonbreeding in state.<br>S#B = Rank for avian species in breeding status<br>S#N = Rank for avian species in non-breeding status<br><br>! *P. aestivalis* has been observed on several occasions but has not been observed at RMTC since 2003.<br><br>* One *C. rafinesquii* was collected by Pitts and placed in the UALR museum; subsequent inventories have not recorded this species.<br><br># *H. leucocephalus* and *S. virens* have been observed on RMTC on several occasion but nests/nesting behavior have not been observed for these species. | |

### 2.7.1 Federal

The FWS administers the ESA of 1973 as amended. This act provides federal protection for all species designated as endangered or threatened. An endangered species is “in danger of extinction throughout all or a significant portion of its range”, and a threatened species “is likely to become an endangered species within the foreseeable future” (FWS 1988).

No federally listed threatened or endangered species are currently known to be permanent residents, breed, and/or be common visitors to the installation. Bald eagles (*Haliaeetus leucocephalus*), a former federally listed threatened species still protected under the Bald and Golden Eagle Protection Act, have sporadically been observed flying over or perched in trees on the installation but have not been observed residing or nesting on RMTC or adjacent areas. Suitable habitat for the bald eagle potentially exists within the installation at Grassy Lake and adjacent AGFC property (CRSUA to the north and Bell Slough State Wildlife Management Area to the west of the installation).

### 2.7.2 State

AGFC has responsibility for management and protection of all game and nongame wildlife in Arkansas including rare and endemic species. AGFC maintains and updates a list of state protected species and specifies rules and regulations for permits to hunt or collect any wildlife in the state. ANHC is responsible for gathering, categorizing, and disseminating information on rare species and significant natural areas within the State of Arkansas. See Sections 2.4-2.7 for more information on SOCCs.

## 2.8 Cultural Resources

Cultural resources identified at RMTC are historically important and need to be protected. A statewide Integrated Cultural Resources Management Plan (ICRMP) was prepared for RMTC and other AR ARNG/MDA facilities in 2001.

Cultural resources are any prehistoric or historic district, site, building, structure, or object significant in American history, architecture, archaeology, engineering, or culture and included in, or eligible for inclusion in the National Register of Historic Places (NRHP), including artifacts, records, and material remains related to such a property or resource. The statewide ICRMP should be consulted for detailed information and procedures for cultural resources management at RMTC. This plan addresses surveys, evaluations and protection of cultural resources at the installation.

On October 27, 1999, the DoD promulgated its *American Indian and Alaska Native Policy*, which emphasizes the importance of respecting and consulting with tribal governments on a government-to-government basis. The policy requires an assessment, through consultation, of the effects of proposed DoD actions that may have the potential to significantly affect protected tribal resources, tribal rights, and Indian lands before decisions are made by the services. Sensitive Native American cultural resources are defined by the most current Bureau of Indian Affairs (BIA) list of tribal entities published in the Federal Register pursuant to Section 104 of the Federally Recognized Indian Tribe List Act. Cultural resources are more fully discussed in the ICRMP and provisions of that document are expected to facilitate the protection of Native American Indian cultural sites from potentially disruptive DoD actions. The Caddo Tribe of Oklahoma, Cherokee Nation of Oklahoma, Osage Tribe of Oklahoma, Quapaw Tribe of Oklahoma, and Tunica-Biloxi Indians of Louisiana, Inc. are federally recognized Native American tribes that may have ancestral ties to RMTC. The tribes have been given an opportunity to review and comment on the updated INRMP (Appendix G).

While there had been several previous cultural resource surveys, including three intensive surveys (Stewart-Abernathy, 1980; Miller, 1992; Dunn, 1992; and Cobble, 1993), there had been only one Native American site location recorded for RMTC. Since that time, approximately 75 locations have been recorded on the installation. These can be divided into two categories; isolated finds which include a single or very limited number of artifacts and finds that include denser (or more extensive) clusters of artifacts. Isolated finds have consisted, with one exception, of broken tools or flakes from stone tool manufacture or maintenance. The one

exception to this has been a single, grit-tempered potsherd found in a shovel test. Where clusters of artifacts have been identified, these include stone tool manufacture or maintenance debris and ceramics and, occasionally, fire-cracked rock.

Implementation of INRMP objectives has no potential to adversely impact historic architectural resources at RMTC. Erosion control projects would be limited to areas that have been heavily used and previously disturbed. Therefore, these areas have a low potential for intact archaeological resources to be present. Nonetheless, potential impacts of ground disturbing activities will be evaluated on a case by case basis prior to implementation to ensure that impacts are avoided. Prior to implementing these activities, the area of potential effect will be evaluated to determine the potential for intact archaeological resources to be present. This evaluation will be based on the ICRMP, findings of existing archaeological surveys, the level of previous disturbances, and the overall archaeological potential of the site (based on factors such as topography, soils, distance to water, etc.)

Goals of the ICRMP are to manage cultural resources using the applicable federal and state cultural resource laws and regulations to integrate these resources with training activities conducted at RMTC. Laws and regulations include the Natural Historic Preservation Act (NHPA), Archaeological Resources Protection Act, Native American Graves Protection and Repatriation Act, American Indian Religious Freedom Act, EO 13007 (*Indian Sacred Sites*), and EO 13175 (*Consultation and Coordination with Indian Tribal Governments*). Procedures for inadvertent discovery can be found in the Standard Operating Procedures of the ICRMP. The ICRMP directs that cultural resources will be considered during the planning stage of all proposed undertakings. The ARNG Cultural Resources Manager will evaluate proposed ground disturbing activities to determine what NHPA Section 106 requirement will be needed (if any). If an inventory is required, the Cultural Resource Manager will indicate this requirement to the RMTC Commander.

Resources sites will be identified and evaluated for eligibility to the NRHP, and eligible properties will be managed in a manner consistent with the applicable standards and guidelines specified by the State Preservation Office, the Advisory Council on Historic Preservation, the DA, and the Secretary of the Interior.

# 3.0 NATURAL RESOURCES PLANNING STRUCTURE

## 3.1 Introduction

As required by the Sikes Act, this INRMP is reviewed and updated annually with supplemental reviews “for operation and effect” each five-year period. These reviews are performed to determine whether the existing RMTC INRMP:

1 Remains sufficient to maintain sustainable natural resources for current AR ARNG/MDA training requirements
2 Is being implemented in accordance with the Sikes Act requirements
3 Ensures stewardship and stability of the environment through ecosystem management. This review has been conducted in accordance with ARE-ILE Supplemental Guidance for Implementation of the SAIA (ARE-ILE 2012)

## 3.2 Ecosystem Management Defined

Ecosystem management is a style of natural resource management where a broad approach is used to integrate relationships of all organisms, including humans, with each other and with nonliving elements of their environment. Managers identify and integrate human activities, natural communities, ecosystems, and the natural disturbances found in those ecosystems.

## 3.3 Responsibilities and Requirements

The SAIA requires INRMPs for military installations, unless the lack of significant resources makes preparation of a plan inappropriate. ARNG-ILE and AR ARNG/MDA have determined that an INRMP is appropriate and necessary for RMTC to comply with DA policy. TAG of AR ARNG/MDA has overall responsibility for the preparation and implementation of an INRMP that fulfills environmental stewardship, legal, and training requirements. The RMTC Training Site Manager (RMTC-TSM) is responsible for ensuring that the INRMP supports AR ARNG/MDA training requirements. The RMTC-TSM provides initial areas of concern, reviews the plans to ensure they are consistent with training requirements, and is a signatory to the plan. The DCSEN-E EPM is assigned day to day responsibility for development and implementation of the INRMP. RMTC staff are responsible for providing input to the plan and implementing specific elements of the plan.

## 3.4 The AR ARNG/MDA DCSEN-E and Natural Resource Program Management

The DCSEN-E, EPM currently has overall responsibility for the Environmental Management Program at RMTC. The RMTC NRM serves as the lead representative for natural resources-related issues. Specific responsibilities regarding the RMTC INRMP include the following:

1. Identifying and evaluating management issues and concerns
2. Providing policy, guidance, and oversight for development of goals and objectives
3. Overseeing development, implementation, and revision of the INRMP
4. Fostering environmental awareness and good stewardship at RMTC

A multidisciplinary AR ARNG/MDA team represents military land use needs and provides natural resources subject matter expertise to ensure sound management of all natural resources at RMTC.

## 3.5 Stakeholders

In addition to the DCSEN-E, internal and external stakeholders are involved in the natural resources planning and implementation process. Internal stakeholders include all users of the RMTC facilities and lands, as well as managers of those facilities and lands. External stakeholders include the AGFC, ANHC, ADEQ, FWS, and adjacent landowners. These stakeholders have a vested interest in how the natural resources at RMTC are managed. As such, stakeholders are included in the natural resources planning process and have the opportunity to provide technical and/or regulatory input.

## 3.6 Cooperative Agreements

The AR ARNG/MDA relies on a variety of innovative, cooperative relationships to expand its knowledge and technical expertise in managing its diverse resources. As required by the SAIA, this INRMP has been prepared in cooperation and coordination with the FWS, AGFC, ANHC, and ADEQ. Concurrence with this INRMP by these agencies represents a mutual agreement of the parties concerning conservation, protection, and management of fish and wildlife resources. Correspondence documenting the cooperation of these agencies during preparation of this INRMP can be found in Appendix G.

AR ARNG/MDA and the AGFC implemented a MOU in October 2000. The purpose of this MOU is to provide for the cooperative management of portions of RMTC. The portion of RMTC including TAs north of the pipeline, but not including the Small Arms Impact Area, Mortar Impact Area, Cantonment Area, All-American Drop Zone (TA 7), and TAs 1, 2, 19, 20, 21, 22, and portions of TA 3 south of the natural gas pipeline bisecting it, has been designated as the Camp Robinson Wildlife Management Area (CRWMA). The MOU recognizes the INRMP as the

guideline for management of natural resources on RMTC and designates responsibility for:

1. Land and resources management practices that will benefit wildlife and the environment
2. Cooperative management of fish and wildlife
3. Enforcement of all state fish and game regulations
4. Authority to resolve differences related to the MOU

The MOU is included in Appendix N of this INRMP.

## 3.7 Management Program Overview

Resource-specific natural resources management goals have been developed to address relevant issues at RMTC. These goals have been developed based on installation-specific management situations and identify and prioritize natural resource issues. The structure of this plan delineates objectives and management actions necessary to meet each goal and designates responsibility for project funding, implementation, and tracking.

Program goals are outlined based on subject areas and training needs. Due to the inherent interaction of natural resources, significant overlap exists among programs that have responsibility for achieving these goals. Therefore, all programs are integrated with each other, as well as the overall land use and mission planning processes at RMTC. Management programs are covered separately in Sections 4 through 10.

## 3.8 Natural Resources Planning Process

### 3.8.1 Assessing Natural Resources Programs

Periodic assessment is an integral part of the natural resources planning process that evaluates program status, measures progress, and identifies new management issues, concerns, goals, and objectives. The natural resources planning framework, programs, issues, concerns, goals, and objectives presented in this INRMP are based on an assessment of existing information on the military mission, current programs, and natural resources. Although surveys of floral, faunal, and wetland resources had been conducted at RMTC, the original INRMP established formal programs for many natural resource issues at the installation. The updated INRMP documents the current status of natural resources programs and proposes modifications where appropriate. The current status of programs or management activities at the RMTC is provided in Table ES1 and Sections 4 through 10, along with recently identified natural resources issues and program development needs. The formal INRMP review and update process is described in Section 3.11.

RMTC staff are responsible for the environmental briefings related to specific training activities. The briefings include the RMTC staff with unit commanders, commissioned officers,

and senior noncommissioned officers.

### 3.8.2 Identifying Natural Resources Issues and Concerns

Natural resources issues and concerns are defined as any action, process, activity, program, etc. that might present constraints to operations and mission activities, readiness, and future planning at RMTC. DCSEN-E staff, in conjunction with the RMTC-TSM, are responsible for identifying issues and concerns by determining training needs and identifying how Natural Resources Management impacts training, and by evaluating natural resources programs and conducting assessments of the status and trends of natural resources. This is necessary to meet the “no net loss of training capability” standard.

### 3.8.3 Developing Natural Resources Goals and Objectives

The goals identified in this INRMP are established to address each management issue and concern in order to provide a clear direction and concrete approach to natural resources planning. These goals have been developed within each management program and represent the overall management approach that will be used at the installation. Specific objectives and management actions are defined as project-level activities that the installation intends to implement, if funding is available, in an effort to fulfill the general goals.

## 3.9 Staffing

Staffing for implementation of the INRMP comes from the DCSEN-E and RMTC-TSM staff, as well as outside contractors, when necessary. Cooperating agencies, non-governmental organizations, and contractors may provide additional staffing for specific INRMP projects. The NRM at NGB provides technical guidance and support to implement various aspects of the INRMP. Estimated staffing requirements for implementing specific INRMP goals and programs are presented in Section 6.1.2.

## 3.10 Funding

Funding for the DCSEN-E and standard supplies comes from direct funding sources. A variety of funding sources, including the following, may be used to implement specific projects:

- Status Tool for the Environmental Program (STEP) -Conservation Program
- Integrated Training Area Management (ITAM) Program
- DoD Legacy Program
- State Wildlife Grants

Estimated funding requirements for implementing specific INRMP goals and programs are presented in Section 6.1.3.

## 3.11 Public Review and NEPA Process

The NGB General Counsel has determined that SAIA requirements for INRMP implementation necessitate the preparation of NEPA documentation prior to plan approval. In addition, the SAIA requires that INRMPs be made available to the public for review.

The NEPA requires federal agencies to take into consideration the potential environmental consequences of proposed actions in their decision-making process. The intent of NEPA is to protect, restore, or enhance the environment through well-informed federal decisions. The Council on Environmental Quality (CEQ) has been established under NEPA to implement and oversee federal processes. The CEQ has issued the *Regulations for Implementing Procedural Provisions of the National Environmental Policy Act* (40 CFR § 1500-1508) (CEQ 1978). These regulations specify that an EA be prepared to:

- Briefly provide sufficient evidence and analysis for determining whether to prepare an EIS or a FONSI
- Aid in an agency's compliance with NEPA when no EIS is necessary
- Facilitate the preparation of an EIS when one is necessary

In accordance with NEPA, an EA was prepared to evaluate the potential environmental consequences of implementing the original RMTC INRMP. The EA was prepared following NGB guidance for preparing NEPA documents for INRMPs and was made available for public review. In addition, the INRMP was made available for public review at public libraries and notices of availability were published in local newspapers. The INRMP was made available for review to pertinent agencies, Indian tribes, and non-governmental organizations (NGOs). Letters documenting this are included in Appendix G. Because no significant new actions are proposed in this updated INRMP and the activities proposed are studies to collect data, monitor the environment, and gather information, the INRMP qualifies for a Categorical Exclusion (32 CFR Part 651). The ARNG Environmental Checklist and Record of Environmental Consideration documenting the Categorical Exclusion are included in Appendix K. The original version of the INRMP and corresponding NEPA documentation are available from DCSEN-E upon request.

### 3.11.1 Integrated Natural Resources Management Plan Evaluation and Revision

SAIA requires annual review of the INRMP to keep the plan current. Review “as to operation and effect” must be made no less often than every five years (typically three to five years). Page revisions can be made when major revisions are unnecessary. Information such as that relating to the soils, natural vegetation, and environmental data, not requiring revision, will be retained in the plan. Periodic evaluations and revisions will be conducted under the management of the DCSEN-E with input from the RMTC-TSM, FWS, AGFC, and ANHC and internal and external stakeholders, as appropriate.

The five-year review was conducted in 2011 and 2012. That review has resulted in an updated INRMP rather than a revision. This review, as well as the current updated INRMP, has

been conducted in accordance with the 2012 Supplemental Guidance and documents progress in implementing the original INRMP as well as modifications of the some objectives and management actions to reflect current conditions at RMTC.

# 4.0 ITAM PROGRAMS OBJECTIVES

## 4.1 Overview and Management Goal

Headquarters DA (HQDA), Training Support Systems Division (DAMO–TRS), Office of the Deputy Chief of Staff, G–3/5/7 (ODCS, G–3/5/7) is the primary proponent for the SRP, which contains the ITAM Program. The ARNG Training Division (ARNG-TR) has overall program responsibility for ITAM programs at ARNG installations.

The RMTC-TSM provides oversight of the ITAM program to ensure that ITAM funds protect and enhance the ability of AR ARNG/MDA training sites to support AR ARNG/MDA training. Overall program development responsibilities will be coordinated among the DCSEN staff, and RMTC-TSM.

The ITAM Program requirements are specified in AR 350-19, *The Army Sustainable Range Program*. As the DoD's premiere land force, the Army relies on land to achieve its training objectives and to maintain readiness standards. Consequently, training lands are one of the Army's most valuable assets. In order to achieve its missions, the Army must have lands that are capable of supporting training and other functions indefinitely. The ITAM Program was developed by the DA to integrate training and other mission requirements for land use with sound natural resources management of the land. Components of ITAM can be thought of as preventive maintenance of training land. Just as the Army conducts preventive maintenance programs to protect its substantial investment in tactical equipment, it also must invest in preventive maintenance of its training lands.

The ITAM Program establishes procedures to achieve optimum, sustainable use of training and testing lands by implementing a uniform land management program that includes the following:

1. Inventorying and monitoring land conditions
2. Integrating training and testing requirements with training land carrying capacity
3. Educating land users to minimize adverse impacts
4. Providing for training Land Rehabilitation and Maintenance (LRAM)

The ITAM Program is based on user requirements derived from continuous interaction among HQDA, Major Commands (MACOMs), and installations and is applicable to Active Army, Army Reserve, and ARNG installations that have a major training or testing mission, including those managed by NGB. The ITAM Program is comprised of the following four components:

1. RTLA
2. Training Requirements Integration (TRI)
3. LRAM
4. Sustainable Range Awareness (SRA)

The overall goal of the ITAM Program at RMTC is to ensure sustained use of the installation lands for military training while integrating sound natural resources and land management practices and aligning training land management priorities with training and

readiness priorities.

The RTLA is a management procedure that inventories and monitors land conditions. It incorporates relational database and GIS technologies into the land-use decision process. RTLA collects physical and biological resources data from training land in order to relate land conditions to training and testing activities. These data provide the information to effectively manage land use and natural and cultural resources. By documenting and understanding training-related impacts, excessive or irreversible damage and associated land rehabilitation costs can be minimized.

The TRI component is a decision support procedure that integrates all requirements for land use with natural and cultural resources management processes. TRI integrates the installation training requirements for land use derived from the Range and Training Land Program; the range operations and training land management processes; and the installation training readiness requirements with the installation's natural resources conditions.

The LRAM component is a preventive and corrective procedure that reduces the long-term impacts of training and testing on an installation. It mitigates training and testing effects by combining preventive and corrective land rehabilitation, repair, and/or maintenance practices. It includes TA redesign and/or reconfiguration to meet training requirements.

The SRA (formerly known as ITAM-EA) provides a means to educate land users on their environmental stewardship responsibilities. It provides for the development and distribution of educational materials to land users. These materials relate the principles of land stewardship and the practices of reducing training and/or testing impacts. SRA also includes information provided to environmental professionals concerning operational requirements.

Specific objectives and management actions of the RMTC ITAM Program are organized according to the four ITAM Program components described previously.

# 5.0 NATURAL RESOURCES MANAGEMENT PROGRAM OBJECTIVES

## 5.1 Terrestrial Community Management

### 5.1.1 Overview and Management Goal

The plan is based on ecosystem management principles. This means that terrestrial community management at RMTC will consider the following factors:

1. Military land use needs at RMTC
2. Available forest resources as described in inventories
3. Pre-settlement plant communities as described in the GLO surveys
4. Patterns of natural disturbances such as fire, tornadoes, lightning, and windstorms
5. Habitat needs of state and federal listed species and other SOCCs
6. Effects on adjacent land uses
7. Effects on other resources and concerns such as soil and water quality

In conjunction with the RMTC-TSM and the EPM, the RMTC NRM and Forest Resource Manager (FRM) will determine goals and objectives by integrating all available biological inventory and environmental monitoring data with military land use requirements. The RMTC-TSM will ensure that training site objectives are supported by the plan. Terrestrial community management will be integrated with other resource management at RMTC to support training and ecosystem management.

Consistent with the military mission at RMTC and sound ecosystem management principles, the terrestrial community management goal is to manage and maintain diverse natural terrestrial communities to promote native flora and fauna and provide recreational opportunities.

## 5.2 Fish, Wildlife and Outdoor Recreation Management

### 5.2.1 Overview and Management Goal

Consistent with the military mission at RMTC and sound ecosystem management principles, the fish and wildlife resources goal is to manage and maintain year-round fish and wildlife habitat that contributes to the sustained populations of resident species and to provide seasonal habitats for migratory species. In addition, fish and wildlife resources will be utilized to

the extent possible to enhance the recreational opportunities for the military community.

## 5.3 Species of Conservation Concern Management

### 5.3.1 Overview and Management Goal

The ESA was passed by Congress in 1973 to protect endangered species and their habitats. This act along with AR 200-1 and DoDI 4715.03 requires installations to be in compliance and all military land uses are subject to these regulations. While no species listed under the ESA are known to reside or utilize RMTC, any new discoveries would be addressed according to all pertinent laws and regulations.

Consistent with the military mission at RMTC and sound ecosystem management principles, the rare, threatened, and endangered species goal is to manage, maintain, and enhance existing habitats to support known populations of SOCCs in compliance with the ESA and applicable Arkansas laws and regulations.

## 5.4 Surface Waters and Wetlands Management

### 5.4.1 Overview and Management Goal

Surface water and wetlands quality can easily be affected by land use. Consistent with the military mission at RMTC and sound ecosystem management principles, the surface water and wetlands goal is to manage and maintain diverse natural aquatic communities and to protect their associated watersheds. In addition to supporting the military mission, these communities will promote native flora and fauna and provide recreational opportunities while ensuring compliance with Section 404 of the Clean Water Act and state wetland/water quality regulations.

## 5.5 Pest and Invasive Species Management

### 5.5.1 Overview and Management Goal

AR ARNG/MDA owns RMTC and manages the various communities for multiple uses including military training, habitat for wildlife, consumptive recreation (e.g., hunting and fishing), and non-consumptive recreation (e.g., bird watching). AR ARNG/MDA and RMTC staff carryout natural resources management by conserving and protecting the terrestrial and aquatic communities, using environmentally sound training methods, and through the implementation of the ITAM and conservation programs.

All use of pesticides will be in compliance with AR420-76 and the AR ARNG/MDA IPMP. The plan describes the pest management requirements, outlines the resources necessary for surveillance and control, and describes the administrative, safety, and environmental requirements of the program. It is intended to reduce reliance on pesticides, to enhance environmental protection, and to maximize the use of IPM techniques. DCSEN-E assists in managing pests and using pesticides. Pesticides include chemicals used to kill or limit plants, insects, rodents, and other pests. DCSEN-E coordinates pesticide training for a limited number of site personnel through DoD and state certification courses.

The Pest Management Program as it relates to the INRMP focuses on natural resources-related or “outdoor” pest management issues such as ticks, fire ants, nuisance wildlife, domestic vertebrate pests (i.e., feral cats), and exotic forest pests. General “indoor” pest management activities including services to buildings and industrial areas are not specifically addressed in the INRMP.

Management of invasive plants is specifically addressed under the Invasive Species Management Program (ISMP). The term invasive species may refer to any alien species whose introduction is likely to cause economic or environmental harm or harm to human health. The primary focus of the ISMP is to reduce or eliminate invasive species populations in order to protect biodiversity and ecosystem stability. Invasive species management is closely linked with pest management programs and produces benefits for fish and wildlife, rare species, wetlands, and forest management programs, as well as military training.

The development of the ISMP allows RMTC to comply with EO 13112 – Invasive Species, which was issued on February 3, 1999. The EO requires that federal agencies coordinate complementary, cost-effective activities concerning invasive species with existing organizations addressing invasive species.

The pest and invasive species goal is to judiciously use both non-chemical and chemical controls to suppress or prevent pests from exceeding acceptable populations or damage thresholds. Pest species, including invasive species, will be controlled using mechanical,

physical, cultural, and chemical controls with an overall goal of minimizing the use of pesticides.

## 5.6 Training Site Resource Information Management

### 5.6.1 Overview and Management Goal

DCSEN-E is primarily responsible for Training Site Resource Information Management (TSRIM) as it pertains to environmental issues and natural resources. TSRIM focuses on the maintenance and development of data, records, GIS, and the dissemination of this information, particularly for natural resources and military training purposes.

The TSRIM goal is to manage training site data to facilitate decision-making that integrates military training requirements with natural resources information.

# 6.0 INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN IMPLEMENTATION

## 6.1 Plan Implementation Summary

### 6.1.1 Overview

This section presents estimated staffing and funding requirements for implementation of the updated AR ARNG/MDA INRMP for RMTC, as well as the implementation schedule. In accordance with ARNG-ILE Supplemental Guidance, the staffing and funding requirements were reviewed and updated as part review for operation and effect (ROE) conducted at a minimum of five years from the previous INRMP ROE. The AR ARNG/MDA intends to implement the overall management approach and project-specific goals contained in this INRMP based on available funding and personnel. However, the AR ARNG/MDA recognizes the need for an adaptive management approach to address changing land use requirements, natural resources conditions, and other unforeseen factors. It is unlikely that program goals will change; however, unforeseen factors might prohibit the AR ARNG/MDA from implementing some of the project-specific goals in accordance with the implementation schedule. In addition, implementation of project-specific goals is contingent upon the availability of funding and other project funding priorities within the DA, ARNG-ILE, and AR ARNG/MDA. The INRMP will be routinely reviewed and updated to address changing conditions.

A detailed INRMP implementation summary is presented in Table 6.3. The summary includes information for each project-specific goal including scheduling information, staffing requirements, funding requirements, and funding sources.

### 6.1.2 Staffing Requirements

Effective implementation of the INRMP will require a variety of AR ARNG/MDA staff including personnel from the EPM, NRM, RMTC Operations Officer (RMTC-OPS), installation maintenance, and Engineer units. Estimated labor hours are approximately 67,550 for the five-year planning period. It is recognized that these estimates only include program labor to assist in the prioritization and implementation processes, labor for routine activities, and program administration.

Other units/sections within the AR ARNG/MDA will provide vital implementation support for the INRMP, especially within the LRAM, Surface Waters and Wetlands Management, and Pest and Invasive Species Management programs. To the extent possible, INRMP projects that require specialized design and engineering services will be integrated into Engineer units Annual Training and Initial Active Duty (IAD) training. These activities will be coordinated between the EPM, NRM, FRM, RMTC-OPS, and unit commanders. The DCSEN will also provide design support.

# Appendix A
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# Appendix B

# Glossary

**adaptive management** — A style of natural resource management that sets specific goals and objectives for managing, protecting, monitoring, and utilizing natural resources, but uses a “trial and error” type of management to achieve the desired results. The types of management activities used may change based on their prior success or failure in producing the desired results. Managers adapt to ever-changing situations to ensure the desired management results are achieved.

**air quality attainment area** — Areas designated by the EPA as having met national air quality standards.

**alluvium** — Sand, clay, or similar material gradually deposited by moving water, as along a river or the shore of a lake.

**Annual Training** — Two week yearly training period required for National Guard troops.

**battalion** — A military unit consisting of a headquarters company and three to five functional (combat arms, combat support, or combat service support) companies consisting of approximately 250 to 1,000 persons, depending on the type of unit.

**berm** — An earthen ridge created to provide concealment or to protect an emplacement from enemy fire.

**Best Management Practices (BMPs)** — Resource management decisions that are based on the latest professional and technical standards for the protection, enhancement, and rehabilitation of natural and cultural resources.

**biodiversity** — The variety of life and its processes, including genetic combinations, species functions and associations occurring in an area, the differences among species, and the communities and ecosystems in which they occur.

**bivouac** — A temporary encampment made by soldiers in the field. On permanent training installations, several bivouac sites may be established throughout the area to avoid overuse of any given site.

**brigade** — A military unit composed of several battalions, augmented by specialized units (up to approximately 5,000 persons, depending on the type of unit).

**cantonment area** — The developed portions (city-like areas) of a permanent military installation.

**chert** — A type of rock commonly used by Native Americans to form arrowheads and other tools.

**convoy** — A group of vehicles travelling together for mutual protection and convenience.

**cultural resources** — Buildings, structures, sites, districts, sacred sites, artifacts, and any objects eligible for or included in the National Register of Historic Places.

**demolitions training** — Training that teaches individuals how to utilize demolitions in the course of their duties. Specific training actions may include use of blasting caps, C4, TNT, military dynamite, detonation cord, fuses, and both electrical and non-electrical detonating systems.

**dud (ammunition)** — A bomb, shell, or other round that fails to explode when intended.

**dudded impact area** — any portion of a training installation known to have the potential to contain unexploded ordnance (UXO) that has residual or remaining kinetic energy.

**ecosystem** — A dynamic and natural complex of living organisms interacting with each other and with their associated nonliving environment.

**ecosystem management** — A style of natural resource management that uses a broad approach to integrate the relationships of all organisms, including humans, with each other and with the nonliving elements of their environment. Managers identify and integrate human activities, natural communities, ecosystems, and the natural disturbances found in those ecosystems. Management is goal-driven; preserves ecosystem integrity; is at a scale compatible with natural processes; is cognizant of nature's timeframes; recognizes social and economic viability within functioning ecosystems; is adaptable to complex and changing requirements; and is realized through effective partnerships among private, local, State, tribal, and Federal interests.

**edge** — Interface or transition zone between closed forest and clearings or roadways; a favored habitat of several wildlife species including many game species.

**endangered species** — Any species which is in danger of extinction throughout all or a significant portion of its range.

**exotic species** — Species that occur in a given place, area, or region as the result of direct or indirect, deliberate or accidental introduction of the species by human activity. These species often spread rapidly, reduce populations of native species, and cause substantial detrimental changes to natural communities.

**firing range** — The area or group of practice firing points designed for use by particular types of weapons.

**geographic information system (GIS)** — A computer system which enables a person to process natural resource and a variety of other data collected from various surveys and inventories.

**hydrogeological** — Of, or pertaining to, subsurface waters with related geologic aspects of surface waters.

**impact area** — The area where projectiles fired in gunnery practice are aimed.

**inactive duty training** — Training normally accomplished during a weekend training period.

**Integrated Cultural Resources Management Plan (ICRMP)** — A plan that defines the

process for the management and protection of cultural resources on military installations.

**Integrated Natural Resources Management Plan (INRMP)** — A plan written to provide an overall framework and approach for managing, monitoring, protecting, and utilizing natural resources on military installations. These plans typically use an ecosystem-based approach to support sustainable military use of installation lands, while protecting and enhancing resources for multiple use, sustainable yield, and biodiversity.

**Integrated Pest Management Plan (IPMP)** — A plan that defines the process for the management and control of pest species on military installations.

**Integrated Training Area Management (ITAM)** — A program designed by USACERL to help determine the land's ability to support training with the least impact on natural resources, including wildlife habitats.

**Land Rehabilitation and Maintenance (LRAM)** — A component of the ITAM program which provides a means to repair, restore, and maintain land impacted by training activities through the use of erosion control practices and revegetation.

**Legacy Program** — DOD program designed to encourage and promote research, conservation, and preservation of natural, cultural, and historical resources on military installations.

**lentic ecosystems** — Relating to standing waters, such as ponds, lakes, and reservoirs.

**listed species** — Any plant or animal designated as a state or federal threatened, endangered, special concern, or candidate species.

**maneuver** — The planned and controlled tactical movement of troops, vehicles, and aircraft.

**mitigation** — Lessening the effects to natural or cultural resources caused by implementation of projects or activities that result in adverse impacts. Mitigation can include limiting the magnitude of the action; repairing, rehabilitating, or restoring the affected resource; avoiding the effect altogether; reducing or eliminating the effect over time by preservation and maintenance operations during the life of the action; and/or compensating for the effect by providing substitute resources or environments.

**multiple use** — The integrated, coordinated, and compatible use of natural resources so as to achieve a sustainable yield of a mix of desired goods, services, and direct and indirect benefits while protecting the primary purpose of supporting and enhancing the military mission and observing stewardship responsibilities.

**National Environmental Policy Act (NEPA) PL 91-190, 1 Jan 1970** — The law requiring Federal governmental agencies to consider the potential impacts to the environment when planning and executing major actions.

**National Register of Historic Places (NRHP)** — The listing of officially recognized historical structures, places, buildings, objects, and districts; under the authority of the U.S. Department of the Interior; operated by the National Park Service. Items on this list are worthy of preservation consideration because of significance in American history, architecture, archaeology, engineering, or culture. Significance may be local, state, or national in scope.

**natural communities** — Interrelated assemblages of plants and animals found in a given area.

**natural resources** -All elements of nature and their environments of soil, air, and water. Those consist of two general types: earth resources, which consist of the nonliving resources such as minerals, water, and soil components and biological resources, which consist of living resources such as plants and animals.

**nondudded impact area** — Areas on training installations that do not have the potential to contain unexploded ordnance (UXO) that has residual or remaining kinetic energy.

**platoon** — A subdivision of a military company divided into squads or sections and usually commanded by a lieutenant.

**Range and Training Land Analysis (RTLA)** — A component of the ITAM program which was designed to inventory, monitor, and evaluate the natural resources on Army lands.

**Resource Conservation and Recovery Act (RCRA)** — Act which established criteria for the management of hazardous wastes; i.e., handling, disposal, and record keeping.

**riparian** — Relating to, living, or located along the bank of a natural watercourse such as a river, stream, or sometimes a lake, etc.

**safety fan** -The access exclusion zone set around target areas on a firing range.

**sensitive species** — Those plant and animal species for which population viability is a concern because they are highly responsive or susceptible to modification by external agents or influences. These species often show decreases in population numbers or densities following **small arms** — Weapons carried and operated by individuals. This group of weapons includes pistols and rifles carried and operated by individuals.

**snags** — Dead, but standing, trees.

**Species of Conservation Concern (SOCC)** — A species which meets at least one of the following ANHC conservation criteria (adapted from Robles et al. 2007):

- species with a Rounded GRANK = G1, G2, G3
- subspecies with a Rounded GRANK = T1, T2, T3
- Species listed according to the US Endangered Species Act (including proposed, candidate, species of concern)
- Species with a Rounded SRANK = S1, S2

**stewardship** —-The management of resources entrusted to one's care in a way to preserves and/or enhances the resources and their benefits for present and future generations.

**sustainable use** — Managing to provide long-term availability and quality of installation lands for military training operations by not degrading existing natural resources, including living and non-living components and the processes that tie them together.

**sustainable yield** — Managing a renewable natural resource to provide an annual or periodic yield of goods, services, and direct and indirect benefits, into perpetuity. That may include, but is not limited to, maintaining economic benefits, ecological processes and functions, and biodiversity.

**threatened species** — Any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

**watershed** — The region draining into a particular stream, river, or entire river system.

**wetlands** — Areas that are inundated or saturated with surface or groundwater at a frequency and duration sufficient to support a prevalence of vegetation typically adapted for life in saturated soils. This classification includes swamps, marshes, bogs, wet meadows, and similar areas.

**xeric** — Of or concerning plants and/or areas with low or irregular supplies of water.

# Appendix C

# Laws, Regulations, Executive Orders and Policies

**NATIONAL GUARD BUREAU**
111 SOUTH GEORGE MASON DRIVE
ARLINGTON, VA 22204-1382

ARNG-ILE 9 Apr 12

MEMORANDUM FOR ENVIRONMENTAL PROGRAM MANAGERS for 54 States and Territories

SUBJECT: Army National Guard Directorate, Environmental Programs Division (ARNG-ILE) Guidance for the Creation, Implementation, Review, and Revision and Update of Integrated Natural Resource Management Plans (INRMPs)

1. REFERENCES:

a. The Sikes Act, as amended by The National Defense Authorization Act of 2012, codified at 16 USC 670a et seq.

b. The Endangered Species Act (ESA), as amended by the National Defense Authorization Act of 2004, codified at 16 USC 1533(b)(2) and 1533 (a)(3)(b).

c. AR 200-1, *Environmental Protection and Enhancement*, 13 December 2007.

d. Department of Defense Instruction (DoDI) 4715.03, Natural Resources Conservation Program, 18 Mar 2011.

e. Department of Defense Memorandum, Updated Guidance for Implementation of the Sikes Act Improvement Act, 10 October 2002.

f. Department of Defense Memorandum, Updated Guidance for Implementation of the Sikes Act Improvement Act – Supplemental Guidance Concerning INRMP Reviews, 1 Nov 04.

g. Department of Defense Memorandum, Integrated Natural Resource Management Plan (INRMP) Template, 14 Aug 06.

h. Department of the Army Memorandum, Guidance for Implementation of the Sikes Act Improvement Act, 25 May 2006.

2. PURPOSE: This Army National Guard (ARNG) INRMP guidance is intended as a supplement to the Sikes Act and Army Regulation 200-1 and supersedes all previous ARNG Directorate INRMP guidance.

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3. APPLICABILITY: This policy guidance applies to the state ARNG Environmental Programs of all 54 States and Territories.

4. INRMP REQUIREMENT:

a. Reference 1a requires the development and implementation of an INRMP for all military installations with significant natural resources. Per reference 1c "significant natural resources" include:

(1) Federally listed, proposed, or candidate species onsite or critical habitat designated or proposed on the installation.

(2) Reimbursable forestry or agricultural out-leasing of 100 acres or more.

(3) Hunting and fishing for which special State hunting and fishing access permits are issued by the installation.

(4) Unique biological resources, wetlands, species at risk, or ecological issues that can only be addressed by an INRMP.

(5) The installation conducts intensive, on-the-ground military missions that require conservation measures to minimize impacts and sustain natural resources.

b. Reference 1a states that the Sikes Act is applicable to "military installations", which are defined in the law as:

(1) Any land or interest in land owned by the United States and administered by the Secretary of Defense or the head of a military department,

(2) All public lands withdrawn from all forms of appropriation under public land laws and reserved for use by the Secretary of Defense or the head of a military department, and

(3) State-owned Army National Guard installations.

5. COORDINATION REQUIREMENTS FOR NEW AND/OR REVISED INRMPS (Reference 1e):

a. Each ARNG installation shall involve the U.S. Fish and Wildlife Service (USFWS) and State fish and wildlife agency (State Agency) in the scoping, design, preparation and/or review of a new or revised INRMP. At a minimum, this requires that the State ARNG provide these agencies with draft INRMPs for review and comment, and that the State ARNG address these comments appropriately.

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b. Each ARNG installation shall advise all appropriate internal and external stakeholders of the intent to prepare or revise an INRMP at least **30 days** prior to starting such an action.

c. Each ARNG installation shall notify the appropriate USFWS office and State Agency of its intent to provide a draft INRMP for review and coordination at least **60 days** prior to delivering such document.

d. For new and revised INRMPs, the following process shall be used to facilitate coordination within and between the various organizations and to ensure adequate documentation of the coordination process. Each ARNG installation shall:

(1) Provide the initial draft INRMP to the USFWS field office and appropriate State Agency office for review and comment. All documents should be sent via certified U.S. mail or certified e-mail to confirm receipt by the USFWS or State Agency.

(2) Request the USFWS to provide written comments to the installation, and furnish copies of these comments to the director's office of the relevant State Agency.

(3) Request the State Agency office to provide written comments to the installation, and furnish copies of these comments to the USFWS office.

(4) Consider all comments received. Any disputed comments should be addressed in consultation with the commenting agency. Once comments are addressed a final draft of the INRMP should be sent to the USFWS office and the director's office of the State Agency with a letter documenting the installation's actions taken in response to the draft comments.

(5) Although it is not expected to occur often, where the USFWS or State fish and wildlife agency withholds its agreement to an INRMP based on objections to elements of the INRMP clearly not within the scope of that agency's authority, an installation may, notwithstanding the objections, finalize the INRMP and proceed to manage its natural resources in accordance with the terms of the plan (Reference 1e).

(6) Request, in writing, that the USFWS and the State Agency provide additional written comments and/or concurrence within 60 days of receipt of the final draft INRMP, unless the participants mutually agree that a longer review period is necessary.

e. Per Department of Defense (DoD) policy (Reference 1e), there are special situations that are exceptions to this timeline. In these cases, the installation, under the direction of the ARNG-ILE, shall request the USFWS notify the installation of the appropriate review timeline within 15 days of receipt of the draft INRMP (for these situations please see references 1d and 1f).

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f. Except for the special situations described in the previous paragraph, if, after a period of 120 days, no final comments or letters of concurrence are received from the appropriate USFWS and State Agency offices, an installation may seek assistance from ARNG-ILE to obtain review of its INRMP. The installation should submit a signed written request to the ARNG Directorate seeking assistance. Within 30 days from receipt of the request ARNG-ILE will communicate with the USFWS Region and/or State fish and wildlife agency or arrange for Headquarters Department of the Army (HQDA) to establish a meeting to finalize regulatory review.

g. Per reference 1a, documentation of mutual agreement must be obtained for new or revised plans to be deemed legally sufficient. Letters indicating the agency has reviewed the plan or that the agency has no further comments are not sufficient to comply with the law. There are three ways to reflect mutual agreement of a new INRMP:

(1) A jointly executed signed letter.

(2) Signed letters back from the USFWS and the State agency that they agree with the INRMP.

(3) New signature page to the INRMP.

h. A new or revised INRMP containing an Environmental Assessment (EA) must be reviewed by the National Guard Bureau, Office of the Chief Council (NGB-JA) to determine legal sufficiency.

6. INRMP FORMAT:

a. The DoD has developed a standardized INRMP template (reference 1g) to aid in the preparation and review of INRMPs. While installations are not required to follow the template, and not all topic areas may apply to all installations, an INRMP must, at a minimum, address the following:

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

(2) Fish and wildlife habitat enhancement or modifications;

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

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

(5) Establishment of specific natural resource management goals and objectives and time frames for proposed action;

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

(7) Public access to the military installation that is necessary or appropriate for the use described in subparagraph (6), subject to requirements necessary to ensure safety and military security;

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

(9) No net loss in the capability of military installation lands to support the military mission of the installation[1] (reference 1c); and

(10) Such other activities as the Secretary of the military department determines appropriate.

b. An INRMP revision/update is not necessary solely to meet INRMP template format. INRMP revisions should be initiated based on the need for significant changes to land management goals and objectives as determined by the State ARNG and documented in the formal INRMP 5-year review for operation and effect.

c. All plans must contain goals, measurable objectives to meet goals, and project implementation timelines. It is most effective to set forth the goals, objectives and implementation schedules in a tabular format.

d. The INRMP is not intended to function as a compilation of all natural resource management activities. Rather, the INRMP is intended to integrate natural resource management activities across an installation to meet the plan's specific goals of sustaining and enhancing military training.

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[1] DoD Policy (Reference 1e) states that appropriate management objectives to protect mission capabilities should be clearly articulated in the planning process and should be high in INRMP resourcing priorities. The effectiveness of the INRMP in preventing "net loss" shall be evaluated annually. It is not the intent that natural resources are to be consumed by mission requirements, but sustained for the use of mission requirements. In order to achieve this, environmental programs and policies must have the goal of preserving the environment for the purpose of the mission.
There may be instances in which a "net loss" may be unavoidable in order to fulfill regulatory requirements other than the Sikes Act, such as complying with a biological opinion under the provisions of the Endangered Species Act or the protection of wetlands under the provisions of the Clean Water Act. Any loss of mission capability must be reviewed and approved of by the HQDA. These instances will be identified in the INRMP with a discussion included of measures being undertaken to recapture the net loss.

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7. COMPONENT PLANS:

a. A "component plan" is a document that supports subject areas of the INRMP. These plans are generally scientific in nature.

b. If the extent and complexity of management activities related to one of the INRMP's component resource areas warrants, an independent assessment and implementation plan may be developed. Otherwise, resource assessments and management activities should be defined in the context of the INRMP.

c. AR 200-1 identifies specific INRMP component plans, which include, but are not limited to:

(1) Soil Erosion and Sediment Control Component (SESCC).

(2) Endangered Species Management Component (ESMC).

(3) Invasive Species Management Component (ISMC).

(4) Wildland Fire Management Plan (WFMP).

d. Component plans should be integrated into the INRMP by brief discussion and reference of the component plan in the INRMP. The component plans, including operating procedures, activity detail, work plans and related administrative documentation may be included as appendices of the INRMP.

8. INTEGRATION WITH OTHER PROGRAMS:

a. Other ARNG plans and programs that should be referenced or discussed in the INRMP include (Reference 1e):

b. Consultation with Native Americans, Native Alaskans and Native Hawaiians – Per Executive Order 13175 and DOD Instruction 4710.02 – Unless pre-existing consultation practices have been established, consultation with federally recognized tribes who have an interest in specific natural resources within the installation should occur during the review of new or revised INRMPs. Evidence of consultation with federally recognized tribes regarding the potential effect of INRMP plans and projects must be included. Concerns from Tribes should also be addressed within the INRMP.

c. Integrated Training Area Management (ITAM) Program –The INRMP should identify natural resource management requirements necessary to support and maintain training areas and ranges and incorporate the ITAM work plan into the implementation of the INRMP where these activities support INRMP goals and objectives.

d. Range Modernization Program –Resource management programs in the INRMP must consider range operations and modernization to avoid loss of training capability. Environmental staff should be involved in the Range Complex Master Planning (RCMP) process to identify any potential natural resources impacts associated with preliminary siting and maintenance of required ranges.

e. Integrated Pest Management Plan (IPMP) – The IPMP and INRMP should contain cross references to requirements and implementation of invasive and nuisance species control. The INRMP will identify overall landscape goals and objectives. The statewide IPMP would provide details and SOPs for managing individual pest species and pesticide application certification.

f. Installation Master Plan – The INRMP should support development of the Installation and State Master Plans by providing information about resource concerns, management requirements, and general natural resources information.

g. State Wildlife Action Plans (SWAP) - Coordination with the State Agency should identify State priorities for overall game and non-game wildlife management. The SWAP should be used to help guide wildlife management goals and priorities.

9. INRMP PROVISIONS:

a. The 2004 amendments to the ESA include two provisions to exclude designation of Critical Habitat[2] (CH) on lands used by the Army (Reference 1b):

(1) Section 4(a)(3)(B) is not discretionary and mandates that the Secretaries of Interior and/or Commerce exclude designating CH on "...any lands or other geographical areas owned or controlled by the Department of Defense, or designated for its use, that are subject to an integrated natural resources management plan prepared under section 101 of the Sikes Act (16 U.S.C. 670a), if the Secretary determines in writing that such plan provides a benefit to the species for which CH is proposed for designation."

(2) Section 4(b)(2), is discretionary. The amendment allows the Secretaries of Interior and/or Commerce to specifically preclude designation of CH on a military facility if they conclude that the benefits of such designation are outweighed by the impact on national security. Such exclusion could not occur if failure to designate an area as CH would result in the extinction of the species.

[2] Installations should request exclusion from Critical Habitat for ARNG installations and armories. Requests should first be submitted to ARNG-ILE for review and concurrence, after which they are submitted to the appropriate USFWS office. ARNG-ILE will also submit a request for exclusion to the USFWS. The Army may also submit a request to the USFWS on behalf of the State ARNG.

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b. To ensure exclusion of proposed CH under section 4(a)(3)(B), an installation's INRMP should provide for the benefit of listed species through the management and/or enhancement of habitat utilized by federally-listed species occurring on or contiguous to the installation.

c. Mutual agreement, in writing, is required between the ARNG and the USFWS to render the exemption appropriate.

d. INRMPs will incorporate the results of an installation's previous species-by-species or programmatic ESA consultations, including any reasonable and prudent measures that may have been identified in an incidental take statement. As a consequence, neither informal nor formal ESA §7 Consultation is required under the Sikes Act. However, depending on the management activities of an installation, consultation may be recommended. For example, installations can consult on individual elements of the INRMP or on INRMP wide activities during the planning process to preclude the need for future consultations.

e. Reference 1d indicates that opportunities to conserve federally listed species and the ecosystems on which those species depend should be identified but that the State ARNG shall not accept a disproportionate burden for the conservation of listed species unless it is required by legal authority.

10. INRMP IMPLEMENTATION AND FUNDING:

a. Section 4-3 d(1)(b), of AR 200-1 defines INRMP funding and implementation as :

(1) Actively requesting, receiving and using funds for priority projects and activities.

(2) Ensuring that sufficient numbers of professionally trained natural resources management personnel are available to perform required INRMP tasks.

(3) Coordinating **annually** with all cooperating offices.

(4) Documenting specific INRMP action accomplishments undertaken each year.

(5) Evaluates effectiveness of past and current management activities and adapts appropriately to implement future actions.

b. Because an INRMP is an installation wide plan, it is necessary to coordinate scoping, development and review with all installation stakeholders (such as Environmental Managers, Facilities Managers, trainers, etc.) with <u>shared responsibility to fund</u> various aspects of the plan.

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c. Funding for INRMP implementation is not limited to environmental funds. Responsibility for funding natural resource management activities is outlined in the Army Sustainable Range/Installation Environmental Responsibilities Matrix, and is clarified in Memorandum, NGB-ARI, 17 Apr 06: *Clarification of Funding Responsibilities.*

d. For projects that are paid for with environmental funds, State ARNGs shall submit requests via the Status Tool for Environmental Programs (STEP) maintained by ARNG-ILE. For information regarding STEP and general environmental program funding refer to the STEP project catalog or contact the Requirements and Analysis Branch.

e. Projects that are funded through facilities, such as pest management application, and wildfire management, shall submit their request through ARNG-ILI.

f. Projects that are funded through ITAM must be submitted to ARNG-TR for validation using the ITAM Workplan in the Range Complex Master Plan (RCMP). Workplans must be updated by 30 July of each year in accordance with annual guidance issued by ARNG-TR.

g. Projects or management efforts necessary to ensure exemption of critical habitat need to be specifically identified and given high priority for funding.

11. ANNUAL INRMP REVIEWS:

a. Reference 1h states that all INRMPs shall be reviewed annually by installations in cooperation with other parties to the INRMP. Annual reviews should include the USFWS and the State Agency.

b. Annual reviews may be used, as appropriate, to determine if a formal review "for operation and effect" is warranted. Annual reviews are mandatory per DoD guidance and provide the foundation for the review for operation and effect of the plan (Reference 1f).

c. Department of Army policy (Reference 1h) directs that INRMP annual reviews shall verify the following:

(1) All "must fund" projects and activities have been budgeted for and implementation is on schedule.

(2) All required trained natural resources positions are filled or are in the process of being filled.

(3) Projects and activities for the upcoming year have been identified in the INRMP. Any changes made during the previous year shall also be discussed.

(4) All required coordination has occurred.

(5) All significant changes to the installation's mission requirements or its natural resources have been identified.

(6) The INRMP goals and objectives are still valid.

(7) "No net loss" of training capability has occurred due to implementation of the INRMP in accordance with the Sikes Act.

d. If, during the annual review, it is determined that one or more of these seven elements are not adequately addressed in the INRMP, the three parties to the INRMP may either correct the need with an INRMP **update** (discussed in section 14) or initiate a more formal review for operation and effect.

e. The installation commander or designated authority responsible for the INRMP will initiate the annual review via a letter to the appropriate USFWS office and the State Agency office 30 days prior to the anniversary of the INRMP agreement.

f. Installations shall prepare a memorandum for record detailing each annual review. Annual review documents shall be appended to the existing INRMP in an active, growing appendix.

g. The ARNG Installation Natural Resources Managers shall ensure that completed annual reviews are tracked and reported in the annual Army Environmental Database Environmental Quality (AEDB-EQ) data submission. AEDB-EQ submissions are due by the end of the 4th fiscal quarter (September 30) of each year. Per the requirements of the Sikes Act, DoD compiles this information and provides a report to Congress on INRMP status and implementation.

12. REVIEW FOR OPERATION AND EFFECT:

a. Each INRMP must be reviewed for "Operation and Effect" (ROE) at least every 5 years by all three parties to the INRMP, which include the installation commander or the installation designee responsible for the INRMP, the USFWS, and the State agency.

b. The ROE is an assessment of the INRMP by all stake holders to determine whether the INRMP is being implemented to meet the requirements of the Sikes Act and is contributing to the conservation and rehabilitation of natural resources on the

military installation. A ROE can result in either an INRMP **revision** or **update**. Updates and revisions are discussed in more depth in sections 14 and 15 respectively.

13. REPORTING AND TRACKING:

a. Per the Sikes Act (reference 1a), the DOD compiles an annual report to Congress on INRMP status and implementation. The DOD uses natural resources Measures of Merit (MoM) to gauge overall natural resource management effectiveness and compliance with the Sikes Act.

b. State ARNG's shall submit data and information required to prepare the report to ARNG-ILE through the AEDB-EQ data entry. For more information regarding the AEDB-EQ see the Army Environmental Reporting Online (AERO) web portal; http://aec.army.mil/usaec/reporting/index.html.

14. PLAN UPDATES:

a. Definition: An INRMP Update is an amended INRMP that contains limited changes that are not expected to result in biophysical consequences materially different from those anticipated in the existing INRMP (reference 1e).

b. Discussion:

(1) An INRMP update can be initiated during the annual review or the ROE and includes, at a minimum, the results of the current annual review or ROE and project schedules for at least five years.

(2) Mutual agreement between the ARNG, USFWS, and State Agency is documented via a decision memorandum signed by all three parties or by any of the three methods listed in section 5g above.

(3) Staffing for an INRMP update should follow the same process outlined for original INRMPs in section 6.

15. PLAN REVISIONS:

a. Definition: An INRMP Revision is an amended INRMP that contains substantial changes that are expected to result in biophysical consequences materially different from those anticipated in the existing INRMP (reference 1e).

b. Discussion:

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(1) The determination to develop a complete revision of an INRMP is the State's discretion that should be based on management and mission needs. A revised plan replaces the existing INRMP, must meet all INRMP requirements, and will require an EA to meet NEPA requirements.

(2) The current INRMP remains in effect until the USFWS and the State agency mutually agree upon the INRMP revision. Mutual agreement between the ARNG, USFWS, and State Agency is documented via any of the three methods listed in section 5g above.

(3) Staffing for an INRMP revision should follow the same process outlined for original INRMPs in section 6.

16. PUBLIC REVIEW AND NEPA:

a. The Sikes Act (Reference 1a) requires that an **initial** INRMP be available for public review and comment. In accordance with 32 CFR 651, *Environmental Analysis of Army Actions*, the NEPA process should be used to accomplish this. An EA should be used to evaluate all new management plans. Documentation must be included to provide record of public notice, any comment received and actions taken to address comments.

b. **Revised** INRMPs will also require an EA public comment and signed Finding of No Significant Impact (FNSI).

c. INRMP **updates** that are not expected to result in biophysical consequences materially different from those anticipated in the existing INRMP must be supported by a REC that tiers off the original INRMP EA (FNSI must be attached to the REC), but do not require public comment (reference 1h).

17. The point of contact for this subject is Mr. Chuck Chamberlain, Natural Resources Program Manager at 703-607-7982, or chuck.chamberlain@us.army.mil.

Michael J. Bennett
COL, LG
Chief, Environmental
Programs Division

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Attachment 1. List of required ARNG INRMPs.

| State | Installation Name | Owner | Acres |
|---|---|---|---|
| AK | Stewart River Training Site | State | 24,160 |
| AL | Fort McClellan | Federal | 22,550 |
| AR | Camp Robinson | State | 32,867 |
| AR | Fort Chaffee | Federal | 64,272 |
| AZ | Camp Navajo | Federal | 28,345 |
| AZ | Florence Military Res | Federal | 6,495 |
| CA | Camp Roberts | Federal | 42,784 |
| CA | Camp San Luis Obispo | State | 5,612 |
| CA | Santa Cruz Armory | State | 40 |
| CT | Camp Hartell | State | 59 |
| CT | Camp Rell | State | 82 |
| CT | East Haven Rifle Range | State | 121 |
| CT | Stones Ranch Military Res | State | 1,862 |
| DE | Bethany Beach TS | State | 104 |
| DE | New Castle Rifle Range | Federal | 227 |
| FL | Camp Blanding | State | 72,000 |
| FL | Snake Creek TS | Federal | 322 |
| HI | Keaukaha Military Res | State | 509 |
| HI | Kekaha Rifle Range | State | 68 |
| HI | Ukumehame Firing Range | State | 39 |
| HI | Waiawa Gulch Training Site | Federal | 4 |
| IA | Camp Dodge | Federal | 31,180 |
| ID | Orchard TS | Federal | 138,551 |
| IL | Marseilles TS | State | 2,814 |
| IL | Sparta TS | State | 2,653 |
| IN | Camp Atterbury | Federal | 33,139 |
| IN | Muscatatuck | Federal | 63 |
| KS | Kansas Regional TS | Federal | 3,536 |
| KY | Disney TS | Federal | 558 |
| KY | Eastern Kentucky TS | State | 542 |
| KY | Wendell Ford TS | State | 11,080 |
| LA | Camp Beauregard TS | State | 728 |
| LA | Camp Minden LAAP | State | 15,253 |
| LA | Camp Villere TS | State | 1,707 |
| MA | Camp Curtis Guild | State | 680 |
| MA | Camp Edwards | Federal | 14,712 |

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| | | | |
|---|---|---|---|
| MD | Lil Aaron Straus TS (Baker) | State | 6 |
| ME | Casswell-Loring TS | Federal | 1,056 |
| ME | Hollis TS | State | 425 |
| ME | Auburn TS | Federal | 300 |
| ME | Riley/Bog Brook TS | State | 10,220 |
| MI | Camp Grayling | State | 146,750 |
| MI | Fort Custer | Federal | 7,570 |
| MN | Arden Hills TS | Federal | 1,496 |
| MN | Camp Ripley | State | 52,759 |
| MO | Camp Clark | Federal | 1,282 |
| MO | Camp Crowder | Federal | 4,362 |
| MO | Macon TS | State | 3,083 |
| MO | Truman TS | Federal | 691 |
| MO | Wappapello TS | State | 2,200 |
| MS | Camp McCain | Federal | 12,887 |
| MS | Camp Shelby | Federal | 133,882 |
| MT | Fort Harrison | Federal | 6,366 |
| MT | Limestone Hills TS | Federal | 19,997 |
| NC | Camp Butner | State | 4,800 |
| ND | Camp Grafton | State | 662 |
| ND | Garrison TS | State | |
| ND | Williston WETS | State | 303 |
| NE | Camp Ashland | Federal | 980 |
| NE | Greenlief TS | Federal | 3,211 |
| NE | Mead TS | Federal | 1,197 |
| NH | New Hampshire NGTS | State | 105 |
| NJ | Sea Girt TS | State | 167 |
| NM | Black Mountain TS | Federal | 2,081 |
| NM | Camel Tracks TS | Federal | 9,035 |
| NM | Carlsbad TS | Federal | 720 |
| NM | Roswell WETS | Federal | 5,212 |
| NV | Floyd Edsall TS | State | 3,984 |
| NV | Stead TS | State | 370 |
| NY | Camp Smith | State | 1,614 |
| NY | Guilderland WETS | State | 238 |
| NY | Youngstown TS | Federal | 860 |
| OH | Camp Perry | State | 640 |
| OH | Ravenna TS | Federal | 41,559 |
| OK | Camp Gruber | Federal | 33,027 |

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| | | | |
|---|---|---|---|
| OR | Biak TS | Federal | 44,121 |
| OR | Camp Adair | Federal | 527 |
| OR | Camp Rilea | State | 1,750 |
| PA | Fort Indiantown Gap | State | 17,222 |
| PR | Camp Santiago | Federal | 11,930 |
| RI | Camp Fogarty TS | Federal | 374 |
| SC | Clarks Hill TS | Federal | 735 |
| SC | McCrady TS | Federal | 15,200 |
| SD | Austin TS | State | 384 |
| SD | West Camp Rapid | State | 760 |
| TN | Catoosa VTS | Federal | 1,627 |
| TN | Milan VTS | Federal | 2,466 |
| TN | Smyrna VTS | Federal | 868 |
| TN | Tullahoma VTS | Federal | 6,311 |
| TX | Camp Bowie | Federal | 8,753 |
| TX | Camp Mabry | Federal | 376 |
| TX | Camp Maxey | State | 6,424 |
| TX | Camp Swift | Federal | 11,659 |
| TX | Fort Wolters | Federal | 3,990 |
| UT | Camp Williams | Federal | 25,000 |
| UT | St George Armory | Federal | 70 |
| VA | Camp Pendleton | Federal | 348 |
| VA | Fort Pickett | Federal | 42,276 |
| VT | Camp Johnson | State | 64 |
| VT | Ethan Allen Firing Range | Federal | 667 |
| WA | Camp Murray | Federal | 231 |
| WI | Camp Wismer TS | State | 3,244 |
| WV | Camp Dawson | Federal | 4,527 |
| WY | Camp Guernsey | State | 40,346 |
| WY | Lander TS | Federal | 1,360 |
| WY | Lovell TS | Federal | 3,544 |
| WY | Sheridan TS | Federal | 3,960 |
| | **Total = 107** | | |

OFFICE OF THE UNDER SECRETARY OF DEFENSE
3000 DEFENSE PENTAGON
WASHINGTON, DC 20301-3000

ACQUISITION
TECHNOLOGY
AND LOGISTICS

NOV 0 1 2004

MEMORANDUM FOR DEPUTY ASSISTANT SECRETARY OF THE ARMY
(ENVIRONMENT, SAFETY & OCCUPATIONAL
HEALTH)
DEPUTY ASSISTANT SECRETARY OF THE NAVY
(ENVIRONMENT)
DEPUTY ASSISTANT SECRETARY OF THE AIR FORCE
(ENVIRONMENT, SAFETY & OCCUPATIONAL
HEALTH)
DIRECTOR, DEFENSE LOGISTICS AGENCY

SUBJECT: Implementation of Sikes Act Improvement Amendments: Supplemental Guidance concerning INRMP Reviews

This memo provides supplemental guidance for implementing Sikes Act Improvement Amendments requirements consistently throughout the Department of Defense. It adds to implementing guidance dated October 10, 2002, same subject.

The attached guidance covers three elements of the INRMP review process – the scope of the review, public comments on INRMP reviews, and Endangered Species Act consultation on INRMPs.

These guidelines are effective immediately. If you have any questions, please contact Mr. Peter Boice at (703) 604-0524.

Alex A. Beehler
Assistant Deputy Under Secretary of Defense
(Environment, Safety and Occupational Health)

Attachment:
As stated

## SUPPLEMENTAL GUIDANCE FOR IMPLEMENTATION OF THE SIKES ACT IMPROVEMENT ACT*

### Additional Guidance Concerning INRMP Reviews

Scope of the Review

*Legislative Language*

Section 101(b)(2) of the Sikes Act [16 U.S.C. 670a(b)(2)] states that each INRMP "must be reviewed as to operation and effect by the parties thereto on a regular basis, but not less often than every 5 years."

*DoD Policy*

The requirement to "review" the INRMPs "on a regular basis, but not less often than every 5 years" does not mean that every INRMP necessarily needs to be revised. The Sikes Act specifically directs that the INRMPs be reviewed "as to operation and effect," emphasizing that the review is intended to determine whether existing INRMPs are being implemented to meet the requirements of the Sikes Act and contribute to the conservation and rehabilitation of natural resources on military installations. We expect that many existing INRMPs will be determined to be adequate and not in need of revision.

These reviews must be performed by "the parties." This means that no less frequently than every 5 years, all three parties to the INRMP must complete a review of the INRMP. Although not expressly required by the Sikes Act, installations should document the outcome of this joint review in a memorandum or letter summarizing the rationale for the conclusions the parties have reached. This written documentation should be jointly executed or in some other way reflect the parties' mutual agreement.

Although the Sikes Act specifies only that a formal review must be completed no less often than every 5 years, DoD policy requires installations to review INRMPs annually in cooperation with the other parties to the INRMP. Annual reviews facilitate "adaptive management" by providing an opportunity for the parties to review the goals and objectives of the plan, as well as establish a realistic schedule for undertaking proposed actions. Although not required by the Sikes Act, installations will likely find it useful to memorialize these less formal reviews through an exchange of letters or a jointly executed memorandum. These documented annual (or otherwise) reviews may be useful in developing the *ex parte* reports required by Section 101(f) of the Sikes Act, as well as expedite—or, in appropriate cases, substitute for--the more formal 5-year reviews (provided these "regular" reviews are reasonably comprehensive and the written documentation evidences the parties' mutual agreement).

Public Comment On INRMP Reviews

*Legislative Language*

Section 2905 of the Sikes Act Improvement Act of 1997 [16 U.S.C. 670a note] required the Secretary of each Military Department to provide the public an opportunity for the submission of comments on the initial INRMPs prepared pursuant to new Section 101(a)(2) of the Sikes Act [16 U.S.C. 670a(a)(2)].

*DoD Policy*

There is no legal obligation to invite the public either to review or to comment upon the parties' mutually agreed upon decision to continue implementation of an existing INRMP without revision.

If the parties determine that revisions to an INRMP are necessary, public comment shall be invited in conjunction with any required National Environmental Policy Act analysis:

- If only limited revisions to an existing INRMP are thought to be required, and these revisions are not expected to result in biophysical consequences materially different from those anticipated in the existing INRMP and analyzed in an existing NEPA document, then neither additional NEPA analysis nor an opportunity for public comment should be necessary.

- If more substantial revisions to an INRMP are thought to be required, and these revisions are expected to result in biophysical consequences materially different from those anticipated in the existing INRMP and analyzed in an existing NEPA document, then a new or supplemental NEPA analysis must be prepared and the public provided a reasonable opportunity to comment on the revised INRMP.

Endangered Species Act Consultation

*Legislative Language*

The Sikes Act is silent regarding the necessity for ESA consultation on INRMPs.

*DoD Policy*

It is expected that in most cases INRMPs will incorporate by reference the results of an installation's previous species-by-species ESA consultations, including any reasonable and prudent measures that may have been identified in an incidental take statement. As a consequence, neither a separate biological assessment nor a separate formal consultation should be necessary concerning most INRMPs or INRMP revisions. Nonetheless, because the INRMP may include management strategies or other actions designed to

balance the potentially competing needs of multiple species, listed or not, it may be prudent to engage in informal consultation with the Fish & Wildlife Service during the INRMP revision process to confirm that these proposed actions will not affect listed species or designated critical habitat. If the INRMP does include management strategies or other actions that may affect listed species or designated critical habitat and these actions have not been the subject of previous consultations, then Section 7 consultation on these actions will be necessary before the actions may be implemented.

*This guidance should be used in conjunction with OSD policy memo "Implementation of Sikes Act Improvement Ac t: Updated Guidance, dated October 10, 2002.

Appendix C

## LIST OF REGULATIONS RELATED TO THE INRMP

The latest version for each of these regulations was obtained via links to the following web sites:

Cornell Law School Legal Information Institute (LII) http://www4.law.cornell.edu/uscode United States Government Printing Office http://www.access.gpo.gov

These links were provided by the Defense Environmental Information Exchange (DENIX) on the World Wide Web at http://www.denix.osd.mil.

### ARMY ENVIRONMENTAL CENTER (AEC) GUIDANCE

Leslie, M., G.K. Meffe, J.L. Hardesty and D.L. Adams. 1996. Conserving Biodiversity on Military Lands: A Handbook for Natural Resources Managers. The Nature Conservancy. Arlington, VA.

DoD Commander's Guide to Biodiversity. 1996. The Keystone Center. Keystone, CO.

Keystone Center Policy Dialogue on DoD Biodiversity Management Strategy—Final Report. 23 Jan 1996. The Keystone Center. Keystone, CO.

### ARMY NATIONAL GUARD GUIDANCE

[Note: As of October 2000 ARNG did not have anything posted on DENIX. ARNG regulations can be scanned and incorporated into cd-rom package. If this is the case, need to get hard copies of these regs.]

### ARMY REGULATIONS

Commander's Guide to Environmental Management. March 1998. USAEC.

Army Regulation (AR) 200-1: Environmental Protection and Enhancement. 21 Feb 1997. Department of the Army. Washington, D.C.

AR 200-2: Environmental Effects of Army Actions. 16 Nov 1998.

AR 200-3: Natural Resources—Land, Forest and Wildlife Management. 28 Feb 1995.

AR 200-4: Cultural Resources Management. 1 Oct 1998
PAM 200-4 Cultural Resources Management. 1 Oct 1998.

AR 200-5: Pest Management. 29 Oct 1999.

### DEPARTMENT OF DEFENSE DIRECTIVES

DODD 1010.10: Health Promotion. 11 Mar 1996.

DODD 3150.2: DoD Nuclear Weapon System Safety Program. 23 Dec 1996.

DODD 3150.8: DoD Response to Radiological Accidents. 13 Jun 1996.

DODD 4145.19-R-1: Storage and Materials Handling. Sep 1979.

DODD 4165.6: Real Property Acquisition, Management and Disposal. 1 Sep 1987.

DODD 4700.3: Mineral Exploration and Extraction on DoD lands. 28 Sep 1983.

DODD 4700.4: Natural Resources Management Program. 24 Jan 1989.

DODD 4705.1: Management of Land-Based Water Resources in Support of Contingency Operations. 9 Jul 1992.

DODD 4710.1: Archeological and Historic Resources Management. 21 Jun 1984.

DODD 4715.1: Environmental Security. 24 Feb 1996.

DODD 4715.11: Environmental and Explosives Safety Management on DoD Active and Inactive Ranges within the U.S. 17 Aug 1999.

DODD 4715.12: Environmental and Explosives Safety Management on DoD Active and Inactive Ranges outside the U.S. 17 Aug 1999.

DODD 5030.41: Oil and Hazardous Substances Pollution Prevention and Contingency Program. 1 Jun 1977.

DODD 6050.07: Environmental Effects Abroad of Major DoD Actions. 31 Mar 1979.

DODD 6050.1: Environmental Effects in the U.S. of DoD Actions. 30 Jul 1979.

DODD 6050.15: Prevention of Oil Pollution from Ships Owned or Operated by the Department of Defense.

DODD 6050.4: Marine Sanitation Devices for Vessels Owned or Operated by the DoD. 16 Mar 1982.

DODD 6055.9: DoD Explosives Safety Board (ODESB) and DoD Component Explosives Safety Responsibilities. 29 Jul 1996.

DODD 6055.9-STD: DoD Ammunition and Explosives Safety Standards. Aug 1997.

DODD 6230.1: Safe Drinking Water. 24 Apr 1978.

DEPARTMENT OF DEFENSE INSTRUCTIONS

DODI 4150.7: DoD Pest Management Program. 22 Apr 1996.

DODI 4715.1: Environmental Security. 24 Feb 1996.

DODI 4715.2: DoD Regional Environmental Coordination. 3 May 1996.

DODI 4715.3: Environmental Conservation Program. 3 May 1996.

DODI 4715.4: Pollution Prevention. 18 Jun 1996.

DODI 4715.5: Management of Environmental Compliance at Overseas Installations. 22 Apr 1996.

DODI 4715.6: Environmental Compliance. 24 Apr 1996.

DODI 4715.7: Environmental Restoration Program. 22 Apr 1996.

DODI 4715.8: Environmental Remediation for DoD Activities Overseas. 2 Feb 1998.

DODI 4715.9: Environmental Planning and Analysis. 3 May 1996.

DODI 4715.10: Environmental Education, Training and Career Development. 24 Apr 1996.

DODI 6055.1: DoD Safety and Occupational Health Program. 19 Aug 1998.

DODI 6055.5: Industrial Hygiene and Occupational Health. 10 Jan 1989.

DODI 6055.6: DoD Fire and Emergency Services Program. 15 Dec 1994.

EPA AND DOD MISC POLICY MEMOS

International Organization for Standardization (ISO) 14000/14001 folder:

(epa.pdf) Environmental Protection Agency (EPA) Position Statement. Subject: Environmental Management Systems (EMSs) and ISO 14001 and a Request for Comments on the Nature of the Data to be Collected from EMSs/ISO14001 Pilots. 12 Mar 1998. Federal Register 63:48:12094-12097, DOCID:fr12mr98-64, FRL-5976-6.

(ige.pdf) Goodman, Sherri. Deputy Under Secretary of Defense-Environmental Security (USD-ES) memo. Subject: Interim Guidance on EMSs and ISO 14001.

(memo.pdf) Goodman, Sherri. USD-ES memo. Subject: Participation in DoD Component ISO 14001 EMS Pilot Cost/Benefit Study. Nov 1997.

(memo1.pdf) Longuemare, R. Nole. Acting Under Secretary of Defense-Acquisition and Technology (USD-AT) memo. Subject: Requiring Processes on Contract ISO 14001. 18 Sep 1997.

(qmm.pdf) Cohen, William. Secretary of Defense memo. Subject: ISO 14001 Quality Management. 11 Aug 1997.

(dds1.pdf) Finch, Frank R. DAIM-ED-R (200-1c) memo. Subject: Revised Interim Policy for Staffing and Approving Decision Documents (DD's), RCRA Corrective Actions or Installation Restoration Under CERCLA. 15 Nov 1995.

(p2mom.pdf) Goodman, Sherri. DOD-AT-USD memo. Subject: New DoD Pollution Prevention and Non-Hazardous Solid Waste Diversion Rate Measure of Merit (MOM). 13 May 1998.

(vat.pdf) Goodman, Sherri W. DOD-AT-USD memo. Removal of Vinyl Asbestos Tile (VAT).

MEMORANDUMS OF UNDERSTANDING (MOU'S)

(epaipm.pdf) MOU between EPA and DoD concerning Pest Management. 20 Mar 1996.

(marine.pdf) MOU between DOT, DOC and DoD concerning Conservation and Management of Living Marine Resources in the U.S. 11 Oct 1993.

(mouducks.pdf) MOU b/w DoD and Ducks Unlimited concerning the Development of Selected Wetlands and Uplands to Maintain and Increase Waterfowl Populations as Part of the North American Waterfowl Management Plan. 22 Sep 1998.

(moutoxic.pdf) MOU b/w ATSDR and DoD on the Development of Toxicological Profiles for Hazardous Substances and Public Health Assessments and Related Activities at DoD Facilities. 14 Jun 1993.

(nativeplant.pdf) USD-ES memo. Subject: DoD joins the Federal Native Plant Conservation MOU. 23 Nov 1994.

(note4.pdf) MOU b/w USDA-FS, USACOE, USDOC-NMFS, USDOD, USDOI-BLM, USDOI-BOR, USDOI-FWS, USDOI-MMS, USDOI-NPS, USDOT-CG, USDOT-FAA, USDOT-FHWA and the USEPA on the Endangered Species Act. 28 Sep 1994.

(note5.pdf) MOU b/w CEQ, USDA, DOA, DOC, DOD, DOE, DOHUD, DOI, DOJ, DOL DOS, DOT, EPA, OSTP concerning Ecosystem Approach. 15 Dec 1995.

(note7.pdf) MOU b/w EPA, DOE and DOD concerning Cooperation in Environmental Security. 3 Jul 1996.

(watchwildlife.pdf) MOU b/w the Defenders of Wildlife, The Izaak Walton League of America, Inc., National Audubon Society, NWF, BLM, NPS, USF&WS, BOR, DAF, DA, DN, FS and the International Association of Fish & Wildlife Agencies concerning the Watchable Wildlife Program. 3 Dec 1990.

EXECUTIVE ORDERS (EO)

EO 11288. Prevention, Control and Abatement of Water Pollution by Federal Activites. 31 FR 9261. 2 Jul 1966.

EO 11472. Establishing the Cabinet Committee on the Environment and the Citizen's Advisory Committee on Environmental Quality. 34 FR 8693. 29 May 1969.

EO 11514. Protection and Enhancement of Environmental Quality. 35 FR 4247. 5 Mar 1970.

EO 11564. Transfer of Certain Programs and Activities to Secretary of Commerce. 35 FR 15801. 6 Oct 1970.

EO 11593. Protection and Enhancement of the Cultural Environment. 36 FR 8921. 13 May 1971.

EO 11644. Use of Off-Road Vehicles on Public Lands. 37 FR 2877. 8 Feb 1972.

EO 11738. Providing for Administration of the Clean Air Act and the Federal Water Pollution Control Act with Respect to Federal Contracts, Grants or Loans. 38 FR 25161. 10 Sep 1973.

EO 11742. Delegating to the Secretary of State Certain Functions Under the Federal Water Pollution Control Act with Respect to Negotiation of International Agreements. 38 FR 29457. 23 Oct 1973.

EO 11987. Exotic Organisms. 42 FR 26949. 24 May 1977.

EO 11988. Floodplain Management. 42 FR 26951. 24 May 1977.

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EO 12144. Environmental Effects Abroad of Major Federal Actions. 44 FR 1957. 4 Jan 1979.

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# Appendix D

# Environmental Overview

# Other Management Programs Related to the INRMP

## Spill Prevention Plan

Camp Robinson is required to have Spill Prevention Control and Countermeasure Plan (SPCCP) (Refer to AR 200·1). The first SPCCP document for the installation was prepared by CJTR staff in 1993 and signed in 1994. This plan "package" included a Spill Prevention Control and Countermeasure Plan (SPCCP), Installation Spill Contingency Plan (ISCP), and Hazardous Waste Contingency Plan (HWCP). The SPCCP was revised in 1995 in a study prepared by a contractor (Genesis Environmental Consulting 1995a) after operational improvements and improvements in the volume and types of chemicals used at CJTR. Of particular significance was the renovation of the 90-day Hazardous Material Storage Facility.

There are no toxic substances or Flammable substances above threshold quantities managed at Camp Robinson, and there is minimal potential for a large spill of pollutant or hazardous waste. Used vehicle batteries are stored, and there are many facilities with oil/water/solids separators to pre-treat stormwater that comes in to contact with work and washpad areas prior to entering the sewer system. The largest containers of petroleum, oil, and lubricants and the largest potentials for spills are at the Aviation Support Facility (AASF) Bulk Fuel Storage Facility, AASF Fuel Truck Storage Area, and Training Site Fuel Dispensing Facility. A total of 40-70 thousand gallons of fuel and varying amounts of oil may be stored at CJTR as any given time.

Recommendations in the SPCCP for reducing the spill potential at CJTR are the following:

- Regularly monitor and clean oil/water separators.
- Regularly review the HazMat Inventory for each site.
- Empty fuel tanker trucks after use.
- Provide HazMat buildings with secondary containment.
- Maintain general housekeeping, including disposal of chemicals no longer in use,
- Battery storage, no exposure of pollutants and HazMat's to stormwater or runoff.
- Store spill kits in unlocked areas.

## Pollution Prevention Plan

The Pollution Prevention Plan (Genesis Environmental Consulting 1995b) for Camp Robinson addresses the Cantonment Area and summarizes current pollution prevention measures (source reduction, recycling, treatment, and disposal) and provides goals for improving them in order to prevent or reduce the environmental impact of CJTR operations. A list of requisite permits (contingency plans, audits, environmental) that apply to the CJTR facility is provided in Appendix C of the Pollution Prevention Plan. A Pollution Prevention Opportunity Assessment (PPOA) for CJTR is included as Appendix E of the PPP.

The intention of these pollution prevention goals and policy is to initiate a program that will move the Arkansas Army National Guard toward compliance with Executive Order (EO) 12856. This EO states that it is the goal of the Army to reduce its total releases of toxic pollutants to the environment and off-site transfers for treatment and disposal by at least 50% before 31

December 1999, compared to a total release baseline established no later than December 1994.

The CJTR Toxic Pollutant Report for 1994 is reported in Appendix1l'of the Pollution Prevention Plan.

Operations at CJTR that were reviewed and found to be potential pollution prevention opportunities were the following:

- Hazardous and non-hazardous materials storage
- Hazardous and non-hazardous waste management

- Equipment and vehicle storage
- Equipment and vehicle maintenance
- Equipment and vehicle cleaning
- Equipment and vehicle painting and sandblasting
- Small arms and artillery ranges operations
- General facility maintenance

## Wastewater-Treatment ··

Equipment and vehicle maintenance (mostly engine and transmission) at Camp Robinson require the greatest quantity of hazardous materials and generate the greatest quantities of waste. Most of this activity is in the Combined Support Maintenance Shop, the Organizational Maintenance Shops, and the Army Aviation Support Facility. These maintenance processes are a particularly large source of solid and petroleum regulated wastes that are transported off-site for recycling or disposal.

## Air Pollution

An inventory of hazardous air pollutant emissions was conducted April-June 1995, for Camp Robinson (Taylor and Bown 1995). This air pollution inventory was completed in order to insure compliance with state and federal standards. [Refer to Title III (hazardous air pollutants) and Title IV (permits) of the 1990 Clean Air Act Amendment (CAAA-90), the Arkansas State Implementation Plan (Reg.19), and Army Environmental Protection and Enhancement (Reg. 200·1) for more information]. The State of Arkansas is under the jurisdiction of the Air Division of the Arkansas Department of Pollution Control and Ecology (ADPC&E) and EPA Region VI. Protocols for the CJTR study were taken from the document entitled "Air Pollution Emission Inventory Protocol for Army installations and Activities."

## Point and Area Sources of Air Pollution

Five point source categories and five area sources were identified on CJTR facilities.

### *Point sources:*

Petroleum storage tanks
Paint spray booth operations
Sandblasting Welding operations Fog oil generators

**Appendix D**

*Area sources:* **Degreasing operations Pesticides and herbicides Landfill operations**
Prescribed burning
Residential heaters

Only one of the point sources required permitting pursuant to requirements outlined in the CAAA, Reg. 19 (Minor Sources), or Reg. 26 (Operating Air Permit Program).of the State of Arkansas. A "minor source" permit (#1107-AR-1, Reg. 19) is issued to the CJTR facility. It is for the operation of the paint booth at the Combined Maintenance Support Shop (CSMS) and was issued to the Air Division on 11 Sep 1991. Paint thinner, the primary source of volatile organic compounds (VOC's), is used to thin paint and clean equipment. A request for modification of this permit, to include the operation of a sandblasting unit at the CSMS facility, was submitted to the ADPC&E Air Division on 3 Apr 1995.

Following the requirements outlined in AR 200·1and AR 40·5, Taylor and Bown (1995, Executive Summary) recommended that the air emission inventory "be updated on an annual basis to quantify emissions from new equipment or process changes and to insure compliance with changing regulations." They also noted that "Inventory tracking at the CSMS facilities should include logs for solvent (evaporation) and fog oil usage in order to better quantify these types of air emissions. The next air inventory will need to include a comprehensive review of all emissions from residential heating sources due to the new gas transport system."

The air emissions inventory did not address mobile sources, chlorofluorocarbons (CFC's), motor pools (exhaust vents), weapons detonation, or small arms fire. Usage of Ozone Depleting Substances, which includes CFC's, is reported to the USAEC each February of every year in accordance with the Department of Defense Directive 6050.9. Records of these reports (DD Form 2430) are kept at the Environmental Section of the Facility Management Office.

## Wildfires and Prescribed Burns

Wildfires and prescribed burning produce by far the largest amounts (from 100-500 times greater than other sources) of air pollutants emitted annually from Camp Robinson, based. The 1994 burned area of 5300 acres (2146 hectares). The major pollutants in this emission were particulates, carbon monoxide, and volatile organics. Nitrogen oxides are emitted in smaller amounts but are still10 times greater than the only other emitter of nitrogen oxide on the post, residential heaters (Taylor and Bown 1995). The emission rates would be correspondingly greater if the burned area were figured as 7800 acres (the area prescribed to be burned regularly in the informal burning plan • see discussion of Fire Descriptions and Policies). Hazardous Waste Management Plan

## Storage and Disposal of Hazardous Wastes

Maintenance of land-based vehicles and aircraft are the primary waste generation activities at Camp Robinson. Petroleum wastes represent the largest waste volume and come largely from land-based vehicles and aircraft refueling operations. Leaded motor gasolines were used extensively before the early 1980's, when unleaded gasolines became the common petroleum fuel for land-based vehicles. Aircraft use either JP-4 jet fuel or leaded motor gasoline.

The primary wastes currently managed at Camp Robinson are the following:

- petroleum
- solvents
- batteries (lead acid and others)
- paint and paint-related compounds
- cleaning compounds
- photographic solutions
- miscellaneous wastes (medical, radioactive, asbestos, PCB's, and solid wastes)

During WWII and until about 1959, two onsite solid waste incinerators were used to destroy and reduce the volume of solid wastes accumulated at Camp Robinson. The camp was largely abandoned and demolished after WWII. Since about 1984, Arkansas Military Operations have produced gradual increases in solid waste generation to current levels. Currently, CJTR generates about 30,000 pounds of petroleum wastes, 26,300 pounds of hazardous wastes, and 20,000 cubic yards of solid wastes each year. Camp Robinson developed a comprehensive waste management plan in 1991. As part of the plan, CJTR established self-contained satellite accumulation pointe at each of the points of hazardous waste generation. In 1992, CJTR constructed a new USP&FO less-than-90-day, self· contained hazardous waste storage facility. Primary wastes currently consist of petroleum wastes, solvents, and batteries, with lesser amounts of miscellaneous wastes.

Camp Robinson was first identified as a generator of hazardous waste by EPA and the State of Arkansas in the early 1980's; and the camp was assigned EPA Identification Number AR4210499956. CJTR is considered to be a less-than-90-day-storage hazardous waste generator.

The foregoing summary of Camp Robinson waste management has been taken largely from the description in CH2M HILL (1966a).

## Pocket Guide Guidelines

The following guidelines regarding" Petroleum, Oil, Lubricants, and Hazardous Materials" are reproduced from Training and the Environment: A Soldier' Field Guide (CJTR). See Figure 34.

- Contain the spill if it can be done safely.
- Report all spills to Range Office. The Range Office will determine if the Installation
- Response Team needs to be alerted.
- Failure to report a spill may result in the commander receiving fines up to $10,000 and/or one year in prison.
- Cleanup spills if resources are available.
- Drip pans will be placed under all vehicles that are parked for extended periods of time, i.e. during bivouac when vehicles have Class II or Class III leaks.
- Turn in any waste product in accordance with AR ARNG 420·47.
- Procedures for waste turn in can be obtained from the Range Office or the Environmental Office. Procedures for the disposal of contaminated soil can be obtained from the Range Office.

- Commanders will ensure that all waste products are managed and disposed of in accordance with all related laws and regulations.

## Landfill Sites and Groundwater Monitoring Wells

At least seven landfill sites within the Camp Robinson Cantonment Area were active between the 1940's and the 19SO's (CH2M HILL 1996a). All of these are within or near the boundary of the Cantonment Area; almost all of this area is within the Fivemile Creek watershed. The last two active sites closed sometime in late 1980's or early 1990's. The closure dates given in USAEHA (1992) and CH2M HILL (1996a) are earlier than those given in the FEIS for the Northbelt construction project (US Dept. of Transportation et al. 1994; see "Proposed Highway").

In 1992, the U.S. Army Environmental Hygiene Agency (USAEHA) drilled 23 groundwater monitoring wells around 7 closed (abandoned) landfill sites on the post to assess the potential for adverse health and environmental impacts (see Figure 28). The water was analyzed for 15 metals, 6 nonmetallic parameters, and priority organic pollutants (volatiles, herbicides, and pesticides). Higher than acceptable levels of cadmium were found at four of the test wells, and problems with subsidence, exposed trash and debris, and leachate were encountered at others. Recommendations of the study for further sampling and landfill modifications were not formally considered until the RCRA actions of 1994-96. The RCRA report by CH2M HILL (1996a) provides a description of each of these seven landfill sites and the kinds of waste and debris in each one.

Two of these landfill sites are of special concern because the proposed Northbelt route through Camp Robinson must pass either narrowly between them or over one of them.

### *Abandoned Landfill Site 5*

Area of about 4 acres (FEIS 1994) or 1.7 acres (CH2M HILL 1996a); west side of 6th St, north of Landfill Site 6 and connected to it by a small dirt road; late 1950's through early 1980's; primarily for building materials (concrete blocks and slabs, steel supports)

### *Abandoned Landfill Site 6*

Area of about 17 acres (FEIS 1994) or 5.5 .acres (CH2M HILL 1996a); north of barracks complex, north of H Avenue and 16th Stand contiguous with them, in the long recess formed by Have, 16th St, and 6 St., immediately upslope and northwest of Lake Jewett; early 1970s through about 1989 (USAEHA 1992) or about 1992 (Hwy FEIS p. IV·40), the last active landfill site on the post; primarily for construction debris, but site indications and staff discussion also indicate disposal of petroleum-based products (1994 FEIS p. IV-40) as well as "corrosives, putrescibles, large appliances, and infectious wastes" (CH2M HILL 1996a).

One of the USAEHA test wells was drilled outside contamination sources in the Cantonment Area to provide a control estimate of natural water quality. It is an artesian well, now capped by a valve, located west of Cato Road at the western boundary of the Cato Syncline.

# RCRA Corrective Action Program

The Arkansas Department of Pollution Control and Ecology (ADPC&E), under its own statutes, signed a consent administrative order in 19xx requiring Camp Robinson to conduct a facility investigation. The 1984.Hazardous and Solid Waste Amendments (HSWA) to the Resource Conservation and Recovery Act (RCRA), Section 3008(b), authorized the U.S. Environmental Protection Agency to require comprehensive corrective actions at hazardous waste management facilities seeking a RCRA permit. In Arkansas, EPA has delegated responsibility for this program to ADPC&E.

The first phase of the RCRA corrective action program at Camp Robinson was the RCRA Facility Assessment (RFA) to identify releases or potential releases from solid waste management units (SWMU's) and areas of concern (AOC's) requiring further investigation. Next, a RFI Work Plan was prepared in 1995 to provide detailed descriptions of the background and tasks necessary to complete the facility investigation (RFI) and confirmation sampling (CS) in evaluating the nature and extent of known or suspected releases of hazardous wastes or hazardous substances from SWMU's and AOC's. Field investigations for the RFI and CS were made by CH2M HILL in July and August 1995, and the results were reported in 1996 (CH2M HILL 1996).

CS's were conducted if a hazardous release was suspected, to determine if a site should proceed to an RFI, undergo interim measures, or be dropped from the RCRA corrective action program. RFI's were conducted where a hazardous release had been documented or observed, to determine if a site should go to a Corrective Measures Study (CMS), undergo interim measures, or be dropped from the RCRA corrective action program. 3 SWMU's and 10 AOC's were investigated as part of the CS, and 12 SWMU's and 2 AOC's were investigated as part of the RFI. Included among these were the seven inactive solid waste landfills, storm drainage and sewers, former solid waste incinerators, fueling areas, a WWII grease rack, radiator cleaning area, former rifle range, various storage areas, and others. These sites are located predominantly within the CJTR Cantonment Area.

Regarding the nature and extent of contamination at RFI and CS sites, CH2M HILL (1996a) concluded that "the upper portion of the bedrock beneath the Cantonment Area generally does not have significant migration pathways for surface releases of contamination to migrate downward into the bedrock aquifer. This conclusion is supported by groundwater monitoring results from the RFI. No COC's were detected above action levels in any monitoring. wells that were sampled as part of the RFI. Thus, activities at Camp Robinson do not appear to have adversely impacted the quality of groundwater in the bedrock aquifer and, as a result, contaminant releases from the SWMU's and AOC's are limited to the soil that overlies bedrock."

Contaminants above action levels were found at five of the sites investigated as part of the RFI (SWMU 13, SWMU 42, AOC 3, AOC 14, AOC 7, and AOC 15). The most serious of these appeared to be AOC 15, where the contaminants are not restricted to a small area of surface soil.

# Area of Concern (AOC) 15 RCRA Facility Investigation (RFI)

One of the findings of the CS-identified hazardous substance releases as Area of Concern 15 (AOCI5), a former rifle range that was used by the National Guard from the 1940's until the late 1950's when Engineers Lake was constructed. This site is now mostly covered by water within Engineers Lake at its northwest end, but an impact area on the northern bank is still exposed.

AOC 15 was recommended to progress to an RFI because lead and polycyclic aromatic hydrocarbons (PAH's) were detected above sediment action levels. In addition, lead was detected above the surface water action level. Results of the CS and site reconnaissance indicated that soils, surface water, and sediment contain contaminants related to the former firing range. Elevated lead levels were detected in soil and sediment collected from the ammunition impact area. Fragments of lead bullets have been observed at the soil surface along the exposed steep impact area, and surface water samples collected from the southern half of the lake also had elevated lead levels. (CH2MHILL, February 1998)

## Phase I RFI of AOC 15

This phase of the RFI was completed in February 1997.

- Phase I investigations were designed to determine the risks to environment and human health associated with the lead and PAH contamination.

- Phase I field sampling identified the nature and extent of contamination within the Engineers Lake complex that is attributable to AOC 15 as well as other possible contributing sources of PAH's within the Fivemile Creek drainage basin. Samples will be taken at 5 soil, 18 sediment, and 18 surface water stations. The surface water and sediment stations are from the uppermost end of Lake Jewett through the main body of Engineers Lake and along Fivemile Creek to the eastern boundary of CJTR.

| | |
|---|---|
| Soil | RCRA metals |
| Sediment | RCRA metals, PAH's, and total organic carbon |
| Surface Water | RCRA metals, PAH's, hardness, alkalinity, dissolved oxygen, temperature, pH, and conductivity |

- Lead was determined to be the only contaminant of potential concern that required further investigation in Phase II
- An intermediate Phase IA study of surface water lead was conducted prior to Phase II. No samples taken during this study exceeded the surface water lead criterion of 0.6 micrograms per liter.

## Phase II RFI of AOC 15

Phase II study was initiated to resolve the remaining human health and ecological risk issues associated with lead contamination. It was completed in February 1998.

Phase II studies assessed risk by looking.at the following aspects of the Engineers Lake Complex:

- Surface soil lead
- Background sediment metals
- Sportfish tissues-largemouth bass, crappie and bluegill
- Terrestrial ecosystem-shoreline lead fragments and wildlife food items

The risk assessment revealed that the site had clearly been affected by the former rifle range. However, the concentrations of lead found in the soils "do not pose an unacceptable risk to human receptors using the area for recreational purposes, or for human receptors involved in potential, although unlikely, future industrial land uses" (CH2MHILb;·February 1998). Sportsfish taken from the lake had undetectable lead concentrations is their edible tissues. Further, lead concentrations do not pose an unacceptable risk to terrestrial wildlife or plants. No further action was recommended. In fact, the assessment team concluded that soil remediation would unnecessarily impact the natural resources of the site.

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# Wastewater Management Plan

The original sewer collection and treatment system was built for Camp Pike in 1916-i917 as part of the WWI mobilization. The current plant is in essentially the same location as the original one, beside Fivemile Creek just below Engineers Lake.

The original Camp Pike plant included primary settling of solids and secondary treatment using sprinklers to apply the effluent for filtration through a rock filter. The plant was modified and expanded in 1940-41 to accommodate more troops in the early phases of WWU (CQ 1941, Plan Number 6110-666 and discussion). That system used screeners, a grease removal tank, settling tanks and clarifiers, a more elaborate trickle filter bed with sprinklers, holding basins, sludge digesters, and sludge drying beds. The fate of the sludge was not mentioned. Various repairs were made on the treatment plant during the Korean War.

Extensive modifications were made on the wastewater plant in 1987 under the direction of LTC W.C. Hohnes (DCSEN) and a contracted study (McClelland Consulting Engineers, Inc. 1985), and an activated sludge/ extended aeration facility was put into operation. This included a 3-track circular (racetrack) design for the oxidation ditch, followed by secondary clarification and chlorination of effluent. Several of the pre-existing concrete structures were used, including the circular oxidation ditch, circular chlorination basin, shunt flow clarifier, and sludge stabilization basins. This system, however, was not designed to control dissolved oxygen concentration in the oxidation ditch and the rotor design did not impart adequate energy to the water column to achieve complete mixing of the incoming wastewater and mixed liquor of suspended solids/sludge. Much settling of solids resulted and became problematic because of anaerobic conditions at the bottom. A permit violation ensued because of high amounts of suspended solids (ammonium/nitrogen).

The 1987 plant was designed to process 0.5 million gallons per day but received up to 8 million daily during and following some storm events because of excessive inflow and infiltration of local stormwater and groundwater. By-passes and biomass wash-outs in the Oxidation Ditch sometimes occurred. These events were commonly followed by sustained periods of low flow during dry weather. Such extreme fluctuations in flow conditions made the plant difficult to operate with consistent results and contributed to violations of the National Pollutant Discharge Elimination System (NPDES) permit conditions. Modifications were made to this plant based on recommendations from an evaluation by CH2M HILL (1991).

The sewer collection system was modified and improved in 1988 but remained a gravity flow system, as were earlier ones. The depth of most of the existing lines was less than six feet, except where deeper to maintain the gravity flow. There were about 73,375linear feet of pipe and 235 manholes.

Problems in the collection system remained evident in 1991-92, according to an evaluation by ADS Environmental Services, Inc. (1992), which located 388 defects in the nearly 75,000 linear feet system through manhole inspections, dyed water flooding, flow isolation, internal TV inspection, and line cleaning. An extensive storm drain system was constructed for Camp Robinson in 1941 (CQ 1941, Plan Number 6110-675), but no repairs had been made since. Further, many unapproved storm water connections had been made into the sanitary sewer lines. These lines still included portions of the collection lines laid for Camp Pike in WWI.

Deterioration of clay and concrete pipes allowed infiltration into the collection system. Large ·amounts of inflow rapidly exceeded storage capacity of the treatment plant and raw sewage essentially bypassed the plant and was released into Fivemile creek with chlorination as the only treatment.

Residual chlorine remained in the undiluted effluent of the 1987 Camp Robinson plant to ensure kill of bacteria, and the substance was subsequently moved immediately with potentially damaging results into the aquatic ecosystem of Fivemile Creek. Further, chlorine is a hazardous substance for operators to handle and legally requires detailed inventory. Several incidents of accidental chlorine gas release had occurred.

In 1992 the Arkansas Dept. of Pollution Control & Ecology addressed a number of problems in the issuance of a Consent Administrative Order to Camp Robinson, including the periodic discharge of chlorinated but otherwise untreated effluent from the wastewater treatment plant. The. CAO set out schedules for compliance for facilities permitted by NPDES permit under the. Federal Clean Water Act. This action included a Sewer Evaluation Survey, remedial work on the sewer lines, and modifications to the wastewater treatment plant. Also, it seemed evident that NPDS would eventually raise permit limits for chlorine discharge as well as other standards. In response to this situation, it was decided that a complete replacement of both the sewer collection system and the wastewater treatment plant would be the most efficient long-term solution, and Camp Robinson requested funding from National Guard Bureau to replace both. The National Guard Bureau provided 2.2 million dollars for collection system upgrade and 3.2 million dollars for a new treatment plant. The new collection system was in operation) in February 1995, and the new treatment plant came into operation in January 1996. Marlar Engineering Co. of North Little North Little Rock, Arkansas designed both.

About 40,000 feet (7.5 miles) of the collection system (main interceptor sewers and laterals) was in open fields and wooded areas and was replaced by traditional, open-trench methods using PVC and ductile iron pipe in fall1994. In some cases, because of the rocky substrate, portions of routes for sewer lines had to be "blown" with explosive charges. About 6000 feet of the existing sewer, however, was located under pavement, buildings, railroad lines, historical monuments, gates, and through arched stone encasement structures spanning streams and gullies. This part of the system was rehabilitated using trenchless U-liner technology, where high-density polyethylene is deformed during manufacture to reduce its diameter and then reformed. By heating once inserted and pulled through the host pipe. The new collection system resulted in an 85% reduction in infiltration and inflow (Marlar 1996).

Previous sewage collection systems (1941and 1988) were designed to run by "gravity flow" even though some lines had to be constructed longer to avoid pumping stations and high maintenance requirements. For increased efficiency, the new collection system includes two pump stations: one south of New York Avenue on the west side of the 6th Street-3rd Street intersection and the other at "Monkey Island" near the Battle Skills Maintenance Facility Bldg. 6602, west of 6th Street and immediately adjacent to the southern shore of Engineers Lake.

Benny Swafford and Terry Marlar (Camp Robinson) and Mike Marlar (Marlar Engineering) designed the new wastewater treatment plant after an evaluation of various treatment plants around the state. A proven methodology was chosen for secondary treatment···activated sludge and extended aeration, which reduces and converts the organic material to inert gases,

liquid, and solids. The process includes mechanical screening, grit removal, extended aeration (2 oval shaped oxidation ditches), and two secondary clarifiers designed to operate either in series or in parallel. A tertiary treatment of sand filtration (self-cleaning Parkson filters) and UV lights for disinfection eliminates the necessity for terminal chlorination.

The "return activated sludge" and·"waste activated sludge" operations and operation of the Parkson·filters are automated from a computer in the plant office. Also, Instrumentation measuring influent and effluent flow rates, pH, and dissolved oxygen is connected to the plant computer for display and reporting; The new treatment plant normally runs at a capacity of 0.5 million gallons per day, but it is designed to handle 1 million gallons daily in case of a large influx of troops or other sudden increase in potential wastewater influent. An equalization basin, which is lined with impervious material to prevent leakage, is available to store additional peak flows. A backup generator is available (on-site) in case of main power failure. Most of the old treatment plant structures were removed and the area was variously landscaped and resodded.

The effluent from the new plant is of high quality. Nephometric turbidity units (NTU's) are less than 3-4 and suspended solids are normally less than 4 mg/liter, far below the legal limit. By-passes and overflows into Fivemile Creek have been eliminated. The effectiveness of the disinfection has eliminated the need to stock and handle chlorine at the post. The Consent Administrative Order was closed out by ADPCE in August 1996.

With the exclusion of stormwater from the new sewer collection system, it seems certain that this water now drains more directly downhill from the Cantonment Area into the Engineers Lake complex and Fivemile Creek. The uppermost segment of Jewett/Engineers Lake, immediately above Lake Jewett, is a swamp-like wetland that receives runoff from the Golf Course and the Troop Complex and serves as a natural settlement basin. There is evidence of recently increased sedimentation in that area.

## Wastewater Treatment Plant Sludge Disposal

The Camp Robinson Wastewater Treatment Plant uses aerobic digestion to stabilize waste activated sludge produced at the plant. Four stabilization chambers are available, each with a holding capacity of approximately 80,000 gallons. The aerobic digestion process produces a sludge with relatively low volatile solids concentration (ca. 40%). Previously, CJTR has sent its stabilized sludge to Little Rock but there is relatively little economic benefit to Little Rock from accepting the CJTR sludge because of its lowered concentration of volatile solids. In the first nine months of its operation, the new CJTR wastewater treatment plant delivered 148,800 gallons of sludge to Little Rock, but the National Guard has no assurance that Little Rock will continue to accept sludge.

An alternative method of sludge disposal is necessary to ensure uninterrupted operation of the Camp Robinson plant. The preferred method is land application where the sludge can be beneficial. Sludge was applied under NPDES permit in 1992 to four CJTR sites adjacent to Maryland Avenue, two with Christmas trees (Virginia pine) in cultivation, but all of these sites have more recently been taken for construction projects and firing ranges, and the program of land sludge application has been discontinued. Alternative sites for sludge application on CJTR are being considered. One such site is the M-60 Machine Gun Transition Range at Cato and Declination Roads, which probably has the best potential for land application on CJTR.

CDR Environmental of Russellville, a regional private contractor, transports sludge and operates a local land application site as a sod farm. In accordance with "503 EPA regulations" for sludge land application, however, such sludge must be certified for stabilization in a digester. At present, there is not enough daily documentation at the CJTR wastewater treatment plant to allow such certification.

These comments on wastewater treatment and sludge disposal have been drawn from conversations with Benny Swafford (Oct 1996, Feb 1997), the EA for Proposed Multiple Construction activities (DCSEN 1995), the 1941Completion Report (CQ 1941), Nominations for ANG Environmental Awards Program (Thrash 1996), a published summary by Mike Marlar (1996), designer of the recent rehabilitation of the sewage collection and treatment facilities, and LTC William Holmes, Camp Robinson Facility Management Officer and director of the project.

# Appendix E

# Standard Operating Procedures

## INRMP Standard Operating Procedure #1: Wildlife Hazard Avoidance

Due to the amount and type of natural resources present on RMTC interaction with wildlife is very likely by humans utilizing the installation for training or other purposes. Following these steps for any wildlife encountered will help ensure the safety and welfare of both humans and wildlife:

A. If possible do not approach wildlife encountered. Most animals are inherently cautious of humans and will flee if given the opportunity.
B. Do not attempt to pick up, capture, or in any other way make physical contact with wildlife. Most injuries inflicted by animals on humans are a direct or indirect result of the humans attempting to kill or remove those animals.
C. Do not attempt to assist any wounded wildlife. Contact Range Control or the Department of Public Safety if an injured animal is discovered. Again, the chances of receiving an injury due to an animal bite or scratch are greatly reduced if humans avoid physical contact with animals.
D. Apply these principles to any stray or feral animals. Stray or feral dogs or cats should be treated the same as any wildlife. Contact Range Control or the Department of Public Safety.

**INRMP Standard Operating Procedure #2**
**Toxic/Injurious Plant Hazard Avoidance**

Due to the amount and type of natural resources present on RMTC poisonous/injurious plants are hazard for anyone utilizing the installation for training or other purposes. Preventing physical contact with any plant on the installation is not realistic but avoiding harmful plants by becoming aware of surroundings in the vicinity of activity will help prevent physical harm or injury to humans. Following these steps will help ensure the safety and welfare of humans:

A. If possible avoid touching any unknown plant. Several plant species have thorns, irritating chemicals, or stinging hairs that can cause physical harm or allergic reactions for humans. If you or someone in your group does not recognize a plant steer clear of it.
B. Never consume any plant or plant part found in the wild. Many plants look alike so determining those that are safe to consume can be tricky. Surfaces of any plant may also be covered in dirt, water, or saliva from animals containing microorganisms that can cause severe illness in humans. Many people have become very sick or even died from consuming berries, leaves, or other plant parts that they believed were safe to eat.
C. Wash your skin as soon as possible when returning from the field. If you have come in contact with any detrimental plants thoroughly cleaning yourself with soap and water will help prevent allergic reactions or infection. Laundering clothes with a detergent is also advised to remove any chemicals or debris.

**INRMP Standard Operating Procedure #3**
**Natural Resource Protection**

Many of the natural resources present on RMTC are suitable for use by those training or conducting other activities on the installation. However, some are very unique and fragile. In many cases if these resources are harmed or destroyed they cannot be restored and are lost forever. Protecting these resources will ensure their availability for future generations. Following these steps for any help ensure that these resources are not harmed:

A. Follow INRMP SOPs #1 and #2. In many cases the same practices for avoiding plants and animals for the purposes of human welfare also ensure that these resources are protected.
B. Avoid disturbing wet areas and fields. Wetlands and prairies are two of the most important types of natural communities on RMTC. Both are very fragile and therefore do not rebound from disturbances caused by vehicles or digging. The soils, plants, and water present in these communities are necessary for their survival. They contain plant and animal species that are uncommon or rare in Arkansas. These communities are estimated to have declined statewide to less than 10% of pre-European settlement.
C. Do not harvest firewood without a permit. RMTC allows limited firewood harvesting but a permit must be obtained from Training Site Headquarters. Regulated harvesting ensures that forest resources are available for training, recreation, and other activities on the installation.

D. Drive vehicles only on specified roads and trails. RMTC maintains numerous vehicular paths that provide access for everyone utilizing the installation. Driving off-road on firebreaks or creating unauthorized trails causes damage to resources and can cause damage to vehicles. Staying on specified maintained roads will also ensure that financial resources are utilized efficiently by preventing repair or restoration to damaged areas.

## INRMP Standard Operating Procedure #4
## Water Quality Protection

Arkansas is fortunate to have substantial water resources relative to many other states but the status of these water resources depends on sustainable use and pollution prevention. Following these guidelines will help ensure that the surface and ground water quality at RMTC is protected:

A. Surface water, ground water, and wetlands are protected from nonpoint source pollution by the Clean Water Act. NRCS, USACE, ADEQ, UACES, and other state and federal agencies can provide additional information on practices that offer site-specific control of potential nonpoint source pollution to maintain or enhance water quality.
B. Silvicultural practices can cause movement of soil through erosion and can cause deposition into rivers, lakes, or streams if proper practices are not utilized to prevent this type of nonpoint pollution. Forestry BMPs should be used to ensure these measures are in place. These BMPs include structural and nonstructural controls, operations, and maintenance procedures that can be applied before, during, and after silvicultural activities. AFC is the lead agency in Arkansas in establishing, interpreting, monitoring, and updating forestry BMPs. Refer to AFC 2010 in Appendix A for more information on forestry BMPs.
C. Facility and road/trail construction and maintenance can also cause erosion and sedimentation. Refer to Appendix M for more information on erosion and sedimentation prevention at RMTC.

# Appendix F

# NEPA Documentation

| | | | |
|---|---|---|---|
| c. Will the proposed action change the quality and/or quantity of ground waters, either through direct additions or withdrawals or through interception of an aquifer by cuts or excavations? | | ☐ YES | ☑ NO |
| d. Does the proposed action have the potential to accidentally spill hazardous or toxic materials in or near a body of water? | During proposed action | ☐ YES | ☑ NO |
| | During normal operations after proposed action completed | ☐ YES | ☑ NO |
| e. Does the proposed action have the need for a Spill Control and Countermeasure Plan and/or Installation Spill Contingency Plan (SPCC and/or ISCP)? | During proposed action | ☐ YES | ☑ NO |
| | During normal operations after proposed action completed | ☐ YES | ☑ NO |
| f. Will the proposed action construct facilities or implement actions within floodplains and/or wetlands? **Attach appropriate (404) permits.** | During proposed action | ☐ YES | ☑ NO |
| | During normal operations after proposed action completed | ☐ YES | ☑ NO |
| g. Does the proposed action require an NPDES stormwater or wastewater discharge permit? | | ☐ YES | ☑ NO |
| h. Does the proposed action involve the construction of a water or wastewater treatment system (oil water separators, grease traps, etc)? | | ☐ YES | ☑ NO |

Explain any **YES** answers.

## 10. CULTURAL RESOURCES

| | | |
|---|---|---|
| a. Is a Cultural Resource Survey required? If **YES**, explain when it has taken or will take place. | ☐ YES | ☑ NO |
| b. Will the proposed action change the character or use of any historic property eligible for or listed in the National Register of Historic Places (i.e. historic buildings, cemeteries, etc.)? | ☐ YES | ☑ NO |
| c. Do you have any federally recognized tribe(s) located in or culturally affiliated with your state? | ☑ YES | ☐ NO |
| d. Will the proposed action impact any resource of significance to Native American tribes? | ☐ YES | ☑ NO |

Explain any **YES** answers.
There are federally recognized Native American tribes in Arkansas. Project will not affect the tribes.

## 11. POPULATION

## 12. INFRASTRUCTURE

a. Will the proposed action result in the need for new systems or susbstantial alterations to the following utilities:

| | | |
|---|---|---|
| (1) Electrical power, fossil fuel or other (specify): | ☐ YES | ☑ NO |
| (2) Drinking water? | ☐ YES | ☑ NO |
| (3) Wastewater treatment? | ☐ YES | ☑ NO |
| (4) Sewer collection system? | ☐ YES | ☑ NO |
| (5) Wash racks? | ☐ YES | ☑ NO |
| (6) Solid waste disposal? | ☐ YES | ☑ NO |

Explain any **YES** answers.

## PART E - INNOVATIVE READINESS TRAINING

**Skip this portion if this is not an Innovative Readiness Training Project**

## 1. REQUESTER INFORMATION

| | | |
|---|---|---|
| a. REQUESTER NAME: | b. TITLE: | |
| c. AGENCY NAME: | | |
| d. AGENCY ADDRESS: | | |
| e. COMM VOICE: | f. COMM FAX: | g. DSN VOICE: |
| h. DSN FAX: | h. EMAIL: | |

j. TYPE: ☐ FEDERAL ☐ STATE ☐ LOCAL/MUNICIPAL ☐ YOUTH/CHARITABLE

k. SUPPORT TYPE REQUESTED:

☐ ENGINEER ☐ TRANSPORTATION ☐ TECH ASSISTANCE ☐ LOGISTICAL
☐ COMMUNICATION ☐ ADMINISTRATIVE ☐ CEREMONIAL ☐ PARADE
☐ OTHER (SPECIFY):

## 2. ASSIGNED UNIT INFORMATION (Filled out by assigned National Guard unit)

| | |
|---|---|
| a. UNIT ASSIGNED PROJECT: | b. SERVICE COMPONENT: |
| c. UNIT ADDRESS: | |
| d. PROJECT OFFICER RANK: NAME: | |
| e. SITE VISIT DATE (dd-mmm-yy): | |

f. PROJECT ASSESSMENT (Give detailed assessment of project requirements. Review project requirements against the screening criteria in Section 651.29 of 32 CFR Part 651. If the project qualifies for a Categorical Exclusion, indicate the Categorical Exclusion code).

| | | |
|---|---|---|
| a. Does the proposed action have the potential to degrade the quality of the environment, or curtail the diversity of the environment? | ☐ YES | ☑ NO |
| b. Does the proposed action have the potential for cumulative impacts on environmental quality when the effects are combined with those of other federal/state actions or when the action is of lengthy duration? | ☐ YES | ☑ NO |
| c. Does the proposed action have environmental effects that will cause substantial adverse effects on the human or natural environment either directly or indirectly? | ☐ YES | ☑ NO |

**On the basis of this initial evaluation, the following is appropriate (check one):**

- ☐ An **Environmental Baseline Survey (EBS)** and a **new checklist** once the EBS is completed.
- ☑ IAW 32 CFR 651 Appendix B, the proposed action qualifies for a Categorical Exclusion that does not require a REC. Explain below in "Remarks." **Cite Catex code.**
- ☑ A **Record of Environmental Consideration (REC)**
- ☐ An **Environmental Assessment (EA)**
- ☐ A **Notice of Intent (NOI)** to prepare an **Environmental Impact Statement (EIS)**

| | |
|---|---|
| Signature of Proponent (Requester) | Concurrence: Environmental Program Manager |
| Mr. Brian Mitchell | MAJ Marty P. Curtright |
| Printed Name of Proponent (Requester) | Printed Name of Env. Program Manager |
| July 6, 2006 | 7 July 06 |
| Date Signed | Date Signed |

**Remarks:**

| 1. PROJECT NAME | 2. PROJECT NUMBER | 3. DATE CHECKLIST COMPLETED |
|---|---|---|
| **Integrated Natural Resources Management Plan** | **N/A** | **30-Jun-06** |

4. START DATE (dd-mmm-yy): 1-Oct-06 | 5. END DATE (dd-mmm-yy): 30-Sep-07

6. CHOOSE **ONE** OF THE FOLLOWING:

☐ An existing **Environmental Assessment** adequately covers the scope of this project.

EA Date (dd-mmm-yy): Conducted By:

☐ An existing **Environmental Impact Statement** adequately covers the scope of this project.

EIS Date (dd-mmm-yy): Conducted By:

☑ After reviewing the screening criteria this project qualifies for a **Categorical Exclusion** (select one below).

Categorical Exclusion Code: D-4: Studies, data collection, monitoring, and information gathering...

*See 32 CFR Part 651 App B*

☐ This project is exempt from NEPA requirements under the provisions of:

Cite superseding law:

Signature of Proponent (Requester)

Mr. Brian Mitchell

Printed Name of Proponent (Requester)

July 6, 2006

Date Signed

Concurrence:

Signature of Landowner

N/A

Printed Name of Landowner

Date Signed

Concurrence: Marty P. Curtright

Environmental Program Manager

MAJ Marty P. Curtright

Printed Name of Env. Program Manager

Concurrence: Everett S. Payne

Signature of Commander

COL Everett S. Payne

Printed Name of Commander

**2013**

| Enviro Tracking #: | ARNG ENVIRONMENTAL CHECKLIST | State ARNG |
|---|---|---|
| | Enter information in the yellow shaded areas. | |

## PART A - PROJECT INFORMATION

1. PROJECT NAME:

Robinson Maneuver Training Center (RMTC) Integrated Natural Resources Management Plan

| 2. PROJECT NUMBER: (MILCON if applicable) | 3. DATE PREPARED: |
|---|---|
| | 1-Dec-12 |

4. DESCRIPTION AND LOCATION OF THE PROJECT/PROPOSED ACTION:

a. Location (Include a Detailed Map):

RMTC

b. Description:

The environmental evaluation for Annual Review and Update of the RMTC Integrated Natural Resources Management Plan (INRMP) for the AR ARNG/MDA which describes the natural resource management requirements, outlines the resources necessary for implementation, and describes the administrative, safety and environmental requirements of the program. No significant changes in the INRMP are anticipated before the expiration of this evaluation (30-Sep-17).

c. The proposed action will involve (check all that apply):

- ☐ Training Activities/Areas
- ☐ Construction
- ☐ Natural Resource Management
- ☐ Maintenance/Repair/Rehabilitation
- ☐ Real Estate Action
- ☑ Environmental Plans/Surveys
- ☐ Innovative Rediness Training Project
- ☐ Other (Explain):

d. Project Size (Acres): (if applicable)

Acres of New Surface Disturbance (Proposed): 0 (if applicable)

| | | |
|---|---|---|
| 5. START DATE of PROPOSED ACTION (dd-mmm-yy): | 31-Dec-12 | Note: This must be a future date. |
| 6. PROGRAMMED FISCAL YEAR (if applicable): | FY12 | |
| 7. END DATE (if applicable): | 30-Sep-17 | |

## PART B - DECISION ANALYSIS GUIDE

To use a categorical exclusion, the project must satisfy the following three screening criteria: no segmentation, no exceptional circumstances and a qualifying categorical exclusion that covers the project. The following decision tree will guide the application and documentation of these three screening criteria. The criteria were extracted from 32 CFR Section 651.29 and represent the most common screening conditions experienced in the ARNG. NOTE: Each question in Part B must have a block checked for concurrence with REC.

1. Is this action segmented (the scope of the action must include the consideration of connected, cumulative, and similar actions)? ☐ YES (go to #30) ☑ NO (go to #2)

2. Is there reasonable likelihood of significant environmental effects (direct, indirect and cumulative)? If action meets screening

## PART B - DECISION ANALYSIS (continued)

7. Will there be reportable releases of hazardous or toxic substances as specified in 40 CFR Part 302? If action meets screening criteria but is assessed in an existing EA or EIS, check NO and proceed to the next question.

☐ YES (go to #30) ☑ NO (go to #8)

8. Will air emissions exceed de minimus levels or otherwise require a formal Clean Air Act (CAA) conformity determination? If action meets screening criteria but is assessed in an existing EA or EIS, check NO and proceed to the next question.

☐ YES (go to #30) ☑ NO; ensure RONA is completed and on-file at State (go to #9)

9. Will the project have effects on the quality of the environment that are likely to be highly controversial? If action meets screening criteria but is assessed in an existing EA or EIS, check NO and proceed to the next question.

☐ YES (go to #30) ☑ NO (go to #10)

10. Will the project establish a precedent (or make decisions in principle) for future or subsequent actions that are reasonably likely to have future significant effects? If action meets screening criteria but is assessed in an existing EA or EIS, check NO and proceed to the next question. ☐ YES (go to #30) ☑ NO (go to #11)

11. Has federal funding been secured for the Innovative Readiness Training project?

☑ N/A (go to #13) ☐ YES (go to #13) ☐ NO (go to #12)

12. NOTE: IRT projects not currently funded can secure approved NEPA documentation. However, once funding is secured State ARNG is required to coordinate with ARNG-ILE-T to complete natural and cultural surveys via proponent funding.

☐ CONFIRMED (go to #27)

13. Do you have a species list from the U.S. Fish and Wildlife Service that is less than 90 days old?

☑ YES (go to #14) Date of List: 01 Dec 2012 ☐ NO (update species list return to #13)

14. In reviewing the species list, what determination was made by the State ARNG?

☑ No species present (go to #16)
☐ No affect (go to #16)
☐ May affect but not likely to adversely affect (go to #16)
☐ May affect likely to adversly affect (go to #15)

15. Does an existing Biological Opinion cover the action?

☐ YES (go to #16) ☑ NO (go to #30)

16. Have the Endangered Species Act, Section 7 requirements been completed?

☑ YES (go to #17) Date of Documentation: 01 Dec 2012 ☐ NO (complete documentation, return to #16)

17. Does the project involve an undertaking to a building or structure that is 50 years of age or older?

☐ YES (go to #18) ☑ NO (go to #20)

18. Has the building or structure been surveyed for the National Register of Historic Places?

☐ YES (go to #19) ☐ NO (complete inventory, return to #18)

19. Is the building or structure eligible for or listed on the National Register of Historic Places?

☐ YES (go to #20) ☐ NO (go to #20)

20. Does the action involve ground disturbing activities?

☐ YES (go to #21) ☑ NO (go to #22)

## PART B - DECISION ANALYSIS (continued)

24. Per DoDI 4710.02 did the state ARNG determine that tribal consultation was necessary for this project?

☐ YES (provide date of MFR, go to #25) Date of MFR:

☑ NO (Provide reason in this block 24a, go to #27)

24a. The action will not significatly affect tribal resources, rights, or Indian lands per DoDI 4710.02. However, copies of INRMP will be sent to tribes.

25. Did the Tribes express an interest or respond with concerns about the project?

☐ YES (go to #26) ☐ NO (go to #27) Date of Documentation:

26. Has the State ARNG addressed the Tribal concerns?

☐ YES (place date of MOU or explanation of how State ARNG addressed tribal concerns in box below, go to #27)

☐ NO (address concerns, return to #26)

Complete only if additional documentation is required in question #26

26a.

27. Does the project involve an unresolved effect on areas having special designation or recognition such as those listed below? For any yes responses go to #30 otherwise go to #28. If any No response is a result of negotiaged and/or previously resolved effects please describe resolution in box 27a below.

| TYPE | Unresolved Effects? | TYPE | Unresolved Effects? |
|---|---|---|---|
| a. Prime/Unique Farmland | ☐ Y or ☑ N | e. Wild/Scenic River | ☐ Y or ☑ N |
| b. Wilderness Area/National Park | ☐ Y or ☑ N | f. Coastal Zones | ☐ Y or ☑ N |
| c. Sole-Source Aquifer | ☐ Y or ☑ N | g. 100-year Floodplains | ☐ Y or ☑ N |
| d. Wetlands | ☐ Y or ☑ N | h. National Wildlife Refuges | ☐ Y or ☑ N |

27a.

28. Is this project addressed in a separate EA or EIS review?

☐ YES (complete table below; go to Part C, Determination) ☑ NO (go to #29)

| | |
|---|---|
| Document Title: | |
| Lead Agency: | |
| Date of Decision Document: | |

29. Does the project meet at least one of the categorical exclusions listed in 32 CFR 651 App B?

☑ YES (complete table below; go to Part C, Determination) ☐ NO (go to #30)

| | |
|---|---|
| List primary CAT EX | D2 |

## PART C - DETERMINATION

**On the basis of this initial evaluation, the following is appropriate:**

- ☐ IAW 32 CFR 651 Appendix B, the proposed action qualifies for a Categorical Exclusion (CX) that does not require a Record of Environmental Consideration.
- ☑ A Record of Environmental Consideration (REC).
- ☐ An Environmental Assessment (EA).
- ☐ A Notice of Intent (NOI) to prepare an Environmental Impact Statement (EIS).

| | |
|---|---|
| | |
| Signature of Proponent (Requester) | Environmental Program Manager |
| Brian D. Mitchell | LTC Spencer W. Robinson |
| Printed Name of Proponent (Requester) | Printed Name of Env. Program Manager |
| | |
| Date Signed | Date Signed |

**Other concurrence (as needed):**

| | |
|---|---|
| Signature | Signature |
| Printed Name | Printed Name |
| Date Signed | Date Signed |
| Signature | Signature |

| Enviro Tracking #: | ARNG Record of Environmental Consideration | State ARNG |
|---|---|---|
| | Enter information in the yellow shaded areas. | |

1. PROJECT NAME:

**Robinson Maneuver Training Center (RMTC) Integrated Natural Resources Management Plan**

| 2. PROJECT NUMBER: (MILCON if applicable) | 3. DATE PREPARED: |
|---|---|
| 0 | 1-Dec-12 |

| | | |
|---|---|---|
| 4. START DATE of PROPOSED ACTION (dd-mmm-yy): | 31-Dec-12 | Note: This must be a future date |
| 5. PROGRAMMED FISCAL YEAR: | FY12 | |
| 6. END DATE: | 9/30/2017 | |

7. DESCRIPTION AND LOCATION OF THE PROPOSED ACTION:

a. Location (Include a Detailed Map):

RMTC

b. Description:

The environmental evaluation for Annual Review and Update of the RMTC Integrated Natural Resources Management Plan (INRMP) for the AR ARNG/MDA which describes the natural resource management requirements, outlines the resources necessary for implementation, and describes the administrative, safety and environmental requirements of the program. No significant changes in the INRMP are anticipated before the expiration of this evaluation (30-Sep-17).

8. CHOOSE **ONE** OF THE FOLLOWING:

☐ An existing Environmental Assessment adequately covers the scope of this project. Attach FNSI if EA was completed by another federal agency (non-ARNG).

EA Date (dd-mmm-yy): Lead Agency:

☐ An existing Environmental Impact Statement adequately covers the scope of this project.

EIS Date (dd-mmm-yy): Lead Agency:

☑ After reviewing the screening criteria and completing the ARNG Environmental Checklist, this project qualifies for a Categorical Exclusion Code:

**See 32 CFR 651 App. B**

B-3: Preparation of regulations, procedures, manuals, and other...

☐ This project is exempt from NEPA requirements under the provisions of:

Cite superseding law:

9. REMARKS:

# Appendix G
# Correspondence with External Stakeholders

# 2005

# Arkansas Game and Fish Commission

2 Natural Resources Drive Little Rock, Arkansas 72205

Scott Henderson
Director

Mike Gibson
Deputy Director

David Goad
Deputy Director

Loren Hitchcock
Deputy Director


November 18, 2005

Lieutenant Colonel Robert Embrey
Military Department of Arkansas
Office of The Adjutant General
Camp Joseph T. Robinson
1301 Missouri Avenue
North Little Rock, AR 72199-9600

Dear Colonel Embrey:

Your letter regarding the updated Draft Integrated Natural Resources Management Plan for FY 2006-FY 2010, related to natural resources in the vicinity of the Robinson Maneuver Training Center, which is located in Pulaski County, Arkansas, has been referred to me for reply.

Biologists from our agency have reviewed the proposed project and we anticipate insignificant adverse impacts to fish and wildlife resources associated with these proposed activities.

We appreciate the opportunity to review this project proposal and if we can be of further assistance, don't hesitate to call us.

Sincerely,

Robert K. Leonard

Robert K. Leonard, Biologist
River Basins Division

Cc: Doyle Shook
Mike Gibson
Kenny R. Vernon
USFWS, Conway Office

Phone: 501-223-6300 Fax: 501-223-6448 Website: www.agfc.com

United States Department of the Interior

FISH AND WILDLIFE SERVICE
1500 Museum Road, Suite 105
Conway, Arkansas 72032
Tel.: 501/513-4470 Fax: 501/513-4480

IN REPLY REFER TO:

April 5, 2005

Ms. Claire Barnett, P.E.
EnSafe Inc.
5724 Summer Trees Drive
Memphis, Tennessee 38134

Dear Ms. Claire Barnett:

The U.S. Fish and Wildlife Service (Service) has received your letter dated March 9, 2005 requesting information related to natural resources in the vicinity of the Camp Robinson Maneuver Training Center (RMTC) located in Pulaski County, Arkansas. In that letter you invited comments related to site-specific or general natural resources management at Camp Robinson that would assist in the preparation of the environmental assessment (EA), or the Integrated Natural Resources Management Plan (INRMP). We have reviewed our records and offer the following comments in accordance with your request and Section 7 of the Endangered Species Act (87 Stat. 884, as amended: 16 U.S.C. 1531 et seq.); the Sikes Act Improvement Act (Public Law 105-85, Div. B Title XXIX, Nov. 18, 1997); and the Fish and Wildlife Coordination Act (Public Law 85-624; 16 U.S.C. 661-666e.).

The Service is not aware of any known federally-listed of candidate rare, threatened, or endangered species, significant critical wildlife habitat, or unique natural communities occurring within a one-mile radius of RMTC. Additionally, at this time there are no federally-designated scenic rivers, forests, parks, nature preserves, refuges, or proposed scenic river trails in that area. At present, no further consultation in accordance with the Endangered Species Act is required.

The Service previously commented on the EA and the INRMP for RMTC in 2001. After reviewing our previous comments we would like to submit the following recommendations.

The Service recommends that the EA and INRMP:

- include additional integration of the bird conservation plan initiatives as recommended by Partners in Flight (PIF) for priority species into natural resource management objectives and include a list of priority species of concern present at RMTC;

- provide a migrant bird management plan with specific objectives and goals for integration into habitat management and preservation objectives (i.e., Prairie, forest, and wetland preservation, migrant bird nesting disturbance/destruction in building, bridge, or tree

removal, demolition, or related activities under the Migratory Bird Treaty Act (Public Law 65-186; 16 U.S.C. 703) and Endangered Species Act);

- include an inventory list of species occurring at RMTC; and
- we encourage you to develop plans with ecosystem health and sustainability as an objective and desired outcome. For several thousand years prior to European settlement much of this region was influenced by Native American practices including frequent burning done for a variety of purposes. Fire is an essential ecological process for the upland forests and woodlands of the training center. The INRMP should include the use of prescribed fire and selective thinning treatments to restore and maintain fire dependent communities.

The Service thanks you for the opportunity to provide comments and your concern for endangered species. If you have any questions or additional comments, please contact Lindsey Lewis at (501) 513-4489.

Sincerely,

Margaret Harney

Margaret Harney
Acting Field Supervisor

cc:

Arkansas Game and Fish Commission, Little Rock, Arkansas
Attn: Robert Leonard

Arkansas Natural Heritage Commission, Little Rock, Arkansas
Attn: Cindy Osborne

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**United States Department of the Interior**

FISH AND WILDLIFE SERVICE
1875 Century Boulevard
Atlanta, Georgia 30345

In Reply Refer To:
FWS/R4/F

Mr. Brian Mitchell
RMTC Natural Resources Manager
ARARNG
DCSEN-E Building 1301
Camp Joseph T. Robinson
North Little Rock, Arkansas 72199-9600

Dear Mr. Mitchell:

The Fish and Wildlife Service's Conway Field Office and Southeast Regional Office have reviewed the information you provided regarding the annual update to the Integrated Natural Resources Management Plan (INRMP) for the Camp Joseph T. Robinson, Arkansas. This information appears to be appropriate and adequate.

Thank you for the opportunity to comment on the INRMP for your facility. Your concern for and efforts to protect endangered and threatened species are greatly appreciated. If you have any questions, please feel free to contact me at 404/679-7324

Sincerely yours,

Thomas B. Sinclair, Jr.
Regional Sikes Act Coordinator

IN REPLY REFER TO:

# United States Department of the Interior

FISH AND WILDLIFE SERVICE
1500 Museum Road, Suite 105
Conway, Arkansas 72032
Tel.: 501/513-4470 Fax: 501/513-4480

January 6, 2006

Lieutenant Colonel Robert Embrey
c/o Brian Mitchell, RMTC Natural Resource Manager
Camp Joseph T. Robinson
North Little Rock, AR 72119-9600

Dear Colonel Embrey:

The U.S. Fish and Wildlife Service (Service) has reviewed your letter of September 2, 2005 along with the Integrated Natural Resources Management Plan (INRMP) for FY 2006-2010. In that letter you identified several changes and decisions that had been made regarding the National Environmental Policy Act Record of Consideration (REC) and the Environmental Assessment (EA). Our comments were requested on these changes and decisions along with the updated plan in accordance with the Sikes Act.

Your letter indicated that after further review of the INRMP and its intended scope the previously proposed development of an EA has been determined to be unnecessary. It was determined that there would be no significant change from the previous INRMP and EA; therefore, the decision was made to continue the process with the similar REC.

After reviewing the INRMP and the EA the Service concurs with this decision. In addition, the Service has no additional comments or requests for changes to the INRMP at this time. Therefore, the Service considers the requirements of Section 7 of the Endangered Species Act, NEPA, and the Sikes Act to be fulfilled. If you have any questions, please contact me at (501) 513-4489.

Sincerely,

Lindsey Lewis
Fish & Wildlife Biologist

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# United States Department of the Interior

FISH AND WILDLIFE SERVICE
1875 Century Boulevard
Atlanta, Georgia 30345

In Reply Refer To:
FWS/R4/F

FEB 07 2006

Mr. Brian Mitchell
Natural Resources Manager
Arkansas Army National Guard
Camp Joseph T. Robinson
DCSEN-E Building 1301
North Little Rock, Arkansas 72199-9600

Dear Mr. Mitchell:

The Fish and Wildlife Service's Arkansas Field Office and Southeast Regional Office have reviewed the latest revision of the Integrated Natural Resources Management Plan (INRMP) for the Robinson Maneuver Training Center, Arkansas, and have found that, pursuant to Paragraph (a) (2) of the Sikes Act (16 U.S.C. 670a et seq.), the Service and the Complex are now in mutual agreement as to the plan's content.

We are providing this letter as recognition of our mutual agreement with regard to the INRMP.

Thank you again for the opportunity to comment on the INRMP for your facility. Your concern for and efforts to protect endangered and threatened species are greatly appreciated. If you have any questions, please feel free to contact me at 404/679-4000 or Mr. Tom Sinclair, Regional Sikes Act Coordinator, at 404/679-7324.

Sincerely yours,

for Sam D. Hamilton
Regional Director

TAKE PRIDE IN AMERICA

# Arkansas Game & Fish Commission

2 Natural Resources Drive Little Rock, Arkansas 72205

David Goad
Deputy Director

Loren Hitchcock
Deputy Director

Scott Henderson
Director


May 6, 2005

Military Department of Arkansas
Camp Joseph T. Robinson
Attn: Brian Mitchell, Natural Resource Manager
1301 Missouri Avenue
North Little Rock AR 72199-9600

Dear Mr.Mitchell:

Your letter regarding the Draft Environmental Assessment for the Integrated Natural Resources Management Plan for FY 2006-FY2010, which is located in Pulaski County, Arkansas, has been referred to me for reply.

Biologists from our agency have reviewed the proposed project and we have the following comments and recommendations:

The plan discusses a 30 to 1 ratio of mixed hardwoods to pine on the post. Our agency would like to know the current hardwood to pine ratio.

We would also like to know if there is any prairie included in this mix. The proposed plan recommends converting old fields to pine plantations. Our agency is concerned that these fields are potential prairie lands and are essential to the ecosystem, which helps to provide a diverse forest for fish and wildlife habitat.

Our agency would like to see maps from the past five years that show what species of trees have been planted and the location of these tree species, so we can make recommendations that would help to diversify this forest and improve the potential for fish and wildlife habitat. We would also like to see maps that show proposed future tree plantings and their species composition.

We would also like to evaluate the proposal on page D-3, where the plan proposes to convert an oak stand to an even age plantation. Our agency feels that a diverse forest is better for fish and wildlife resources.

We appreciate the opportunity to review this project proposal and if we can be of further assistance, don't hesitate to call us.

Phone: 501-223-6300 Fax: 501-223-6448 Website: www.agfc.com

Sincerely,

Richard K. Vernon

Richard K. Vernon
Regional Supervisor
Region 10

Cc: Rick Chastain
Bob Conley
Matt Mourot
Mike Widner

**MILITARY DEPARTMENT OF ARKANSAS**
**OFFICE OF THE ADJUTANT GENERAL**
**CAMP JOSEPH T. ROBINSON**
**NORTH LITTLE ROCK, ARKANSAS 72199-9600**

MIKE HUCKABEE
GOVERNOR

DON C. MORROW
MAJOR GENERAL
THE ADJUTANT GENERAL

September 2, 2005

Mr. Richard W. Davies, Executive Director
Arkansas Parks and Tourism
One State Capitol Mall, Room 4A-400
Little Rock, Arkansas 72201

Dear Mr. Davies:

Our agency, the Arkansas Army National Guard, previously issued a letter stating that an update to our Integrated Natural Resources Management Plan (INRMP) was forthcoming. Your agency will soon receive a copy of the draft INRMP. In accordance with the Sikes Act, we are requesting input from your agency related to natural resources in the vicinity of the Robinson Maneuver Training Center (RMTC). The INRMP will receive updates on an annual basis so any concerns that arise in the future will also be addressed accordingly.

In compliance with the National Environmental Policy Act, a Record of Environmental Consideration (REC) for implementation of the INRMP has also been prepared and added as an appendix to the INRMP. In the previous letter, a separate Environmental Assessment (EA) was to be developed but, after further review of the INRMP and its intended scope, it was determined there would not be a significant change from the previous INRMP and EA. Therefore, the decision was made to continue this process with the similar REC. The previous INRMP and corresponding EA are available upon request.

For additional information or questions concerning this request, please contact Brian Mitchell, RMTC Natural Resources Manager at 501-212-5891.

Sincerely,

Robert C. Embrey

Robert Embrey
Lieutenant Colonel
Deputy Chief of Staff, Engineering (Acting)

# Appendix H
# Public Comments

# Integrated Natural Resources Management Plan (INRMP) For Robinson Maneuver Training Center (RMTC), Arkansas

The Arkansas Army National Guard in accordance with pertinent laws, regulations, and policies has made available for public comment its revision of the INRMP for RMTC FY2006-2010. This document will be available December 2, 2005 through January 1, 20063 at William F. Laman Public Library in North Little Rock, Arkansas. If you have any questions or comments contact Brian Mitchell, RMTC Natural Resources Manager, at 501-212-5891 or brian.david.mitchell@ar.ngb.army.mil

No public comments were received from the initial INRMP creation (2001) or the previous Review for Operation and Effect (2006). The INRMP will be made available by anyone requesting a copy of the document.

# Appendix I

# Summary of Natural Resource Management Program Efforts

# Fauna

## White-tailed Deer (*Odocoileus virginianus*)

White-tailed deer is an abundant large game species located throughout Arkansas. It is considered one of the most studied species in North America. In conjunction with AGFC, AR ARNG/MDA the deer management program at RMTC is designed to ensure a sustainable deer population exists for recreational hunting and to maintain a population below the estimated ecological carrying capacity which ensures overall health of the species.

Assessing overall health and estimating densities of the deer population at RMTC are accomplished by using a combination of biological data from deer harvest, spotlight surveys conducted by AR ARNG/MDA staff, and other AGFC surveying and monitoring. These gauges vary among separate units designated by AGFC based on ecoregions and land uses. These divisions are called Deer Management Units (DMUs). RMTC lies in the Ouachita Mountains DMU. According to AGFC a density of 25 to 30 deer per square mile is appropriate for RMTC (AGFC 1999).

In order to achieve this density harvest limitations are set by AGFC each hunting season as appropriate, habitat enhancements such as wildlife openings and food plots are implemented and maintained by AR ARNG/MDA, and population trends are examined such as the ratio of buck to doe and average weights by age class structure.

## Bats (Order Chiroptera)

A total of eight bat species (out of the sixteen known from Arkansas) have been documented on the post from four seperate efforts. During the initial faunal PLS (Penor et al. 1996a), two species, *Lasiurus borealis* and *Nycticeius humeralis*, were trapped and one species, *Coryrhinus rafinesquii*, was found as a UALR museum record (Pitts 1988). A second faunal PLS which focused on characterizing bat species at the installation (Saugey 1998) found that in addition to the two species captured during the previous PLS three other species, *Eptesicus fuscus*, *L. cinereus*, and *Pipistrellus subflavus*, are present on installation. A third bat fauna PLS (Britzke and Redman 2006) primarily utilized ultrasonic detection and analysis further expanded the species known at RMTC by two (*Myotis septentrionalis* and *Myotis lucifugus*).

The only bat species documented from RMTC that is a species of conservation concern is *C. rafensquii*. The only known record of this species comes from aforementioned UALR mammal museum specimen as it has not been subsequently captured or documented from the installation. According to Saugey, “Pitts indicated that the specimen had been removed from an abandoned theatre located near the old headquarters building. A search for this building revealed it had been demolished in the ensuing years. The old headquarters building to which Pitts referred was still intact and was examined on numerous occasions with no bats observed inside” (Saugey 1998). The report for this survey also indicated that other abandoned structures were examined with no additional specimens found. In addition

Saugey stated that, ". . . none of the cavity trees observed on upland sites on Post appear large enough to accommodate a maternity colony of this species at the present time."

## American Beaver (*Castor canadensis*)

The American Beaver is considered a keystone species in wetlands throughout North America. As human population numbers have increased so has the demand on our natural resources. Lands which were at one time diverse ecosystems were depleted of their richness and turned into farming lands. This has been the single largest cause for the loss of wetland habitat in North America. However, a healthy beaver population can aid in reclaiming these vital wetlands. Beaver hunting and trapping is also a part of the cultural heritage of Arkansas and beaver have been used for food, pelts for sale and trade, and was even the main material composing top-hats that were widely fashionable during the eighteenth and nineteenth century.

At RMTC, most of the emphasis placed on beaver has been in reference to control as a nuisance species due to its need to dam and flood creeks and streams in order to enhance (or create) habitat. Tree damage and mortality caused by girdling from beavers can also be problematic in some areas of the installation. This can cause a conflict with training, construction, and recreation so a balance in managing the species with human interest is necessary. In some cases, beaver can actually enhance some human activities, such as duck hunting or fishing.

Recreational and contracted trappers have historically helped control unwanted beaver in specific areas on the installation. The Engineers Lake complex, Grassy Lake, and Cato Community are locations that have periodically receive control through trapping and dam and lodge demolition.

## Other Mammals (Class Mammalia)

A total of 31 mammalian species (including deer, bat, beaver, and feral hog) have been recorded for RMTC out of a possible 54 that are known to occur in Central Arkansas (Sealander and Heidt 1990). Two of these records were obtained from UALR museum records. It is likely that at least some of these may be found with more intensive sampling.

None of the mammal species found on RMTC are considered rare or threatened (ANHC 2012) and no such species are expected to be found on the installation. Further assessment with particular emphasis on wetlands and riparian communities, grasslands and shrublands, and management activities (such as the short-and long-term effects of prescribed fire) should allow more robust evaluation of ecosystem function, wildlife habitat and food availability, and overall faunal biodiversity. See Appendix J for a comprehensive list of mammalian fauna at RMTC.

# Herpetofauna

The term herpetofauna includes species of reptile (Class Reptilia) and amphibian (Class Amphibia). During the initial faunal PLS several species of snake, lizard, turtle, frog, and salamander were found on RMTC (Penor et al. 1996). These animals are valued for their contributions to Arkansas' natural diversity. They serve important roles in controlling many pest species and as ecosystem health and function indicators.
To date the only formal study that has examined the herpetofaunal composition of RMTC is aforementioned faunal PLS (Penor et al. 1996). AR ARNG/MDA personnel are currently revisiting much of the work from this effort and utilizing supplemental listening stations, road surveys, and coverboard arrays. As with the mammalian fauna, assessment of targeted areas and land management activities are presently underway and should allow more robust evaluation of ecosystem function, wildlife habitat and food availability, and overall faunal biodiversity.

Presently, 36 reptile and 16 amphibian species have been identified for RMTC. None of the recorded species is currently considered a SOCC. However, likely habitat exists for one amphibian SOCC, the Bird-voiced Tree Frog (*Hyla avivoca*) in the Grassy Lake area and has been recorded in the adjacent Bell Slough WMA. See Appendix J for a complete herpetofaunal species list.

# Waterbirds (Waterfowl, Wadding Birds, and Shorebirds)

The presence of open water and wetland areas provide opportunities for waterbird conservation, viewing, and harvesting at RMTC. Management practices to have been undertaken to preserve and enhance this habitat for both game species such as the Wood Duck (*Aix sponsa*) and Mallard Duck (*Anas platyrhynchos*) and non-game species.

Waterfowl hunting occurs annually at the RMTC. Harvest data gathered on the installation indicates Wood Ducks are harvested more than any other waterbird species. Since Wood Ducks are a recovering, highly popular game species, extra efforts are made to sustain and enhance the resident population.

One such effort began in 2003 with the installment of 35 wood duck boxes in TA10 and TA12 in the areas of Grassy Lake and Tupelo Gum Pond. An additional ten Wood duck boxes were placed in the cantonment area of Camp Robinson on the Engineer Lakes complex (Jewitt, Hunter, Engineer, and Bottom).

Subsequent studies of Wood Duck nest boxes in 2009 and 2011 revealed that artificial cavities are rarely, if ever, used in the vicinity of Grassy Lake and Tupelo Gum Pond because of the abundance of natural cavities suitable for breeding, incubating eggs, and fledging chicks. Several years of low rainfall totals and high summer temperatures have dried up Tupelo Gum pond. As of April 2011 there is no water feature suitable for Wood Ducks within 2 kilometers of the five boxes placed in the Tupelo Gum Pond area. Furthermore, in April of 2011, a tornado touched down in the area of Grassy Lake and

damaged approximately 600 acres of wetland forest where twenty Wood Duck boxes were located. None of these nest boxes showed evidence Wood Duck utilization during the 2003, 2004, 2009, or 2011 monitoring efforts. Flooded and beset with fallen trees, it may be many months before the fate of those boxes is known. It recommended that the surviving boxes of these areas be salvaged and relocated when time and manpower permits.

In contrast to the Wood Duck boxes placed in Grassy Lake and Tupelo Gum Pond areas, use of these artificial cavities was observed to be much higher in the Cantonment Area (Engineer Lakes complex) during each of the monitoring surveys. This area in which hunting is prohibited provides adequate open water, food, and resting habitat, but its limiting factor appears to be natural nesting cavities. Evidence of repeated breeding success in nest boxes exists in the form of cracked egg shells, unfertilized eggs, and nesting down, as well as game camera footage of parent birds with chicks. Planned efforts to further enhance the nesting capacity of the area include erecting at least ten more wood duck boxes and temporarily placing stationary wildlife cameras to help track nesting success.
It has further been suggested that future enhancements of the Engineered Lakes could include a water level control structure such as a stoplog system or levy screw in order to manipulate water levels to the benefit of natural grasses and sedges commonly used by waterfowl. Current management practices used by USFWS suggest a minimum of 400 pounds of seed food per acre could be produced further enhancing waterfowl numbers.

## Other Avifauna (Birds)

Five major avifaunal studies have been conducted on RMTC. The first study was completed in 1996 by Kenton Lohraff under the direction of Dr. Kimberly Smith, UA-Fayetteville (Lohraff 1996). This study recorded the occurrence of 141 species on the installation. The second study was completed in 1999 (Wiedenfield et al. 1999b). This study focused on the delineating and describing five species of interest: Bachman's Sparrow, Bobwhite Quail, Brown-headed Cowbird, Cerulean Warbler, and Loggerhead Shrike. A third was conducted between April 2002 and February 2003 (Guilfoyle and Fischer 2003). To date this and the 1996 Lohraff study are the most comprehensive of the aviafaunal efforts on RMTC.

The 2003 study found that, "U.S. Army Installation, Camp Robinson, AR, is mostly comprised of mature upland hardwood forest (Fig. 11), but the installation also possesses large areas of bottomland hardwood wetlands, plus areas of open grassland and early successional habitats. These habitats support a wide variety of forest and open-country birds, including many Neotropical migrants and other species identified by PIF as species of regional concern. The bottomland areas were also important to several Nearctic migrants during the over-wintering seasons."

Additionally, the authors recommended in their report:

"**Bottomland Hardwood and Riparian Area Management:**

1) Protect existing bottomland hardwood forests in the Grassy Lake and Tupelo Creek areas from development, timber harvest, and/or intensive military

training exercises."
"…2) Limit access roads into bottomland hardwood areas."
"…3) Promote restoration of bottomland forests when and where practical."
"…4) Monitor and control beaver activities when appropriate."
"…5) Maintain existing riparian areas when possible, leaving wide (at least 50m) forested buffers on each side of streams and wetlands during any future planned silvicultural activities."
"…6) Any forest alterations (e.g., cutting, burning) or disturbances (e.g., mowing) that are planned in the future should not occur during the breeding season (approximately 15 April to 15 August)."
"…7) Retain or encourage snags 25 cm dbh or greater."
"…8) Minimize the number, length, and width of any new roads in development plans."

"**Open Grassland and Early Successional Management:**
1) Protect and maintain current grassland and early successional habitats."
"…2) Expand sizes of current grassland and early successional areas."
"…3) Consider planting native grass and forb species in restoration efforts."

Subsequent PLS efforts (GBMc 2005, Sarraco et al. 2008, DCSEN-E 2012c) have not yielded additional avifaunal species but have allowed for a more robust assessment of ecosystem health and overall biodiversity. All existing avifaunal efforts should be further scrutinized for future planning and management purposes.

Several bird SOCCs have been on RMTC recorded during all of these efforts. Bachman's Sparrows, Loggerhead Shrikes, and Cerulean Warblers have all been observed during multiple efforts but have not been observed since the 2003 effort (only one Bachman's Sparrow was observed during the 2003 study and neither Loggerhead Shrike nor Cerulean Warbler during that effort). While Bald Eagles and Black-throated Green Warblers have been observed on the installation during some of these efforts neither species is known to nest or reside on the installation and so are not considered breeding residents on RMTC. Sharp-shinned Hawk, Cooper's Hawk, and Osprey have also been observed on several occasions.

## Fish

Only one fish PLS has specifically been conducted on RMTC (Harris and Rickett 1996). Other efforts examined fish in streams as part of an aquatic biota and water quality characterization (GBMc 2003, 2005a) or certain species of sport fish (Large-mouth Bass, Black Crappie, etc.). A total of 22 fish species have been described from RMTC.

## Terrestrial Invertebrates

The terrestrial invertebrates have not been extensively studied on RMTC. Formal efforts to examine terrestrial invertebrates at the installation focused on general community characterization rather than exhaustive taxonomic descriptions (Parsons 2003, GBMc

2006). While this focus gives a general assessment of ecosystem function and wildlife habitat it fails to account for biodiversity or SOCCs.

Additional efforts which have recorded species-level observations are not comprehensive and, therefore, do not relay specific population trends or habitat utilization information. These have included ancillary observations during surveys to identify the presence of the American Burying Beetle (Schnell and Hiott 1998), a state-level delineation of the Diana Fritillary Butterfly (Moran and Baldridge 2002) aquatic larval descriptions for water quality assessment (Rickett 1995), and field identification by local recreational enthusiasts (Raney et al. 2010).

There remains a substantial informational gap with regard to terrestrial invertebrate composition, distribution, and habitat utilization. Further investigation will be necessary to adequately make comprehensive management and planning decisions at RMTC with regard overall biodiversity, specific ecosystem function, and community-level interactions.

The terrestrial invertebrate SOCCs recorded at RMTC at present are the Diana Fritillary Butterfly, Ozark Emerald, and Byssus Skipper all characterized as globally vulnerable (G3 and G3G4). It is very likely other rare species would be identified with further effort.

## Aquatic Invertebrates

Aquatic macroinvertebrates were sampled in connection with the water quality studies conducted by Rickett (1995), Harris and Rickett (1996), and Rickett (1996). Seine and dip net sampling collected aquatic invertebrates representing 108 genera in 71 families. Seven (7) taxa were found at all sites, while 4 taxa were found at 7 of the 8 sites. Nineteen (19) taxa were found in all four streams, while 20 taxa were found in 3 of the 4 streams. Seven (7) taxa were collected during all sampling periods, while 56 were collected during only one series. Forty-seven (47) taxa were collected from only one stream, and 42 taxa were from only one site.

"The aquatic macroinvertebrates were surprisingly diverse but not especially abundant, except for the occasional dense pockets of animals at certain times during their annual growth cycles. Stream intermittency theoretically would not affect macroinvertebrates as much as fishes because of the shorter generation times and multiple reproductive efforts during the warmer months by macroinvertebrates" (Rickett 1996)

# Flora

## Vascular Plants

The vascular flora at RMTC has been inventoried specifically as part of the floral PLS (Foti et al. 1995) and the ITAM program (Emrick and Thompson 2003). To date 641 vascular plant species have been identified on the installation. Eight SOCCs have been recorded on the installation.

# Appendix J

# Species List

# Appendix K

# Integrated Invasive Species Management Program

# Invasive Plants

## Privet

Privet (*Ligustrum* spp.), are several species of invasive shrub/tree native to Europe, Asia, and Australia. These species alternative natural communities by forming dense shrub/understory layers that shade out most ground cover plants. They were brought into North America by humans for landscaping purposes, primarily as ornamental hedgerows. They have since escaped and naturalized in most of the Southeastern U.S.

Populations can become established in a variety of soil, hydrologic, and shade conditions, but tend to thrive along stream banks and or in floodplains. Large numbers of fruit are produced by each plant, and consumed by birds, which is the primary means of translocation. The prevailing method of control is through a combination of mechanical removal and chemical treatment, although prescribed fire may warrant exploration in concert with these two control methods.

# Invasive Animals

## Feral Hogs

Feral hogs (*Sus scrofa*), also known as wild pigs, are mammals native to Europe, Asia, and North Africa. This species includes numerous subspecies, both wild and domesticated. They were brought into North America by humans as long ago as 1650. They have since been reintroduced to North America numerous times primarily by intentional release for hunting or by accidental escape from domestic pig farms. Feral hogs are habitat generalist that can tolerate a wide range of climatic conditions.

Feral hogs have become a major problem at RMTC because of the rooting behavior used to dig up plant parts and animals that exist in the soil. This causes severe disturbance to soil and plant communities. Feral hogs will also consume bird eggs, nuts and seeds, insects, and other small animals. Additionally, feral hogs are prolific breeders and a single female can give birth to upwards of 25-30 young per year, depending on habitat and climatic conditions.

Increases in the frequency and number of hogs observed, capture rates, and other evidence of their presence (rooting, wallows, mud-rubs) indicate relatively rapid population growth on RMTC. All stakeholders agree that if left unchecked, feral hogs populations will negatively impact the ecology, public recreation, training capabilities, and integrity of cultural sites on RMTC.

Present efforts to control feral hog on the installation include: -baiting, capturing, and shooting by MDA/AR ARNG personnel -recreational/opportunistic hunting by the public -educational material distribution and information gathering by MDA/AR ARNG and AGFC personnel

## Imported Fire Ants

Imported fire ants (*Solenopsis invicta*, *Solenopsis richteri*, and their hybrids) are invasive insects accidently introduced from Argentina and Brazil through the seaport of Mobile, Alabama in the 1930's. Their venomous sting may cause an allergic reaction in hypersensitive individuals and/or lead to secondary infections. Fire ants also have a detrimental impact on native species because they are aggressive predators and generalist scavengers. They have been shown to outcompete native ant species to the point of local extirpation.

Currently, imported fire ants are treated on RMTC through chemical measures (predominately baits) on an "as needed" basis but BMPs have been created by the USDA, UACES, and ASPB to inform public and private landowners on ways to control current infestations and prevent spread through transfer of contaminated soil. Additionally, AR ARNG/MDA has partnered with UA Extension and the Little Air Force Base for a collaborative biological control project examining extant populations phorid flies (*Pseudacteon* spp.), which are parasitoids of imported fire ants, and conducting additional releases of phorid flies.

# Invasive Plants

## Privet

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# Appendix L

# Species of Conservation Concern

## Species of Conservation Concern Identified at Robinson Maneuver Training Center

| Scientific Name | Common Name | Conservation Status | Reference |
|---|---|---|---|
| **Vascular Plants** | | | |
| *Callirhoe bushii* | Bush's Poppymallow | G3 S3 | ANHC 2012 |
| *Eupatorium hyssopifolium var. hyssopifolium* | Hyssop-leaved Boneset | G5T5 S3 | ANHC 2012 |
| *Gymnopogon brevifolius* | Shortleaf Skeletongrass | G5 S2 | ANHC 2012 |
| *Krigia occidentalis* | Western Dwarf Dandelion | G5 S3 | Getz 1994 |
| *Nemastylis nuttallii* | Nuttall's Pleatleaf | G4 S2 | ANHC 2012 |
| *Piluria americana* | American Pillwort | G5 S2 | Getz 1994 |
| *Platanthera flava* | Southern Tubercled Orchid | G4 S2S3 | Getz 1994 |
| *Scleria pauciflora* | Fewflower Nutsedge | G5 S3 | ANHC 2012 |
| **Vertebrate Animals** | | | |
| *Accipiter cooperii* | Cooper's Hawk | G5 S1B, S3N | Wiedenfeld et al. 1999 |
| *Accipiter striatus* | Sharp-shinned Hawk | G5 S1S2B | Lohraff 1996 |
| *!Peucaea aestivalis* | Bachman's Sparrow | G3 S3B | Lohraff 1996 |
| **Corynorhinus rafinesquii* | Rafinesque's Big-eared Bat | G3G4 S3 | Pitts 1988 |
| *#Setophaga virens* | Black-throated Green Warbler | G5 S2B, S5N | Lohraff 1996 |
| *#Haliaeetus leucocephalus* | Bald Eagle | G4 S2B, S4N | Lohraff 1996 |
| *Macrochelys temminckii* | Alligator Snapping Turtle | G3G4 S3 | DCSEN-E 2012 |
| *Pandion halieaetus* | Osprey | G5 S1B, S4N | Lohraff 1996 |
| **Invertebrate Animals** | | | |
| *Problema byssus* | Byssus Skipper | G3G4 S1 | Raney et al. 2010 |
| *Utterbackia imbecillis* | Paper Pondshell | G5 S3 | ASU 2003 |
| *Somatochlora ozarkensis* | Ozark Emerald | G3 S1 | Rickett 1995 |
| *Speyeria diana* | Diana Fritillary Butterfly | G3G4 S2S3 | Moran, Baldridge 2002 |

GLOBAL RANK DEFINITIONS

Basic Rank:
G1 = Critically imperiled globally
G2 = Imperiled globally
G3 = Rare or uncommon
G4 = Widespread, abundant, and apparently secure, but with cause for long-term concern
G5 = Demonstrably widespread, abundant, and secure
G#G# = Numeric range rank: A range between two of the ranks that de range of uncertainty about the exact rarity of the species Sub rank:
T = Taxonomic subdivision (trinomial)

REFERENCES
See Appendix A in Robinson Maneuver Training Center Integrated Natural Resource Management Plan.

STATE (SUBNATION) RANK DEFINITIONS

S1 = Critically imperiled
S2 = Imperiled in the state
S3 = Rare or uncommon
S4 = Widespread, abundant, and apparently secure, but with cause for long-term concern
S5 = Demonstrably widespread, abundant, and secure
S#S# = Numeric range rank: A range between two of the ranks that denotes a range of uncertainty about the exact rarity of the species
SU = Possibly imperiled in the state, but status uncertain
SX = Extirpated, or nonbreeding in state.
S#B = Rank for avian species in breeding status
S#N = Rank for avian species in non-breeding status

! *P. aestivalis* has been observed on several occasions but has not been observed at RMTC since 2003.

* One *C. rafinesquii* was collected by Pitts and placed in the UALR museum; subsequent inventories have not recorded this species.

# *H. leucocephalus* and *S. virens* have been observed on RMTC on several occasion but nests have not been observed for these species.

# Appendix M

# Erosion and Sedimentation Control Program

# EROSION AND SEDIMENTATION CONTROL PROGRAM

## Regulatory Background for an Erosion Prevention Program such as LRAM

The Non-point Source Management Program of the Clean Water Act (CWA Section 319) addresses the issue of runoff pollution. It outlines Best Management Practices (BMP's) to prevent runoff from becoming polluted, and where it is polluted, to reduce the amount that reaches surface waters.

CWA Section 402 stipulates that construction sites disturbing five or more acres are considered point sources of pollution and require a National Pollutant Discharge Elimination System (NPDES) storm water permit.

CWA Section 404 permits also may be required for the following:

- Discharge of fill or dredge material, including incidental spillage from construction activities, into waters of the United States.
- Site development fill for residential, commercial, or recreational projects.
- Construction of revetments, groins, breakwaters, levees, dams, dikes, and weirs.
- Placement of riprap and road fills.

Further comments on activities affecting wetlands and Waters of the US are provided under the 'Wetlands' section of the INRMP.

## Erosion-Related Training and Road Issues

Landscape alterations from human activities such as training and roadwork is inevitable, especially when bivouac and field training exercises bring large numbers of troops to relatively small areas. Such damage, however, should not be permanent. It could be repaired by performing relatively minor maintenance such as grating and reseeding. Rest periods for certain areas may also need to be implemented. The length of the rest period should be based on the natural recovery rate for that site (e.g. rest the area for one growing season). "This would require opening up additional training and bivouac areas to replace those closed. Where training must be relatively continuous, efforts should be made to reasonably minimize damage" (COE 1996b, p. 6).

A listing of various types of training-related erosion that occurs on RMTC is given here:

- Vegetation loss resulting from soil compaction in Training Areas, especially at firing points and bivouac, assembly, and HQ areas.
- Silting of streams from runoff and associated damage to the aquatic ecosystem.
- Rutting and increased runoff erosion from unimproved roads and trails.
- Sheet runoff erosion from ditch overflow caused by speeded runoff when vegetation is removed along road and multiple access paths are created into wooded slopes.
- Speeded runoff erosion from unimpeded slope lengths, particularly along roads, and

inadequate ditch volume.
- Road damage from runoff overflow out of barren areas.
- Degradation of bivouac sites and roads during wet conditions.
- Increased erosion from use of highly erodible Training Areas during wet weather.
- Creation of scarred areas at shale pits and borrow areas, where erosive features result from rapid runoff.

**General Recommendations for Preventing Erosion at RMTC**

Specific recommendations are made in the RMTC EI&CP and LRAM Project Inventory & Planning Document in connection with each site studied and described. An overview of these recommendations is given here (separated from their specific context) as a guide to the kinds of actions that may be applicable to these RMTC sites and a range of others on the installation:

- Construct swales to reduce rate and amount of flow.
- Provide riprap protection.
- Provide necessary ditching (greater volume, wider cross-section).
- Fill in gullies with spoil material.
- Plant grass terraces or place sod along erosion gullies.
- Plant vegetation buffer strips around old borrow areas.
- Restore scarred landscape by shaping and sodding around old borrow areas.
- Provide corrugated metal culverts to facilitate drainage and direct runoff into existing drainage.
- Dry persistent mudholes by cutting drainage ditches to the down slope.
- Modify roadway to SB-2 (Lookout Tower Road), by adding stone subbase (Game &
- Fish Road), or by building up with rock fill (Access Road to Flat Rock Mountain).
- Provide stream-crossing structures for track vehicles to prevent turbidity increase.
- Construct hardened bivouac sites (over less erodible soils) for use in inclement weather and hardened access roads in TA's 10 and 12, to provide flexibility in scheduling and to allow environmentally stressed areas to recover before reuse.
- Provide gravel (or hardened) parking areas and access roads for firing points and bivouac, assembly, and HQ areas to prevent compaction, rutting, and other erosion problems.
- Reduce, restrict, or reschedule the use of specific training and bivouac sites and limit vehicle activity on unimproved roads during wet periods when erosion damage would be intensified. Schedule training at drier sites during periods of seasonal high water table and soil saturation. Damage-prone sites are primarily over Amy soils (which occur in level, poorly drained areas along floodplains and drainages) and some
- Leadville soils (where the perched seasonal water table may be at the surface to 1 foot below).
- Mechanically block and reopen fording sites during training exercises.

**Erosion Inventory and Control Plan (EI&CP)**

The EI&CP provides a description of 27 selected sites of erosion concern, including photos, soils information, and general recommendations. The sites were selected on recommendation from CJTR personnel and through a detailed reconnaissance by COE staff. The EI&CP provides a guide for erosion mediation requirements prioritized according to site size (acres), estimated cost, and Relative

Soil Loss Potential (RSLP)--a summary of soil runoff potential, primarily slope and cover, and soil erodibility at each site. Four color GIS coverages are included: General Soils, Soil Erodibility, Potential Soil Erosion Sites, and Environmentally Sensitive Areas.

The sites of concern are distributed over most of the installation. They are mostly 0.1-0.4 acres in size; only two are larger than one acre. A cluster of 8 sites lies near and north of the junction of Clinton Road and Clifton Road (TA's 8, 10, 11, 13), and 7 sites are along Engineers Road and Declination Road (TA's 5 and 17). "Many bivouac sites (or potential bivouac sites)" are found in TA 12, where (at some of them) deep rutting and mudholes result from vehicles driving from Loop Road to the actual site, but these sites are discussed in general. No significant erosion problems were noted in Training Areas 1, 2, 6, 7, 9, 19, 20, and 22. Evaluations were not made in the Small Arms Impact Area, the All-American Drop Zone, and the Mortar Artillery Impact Area.

**LRAM Project Inventory and Planning Document**

The LRAM Project Inventory & Planning Document identifies 38 potential erosion control projects on the installation (see Figure 4). These sites were prioritized using the same method found in the EI&CP. No significant erosion problems were noted in TA06-10, 13-15 or 19-22. The All-American Drop Zone and Mortar Artillery Impact Area were not evaluated. Erosion concerns were noted in TA01-05, 07, 11-12, 16-18, Small Arms Impact Area ranges and TAG Hill along Donovan Briley Avenue. Shale pits were also evaluated with erosion observed on two sites -an abandoned shale pit in TA03 known as ‘Tom’s Pond’ and an active shale pit in TA17 north of Range 19.

# Appendix N

# Wildlife and Fisheries Overview

**MEMORANDUM OF UNDERSTANDING**
**BETWEEN**
**ARKANSAS ARMY NATIONAL GUARD**
**ROBINSON MANEUVER TRAINING CENTER**
**AND**
**ARKANSAS GAME & FISH COMMISSION**

27 July 2017

SUBJECT: Memorandum of Understanding (MOU) Regarding the Use of Robinson Maneuver Training Center (RMTC) as a Wildlife Management Area (WMA)

1. Purpose. The purpose of this MOU is to outline provisions for portions of Camp Robinson to be managed cooperatively by the Arkansas Game and Fish Commission (AGFC) and RMTC as the Camp Robinson Wildlife Management Area (CRWMA). This MOU supersedes all previous agreements between the parties regarding the use of Camp Robinson as a WMA.

2. Reference. This MOU is entered into by the Arkansas Game and Fish Commission (AGFC) through its Director under authority of Amendment 35 of the Constitution of 1874 and the Arkansas Army National Guard (AR ARNG) through the Adjutant General of the State of Arkansas under authority of Arkansas Code Annotated Section 12-63-402.

3. Problem. The primary mission of RMTC is military training and all other utilization is secondary and must be compatible with this mission. Portions designated on RMTC as the AGFC CRWMA must integrate and not conflict with the primary mission. This MOU is designed to provide a basis to avoid conflicts and arrange the coordination for portions of RMTC to be used for wildlife management.

4. Scope. The area of RMTC covered under this MOU as the AGFC CRWMA consist of training areas 03 (North of POW Rd), 04, 05, 08, 09, 10, 11, 12, 13, 15, 16, 17, 18 and 19 (18,683 Acres, see enclosed Hunting Access Map). All other training areas and impact areas are off limits for public hunting and fishing or related activities. Roads and trails open to public vehicles are designated on the map, all other roads and trails are closed to the public, whether marked or not, gated or not. ATV's and UTV's are not authorized for use on RMTC. The only exceptions to this are emergency, law enforcement, and work related use specifically authorized by the Training Site Manager (TSM). ATV use must comply with AR ARNG regulations and policies.

5. Understandings.

a. Those forms of land and resource management that will benefit wildlife and the environment will be practiced as fully as practicable, in coordination with the requirements of training, security, and other uses. Opportunities for public hunting, fishing, and related activities will be provided as much as possible subject to security, staffing, funding, and training requirements. Trapping must be coordinated with Range Control.

b. The AR ARNG and the AGFC will cooperatively manage wildlife and fish (Federally listed Threatened & Endangered Species excepted) on RMTC in accordance with State and Federal Laws. [*Cooperative on fish management according to State and Federal laws*]

c. Primary responsibility for enforcing all state game and fish regulations on RMTC lies with AGFC. [*Game wardens enforce game laws on both public and private areas*]

d. The AR ARNG is the agency primarily responsible for determining the proper use of the CRWMA. The TSM will be the primary point of contact for all matters regarding the MOU. The Deputy Chief of Staff Engineering-Environmental Section (DCSEN-E) is a coordinating element for technical assistance. The TSM will coordinate information with other AR ARNG directorates as appropriate.

e. The AGFC will not release fish or wildlife, or plant any vegetation that may affect RMTC until an agreement is reached between AR ARNG and AGFC.

f. Input and recommendations from AR ARNG will be obtained prior to changing or setting wildlife and fish regulations that may affect RMTC. The AR ARNG comment period will coincide with normal comment period during the months of September and October (for wildlife) and March (for fisheries). In addition, AR ARNG will review and provide comments for each guidebook publication, as appropriate.

g. AGFC will provide technical advice concerning fish and wildlife population and habitat management. It will provide biological technical support to implement a fish and wildlife management program on RMTC.

h. AR ARNG and AGFC personnel assigned cooperative management responsibilities should receive orientation on appropriate objectives and policies from the RMTC TSM, DCSEN-E, AGFC Chief of Wildlife or Fisheries Division, or their designee.

i. The AGFC will cooperate with the RMTC Forestry Program and make every effort to protect forestry resources and coordinate AGFC activities that may affect forestry, such as clearing, prescribed burning, and flooding of timber.

j. Both agencies will cooperate in restoration and management of fish and wildlife resources on RMTC. Equipment, personnel, supplies, facilities, and other resources that are available may be mutually shared.

k. Both agencies will present a united approach to all parties about matters relating to wildlife and fish management.

l. Each provision of this memorandum of understanding is subject to the most current laws of the State of Arkansas and of the United States.

m. Nothing in this MOU shall be construed as obligating the AR ARNG or the AGFC to expend funds or to provide services that would interfere with the primary mission of either agency.

n. Close cooperation of AGFC, TSM, and AR ARNG personnel is necessary including prompt and complete exchanges of information in all matters such as law enforcement, game and fish stocking, predation control, game and fish surveys, emergency feeding, habitat improvement, public education, restoration areas, and studies.

o. A comprehensive Integrated Natural Resource Management Plan (INRMP) will be the guideline for management of natural resources on RMTC. The INRMP includes fisheries management, wildlife resources management, inventories, surveys, land management, and population management. The goal of the wildlife management program is to maintain the minimum healthy numbers of fish and game. An annual work plan will be developed in January and completed by March of each year to implement fisheries and wildlife management. Hunting and fishing regulations will be reviewed and published annually by AGFC in the current statewide regulation handbooks.

p. Authority to resolve differences related to this MOU shall lie with the TSM and the Director of AGFC.

q. AGFC revenue generated from permits, special licenses, or other receipts associated with the CRWMA will be used to offset costs of printing and distribution of permits, educational material, and goods and services, i.e. food plots, seed, fish, wildlife stocking, and law enforcement activities on RMTC. Law enforcement activities referenced here are specific to enforcement of this MOU, AGFC rules and regulations governing WMA activities on RMTC and any applicable laws that fall under the AGFC for enforcement.

6. Effective Date. This MOU becomes effective upon signature. All parties will conduct an annual review by 1 January each year and note any issues related to this MOU or modification needed to this MOU. Either party may propose amendments to this MOU to become effective upon approval by both parties. Unless terminated by written notice, this MOU will remain in effect for 5 years. Either party may terminate this MOU by providing written notice. The AR ARNG retains the right to suspend this MOU in the event of a national emergency and the area designated by this agreement is needed to fulfill the mission of the AR ARNG.

7. Points of Contact for the Memo are as follows

a. Arkansas National Guard Points of Contact:
   (1) Training Site Manager, RMTC, 501-212-5150
   (2) Post Operations, RMTC, 501-210-5234
   (3) Deputy Chief of Staff Engineering, RMTC, 501-212-5850
   (4) RMTC Public Safety 501-212-5280

b. Arkansas Game & Fish Commission Points of Contact:
   (1) Area Biologist, AGFC, 479-967-7577
   (2) Biologist Supervisor, AGFC, 877-967-7577 ext. 1361

SUBJECT: Memorandum of Understanding (MOU) Regarding the Use of Robinson Maneuver Training Center (RMTC) as a Wildlife Management Area (WMA)

JAMES H. TREECE reviewer
COL, NGB
USPFO for AR

10 Aug 17
DATE

JEFFERY D. WOOD reviewer
LTC, JA, AR ARNG
Staff Judge Advocate

9 Aug 17
DATE

CHIS L. RACEY reviewer
Chief Fisheries Division
AR Game and Fish Commission

9/19/17
DATE

BRAD J. GARNER reviewer
Chief Wildlife Division
AR Game and Fish Commission

9/18/17
DATE

MARK H. BERRY
Major General
The Adjutant General

14 Aug 17
DATE

JEFF W. CROW
Director
AR Game and Fish Commission

9/26/17
DATE

RMTA (200-3) 01 April 2000

**CANTONMENT AREA DEER MANAGEMENT PROGRAM (CADMP)**

**POLICY STATEMENT #2-2000**

**1. PURPOSE.** This Policy Statement sets forth the laws and restrictions for the Cantonment Area Deer Management Program (CADMP).

**2. SCOPE:** To establish policies and procedures for the development and control of the deer population with in the Camp Robinson Cantonment Area.

**3. CANTONMENT AREA DEER MANAGEMENT PROGRAM (CADMP).**

**a. Cantonment Area Deer Management Program (CADMP).** The Cantonment Area Deer Management Program (CADMP) has been developed to control the deer herd in selected areas of Camp Robinson. These selected areas include areas within the Camp Robinson Cantonment Area, training areas South of the Pipeline and the Small Arms Impact Areas. Because of the sensitive environment located in and around these areas, only full time employees working for the Arkansas Army National Guard or Camp Pike (State or Federal) will be allowed to participate in this program. For an individual to be eligible to participate in the CADMP, the following guidelines must be met:

(1) Must be a full time employee working for the Arkansas Army National Guard or Camp Pike (State or Federal).

(2) Must have a Sportsman's Pass. The passes will be issued starting 1 September 1 November. No Sportsman's Passes will be issued outside of these dates. Passes will be available at the Training Site Operations Section, Post Headquarters, (building 3130). All personnel requesting a pass will be accessed a biannual $10.00 Fee.

(3) Must have an authorized stamp (Red Stamp) on the Sportsman's Pass, which will be issued during the Annual CADMP Meeting in late September. This stamp will identify individuals who are members of the CADMP. The Cantonment Area Deer Management Program will be established using the guidelines and requirements set forth in the Arkansas Game & Fish Commission Regulations. Only active members of the Cantonment Area Deer Management Program will be allowed to hunt in training areas South of Pipeline and in the Cantonment Area. These hunts will be for archery only and will coincide with the archery season set forth by the AG&FC. Individuals will not be allowed to hunt within 100 yards of a main road or 300 yards of a permanent structure in the Cantonment Area. In addition to the archery hunts, a special Small Arms Impact/Cantonment Area hunt may be conducted annually to reduce the deer herd on and around the weapons ranges. This hunt will be for shotgun and muzzleloader only and will coincide with the dates set forth in the AG&FC Regulations for Central Arkansas, Zone 10. The Post Commander reserves the right to cancel these hunts and reopen the Small Arms Impact Area based training requirements. All participants in the program will be required to abide by all state and federal hunting laws, regulations and CADMP guidelines. Any participant found in violation of the rules, regulations and guidelines will be removed from the program for no less than 2 years starting at the date of the violation.

**b. Sign In and Game Check Station.** The only authorized Sign-in and Check Station for members of the Cantonment Area Deer Management Program (CADMP) is Range Control building 6953. Each individual will sign-in at Range Control on a daily bases for information pertaining to open and

# Appendix O
# Cultural Resources Overview

## Culture Resources at RMTC

Cultural resources identified at RMTC are historically important and need to be protected. A statewide ICRMP was prepared for RMTC and other state facilities in 2001 and revised in 2009. Cultural resources are any prehistoric or historic district, site, building, structure, or object significant in American history, architecture, archaeology, engineering, or culture and included in, or eligible for inclusion in the NRHP, including artifacts, records, and material remains related to such a property or resource. The statewide ICRMP should be consulted for detailed information and procedures for cultural resources management at RMTC. This plan addresses surveys, evaluations and protection of cultural resources at the installation.

On October 27, 1999, the DoD promulgated its *American Indian and Alaska Native Policy*, which emphasizes the importance of respecting and consulting with tribal governments on a government-to-government basis. The policy requires an assessment, through consultation, of the effects of proposed DoD actions that may have the potential to significantly affect protected tribal resources, tribal rights, and Indian lands before decisions are made by the services. Sensitive Native American cultural resources are defined by the most current DIBIA list of tribal entities published in the Federal Register pursuant to Section 104 of the Federally Recognized Indian Tribe List Act. Cultural resources are more fully discussed in the ICRMP and provisions of that document are expected to facilitate the protection of Native American Indian cultural sites from potentially disruptive DoD actions. The Caddo Tribe of Oklahoma, Cherokee Nation of Oklahoma, Osage Tribe of Oklahoma, Quapaw Tribe of Oklahoma, and Tunica-Biloxi Indians of Louisiana, Inc. are federally recognized Native American tribes that may have ancestral ties to RMTC. The tribes have been given an opportunity to review and comment on the updated INRMP (Appendices H and I).

While there had been several previous cultural resource surveys, including three intensive surveys (Stewart-Abernathy, 1980; Miller, 1992; Dunn, 1992; and Cobble, 1993), there had been only one Native American site location recorded for RMTC. Since that time, approximately 75 locations have been recorded on the installation. These can be divided into two categories; isolated finds which include a single or very limited number of artifacts and finds that include denser (or more extensive) clusters of artifacts. Isolated finds have consisted, with one exception, of broken tools or flakes from stone tool manufacture or maintenance. The one exception to this has been a single, grit-tempered potsherd found in a shovel test. Where clusters of artifacts have been identified, these include stone tool manufacture or maintenance debris and ceramics and, occasionally, fire-cracked rock.

Archeological sites within the boundary of RMTC thought to be eligible for the NRHP are at three locations (USACE LRD, 1992). The stone flakes and tools found at the site probably represent an Archaic Period occupation.

Implementation of INRMP objectives has no potential to adversely impact historic architectural resources at RMTC. Erosion control projects would be limited to areas that have been heavily used and previously disturbed. Therefore, these areas have a low potential for intact archaeological resources to be present. Nonetheless, potential impacts of ground disturbing activities will be evaluated on a case by case basis prior to implementation to ensure that impacts are avoided. Prior to implementing these activities, the area of potential effect will be evaluated to determine the potential for intact archaeological resources to be present. This evaluation will be based on the RMTC

ICRMP, findings of existing archaeological surveys, the level of previous disturbances, and the overall archaeological potential of the site (based on factors such as topography, soils, distance to water, etc.)

Goals of the ICRMP are to manage cultural resources using the applicable federal and state cultural resource laws and regulations to integrate these resources with training activities conducted at RMTC. Laws and regulations include the NHPA, Archaeological Resources Protection Act, Native American Graves Protection and Repatriation Act, American Indian Religious Freedom Act, EO 13007 (*Indian Sacred Sites*), and EO 13175 (*Consultation and Coordination with Indian Tribal Governments*). Procedures for inadvertent discovery can be found in the Standard Operating Procedures of the ICRMP. The ICRMP directs that cultural resources will be considered during the planning stage of all proposed undertakings. The ARNG Cultural Resources Manager will evaluate proposed ground disturbing activities to determine what NHPA Section 106 requirement will be needed (if any). If an inventory is required, the Cultural Resource Manager will indicate this requirement to the RMTC TSM.

Resources sites will be identified and evaluated for eligibility to the NRHP, and eligible properties will be managed in a manner consistent with the applicable standards and guidelines specified by the State Preservation Office, the Advisory Council on Historic Preservation, the DA, and the Secretary of the Interior.

# Appendix P

# Forest Resources Management Plan

# FOREST RESOURCES MANAGEMENT PLAN

## Forest Ecosystem Management

The Forest Resources Management Plan (FRMP) took effect at Robinson Maneuver Training Center (RMTC) in the year 2001 and will remain on file at the RMTC Deputy Chief of Staff Engineering-Environmental (DCSEN-E) office. The harvest schedule and other planning activities extend for a 25-year period from 2001 to 2026. The 25-year horizon will be broken into five 5-year management periods, which are appropriate to meet constantly changing circumstances, objectives, and policies. The FRMP will be rolled into the INRMP to streamline and centralize the planning efforts at RMTC. Therefore this INRMP update covers forest management planning from 2017 through 2022 and will be updated again at the five-year revision period. The DCSEN-E Forestry Division will maintain detailed maps and information on individual harvests.

At the beginning of each calendar year, the Forestry Division staff will prepare annual reviews of past accomplishments and plans for the coming year. These reviews and plans will be discussed with the RMTC Forestry Management Committee and affected RMTC entities to maintain coordination among all field operations and environmental activities. Thereafter, the Forestry Division will inform DCSEN-E and the RMTC Operations Offices if changes are necessary in the annual plans. The Forestry Division will also be responsible for preparing general 5-year plan revisions at the beginning of each 5-year period.

## Timber Management

The forests of RMTC are divided into management areas according to the existing training area boundaries demarcated by the Arkansas National Guard. The 27 training area boundaries are divided primarily on the basis of geographic features (roads, ridges, drainages, etc.). The individual stands within the training area boundaries are designated by the training area number, then a consecutively numbered stand number. The GPS code corresponds to stand classification codes used by the U.S. Forest Service and the Society of American Foresters. For example, the designation TA16-02-WHO represents a White Oak/Red Oak/Hickory stand type in the second stand in Training Area 16. To allow for clear communication with forestry contractors and timber buyers, the areas where a forestry activity is conducted will be dually designated using the Government Land Office (GLO) system for legally describing land (i.e. NE ¼, NW ¼, Section 12, Township 4 North, Range 12 West).

DCSEN-E Forestry Division is performing a complete forest inventory of RMTC as funds become available. A stand type map has been developed using current aerial photos and other spatial data. The stand type map is in a Geographic Information System (GIS) format that will enable computer assisted timber management.

Timber management at RMTC will primarily be concentrated on improving the overall health of forest ecosystems at RMTC. More intensive silvicultural activities will be practiced on the natural pine component and pine plantations. The existing natural pine stands and pine plantations will be selectively thinned to improve the overall vigor and health of the trees. The existing natural pine stands will be regenerated at the end of the stand rotation. The hardwood stand acreage exceeds pine stand acreage 30 to 1. Accordingly, the goal is to increase the acreage of pine to 5,000 total acres to achieve a better balance. Planting pine will be avoided in the very poorly drained (wetlands) for water protection, dry soils, and the soils with low fertility. RMTC has a comprehensive soils map in GIS format that was completed in 2006. The soils map will be used extensively to select fertile areas to plant for timber production. Open fields that are not in heavily used military training areas will be planted first. After the open fields are planted, other fertile areas will be harvested and planted with pine. Hardwood stands will be selectively thinned as needed to maintain the health of the stands. Oak trees will be planted in fertile bottomland/ upland areas that are suitable for hardwoods.

A forestry committee was formed at RMTC to provide guidance on forestry matters. The committee is composed of RMTC personnel including the Deputy Adjutant General (chairman), the Director of State Resources, the Range Control Officer, the Training Site Manager, the Environmental Section Chief, the Deputy Environmental Section Chief, and the Forester. Honorary committee members include representatives from the Arkansas Forestry Commission and the Arkansas Game & Fish Commission. The committee voted to allocate 80% of timber revenue to support the forestry program. The remaining 20% is designated for discretionary use to fund projects needed at RMTC.

**Desired Future Conditions**

The general goals and objectives of this plan will be based on current stand structure and the comprehensive forest inventory. The comprehensive forest inventory will be completed as funding permits. Intermediate inventories will be conducted as necessary to facilitate planning. A view of the RMTC forest projected 25 years into the future would show a landscape under ecosystem management, with forest cover types appropriate to natural habitat conditions. All river, lake, and creek systems will be surrounded by functioning riparian zones, continuous throughout a watershed and connected to other watersheds by mixed species corridors. Best Management Practices (BMP) zones will be a major component of this plan for meeting the objective of soil conservation and watershed protection (see Section X.X).

Pinelands and better-drained uplands will be a mosaic of mature natural pine stands, mixed hardwood stands, and pine plantations. The bottomlands will consist of mixed hardwood stands spotted with oak plantations. Oaks will be planted to reforest open areas in the bottomlands. In order to enhance aesthetics, all plantation boundaries will be nonlinear to fit

the landscape (not block shaped). Xeric/poor soils will include shortleaf pine stands, upland oak stands, and mixed hardwood stands critical for wildlife and rare species habitat. Currently, these soils are occupied predominantly by mixed hardwood stands. However, in the event of natural disasters (such as fires or tornadoes), these habitats will be reforested with upland oak or pine. The inundated soils will primarily be occupied by bald cypress and water tupelo. Since soils inundated by water present severe operational hurdles, the extremely wet areas will be left undisturbed and the natural progress of stand succession will be allowed to run its course. Fire will be regularly used throughout the RMTC to reduce fuels and control vegetation (section X.X contains details on RMTC fire management). The result is that the majority of RMTC forestland will be composed of intermediate to mature trees with an open understory.

Complete harvesting may be employed in mature or under stocked pine stands and will be followed by silvicultural operations to ensure expeditious reforestation of each site. Natural regeneration or artificial regeneration will be used in mature natural pine stands. Natural regeneration will be utilized within hardwood stands stocked with the desirable hardwood species. Areas that are damaged as a result of military training, wildfire, disease, or high winds will be reforested. Other areas that have inadequate stocking of merchantable trees, such as overgrown fields, will also be reforested.

**General Scenarios by Soil Conditions and Timber Type**

The areas normally inundated with water (wetlands) will only be managed for protection of water resources and wildlife that occupies those ecosystems. At the other end of the soil moisture gradient, xeric sites will also be managed to meet only specific wildlife and military objectives. Sites with poor soil fertility will be managed similarly to xeric sites. In the wetlands, xeric, poor soil fertility sites silvicultural activities will be limited to meeting only wildlife and military objectives. Prescribed fires will be conducted in xeric areas on a 5 or 7-year cycle as per the RMTC Fire Management Plan to reduce organic fuel loads. In the event of natural disasters (such as fires or tornadoes), the xeric habitats will be reforested with upland oaks or shortleaf pine.

For reforestation of xeric and poor soil fertility sites after a natural disaster, fire, herbicide or mechanical operations may be used for site preparation if needed. Bare root seedlings will be planted during January-March time frame using hand or machine planting techniques. Harvests in the reforested sites will only be conducted to maintain stand vigor and protect the stands from disease. The harvests will supplement revenue from timber management conducted on sites that fall between the soil drainage extremes.

On all other fertile sites that fall between the two soils drainage extremes, forest management will follow two main strategies. Stands with desirable merchantable species that are predominately of natural origin will be maintained with natural or artificial regeneration.

Open sites or sites that can be improved with more merchantable species will be harvested (if applicable) and planted. Whether stands are natural or planted, the sites with hardwoods will be gradually converted to uneven-age management and sites with pine will be managed using even- age techniques. Uneven-age management will have cutting cycles of approximately 20 years. Stand density will be maintained at basal areas between 40 and 70 square feet per acre. Even- age management will have a rotation length of 30 years or less (depending on soil fertility and silvicultural intensity). Stand density after intermediate selective harvests will be between 70 and 90 square feet per acre depending on site quality with the better quality sites carrying a higher basal area (square feet per acre). Selective harvests will be timed to maximize growth. Even-age management pine plantations may be completely harvested and planted with genetically improved seedlings at the end of the rotation. In all other stands, natural regeneration techniques may be used. Prescribed fires will be used on 5 or 7-year cycles depending on the RMTC fire management schedule or as necessary for specific management objectives. Uneven- age stands, with regeneration that will be merchantable in the future, will be protected from fire until the trees can withstand a low intensity prescribed fire.

Only trees native to RMTC will be planted. Shortleaf pine will be the species of choice in most plantations because of rapid growth rates. In areas suitable for planting hardwoods red oaks (particular species dependent upon site conditions) will be the species of choice because of mast production and merchantable value. On xeric sites and sites with poor soils, shortleaf pine and site suitable oaks will be favored for planting because of heartiness and disease resistance. Silvicultural operations will include, on a site specific basis: complete harvesting, transition harvesting, aerial/ground herbicide site prep, shearing, raking, prescribed fire, plowing, bedding, banded ground herbicide applications, machine or hand planting, aerial/ground herbicide release from competition, early/mid-rotation fertilization, and selective harvests. These operations are practiced in Arkansas and are cost-effective with proper prescriptions. Complete harvesting results in more rapid plantation establishment and early growth than other silvicultural regeneration methods. This rapid growth and higher yield, in turn, allows the desired level of timber production to be accomplished on less area. Natural stands can therefore occupy a larger area, which will boost public confidence.

**Plantation Silviculture**

Plantations are a widely accepted forest management option for revenue generation, especially when local markets are characterized by high demands for logs and pulpwood. Current technologies for plantation silviculture in the southern United States have been widely studied and well documented to their contribution to plantation success, sustainability, and cost effectiveness. Many plantations in the South are in the third or fourth generation of plantings since the original forests were cleared. Key components of this silviculture technology include: genetically improved planting stock, nursery culture of robust seedlings, site preparation that focuses on improving site constraints rather than creating additional problems and cultural treatments that improve growth in established stands.

Herbicide and pesticide usage at RTMC will be kept to a minimum. Herbicide will be used in some cases, such as cleared land. Cleared land is capable of rapid resprouting of herbaceous and woody vegetation. Repeated studies have demonstrated that controlling this vegetation with aerial/ground applications of herbicide will decrease stand rotation ages by three to five years, or produce larger trees at a given rotation age, and will usually result in more complete stand stocking through better survival than if not controlled. The herbicides used for this purpose (hexazinone, glyphosate, imazapyr, sulfometuron methyl, triclopyr) act in plants on metabolic pathways that are specific to plants and not animals, and have much lower toxicity than herbicides used in the past. Their effects on the environment and vegetation have been thoroughly studied and are documented in an Environmental Impact Statement concerning their use in forestry in the southern United States (USDA Forest Service, Southern Region, 1989). Herbicides will probably be used no more than two times during a 30-year plantation rotation.

The early growth response promoted by good site preparation is also enhanced by planting genetically improved seedlings with large stem diameters and fibrous root systems. The genetically improved seedlings offer additional benefits for long rotation trees that will be sold as saw timber. One of the first traits subjected to genetic improvement was stem straightness, an important factor in the value of trees sold for lumber, veneer, or poles. In addition to straightness, genetic improvements also include disease resistance and growth rates.

In plantations grown with long rotations for the production of high value solid wood products, mid-rotation cultural treatments will increase growth rates and allow intermediate generation of revenue. Thinning dense stands will not only produce saleable timber, but will concentrate nutrients/water on residual trees. The growing space for residual trees will also be increased. Subsequent prescribed burning and fertilization will enhance foliage and wood production. Combinations of nitrogen and phosphorus fertilizers have proven to be the best supplement to early- and mid-rotation pine stands. Since fertilizer applications will be outside SMZ's there should not be any negative effects on water basins. On the other hand, the increased growth

of understory vegetation that follows fertilization should have a number of positive effects on forage availability and quality for wildlife.

**Nonnative Invasive Plants**

In recent years, an invasion of nonnative plants into forests has become a problem. These plants erode forest productivity, hinder forest use and management activities, and erode forest diversity and wildlife habitat. Some of these plants were introduced accidently, but most were initially brought here as ornamentals for landscaping or for livestock forage.

For this reason, any plants to be planted on any site on RMTC should be native to RMTC or for landscaping purposes noninvasive or sterile cultivar species may be used. Examples of plants that should **NOT** be planted are: Bradford Pear (Callery Pear), Privet, Mimosa (Silktree), Autumn Olive, Japanese Honeysuckle, Chinaberry, Nonnative Wisterias, etc. A reference for invasive plants that should be avoided is ***A Field Guide for the Identification of Invasive Plants in Southern Forests.*** It ***can*** be found at: http://www.srs.fs.fed.us/pubs/gtr/gtr_srs119.pdf . All plans for planting any plant material should be reviewed and approved by the DCSEN-E Forestry and Natural Resources Divisions.

**Effects of Forest Management**

Forest management has been broken down into 24 activities that impact natural resources. These are divided into four major categories: harvesting, site preparation, fire, and fence lines/firebreaks.

**Harvesting-**Potential for soil erosion is always associated with harvesting activities, but can be kept to a minimum provided that slopes and stream areas are avoided, as described in Best Management Practices Guidelines for Silviculture (Arkansas Forestry Commission). Harvesting particular areas may cause changes in species composition and density that affect other species, and will be examined on a site-specific basis as it applies to the overall landscape. Management will be by selective harvesting and complete harvesting. Complete harvesting would be an appropriate harvest method when stands have surpassed maturity and are in decline as well as when stands are under stocked with site specific appropriate species.

**Site Preparation**-Soil erosion is also associated with site preparation and planting on slopes and stream areas. These areas will be avoided as described in Best Management Practices Guidelines for Silviculture (Arkansas Forestry Commission). Changes in species composition do occur where mechanical site preparation is practiced, and may occur with planting and fertilization, therefore, the overall effect of other species in the landscape will be considered when selecting site preparation methods.

**Prescribed Fire**-Prescribed burning will increase diversity and species dominance according to frequency and season of the fire. Fire also provides a more open understory that benefits training activities.

**Fence Lines and Firebreaks**-Disking and mowing fence lines may increase diversity and provide wildlife habitat if properly managed. The timing and depth of cut should be correlated with needs of affected species.

Firebreaks, specifically fire plow lines, have been used aggressively and can lead to degradation of the landscape, where natural firebreaks such as creeks and wetlands occur. Wetland firebreaks cause an unnatural, abrupt edge effect as well as altering hydrology and encouraging exotic and less desirable species encroachment. When fire plow lines must be used, re-work harrowing will lessen the impact to the landscape. Fires should not be routinely suppressed in all wetlands. Rather they should be allowed to intrude naturally into those wetlands lacking muck, peat, or other organic soils, and suppressed in those that have these organic deposits. Fire can consume dry organic soils, and the fire may smolder for months causing a smoke management problem in violation of the Clean Air Act.

**Guidelines for Forest Management**

- Implement Best Management Practices Guidelines for Silviculture (Arkansas Forestry Commission) during all forestry operations.
- Complete harvests in individual stands will be limited to a maximum size of 100 acres in almost all situations. Where stands (both individual and composite) are larger than 100 acres, they will be either subdivided into smaller cutting units by leaving residual buffer strips between cutting units, or they will be split into smaller units for harvesting, with separate units cut at the beginning and end of the designated 5-year period.
- Forest management will be designed to enhance training. Conflicts between forestry activities and training activities will be prevented by yearly coordination to properly integrate both activities. If conflicts cannot be resolved, training activities will take precedence.
- Create connections or linkages between isolated wooded areas using riparian corridors, shelterbelts, and planting trees in open areas surrounding forest patches.
- Minimize permanent clearings within existing large forest patches, and locate roads where they will not disconnect adjacent tracts of forest or impact riparian zones and streams.
- Integration of forestry practices to improve training, recreation, and hunting activities on RMTC.

# Appendix Q

# Wildland Fire Management Plan

**WILDLAND FIRE MANAGEMENT PLAN**

# Robinson Maneuver Training Center
# Fire Management Plan

## Table of Contents

## 1. Fire Management Purpose

Fire Management is an essential element to the mission of Robinson Maneuver Training Center (RMTC). The primary objective is to allow military training to be conducted without the threat of wildfire, to facilitate troop movement, and to control vegetation.

If left undisturbed, areas throughout RMTC will accumulate fuels. Fuels include grass, leaves, brush, and trees. After fuels have accumulated, a hazardous condition exists during dry months of the year. Fuels can be ignited accidentally or purposely set by arsonists. Most wildfires at RMTC are ignited as a result of routine military training operations. The two tools for prevention of wildfire are prescribed fires and fire lines. While the primary objective is to support military training, prescribed fires should be scheduled whenever feasible to protect and enhance natural/cultural resources.

The purpose of this document is to provide guidance for prevention/control of wildfire and prescribed fires to support the mission of Robinson Maneuver Training Center. The organizational structure and procedures will be discussed in detail.

## 2. Organization and Responsibilities

The RMTC Forestry Management Board was organized to provide oversight to the RMTC Forestry Program, to set forestry goals, and to determine the overall values that must be met to have a successful forestry program on RMTC. As a part of that oversight the board will administer the RMTC fire management program. The Board consists of representatives from

the Office of The Adjutant General, Maneuver Training Center -Manager (RMTC-TSM), Range Control, Deputy Chief of Staff-Environmental, with the Arkansas Game & Fish Commission and Arkansas Forestry Commission serving as honorary members. When fire management is to be discussed the RMTC Fire Department will also be invited. The Board's purpose in administering the RMTC fire management program will be to formulate procedures/policy for wildfire prevention/control & prescribed fires. The Board will then schedule activities. Meetings will be held twice annually to coordinate/schedule wildfire prevention and prescribed fire activity as well as other forestry activities. The individual roles and responsibilities, in relation to fire management, are given below.

The Robinson Maneuver Training Center – Training Site Manager (RMTC-TSM) is the overall authority for fire management. RMTC-TSM will ensure that Range Control and the Installation Support Unit maintain or establish permanent (strategic) fire lines around and within RMTC. RMTC-TSM will approve prescribed fire burn plans to ensure that the plans have been properly reviewed by the appropriate personnel. The Office of The Adjutant General representative acts as the chairman for the Board meetings. Range Control and/or DCSEN-E are responsible for executing prescribed fires and fire lines. Prior to prescribed fires, Range Control and/or DCSEN-E will ensure that fire lines are maintained or established around the area to be burned. The RMTC Fire Department is responsible for wildfire control and arson investigation. In accordance with RMTC Post Regulation 420-90, the RMTC Fire Department has been delegated the authority to determine when conditions are safe to conduct a prescribed fire. Once RMTC-OPS approves the prescribed fire burn plan, RMTC Fire Department must be contacted for approval prior to ignition. The Deputy Chief of Staff-Environmental (DCSEN-E) acts as the recorder for the Board meetings. DCSEN-E is responsible for fire management plans. The Arkansas Game and Fish Commission is responsible for providing guidance on wildlife issues pertaining to fire management. The Arkansas Forestry Commission is responsible for providing guidance on forestry issues pertaining to fire management. The above Board members with operational responsibilities are required to secure/maintain equipment necessary

to perform the task. DCSEN-E will supplement with available equipment and manpower.

## 3. Prescribed Fire

### 3.1 Purpose

Prescribed fire reduces the amount of fuel that can potentially burn and create a wildfire. If areas are burned in a controlled situation prior to the dry months, there will be little fuel available for wildfires. These prescribed fires can be scheduled on a regular basis to control fuel buildup. Prescribed fire has many other benefits. Vegetation that has grown up in training operations areas makes maneuvers and bivouac difficult or impossible. Prescribed fire would eliminate or reduce the unwanted vegetation. Ticks and other pests are greatly reduced by prescribed fires. Trees grow faster when competing vegetation is burned. The nutrients and sunlight are concentrated on the trees because they are not shared with competing vegetation. Burning allows new vegetation to be initiated. The new vegetation provides essential food and shelter for many wildlife species.

### 3.2 Strategy

High-risk areas must be burned first. High-risk areas are defined as areas with a large amount of fuel buildup and/or areas with the greatest amount of activity that causes ignition. Lower-risk areas may be burned after the high-risk areas. Areas with a forest and/or wildlife management objective or areas with a specific training need will be burned after the high-risk areas are burned.

### 3.3 Fuels

Fuels are made up of the various components of vegetation, live and dead, that occur on a site. The collective properties of various fuel types have become known as fuel models and can be organized into four groups: grass, shrub, timber, and logging slash. See Anderson (1982) for a review of the 13 fuel models used to predict fire behavior. The fuel models that best describe

the fuels at RMTC are 1 (short grass), 2 (timber-grass and understory), 6 (dormant brush), 8 (closed timber litter), 9 (hardwood litter), and 11 (light logging slash). The training ranges and open, grass-dominated areas are best described by fuel models 1 and 2. Overgrown fields that are dominated by native mixed shrubland are best described by fuel model 6. The mature pine-dominated woodlands are best described by fuel model 8, whereas, the Pine Plantations, Oak-Gum and Oak-Hickory dominated woodlands are best described by fuel model 9. The selectively thinned pine stands are represented by model 11. The majority of prescribed burning will take place in fuel models 1, 2, and 9. See Section 3.7 for general prescription guidelines on each fuel model.

### 3.4 Fire Windows

Prescribed fires should be done during specific time frames to protect wildlife while rearing their young and not to interfere with deer hunting seasons. The windows for conducting prescribed fires are the middle of July to the middle of April. Prescribed fires should not be conducted from the middle of April until the middle of July to protect wildlife during nesting activity. Accordingly, fires should not be conducted during and around established hunting dates during November so as not to interfere with deer hunting. Due to varying training and wildlife requirements, prescribed burns may be conducted outside the windows described above. However, effort should be made to adhere to the windows if at all possible.

### 3.5 Situations to Avoid

Prescribed fires will not be conducted at any time when unfavorable fire or smoke conditions exist. Unfavorable fire conditions are defined as a relative humidity $\leq$ 25%, wind speed at surface > 15 mph, and/or a probability of ignition $\geq$ 80% (see NWCG Fire line Handbook Appendix B Fire Behavior for probability of ignition calculations). Unfavorable smoke conditions are defined as a Smoke Category Day of 1 or 5. The Smoke Category Day is an Arkansas Forestry Commission (AFC) category system. Call AFC for current Smoke Category Day prior to burning. Refer to Arkansas Voluntary Smoke Management Guidelines for an explanation of the Smoke Category Day. Even though an area may have been recently burned to reduce fuels,

conducting training activity that is known to cause ignition during a burn ban is dangerous. Prescribed fires should not be conducted in areas with juvenile pine plantations/hardwood regeneration, trees marked for a timber sale, areas of cultural significance, or rare species (Margaretta Oak trees located on south aspect of Clifton Mountain in TA-8).

### 3.6 Planning and Preparation

A qualified burn boss will be responsible for conducting prescribed fires. The burn boss will bean employee of TSM or DCSEN-E and should be certified as a burn boss either by The Nature Conservancy or other appropriate agency. It is recommended that at least three personnel be qualified as a burn boss. This will provide backup in case of turnover or illness and allow others to check burn plans. The burn boss will determine if conditions are acceptable for burning and will conduct the prescribed burn according to the guidelines in Appendix A. Prescribed fires may also be conducted by the Arkansas Forestry Commission, Arkansas Game & Fish, or other qualified contractors. All prescribed fires will be conducted according to the guidelines in this document.

The Forestry Management Board will approve or schedule prescribed fires. In some cases, fires will be proposed for areas that are not covered in the general fire schedule (see Section 3.8).The proponent will present the fire location and objective to the committee. Once an area is scheduled for a prescribed fire, the burn boss is responsible for carrying out the scheduled fires. If the fire was scheduled involving a proponent, it is the proponent's responsibility to make sure that the burn boss has the necessary information to execute the fire and to ensure that the fire is executed by monitoring the progress. The burn boss will prepare a written prescribed fire burn plan for each fire executed (see Appendix A). The burn plan will be reviewed by the proponent (if there is one), DCSEN-E, RMTC Installation Wildland Fire Manager, the RMTC Fire Department, the Range Control Officer, and RMTC-OPS. Final approval will be made by RMTC-TSM. Reviews are a necessary component to ensure all involved are aware of the details of the fire to be executed. When the burn plan is circulated, two weeks will be allowed for review and comments. Reviewed burn plan will be given to RMTC-TSM for final approval. In accordance with RMTC Post Regulation 420-90, the RMTC Fire Department has been delegated the authority to determine when conditions are safe to conduct a prescribed fire.

Once RMTC-TSM has approved the prescribed fire burn plan, RMTC Fire Department must be contacted for approval prior to ignition.

Preparation must be made well in advance of the fire. Fire lines must be maintained /established around the area to be burned. Advanced preparation will allow the prescribed fire to be conducted when the weather conditions are suitable. The burn boss will monitor weather conditions and forecasts one week prior to the burn window to anticipate when the prescribed fire can be conducted. The burn boss will contact Range Control prior to the prescribed fire to ensure the fire does not conflict with training events. The burn boss and crews should be given flexibility in their work schedule to permit them to cease other planned activities and conduct the prescribed fire when the conditions present the opportunity. Usually the burn boss will know several days to a week in advance when conditions will be suitable. If a prescribed fire is attempted during unfavorable conditions, the fire will be ineffective or hazardous.

### 3.7 General Prescription Guidelines

Actual burn prescriptions for each training area will be dictated by factors including training objectives, forest/wildlife management objectives, fuel load, smoke management constraints, and proximity of neighbors. The following can be used for general guidelines for burning at RMTC. These guidelines are intended to assist in preparation of prescriptions and burn plans for individual training areas.

### 3.8 Schedule

The RMTC Forestry Management Board will meet twice each year to schedule prescribed fires for the next window that follows the meeting. When the committee meets, the schedule will be made for the following prescribed fire window. The schedule will be included with the fire management plan as an attachment. The previous fire activity, equipment/manpower status, upcoming training/forestry/wildlife events, and fires to be executed in the window immediately following the meeting will be discussed.

The Mortar Impact Area and the Psyam DZ, Demo Range, & Adjacent Area (700 acres) will be burned every year if fuel loading will carry the fire. If fuels permit, the firing ranges in the Small Arms Impact Area will be burned annually and Ranges 16 & 19 will be burned twice a year. The areas immediately surrounding firing points can be burned as use requires. The remaining training areas will be burned on a seven-year rotation. Prescribed fires for forestry and wildlife purposes will be scheduled based on specific objectives and will not necessarily beat regular intervals. Table 2 shows the schedule for prescribed burns.

### 3.9 Smoke Management

Any populated or thoroughfare area within ½ mile of a burn unit (either downwind or down drainage) are considered to be critical smoke-sensitive areas. To the east of RMTC, the Cato Community, Gibson Community, North Little Rock, Sherwood, and Sylvan Hills are the commercial/residential areas most likely to be affected. Particularly sensitive areas are the North Little Rock Airport, Sylvan Hills High School, Remount Road, and Batesville-Pike Road. Burning in the Small Arm Impact Area – Interior could cause smoke to accumulate in the Miles and Woodruff Creek drainages. Where the creeks cross Batesville-Pike are likely to have smoke obscuring visibility in the early morning, the day after the burn. To the south is the RMTC Cantonment area. Particularly sensitive areas are the Army Aviation Support Facility (AASF) and the youth training centers. To the west are the Blue Hill, Mayflower, Morgan, and Oak Grove communities. When burning TA-4 smoke could accumulate in the Winifree Creek drainage and irritate people in the nearby housing development. When burning in TA-2 & 3, smoke may settle in the Newton Creek drainage and potentially inundate the Oak Grove

community.

When burning within ½ mile of the critical smoke-sensitive areas, do not conduct a burn when the areas are directly downwind of the burn. Burn when the lifting (mixing height) is greater than 1,700 feet and the Smoke Category Day is 3 or 4. Visibility on roads should be kept to California Highway Patrol Minimum Acceptable Visibility (MAV; used by the Nature Conservancy). The MAV for city/community roads is 535 feet during the day or 1,070 feet at night. The MAV for Highway 89 and Batesville-Pike Road would be 800 feet in the daytime or 1,600 feet at night. A crew member should be available to check major roads for smoke. While participating on prescribed burns, crew members are exposed to a number of toxins present in smoke, for example, carbon monoxide, total suspended particulates, aldehydes, and benzene. The level of exposure varies, depending on the position of the crew member on the burn, the degree of physical exertion, the type and amount of fuel burning, and weather conditions. Symptoms of overexposure to one or more of these compounds include: Headaches, nausea, vomiting, impaired judgment, slowed reaction time, and irritation of eyes, nose, or throat. Crew members who experience symptoms of over exposure to smoke should inform the burn boss immediately. The burn boss will assist the crew member in getting out of that position on the fire line and in getting them first aid if needed.

**3.10 Weather Monitoring**

Weather will be monitored one week prior to the burn window. The National Weather Service forecast will be monitored the day of the burn and a fire weather or spot weather forecast will be obtained from the National Weather Service when available. Information on the transport winds throughout the state, both surface and aloft can be obtained from the National Weather Service. For current fire weather information look on the National Weather Service internet web-site at http://www.srh.noaa.gov/lzk/wxs3.php?pil=PFW For a fire weather brief from National Weather Service personnel call (501) 834-0308. The Arkansas Forestry Commission should be contacted for any weather or fire danger advisories.

On site weather will be monitored with a Kestrel Pocket Weather Meter or a belt weather kit, which contains a psychrometer, anemometer, and compass, beginning one hour before ignition

and continuing at one hour intervals or as conditions require until mop-up is completed. Weather and fire behavior observations can be entered onto a form similar to the one in Appendix A. Burn Day Checklist.

### 3.11 Notification

The following agencies or individuals are to be notified before each burn:

LOCAL LAW ENFORCEMENT:

Arkansas Game and Fish Commission Enforcement Division 877-470-3650
After working hours and weekends, call RMTC Fire Dept. and they will contact by radio.

| | |
|---|---|
| Faulkner County Sheriff | 501-450-4914 |
| Mayflower Police Department | 501-470-1000 |
| North Little Rock Police Department | 501-758-1234 |
| Pulaski County Sheriff | 501-340-6963 |
| Sherwood Police Department | 501-835-1425 |

FIRE DEPARTMENT:

| | |
|---|---|
| Cato Volunteer Fire Department | 501-538-4232 |
| Mayflower Fire Department | 501-470-1200 |
| North Little Rock Fire Department | 501-340-5377/501-771-1800 Dispatch |
| Oak Grove Volunteer Fire Department | 501-454-6469 |
| RMTC Fire Department | 501-212-5281 |
| Sherwood Fire Department | 501-835-0342 |

RMTC

| | |
|---|---|
| Safety Office | 501-212-5092 |
| Public Affairs | 501-212-5020 |
| Aviation | 501-212-5667 |
| Range Control RMTC-TSM | 501-212-5218 |
| DCSAVN | 501-212-5150 |
| OTHER OFFICIALS: | 501-212-5667 |
| Arkansas Dept. of Environmental Quality – Air Division | 501-682-0730 |

OTHER OFFICIALS

| | |
|---|---|
| Arkansas Dept. of Environmental Quality – Air Division | 501-682-0730 |
| Arkansas Forestry Commission (Legal Description, Fuel Tons, POC #) | 800-830-8015 |
| Pulaski Office of Emergency Management | 501-340-6963 |

The public will be notified in advance of each burn in their area. The Public Affairs Office (PAO) will notify the public along with notification of RMTC employees through the Daily Guard. In addition, RMTC will get advanced notice of any adverse public reaction and be made aware of special problems, such as respiratory ailments, washday, etc. Advanced notice can also be published in the Arkansas Democrat-Gazette or through public radio broadcasts by the PAO.

### 3.12 Personnel Organization

A typical burn is usually accomplished by a minimum of four persons: 1) The burn boss, 2) igniter, 3) igniter/holder, and 4) the dozer operator. For fires involving more than 80 acres or heavy vegetation, additional crews are needed. These crews will be directed by a crew leader and consist of a smoke spotter (weather person), and holders.

The **burn boss** usually writes the burn prescription for the unit to be burned, directs the prescribed fire operations, directs the pattern of ignition, and coordinates fire suppression activity. The burn boss completes a crew briefing and makes crew assignments; stays in close communication with crew leaders and smoke spotters (weather persons) (on larger burns);adjusts the planned ignition pattern if needed; is constantly aware of the status of the fire.

The **igniter** carries the drip torch. Typically the igniter is the first crew person along the fire line. The goal of the igniter is to create an even ignition-front along the fire line quickly and efficiently. The igniter is responsible for igniting along the fire line as directed by the burn boss or crew leader, insuring that fire lines are secure at ignition point, keeping a lookout for upcoming hazards along the planned ignition line, and constantly checking for spot-overs. The igniter needs to conserve drip torch fuel as much as possible commensurate with good ignition; keep crew leader or burn boss informed of status of torch fuel, and know where extra torch fuel is located (always inform crew leader or burn boss when torch is ¾ empty); ignite exactly along fire breaks unless conditions cause crew leader or burn boss to indicate otherwise; always be aware of fire behavior at ignition point and call attention to any rapid or unexpected changes in fire behavior; make sure that flaming fuel is not dripped outside of the unit or on self; and insure that the drip torch is extinguished and securely upright when not in use.

The **igniter/holder** serves as the last person on the ignition crew and may be equipped with a water pack and/or rake or flapper. The igniter/holder is responsible for insuring that all smoldering fuels along the line are fully extinguished and that there are no potential perimeter threats, such as burning snags along the line. The igniter/holder needs to patrol the line back to the starting point, for escapes outside of the unit (often this crew member is most out of the smoke and in the best condition to see escapes, lofted firebrands, or spot-overs); walks off the

fire line and outside the burn unit to check for spot-overs; constantly be aware of conditions up the line and be ready to assist with suppression when requested; conserve water as much as possible and be aware of tank status (inform crew leader or burn boss when tank is 2/3 empty and know where extra water is available). On small burns (80 acres or less), the igniter/holder will perform the duties of the holder (see holder duties below).

The **dozer operator** mans a small bulldozer. The dozer operator is responsible for preventing spot-overs and escapes from becoming a wildfire. The dozer operator will use the bulldozer to assist the igniter/holder when there are perimeter threats. The dozer operator will be on hand to extinguish a test fire if conditions are not favorable for the burn. The dozer operator must be on standby to respond immediately and not be occupied with any other fire tasks.

On prescribed fires greater than 80 acres or with heavy vegetation, the burn boss will deploy more manpower. Along with additional igniters and igniter/holders, crew leaders, a smoke spotter (weather person), and holder are added to the organizational structure. A crew consists of a crew leader, igniter, igniter/holder, and a holder or just holders.

The **crew leader (s)** directs and coordinates activities of their crew, stays in close communication with the burn boss, oversees the ignition pattern, coordinates the response of the crew with regard to spotting. A crew consists of an igniter, igniter/holder, and a holder. The crew leader needs to stay in close communication with the burn boss regarding progress of the other crews along the fire line; stay in close communication with crew regarding status of ignition, spotting over, and condition of equipment; direct igniter to any changes in pattern of ignition; direct holder to areas that require attention; be aware of condition of crew members, and rotate crew members out of smoke periodically.

The **holder** may be equipped with a water pack and/or a rake or flapper as appropriate. The holder follows the igniter, insuring that the fire line is secure. Depending on the burn, they may work immediately behind (or in front of) the igniter to lay out a wet line or suppress fire in flashy fuels where fire is backing across the line. In other circumstances, the holder may trail far behind the igniter, patrolling long stretches of fire line and walking back and forth between the

igniter and the igniter/holder. The holder needs to be aware of fire behavior along the fire line and insure that the fire line integrity is preserved; alert crew, especially igniter if problems develop; suppress any minor slop-overs or escapes along the line, and keep an eye out for any potential problems that need to be monitored, such as large snags becoming ignited; use water efficiently in suppression and be aware of tank status (inform crew leader when tank is2/3 empty) and know where extra water is available. Once the igniter completes the fire line, the holder will patrol the perimeter of the fire line checking for spot-overs and assist with suppression when requested.

The **smoke spotter** (weather person) is located outside of the unit, often near a smoke sensitive area such as along a road. The smoke spotter (weather person) is equipped with a radio, a Kestrel Pocket Weather Meter or a belt weather kit and is in communication with the burn boss regarding smoke accumulation and weather. They need to keep vigilant watch over smoke sensitive areas for smoke accumulation and keep in constant communication with the burn boss regarding smoke and weather problems. In most cases, a **Wildland Fire Truck or ATV Fire Pump** will available to utilize to put out spot fires with water.

A minimum of four qualified crew will be on hand for all burns.  An individual certified as a burn boss either by The Nature Conservancy or other appropriate agency, will serve as burn boss. Other crew must have attended an appropriate training course (The Nature Conservancy prescribed fire seminar, wildfire fighting training, volunteer fire department training, etc.) or have experience in firefighting or prescribed burning. Novice crew members can only be used when four trained crew members are present.

### 3.13 Equipment

| Equipment Items Bulldozer | Number 1 | Comments |
|---|---|---|
| First Aid Kit | 1 | |
| Cellular Phone | 1 | Burn Boss. |
| Handheld Radios Nomex Clothing & Hardhat Belt weather kit | 4 4 1 | One for each person. One for each person. Burn Boss. |
| Weather Radio | 1 | Burn Boss. |
| Drip Torches Fuel (2 gas: 1 diesel) All-Terrain Vehicle w/Water Sprayer Backpack pumps Flappers Counsel Rakes | 2 3 1 2 2 2 | Five gallon containers. |
| Chainsaw | 1 | |
| Drinking Water Food | 10 4 | Gallons. Enough for 2 servings |
| Fire Suppressant Water | 200 | per person. Gallons. |

### 3.14 Burning Debris Piles (See Appendix C)

The following is the recommended minimum equipment list (four person burn crew) that will be on site for every burn:

Vegetation and waste are often piled and burned as a means of disposal. Pile burning is less extensive than prescribed fires. Piles to be burned are normally located in open areas. The open areas around the piles act as large firebreaks. Since pile fires require less technical skill and are easier to control, there are less equipment and manpower requirements than for prescribed fires.

The minimum number of personnel required for a pile fire is two people. One person (burn boss) will be designated in charge of the fire and ignition. The burn boss does not need to be burn boss qualified for prescribed fires, but must have training in wildfire control. The other person will be a qualified heavy equipment operator. A bulldozer or other heavy equipment must be on the pile fire site to prevent the fire from escaping. Other equipment not required as listed in 3.13 is an all-terrain vehicle w/water sprayer, backpack pumps, flappers, food, and fire suppressant water. Even though less personnel and equipment are required, the burn boss must complete

the planning and preparation required for a prescribed fire and an Open Pile Burn Plan (see Appendix C). The approval process must also be completed. As with a prescribed fire, smoke management, fire escape prevention, and personnel safety are paramount.

### 3.15 Contingencies

Ignition on any burn will stop in case of spotting over the fire line (escape of fire over the line). The burn boss and/or crew leader(s) will coordinate the crew members in controlling spot fires. If a crew cannot contain a spot fire, the burn boss will direct additional crew members and/or the dozer operator to the spot. If the spot becomes an escape, the RMTC Fire Department and the Arkansas Forestry Commission will immediately be contacted. Cato Road, a large graveled road, flanks TA's 2-7 & 14 on the east and the Small Arms Impact Area & TA's 15 & 17 on the west. Remount and Batesville-Pike Roads provide a firebreak on the east side of the Small Arms Impact Area. Highway 89 and a high voltage transmission line right-of-way flanks TA's 12, 13, & 24 (No Name) on the north side. Declination Road, a large graveled road, flanks TA17 to the south and the Small Arms Impact Area to the north.

Firebreaks will be used as escape routes for the crew if the fire become an escape fire. The safety zone for the crew will be identified in each prescription.

### 3.16 Records

The burn boss will be responsible for documenting prescribed burns once completed. The documentation will consist of the following information: 1) burn boss name and workplace, 2) date of prescribed fire, and 3) approximate area burned (may be hand drawn to scale on a map).The information will be submitted to DCSEN-E for tracking. The form for submitting the information is in Appendix D. The areas burned will be tracked using a Geographical

Information System (GIS). The GIS system will be used to schedule future prescribed burns.

## 4. Wildfire Control

### 4.1 Objectives

The two major objectives for wildfire control are preventing damage and smoke on private property. Once these objectives have been satisfied, the objective becomes to prevent property damage on RMTC. Paramount above all objectives is personnel safety. When fighting wildfires, personnel safety will not be compromised to prevent loss of property. It must be stressed to everyone involved that risk taking will not be tolerated. It is critical to create and maintain fire lines around the perimeter of RMTC. The fire lines around the boundary will serve as a last defense against fire escaping RMTC. The first defense is RMTC firefighting personnel.

### 4.2 Authority and Responsibilities

RMTC Fire Department (RFD) is the responsible authority for extinguishing wildfires. When a wildfire is noticed, it should be reported at earliest possible time to RFD. RFD will evaluate the fire and formulate a plan of action. If additional resources are required, bulldozers and manpower are available from Range Control and DCSEN-E-Forestry. Bambi bucket aerial water containers are available from the RMTC-OPS-MS. If the fire cannot safely be controlled by RMTC personnel, the Arkansas Forestry Commission, Arkansas Game & Fish Commission, and local fire departments will be contacted for assistance. If the fire escapes RMTC or smoke affects the public, RFD will notify the RMTC Public Affairs Officer immediately. RFD will serve as the incident commander and has complete authority over all personnel fighting the fire. RFD will be responsible for training RMTC personnel in wildfire fighting. A list of the firefighting resources and contact information are shown in Appendix B. RFD will be responsible for investigation and prosecution of fires resulting from arson.

### 4.3 Smoke Control

While putting out a wildfire is the main concern, smoke control is also important. When the

advancement of a wildfire head has been stopped, there are many small fires still burning and smoldering left in its wake. The small fires produce smoke that is dangerous to nearby vehicle traffic and very irritating to commercial/residential areas. These small fires can also cause the wildfire the start again. The smoke problem is compounded by inversion layers in the atmosphere. An inversion layer holds smoke close to the ground. Many times the inversion layers are present at night. Smoke also accumulates in low lying areas and drainages. To control the amount of smoke, the small fires must be put out using mop up procedures.

Mop up is a labor-intensive activity. It involves patrolling the burned area and putting out the small fires. The fires are extinguished by removing fuel from the fires or putting water on the fires. Mop up personnel usually carry a counsel rake or shovel for removing fuels. Water can be applied with a backpack sprayer or a tank sprayer mounted on an all-terrain vehicle. Obviously, the number of personnel needed for mop up is proportional to the size of the wildfire. It is important to recruit as many personnel as required to mop up the wildfire as soon as possible. The burned area should not be allowed to smolder for days or when inversion conditions are known exist. The extra work to mop up is well worth the time to prevent potential hazards.

### 4.4 Records

A record will be kept on all wildfires. RFD will be responsible for documenting wildfires once controlled. Documentation will consist of the following information: 1) Name of person and workplace, 2) date wildfire occurred, 3) approximate location and area burned (may be hand drawn to scale on a map). The information will be submitted to DCSEN-E for tracking. The form for submitting the information is in Appendix D. The burned areas will be tracked using GIS. The GIS will be used to schedule prescribed fires.

## 5. Fire Lines

### 5.1 Purpose and Responsibility

Fire lines are essential for the control of wildfire and to implement prescribed fires. The

construction/maintenance of fire lines are the responsibility of RMTC-OPS.

### 5.2 Construction and Maintenance

The purpose for the lines is to prevent fire from escaping RMTC. Fire lines around RMTC should be at least 25 feet wide (about 2 bulldozer blade widths). If houses or other structures are located near the boundary line, the width should be increased to 35 feet (about 3 bulldozer blade widths). The fire lines should be established around the entire RMTC perimeter excluding TA 19 & 20. Fire lines around the perimeter should be maintained each year prior to July (the start of wildfire season). The road network will primarily serve as the fire lines for the RMTC interior. Additional fire lines are to be maintained around the Small Arms Impact Area ranges. These must be maintained on an annual basis. This will routinely be done as preparation for prescribed fire conducted on the area. The boundary and non-road fire lines can be sown with a variety of winter grasses to control erosion and provide food for wildlife.

### 5.3 Records

A record will be kept on fire line construction or maintenance. Roads used as fire lines are an exception. Range Control and Post Engineers will be responsible for documenting fire line work once completed. Documentation will consist of the following information: 1) Name of person and workplace, 2) date fire line was constructed or maintained, and 3) approximate location with length completed (hand drawn to scale on a map). The information will be submitted to DCSEN-E for tracking. The form for submitting the information is in Appendix D. The fire lines will be tracked using GIS. The GIS system will be used to schedule maintenance.

# Appendix Q
# Interagency Review

**Caroline Cone**
Chief of Staff and Deputy Director

**Chris Colclasure**
Assistant Deputy Director

# Arkansas Game and Fish Commission

**Pat Fitts**
Director

March 27, 2018

Coleman Little
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Military Department of Arkansas
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Mr. Little,

The Arkansas Game and Fish Commission (AGFC) appreciates the opportunity to review and provide input on the Integrated Natural Resources Management Plan (INRMP) for Camp Robinson (RMTC). Wildlife Management Division staff have reviewed the current INRMP provided to us in March of this year and we concur with the activities outlined in this plan and offer the following comments related to the plan:

- Page 3 (Management Action #2) and Page 70-71 (3.6 of 3-2) We did not see the latest version of the AGFC MOU in this document. A new version was approved in 2017.
- Page 25 (1-17) Grassy Lake is considered a Green Tree Reservoir (GTR) and is flooded each fall/winter to provide habitat for wintering waterfowl. The moist-soil area is 60 acres and managed for wintering waterfowl as well.
- Page 25 (1-17) We acquired 989 acres of former Camp Robinson property north of Hwy 89 and east of Camp Robinson Special Use Area in the summer of 2017 from the Nature Conservancy. This new tract will be called Stone Prairie WMA. It will be intensively managed for quail once proper clearances from the USACOE and others are achieved.

Again, thank you for allowing us to provide input related to the INRMP. If any of our staff can be of further assistance, please don't hesitate to call.

Sincerely,

Brad Carner

Brad Carner, Chief-WMD

**From:** Lombardi, Melissa
**To:** Little, Coleman Z NFG NG ARARNG (US)
**Subject:** Re: [Non-DoD Source] Re: 2018 Camp Robinson INRMP (UNCLASSIFIED)
**Date:** Thursday, March 8, 2018 8:45:57 AM

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Coleman,
Not much to recommend.
I did notice Zebulon Pike's name is spelled as Zebulin on 1-14.
I like the discussion of prairie management on 2-6, too.
Have you talked to Tommy about a project with the FWS mist-netting for bats? Might be a good update.
May want to mention candidate species rattlesnake-master borer moth from the 2017 surveys in the 2.5.6 Terrestrial Invertebrates section on 2-27. I can send you the interim report from the study if you don't have it already.
On 2-29, for the Buttonbush pond, the spring peeper genus has a typo (should be Pseudacris) and the Western chorus is Pseudacris triseriata.
Oooh, I just hit 2-31 and saw Ozark emerald. That's a petitioned species for FWS and if the guys from U of A haven't surveyed there yet, we should coordinate. I think the dragonflies are so cool. Also, we have very limited info on the aquatic part of their life cycle.
Thanks for looping us in on the review. I look forward to the final document and working with you more. Melissa

Melissa Lombardi
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Southeast Region Vision: Together, we will connect lands and waters to sustain fish, wildlife and plants by being visionary leaders, bold innovators and trusted partners, working with and for people.

On Mon, Mar 5, 2018 at 1:15 PM, Little, Coleman Z NFG NG ARARNG (US) <coleman.z.little.nfg@mail.mil < Caution-mailto:coleman.z.little.nfg@mail.mil > > wrote:

> CLASSIFICATION: UNCLASSIFIED
>
> Anytime in March will work. It hasn't changed much at all. I mostly was working through formatting issues this time around. The next version should start to look better.
>
> -----Original Message-----

From: Lombardi, Melissa [Caution-mailto:melissa_lombardi@fws.gov < Caution-mailto:melissa_lombardi@fws.gov > ]
Sent: Monday, March 5, 2018 1:13 PM
To: Little, Coleman Z NFG NG ARARNG (US) <coleman.z.little.nfg@mail.mil < Caution-mailto:coleman.z.little.nfg@mail.mil > >
Subject: [Non-DoD Source] Re: 2018 Camp Robinson INRMP (UNCLASSIFIED)

All active links contained in this email were disabled. Please verify the identity of the sender, and confirm the authenticity of all links contained within the message prior to copying and pasting the address to a Web browser.

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Will do, Coleman. When did you need comments back? I should be able to review this week. Melissa

Melissa Lombardi
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Southeast Region Vision: Together, we will connect lands and waters to sustain fish, wildlife and plants by being visionary leaders, bold innovators and trusted partners, working with and for people.

On Mon, Mar 5, 2018 at 12:52 PM, Little, Coleman Z NFG NG ARARNG (US) <coleman.z.little.nfg@mail.mil < Caution-mailto:coleman.z.little.nfg@mail.mil > < Caution-Caution-mailto:coleman.z.little.nfg@mail.mil < Caution-mailto:coleman.z.little.nfg@mail.mil > > > wrote:

CLASSIFICATION: UNCLASSIFIED

Attached is a rough draft of the 2018 revision of the INRMP for Camp Robinson. Please review the document and suggest additional content or changes you would like to see. Thank you all very much for your time.

Coleman Little M.S.
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