UPDATED
INTEGRATED NATURAL RESOURCES
MANAGEMENT PLAN

FOR

EASTERN KENTUCKY TRAINING SITE
HIDDEN VALLEY

POWELL COUNTY, KENTUCKY

KENTUCKY ARMY NATIONAL GUARD

MARCH 2009

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INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN
UPDATE

EASTERN KENTUCKY TRAINING SITE - HIDDEN VALLEY
POWELL COUNTY, KENTUCKY

This updated Integrated Natural Resources management Plan (INRMP) meets the requirements for INRMP's per NGB and ARMY policy, meets the intent of the Sikes Act, as amended (16 United States Code [USC] 670a *et seq.),* and contributes to the conservation and rehabilitation of natural resources on military installations. It has set appropriate and adequate guidelines for conserving and protecting the natural resources of the Eastern Kentucky Training Site - Hidden Valley.

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EXECUTIVE SUMMARY

This Integrated Natural Resources Management Plan (INRMP) is an update of the 2003 INRMP for the Eastern Kentucky Training Site - Hidden Valley (EKTS-HV). The INRMP has been updated for use by the National Guard Bureau (NGB) and the Kentucky Army National Guard (KYARNG) as the primary tool for managing natural resources at the KYARNG's 542-acre EKTS-HV. The EKTS-HV is located in northwestern Powell County near the community of Clay City, Kentucky. The EKTS-HV is on state-owned land.

The primary purpose of the EKTS-HV is to support the military missions of the KYARNG. To properly train soldiers, the KYARNG must provide a variety of environmental conditions and ecosystems. This training objective must be met in a way that provides for sustainable, healthy ecosystems, complies with all applicable environmental laws and regulations, and provides for no net loss in the capability of military installation lands to support the military mission of the installation.

INRMPs help installation commanders manage natural resources more effectively to ensure installation lands remain available and in good condition to support the installation's military mission. The KYARNG published the first INRMP for the EKTS-HV in 1997, and updated it in 2003. The reasons for this INRMP update include (1) collection of updated resource information; (2) development of a Forest Ecosystem Management Plan; and (3) new Army National Guard (ARNG) guidance.

The Sikes Act Improvement Act (SAIA) of 1 997, 1 6 U.S. Code (USC) §670a et seq., as amended, requires Federal military installations with adequate wildlife habitat to develop a long-range INRMP and implement cooperative agreements with other agencies. All of EKTS-HV land is state owned. For this reason, EKTS-HV is not a "military installation" as defined in the SAIA. Therefore, the INRMP is an Army policy INRMP pursuant to the U.S. Army policy dated 21 Mar 97 entitled *Army Coals and Implementing Guidance for Natural Resources Planning Level Surveys and INRMP ("Army INRMP Policy").* An INRMP is required by Army Policy for the EKTS-HV because the installation conducts intensive, on-the-ground military missions that require conservation measures to minimize impacts (e.g. soil erosion, prescribed burning, invasive species control) and sustain natural resources.

The revised INRMP is intended to be consistent with the SAIA as well as Army Regulation (AR) 200-1, *Environmental Protection and Enhancement,* 32 Code of Federal Regulations (CFR) 651, *Environmental Analysis of Army Actions',* Department of Defense (DoD) Directive 4700.1, *Natural Resources Management Programs',* and Department of Defense Instruction (DoDI) 471 5.3, *Environmental Conservation Program',* and NGB policy.

Overall, the EKTS-HV has benefited from using the INRMP as a management tool. An evaluation as to operation and effect of the 2003 INRMP, including natural resources management goals, objectives, and projects and their implementation status, can be found in **Appendix A.** A summary of the completion status for the 2003 INRMP projects is provided in **Table ES-1.**

The review of the 2003 INRMP was developed in cooperation with the U.S. Fish and Wildlife Service (USFWS) and the Kentucky Department of Fish and Wildlife Resources (KDFWR). Developed using an interdisciplinary approach, information has been gathered from the KYARNG Environmental Office and training site staff, as well as other Federal, State and local

agencies and special interest groups with an interest in management of natural resources at the EKTS-HV.

Specific goals identified by the updated INRMP in Chapter 7 are listed in **Table ES-2.** These goals are supported in the updated INRMP by objectives and projects, which provide management strategies and specific actions to achieve these goals. Objectives are listed in Chapter 7 of the updated INRMP, and projects are listed in **Chapter 8.**

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

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

Additionally, this updated INRMP presents methods that will increase the environmental awareness of KYARNG personnel, guest units using the EKTS-HV for training, and the public. Implementation of this updated INRMP at the EKTS-HV will ensure successful accomplishment of the KYARNG's military missions while providing for multiple uses of natural resources and promoting adaptive stewardship practices that sustain ecosystem and biological integrity. The updated INRMP complies with applicable Army and Department of Defense (DoD) policies, as well as applicable Federal, State, and local mandates.

TABLE ES-1. COMPLETION STATUS OF PROJECTS FROM THE 2003 - 2007 EKTS-HV INRMP

PROJECT	PROJECT DESCRIPTION	STATUS
4.1	Non-Land Condition Trend Analysis (LCTA) protocol natural resource management surveys *[Note: LCTA is now Range and Training Land Assessment (RTLA)]*	Ongoing. KYARNG Environmental staff prepare annual INRMP review and update if needed. This project is continued to the following planning period.
4.2	Non-plot erosion surveys	Ongoing. Staff conducts periodic windshield survey and reviews orthophotographs. This project is continued to the following planning period.
4.3	Geographic Information System (GIS) data acquisition and management	Partially accomplished. Most of the available layers have been incorporated into central database in Environmental Office in Frankfort. This project is continued to the following planning period.
4-4	Brief Integrated Training Area Management (ITAM) Committee on GIS capabilities	ITAM Committee discontinued. However, KYARNG staff is briefed as needed on GIS capabilities.
4-5	Identify ITAM requirements.	Ongoing. This project is continued to the following planning period with updated funding structure descriptions in the INRMP update.
4.6	Convene ITAM Committee semi-annually	ITAM Committee has been discontinued.
4-7	Aquatic ecosystem management (Siebert stake sensitive areas)	Not accomplished. This was low priority due to lack of training use during the planning period. This project is continued to the following planning period.
4-8	Include Training Site Regulation revisions in annual INRMP revisions	Not accomplished; scope revised. Because of the lack of training during the planning period, there was not a need to finalize the training site regulation. This project is continued to the following planning period.
4-9	Grassland Ecosystem Management; repair maneuver damage	Ongoing, as needed. Ongoing; no serious erosion problems.
4.10	Land Rehabilitation and Maintenance (LRAM); apply fertilizer, lime, seed, and mulch for proactive maintenance or areas damaged by maneuvers	Ongoing, as needed
4.11	Grassland Ecosystem Management; brush plowing and vegetation removal	Ongoing, as needed
4.12	Environmental Awareness; Produce Leader and Soldier Field Cards	Not accomplished. This was low priority due to lack of training activity during the planning period. This project is continued to the following planning period.
4-13	Environmental Awareness; Produce other environmental awareness materials as needed	Ongoing, as needed.

TABLE ES-1. COMPLETION STATUS OF PROJECTS FROM THE 2003 - 2007 EKTS-HV INRMP

PROJECT	PROJECT DESCRIPTION	STATUS
5-1	Planning Level Surveys (endangered species, floristic, natural areas, small mammals)	The Kentucky State Nature Preserve Commission (KSNPCS) updated flora and vegetation communities in 2006. Mammal, fish and invertebrate surveys were not updated.
5-2	Planning Level Survey (bird species, in conjunction with Partners in Flight [PIF])	Ongoing. This project is continued to the following planning period.
5-3	Forest Inventory	Not accomplished because of lack of training activity during the planning period. A preliminary forest management plan prepared concurrent with INRMP update, and forest inventory continued to following planning period.
5-4	Bat Survey	Not accomplished. Low priority because of lack of training activity during the planning period. Mist net surveys for the Indiana bat ***(Myotis sodalis)*** are required prior to tree-cutting activity, including timber stand improvement.
5-5	Planning Level Survey (Long Term Water Quality Monitoring)	Scope revised in this plan. Long term water quality to be done only when necessary, depending on military usage or special issues.
5-6	Erosion Control of Dam at Pond #3	Not accomplished. KYARNG to evaluate whether this is required.
5-7	Invasive Species Control (mowing)	Ongoing; however, due to lack of training activity during the planning period, limited mowing was accomplished. This project is continued to the following planning period.
5-8	Pest Species Surveys (Hemlock Wooly Adelgid)	Ongoing. This project is continued to the following planning period.
5-9	Pest Species Surveys (Southern Pine Beetle)	Ongoing. This project is continued to the following planning period.
5.10	Boundary Marking (signage and marking paint)	Not accomplished. This was low priority due to lack of training during the planning period. This project is continued to the following planning period.
5.11	Law Enforcement (enforce Training Site Regulation)	Not accomplished; scope revised. Because of lack of training during the planning period, there was not a need to finalize the training site regulation. This project is continued to the following planning period.

TABLE ES-2. MANAGEMENT GOALS FOR EKTS-HV

#	MANAGEMENT GOAL
1	Manage natural resources to ***support the military mission*** in a manner consistent with the KYARNG Environmental Management System and in compliance with Federal and State laws, Army regulations, and policies.
2	Continue to ***develop and maintain a GIS system*** providing efficient data storage, retrieval, and presentation to facilitate fully informed management decisions.
3	Manage ***fish and wildlife resources*** in a manner compatible with the military mission and within the limits of the natural habitat.
4	Protect, restore, and maintain populations of ***rare plant and animal species*** in compliance with Federal and State laws and regulations.
5	Protect, maintain, and improve ***soil and water quality*** in accordance with State and Federal laws and regulations to sustain the overall condition of the EKTS-HV training lands.
6	***Protect and maintain riparian, wetland, and aquatic habitats*** in accordance with State and Federal laws and regulations while adhering to the principles of ecosystem management for purposes of water quality enhancement, wildlife food and cover, and aquatic habitat.
7	Maintain ***grassland habitats*** for purposes of military training, wildlife food and cover, and soil stabilization.
8	Maintain ***forest resources*** for purposes of military training, wildlife food and cover, and watershed protection.
9	***Use Integrated Pest Management (IPM) practices*** that maximize safety and minimize pesticide use and potential hazards to humans, wildlife and their environments.
10	***Maintain public access*** within the constraints of the military mission and site security needs consistent with sound ecological principles.
11	Continue to ***develop and maintain a GIS system*** providing efficient data storage, retrieval, and presentation to facilitate fully informed management decisions.
12	***Coordinate mission requirements and land maintenance activities*** to minimize land impacts from training.
13	***Educate site users*** about environmental concerns and responsibilities while using the site to minimize resource damage and instill a sense of pride and stewardship responsibility.
14	***Form communication links with*** other agencies, organizations, and the public to share information and aid in decision-making.

This INRMP includes, as **Appendix C,** a Record of Environmental Consideration (REC). The Environmental Assessment (EA) for the EKTS-HV 2003 INRMP presented the Proposed Action (implementation of the INRMP) and alternatives, summarized the affected environment, and assessed the environmental consequences of implementation. The EA concluded the known and potential impacts of the Proposed Action on the physical, biological, and cultural environment will generally be of a positive nature. Implementing the INRMP will not result in significant adverse environmental effects. This National Environmental Policy Act of 1969 (NEPA) analysis is still valid, and adequately covers the actions in this revised INRMP. The REC describes the Proposed Action and explains why further environmental analysis is not needed.

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CONTENTS

TABLES

FIGURES

APPENDICES

ACRONYMS AND ABBREVIATIONS

ACHP	Advisory Council on Historic Preservation
AEDB-EQ	Army Environmental Database Environmental Quality module
AH PA	Archeological and Historic Preservation Act
AIRFA	American Indian Religious Freedom Act
AR	Army Regulation
ARNG	Army National Guard
ATV	All Terrain Vehicle
BBS	Breeding Bird Survey
BMP	Best Management Practices
CES	Center for Earthquake Studies
CFMO	Construction and Facilities Management Officer
CFR	Code of Federal Regulations
CRM	Cultural Resource Manager
CWA	Clean Water Act
DA	Department of the Army
DENIX	Defense Environmental Network Information Exchange
DMA	Department of Military Affairs
DoD	Department of Defense
DoDI	Department of Defense Instruction
DTC	CSM Harold L. Disney Training Center
DUSD	Deputy Under Secretary of Defense
EA	Environmental Assessment
EAB	Emerald Ash Borer
EIS	Environmental Impact Statement
EKTS-HV	Eastern Kentucky Training Site-Hidden Valley
EL	Environmental Laboratory
EMS	Environmental Management System
EO	Executive Order
EPM	Environmental Program Manager
EQR	Environmental Quality Report
ERDC	Engineering Research and Development Center
ESA	Endangered Species Act
°F	degrees Fahrenheit
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Maps
FM	Field Manual
FOB	Forward Operating Base
FTX	Field Training Exercises
FY	Fiscal Year
GIS	Geographic Information System
ICRMP	Integrated Cultural Resources Management Plan
INRMP	Integrated Natural Resources Management Plan
I PM	Integrated Pest Management
ISO	International Standards Organization
ITAM	Integrated Training Area Management
IWFMP	Integrated Wildland Fire Management Plan
J3	Joint Forces - Operations
KAR	Kentucky Army Regulation
KDEP	Kentucky Department of Environmental Protection
KDFWR	Kentucky Department of Fish and Wildlife Resources
KDMA	Kentucky Department of Military Affairs
KDNR	Kentucky Department for Natural Resources
KDOF	Kentucky Division of Forestry
KDOW	Kentucky Division of Water
KGS	Kentucky Geological Survey
KPDES	Kentucky Pollution Discharge Elimination System
KRS	Kentucky Regulatory Statute
KSNPC	Kentucky State Nature Preserves Commission
KYANG	Kentucky Air National Guard

KYARNG	Kentucky Army National Guard
KY-EPPC	Kentucky Exotic Pest Plant Council
KYNG	Kentucky National Guard
LCTA	Land Condition Trend Analysis
LRAM	Land Rehabilitation and Maintenance
LTA	Local Training Area
MAPS	Monitoring Avian Production Survivorship
MBTA	Migratory Bird Treaty Act
METL	Mission Essential Task List
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
NAGPRA	Native American Graves Protection and Repatriation Act
NBC	Nuclear, Biological, and Chemical Weapons
NCOIC	Non-Commissioned Officer in Charge
NEPA	National Environmental Policy Act of 1 969
NDAA	National Defense Authorization Act
NGB	National Guard Bureau
NGB-ARE	NGB Army Environmental Programs Division
NGB-ARI	National Guard Bureau Army Installations Division
NHPA	National Historic Preservation Act
NMSZ	New Madrid Seismic Zone
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
OCDSOPS	Office of the Deputy Chief of Staff for Operations
OHWM	Ordinary High Water Mark
PAO	Public Affairs Office(r)
PCA	Plant Conservation Alliance
PEM	Palustrine Emergent Marsh
PIF	Partners in Flight
PLS	Planning Level Surveys
POW	Palustrine Open Water
R2UB	Riverine - Lower Perennial, Unconsolidated Bottom
R4SB	Riverine - Intermittent, Streambed
REC	Record of Environmental Consideration
ROTC	Reserve Officers Training Corp
RTLA	Range and Training Land Assessment
RTLP	Range and Training Land Program
SAIA	Sikes Act Improvement Act
SHPO	State Historic Preservation Office(r)
SJA	Staff Judge Advocate
SMZ	Streamside Management Zone
SOP	Standard Operating Procedure
SPB	Southern Pine Beetle
SRA	Sustainable Range Awareness
SRP	Sustainable Range Program
STEP	Status Tool for the Environmental Program
T&E	Threatened and Endangered
TAG	The Adjutant General
TCP	Traditional Cultural Properties
TRI	Training Requirements Integration
TSC	Training Site Commander
US	United States
USACE	U.S. Army Corps of Engineers
use	United States Code
USACHPPM	U.S. Army Center for Health Promotion and Preventative Medicine
USD	Under Secretary of Defense
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
WES	Waterways Experiment Station
WFPM	Wildland Fire Program Manager

WHFRTC	Wendell H. ford Regional Training Center
WQC	Water Quality Certification

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SECTION 1: GENERAL INFORMATION

1.1 PURPOSE

This Integrated Natural Resources Management Plan (INRMP) is an **update** and **reorganization** of the 2003 INRMP for the 542-acre Eastern Kentucky Training Site - Hidden Valley (EKTS-HV), located in northwestern Powell County, Kentucky **(Figure** 1). The property was acquired by the Kentucky Department of Military Affairs (KDMA) in 1 983. Since that time, KDMA has managed the EKTS-HV for Kentucky Army National Guard (KYARNG). The main reasons for the INRMP update are to incorporate updated natural resource information, include a forestry management plan, and incorporate new Army National Guard (ARNG) guidance. The natural resources management philosophies and existing programs have not changed. With this revision, the INRMP has been reorganized to focus on natural resource management issues and associated mission support.

The INRMP has been updated for use by the National Guard Bureau (NGB) and the KYARNG as the primary tool for managing natural resources at EKTS-HV. The EKTS-HV must provide a variety of environmental conditions and ecosystems in which to train soldiers. This objective must be met in a way that provides for sustainable, healthy ecosystems, complies with all applicable environmental laws and regulations, and provides for no net loss in the capability of military installation lands to support the military mission of the installation. An INRMP helps installation commanders manage natural resources more effectively to ensure that installation lands remain available and in good condition to support the installation's military mission. The KYARNG published the first INRMP for the EKTS-HV in 1997, and updated it in 2003. An evaluation as to operation and effect of the 2003 INRMP, including natural resources management goals, objectives, and projects and their implementation status, can be found in **Appendix A.** A summary of the completion status for the 2003 INRMP projects is provided in **Table 1.**

The Sikes Act Improvement Act (SAIA) of 1 997, 1 6 U.S. Code (USC) §670a et seq., as amended, requires Federal military installations with adequate wildlife habitat to develop a long-range INRMP and implement cooperative agreements with other agencies. The EKTS-HV is a state-owned facility, and is not directly subject to the SAIA. However, Army policy requires an INRMP for this site in accordance with U.S. Army policy dated 21 Mar 97 entitled *Army Goals and Implementing Guidance for Natural Resources Planning Level Survey (PLS) and INRMP ("Army INRMP Policy").* An INRMP is required by Army Policy for the EKTS-HV because the installation conducts intensive, on-the-ground military missions that require conservation measures to minimize impacts (e.g. soil erosion, prescribed burning, invasive species control) and sustain natural resources.

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

TABLEI. COMPLETION STATUS OF PROJECTS FROM THE 2003 EKTS-HV INRMP

PROJECT	PROJECT DESCRIPTION	STATUS
4.1	Non-LCTA protocol natural resource management surveys *[Note: LCTA is now Flange and Training Land Assessment (RTLA)]*	Ongoing. KYARNG Environmental staff prepare annual INRMP review and update if needed. This project is continued to the following planning period.
4-2	Non-plot erosion surveys	Ongoing. Staff conducts periodic windshield survey and reviews orthophotographs. This project is continued to the following planning period.
4-3	GIS data acquisition and management	Partially accomplished. Most of the available layers have been incorporated into central database in Environmental Office in Frankfort. This project is continued to the following planning period.
4-4	Brief ITAM Committee on GIS capabilities	ITAM Committee discontinued. However, KYARNG staff is briefed as needed on GIS capabilities.
4-5	Identify ITAM requirements in WAM	Ongoing. This project is continued to the following planning period with updated funding structure descriptions in the INRMP update.
4.6	Convene ITAM Committee semi-annually	ITAM Committee has been discontinued.
4-7	Aquatic ecosystem management (Siebert stake sensitive areas)	Not accomplished. This was low priority due to lack of training use during the planning period. This project is continued to the following planning period.
4-8	Include Training Site Regulation revisions in annual INRMP revisions	Not accomplished; scope revised. Because of lack of training during the planning period, there was not a need to finalize the training site regulation. This project is continued to the following planning period.
4-9	Grassland Ecosystem Management; repair maneuver damage	Ongoing, as needed. Ongoing; no serious erosion problems.
4.10	LRAM; apply fertilizer, lime, seed, and mulch for proactive maintenance or areas damaged by maneuvers	Ongoing, as needed
4.11	Grassland Ecosystem Management; brush plowing and vegetation removal	Ongoing, as needed
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4-13	Environmental Awareness; Produce other environmental awareness	Ongoing, as needed.

TABLEI. COMPLETION STATUS OF PROJECTS FROM THE 2003 EKTS-HV INRMP

PROJECT	PROJECT DESCRIPTION	STATUS
	materials as needed	
5-1	Planning Level Surveys (endangered species, floristic, natural areas, small mammals)	The Kentucky State Nature Preserve Commission (KSNPC) updated flora and vegetation communities in 2006. Mammal, fish, and invertebrate surveys were not updated.
5-2	Planning Level Survey (bird species, in conjunction with PIF)	Ongoing. This project is continued to the following planning period.
5-3	Forest Inventory	Not accomplished because of lack of training activity during the planning period. A preliminary forest management plan prepared concurrent with INRMP update, and forest inventory continued to following planning period.
5-4	Bat Survey	Not accomplished. Low priority because of lack of training activity during the planning period. Mist net surveys for the Indiana bat *(Myotis soda li s')* are required prior to tree-cutting activity, including timber stand improvement.
5-5	Planning Level Survey (Long Term Water Quality Monitoring)	Scope revised in this plan. Long term water quality to be done only when necessary, depending on military usage or special issues.
5.6	Erosion Control of Dam at Pond #3	Not accomplished. KYARNG to evaluate whether this is required.
5-7	Invasive Species Control (mowing)	Ongoing; however, due to lack of training activity during the planning period, limited mowing was accomplished. This project is continued to the following planning period.
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5.10	Boundary Marking (signage and marking paint)	Not accomplished. This was low priority due to lack of training during the planning period. This project is continued to the following planning period.
5.11	Law Enforcement (enforce Training Site Regulation)	Not accomplished; scope revised. Because of lack of training during the planning period, there was not a need to finalize the training site regulation. This project is continued to the following planning period.

If an Army Guard installation has federally listed threatened or endangered species, proposed federally listed threatened or endangered species, and/or candidate species on the installation; or unoccupied habitat for a listed species where critical habitat may be designated, the INRMP must specifically address the benefits of managing these actions for these species or habitats in the document. The benefit should be clearly identified in the document and included in the table of contents. This updated INRMP is intended to provide a benefit to, and gain a critical habitat exemption for, the following federally-endangered species, should they be found on site: Virginia big-eared bat *(Corynorhinus townsendii virginianus),* Indiana bat *(Myotis sodalis),* and fanshell mussel *(Cyprogenia stegaria).*

The revised INRMP is intended to be consistent with the SAIA, which indicates that, an INRMP *"shall, to the extent appropriate and applicable, provide for:*

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

b) Fish and wildlife habitat enhancement or modifications;

c) Wetland protection, enhancement, and restoration, where necessary for support offish, wildlife, or plants;

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

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

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

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

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

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

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

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

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

1.2 AUTHORITY

This updated INRMP has been prepared pursuant to the laws, regulations, guidance, and directives listed in **Table 2.**

TABLE 2. LAWS, REGULATIONS, DIRECTIVES, GUIDANCE, AND POLICIES APPLICABLE TO INRMP DEVELOPMENT AT EKTS-HV

REQUIREMENT	TITLE
Law	The EKTS-HV is a state-owned facility, and is not directly subject to the Sikes Act *"Conservation Programs on Military Reservations"* (16 U.S. Code (USC) §670a et seq.), as amended. However, Army policy is to follow DoD and ARNG guidance on state-owned facilities. The Sikes Act requires Federal military installations with adequate wildlife habitat to develop long-range INRMPs and implement cooperative agreements with other agencies. Natural resources are to be managed for multipurpose uses and provide public access consistent with the military mission. The act also sets guidelines for collecting fees for using natural resources such as hunting and fishing.
U.S. Army policy	*Army Goals and Implementing Guidance for Natural Resources Planning Level Surveys and INRMP* ("Army INRMP Policy"); 21 March 1997. *Army National Guard INRMP Template,* created 16 March 2005, ("Draft NGB Policy")
Department of Defense Instruction (DoDI)	DoDI 471 5.3, Environmental Conservation Program DoDI 4700.1, Natural Resources Management Programs DoDI 471 5.3, Environmental Conservation Program
Army Regulation (AR)	AR 200-1, *Environmental Protection and Enhancement* AR 350-1 9, *Army Sustainable Range Program,* 30 August 2005
Code of Federal Regulations (CFR)	32 CFR 651, *Environmental Analysis of Army Actions* 32 CFR 1 90, *Appendix - Integrated Natural Resources Management*
Kentucky Regulatory Statute (KRS)	KRS 146 Natural Resources KRS 21 7b, Fertilizer and Pesticide Use and Application KRS 249, Trees, Plants, Weeds, and Pests KRS 250, Agricultural Seeds, Feeding Stuffs, and Fertilizers KRS 224 Environmental Protection
Kentucky Army Regulation (KAR)	KAR Title 401, Natural Resources and Environmental Protection Cabinet Department For Environmental Protection KAR Title 402, Natural Resources and Environmental Protection Cabinet Department for Natural Resources
Guidance	Office of the Under Secretary of Defense (USD), *Implementation of Sikes Act Improvement Act: Updated Guidance,* 10 October 2002 Office of the Deputy Under Secretary of Defense (DUSD), *Updated Guidance for Implementation of The Sikes Act Improvement Act,* 5 November 2004 DoD Directive 4700.1, *Natural Resources Management Programs*

Note: Not all applicable Federal and State laws, regulations, and Executive Orders are listed in this table, but are incorporated by reference through the listed documents.

1.3 RESPONSIBILITIES

1.3.1 NATIONAL GUARD BUREAU RESPONSIBILITIES

Within the NGB headquarters, the Chief of Environmental Programs, NGB Army Environmental Programs Division (NGB-ARE) is responsible for reviewing and approving the INRMP and advising the KYARNG Environmental Office before the KYARNG formally submits the plan to the U.S. Fish and Wildlife Service (USFWS), the Kentucky Department of Fish and Wildlife Resources (KDFWR), the public, and others as appropriate. The Environmental Directorate ensures operational readiness by sustaining environmental quality and promoting the environmental ethic, and is responsible for tracking projects, providing technical assistance to states, quality assurance, and validation and execution of funds.

1.3.2 KENTUCKY ARMY NATIONAL GUARD RESPONSIBILITIES

The KYARNG is one entity of the KDMA. KYARNG responsibilities for implementation of the natural resources management plan are identified below.

1.3.2.1 THE ADJUTANT GENERAL

The Office of the Adjutant General is directly responsible for the operation and maintenance of EKTS-HV, which includes implementation of this INRMP. The Adjutant General (TAG) determines what the state's force structure (types and number of units, types of equipment, training events, etc.) will be at EKTS-HV throughout the five-year period of the INRMP. TAG establishes a formal natural resources program for KYARNG/KDMA by implementing this INRMP. TAG also serves as the agency official to ensure natural resources projects and activities meet the intent of the Sikes Act and DoDI 4715.3, and ensures all installation land users are aware of and comply with procedures, requirements, or applicable laws and regulations that accomplish the objectives of this INRMP.

Two key positions within the TAG Office are the State Executive Director and the Chief of Staff. These positions ensure natural resources issues are considered in state and federal budget and policies and ensure coordination of projects and construction among environmental, training, and engineering staffs. The Chief of Staff also serves as chairman of the Environmental Quality Control Committee, which provides overall guidance and policy direction to the environmental program, including management of EKTS-HV natural resources.

Within the State Executive Director's Office, the Director of Facilities Division is responsible for property management, construction, operation, and maintenance of buildings and land statewide for the KDMA. This Director ensures natural resources management is considered during land acquisition, utilities excavation, construction, and maintenance and repair activities on all property managed by the KDMA.

Two key offices on the federal side within TAG'S office that participate in natural resources decision-making in Kentucky are Joint Forces-Operations 03) and the Construction and Facilities Management Officer (CFMO).

1.3.2.2 JOINT FORCES - OPERATIONS (J3)

The J3 has the primary responsibility for scheduling military training and safety of all personnel while training exercises are being conducted. The J3 and the Training Site Commander (TSC) determine the training load of EKTS-HV based on the force structure determined by TAG. The J3 coordinates with the Construction and Facilities Management Office (CFMO) on matters of construction and maintenance priorities. The J3 determines Integrated Training Area Management (ITAM) projects and submits an annual ITAM workplan.

1.3.2.3 CONSTRUCTION AND FACILITIES MANAGEMENT OFFICE

The statewide CFMO manages federal construction, maintenance, and engineering for all KYARNG facilities under the jurisdiction of the KDMA, including EKTS-HV. The CFMO is responsible for master planning and ensuring natural resources consultation requirements are included in timelines for project design and delivery schedules for all military construction projects.

1.3.2.4 ENVIRONMENTAL OFFICE

The statewide Environmental Program Manager is responsible for establishing funding priorities and programming funds for natural resources compliance and management activities into the federal Status Tool for the Environmental Program (STEP). These agencies work with the J3 to

manage the ITAM program budget; advising KYARNG on best ways to comply with federal and state environmental laws and regulations; ensuring natural resources efforts are accomplished either in-house or through contract by individuals with appropriate training; and oversight of Natural Resources Manager activities. The Environmental Program Manager provides technical assistance to KYARNG/KDMA personnel including: developing INRMPs; NEPA documents as appropriate; securing permits; conducting field studies; providing Sustainable Range Awareness (SRA) materials; locating, mapping, and inventorying natural resources; and revising the INRMP at least once every five years. The Environmental Program Manager oversees the NEPA process for the KYARNG.

1.3.2.5 PUBLIC AFFAIRS OFFICE

The Public Affairs Officer (PAO) serves as a liaison with the public for public review, in public meetings, and in community educational events. The PAO gives assistance to the Environmental Office in NEPA public review efforts.

1.3.2.6 STAFF JUDGE ADVOCATE

The Staff Judge Advocate (SJA) reviews legally binding natural resources documents for legal sufficiency and advises on laws and regulations that affect natural resources management.

1.3.3 TRAINING SITE RESPONSIBILITIES

The Training Site Non-Commissioned Officer in Charge (NCOIC) and the statewide TSC will ultimately implement this plan and ensure its success. The Training Site NCOIC is familiar with all aspects of the training site, including training scheduling (and conflicts), locations of training facilities, impairments or problems with human-made structures or natural functions, and needs for improvement or maintenance of the training land.

The Training Site NCOIC, who also manages the CSM Harold L. Disney Training Center (DTC) in Knox County, Kentucky, reports to the TSC and J3. The Training Site NCOIC's natural resource-related responsibilities include the following: (1) control of all training areas; (2) operation and maintenance of training site facilities; (3) conducting briefings concerning safety and orientation; (4) conducting investigations of and requiring reports of fires; and (5) integration of the INRMP with the training mission. The Training Site NCOIC ensures maintenance projects are identified and executed, vegetation cover is maintained on erodible soils, wetlands and rare species habitats are compatible with construction and training activities, and SRA materials are distributed to the troops.

1.4 MANAGEMENT PHILOSOPHY

The KYARNG has developed this updated INRMP using an interdisciplinary approach, with information gathered from the KYARNG Environmental Office and military trainers as well as other Federal, State, and local agencies and special interest groups with an interest in natural resources management at EKTS-HV. Agency coordination conducted as part of the INRMP development is included in **Appendix B.** This updated INRMP describes baseline conditions of natural resources at the EKTS-HV and provides management programs and guidance for successful military training that conserves renewable natural resources, preserves rare and unique resources, and provides long-term resource sustainability. Specific plan expectations are listed in **Table 3.**

TABLE 3. PLAN EXPECTATIONS FOR INTEGRATED NATURAL RESOURCE MANAGEMENT

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

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

1.4.1 MILITARY MISSION

This updated INRMP integrates aspects of natural resources management into the military mission. As such, it becomes the primary tool for ecosystem management at EKTS-HV while ensuring the successful, efficient accomplishment of the military mission. A multiple-use approach will continue to be implemented through this INRMP to accommodate mission-oriented activities and provide for good stewardship.

The purpose of natural resources management at EKTS-HV is to *maintain sustainable natural resources as a critical training asset* upon which to accomplish the KYARNG mission. To accomplish this goal, natural resource managers need to:

- Ensure *no net loss* in capability to support existing and projected military training.
- Maintain *quality training lands* through monitoring, minimizing damage, mitigation, and rehabilitation.

Specific military missions and training requirements are fluid, and change from time to time with realignments, transformations, and changes in equipment and tactics. This requires establishment of basic underlying natural resource management principles and practices that have broad application and can be adapted in multiple situations. Implementation of this updated INRMP will continue to successfully promote adaptive management that protects and enhances natural resources for multiple use, sustainable yield, and biological integrity, while supporting the military mission.

1.4.2 ENVIRONMENTAL MANAGEMENT SYSTEM (EMS)

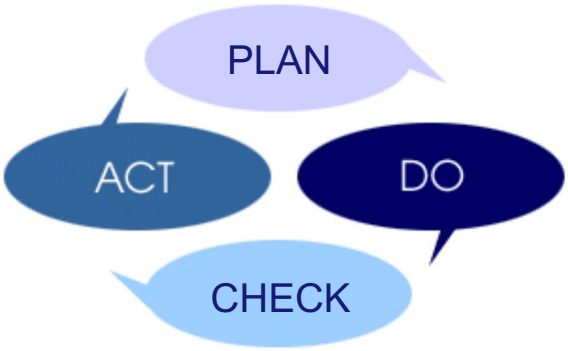
The NGB and KYARNG consider the subject installation to be the combined KYARNG operations in Kentucky. The Environmental Management System (EMS) is part of the overall KYARNG management system and includes organizational structure, planning, responsibilities, practices, procedures, processes, and resource allocation for developing, implementing, achieving, reviewing, and maintaining environmental commitments.

Developing and implementing an EMS is required at all ARNG installations.

In 2000, Executive Order (EO) 13148, *Greening the Government through Leadership in Environmental Management* established a five-year EMS implementation goal for federal facilities.

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

The International Standards Organization (ISO)-I 4001 EMS model used by the KYARNG leads to continual improvement based upon a cycle of "plan, do, check, act":



- *PLAN* - Planning, including identifying environmental aspects and establishing goals
- *DO* - Implementing, including training and operational controls
- *CHECK* - Checking, including monitoring and corrective action
- *ACT* - Reviewing, including progress reviews and acting to make needed changes to the EMS

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

1.4.3 ECOSYSTEM MANAGEMENT

An ecosystem is the "sum of the plant community, animal community, and environment in a particular region or habitat" (Barbour et al, 1987). Ecosystem management may be defined as management "to restore and maintain the health, sustainability, and biological diversity of ecosystems while supporting sustainable economies and communities" (U.S. Environmental Protection Agency [USEPA], 1 994).

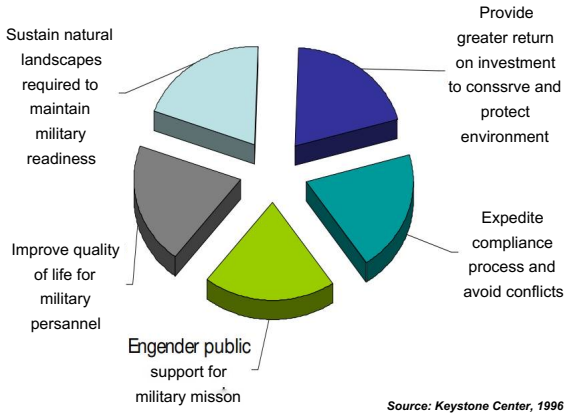
Natural resources at the EKTS-HV will continue to be managed with an ecosystem management approach. The DoD's goal for ecosystem management is "to ensure that military lands support present and future training and testing requirements while preserving, improving, and enhancing ecosystem integrity" (DoDI 4715.3). Principles of ecosystem management, per DoDI 4715.3 are listed in **Table 4.**

TABLE 4. DoD PRINCIPLES OF ECOSYSTEM MANAGEMENT	
PRINCIPLE	
1	Guarantee continued access to land, air, and water for realistic military training.
2	Maintain and improve the sustainability of native biodiversity of ecosystems.
3	Administer with consideration of ecological units and timeframes.
4	Support sustainable human activities.
5	Develop vision of ecosystem health.
6	Develop priorities and reconcile conflicts.
7	Develop coordinated approaches to work toward ecosystem health.
8	Rely on the best science and data available.
9	Use benchmarks to monitor and evaluate outcomes.
10	Use adaptive management.
11	Implement through installation plans and programs.
Source: DoDI 4715.3	

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

The DoD's challenge is ***"to manage for biodiversity in a way that supports the military mission".*** The INRMP is identified by DoD as the primary vehicle for conserving biodiversity on military installations (Keystone Center, 1996).

Why Conserve Biodiversty on Military Lands?



Source: Keystone Center, 1996

Specific management practices identified in this updated INRMP have been developed to enhance and maintain biological diversity within the ecosystems at the EKTS-HV. DoD principles of conserving biodiversity on military lands are listed in **Table 5.**

TABLE 5. DoD PRINCIPLES FOR CONSERVING BIODIVERSITY ON MILITARY LANDS	
PRINCIPLE	
1	Support the military mission;
2	Use joint planning between natural resources managers and military operations personnel.
3	Integrate biodiversity conservation into the INRMP and other planning protocols.
4	Involve internal and external stakeholders up front.
5	Emphasize the regional (ecosystem) context.
6	Concentrate on results.
Source: Keystone Center, 1996	

1.5 SUSTAINABLE RANGE PROGRAM

The Sustainable Range Program (SRP) is the Army's overall approach for improving the way in which it designs, manages, and uses its ranges to ensure long-term sustainability. Requirements for the SRP are set forth in AR 350-1 9, *Army Sustainable Range Program,* and effective August 2005. The two core SRP components are the Range and Training Land Program (RTLP) and the ITAM Program. To ensure the accessibility and availability of Army ranges and training land, the SRP core programs are integrated with the facilities management, environmental management, munitions management, and safety program functions supporting the doctrinal capability.

Information acquired under the SRP/ITAM umbrella is incorporated into this updated INRMP to guide overall military training within the constraints of NEPA and other applicable requirements, threatened and endangered (T&E) species management, rehabilitation activities, and projected sustainability guidelines.

1.5.1 RANGE AND TRAINING LAND PROGRAM

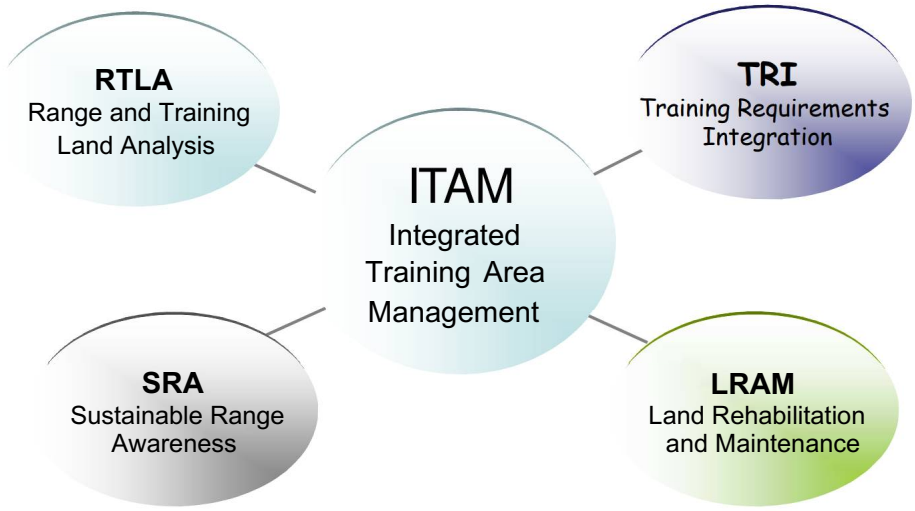
The RTLP provides range operations and modernization capability for central management, prioritization, planning, and programming of live-fire training ranges and maneuver training lands, including design and construction activities associated with them. The RTLP planning process integrates mission support, environmental stewardship, and economic feasibility, and defines procedures for determining range projects and training land requirements to support live-fire and maneuver training. The RTLP defines the quality assurance and inspection milestones for range development projects and the Standard Operating Procedures (SOP) to safely operate military training, recreational, or approved civilian ranges under Army control and support Commanders' Mission Essential Task List, (METL) and Army training strategies. RTLP also establishes the procedures and means by which the Army range infrastructure is managed and maintained on a daily basis in support of the training mission.

1.5.2 INTEGRATED TRAINING AREA MANAGEMENT

The ITAM program is the U.S. Army standard for sustaining the capability of installation land units to support military training missions, ensure compliance with existing statutory regulations, and promote sound stewardship of natural resources contained therein. The ITAM Coordinator is stationed at the KYARNG's Wendell H. Ford Regional Training Center (WHFRTC), but all KYARNG sites can receive ITAM funding.

In addition to maintaining key personnel and natural resources data collection efforts, the ITAM work plan budget will fund a number of projects of major importance to maintaining, preserving, and protecting the natural resources at EKTS-HV. Due to limited site usage. ITAM funds have not been used since 2003 at EKTS-HV and will not likely be used unless site usage levels increase (see **Section** 2.4 for additional training site usage data).

The ITAM subcomponent consists of four proactive subprograms designed to facilitate these processes. The four components of the ITAM program are discussed in the following sections.



1.5.2.1 RANGE AND TRAINING LAND ANALYSIS (RTLA)

RTLA, formerly known as the Land Condition Trend Analysis (LCTA) provides for collecting, inventorying, monitoring, managing, and analyzing tabular and spatial data concerning land conditions on an installation. The intent of RTLA is to collect essential natural resources baseline information needed to effectively manage training lands. The Army initiated RTLA in the mid-1980s, and emphasized uniform data collection methodologies to provide regional, Major Command, or national-level land assessments.

With the adoption of SRP/ITAM by the Training and Operations community, RTLA has evolved into a decentralized, installation-level program. This allows installation-level land managers and range operations staff to determine how they can best collect and use resource data to support short- and long-term land management decisions such as training area allocation, training area use, and land rehabilitation.

Range and Training Land Analysis (RTLA)

The ecological monitoring component of ITAM is used to characterize and monitor installation natural resources

The RTLA program at EKTS-HV was informally initiated in 1992, when baseline data on natural resources (vegetation mapping, plant and animal surveys, aquatic benthos) were first collected and the Natural Resources Conservation Service (NRCS)

developed a resource inventory and conservation plan for the site. The KYARNG has since customized data collection to focus on areas of known heavy use rather than random formal RTLA plots. This is intended to provide the most effective data package, when combined with the site-wide recurring Planning Level Surveys (PLSs). Geographic Information System (GIS) technology is used to integrate natural and cultural resources data and graphically display the relationships between individual resource components.

1.5.2.2 TRAINING REQUIREMENTS INTEGRATION (TRI)

TRI is the land degradation prevention component of the ITAM program. The main goal of TRI is scheduling training exercises and other land uses in areas most capable of supporting these activities. TRI relies heavily on RTLA-generated data to evaluate land capability to sustain particular training activities with minimal resource impact.

Training Requirements Integration (TRI)

Uses RTLA data to prevent or minimize harmful practices or activities within given training areas through military exercise scheduling and logistics.

Disturbances produced by training may be minimal and not appear to require restoration efforts. However, even small areas of disturbance can start a gully on sloping lands. Gullying can damage vehicles and structures, cut off access to training areas, degrade wildlife habitat, and deposit soil into streams.

TRI matches a training activity with the most suitable site, and includes a rotation schedule for training lands. TRI also incorporates restrictions required to maintain site quality, protect significant natural resources, and minimize land damage while providing a safe training environment. Implementing TRI requires coordination between installation/operations training staff and natural resources management/environmental staff.

TRI allows appropriate allocation of specific training requirements to specific land parcels. The decision-making and allocation process is based on the land's "carrying capacity" with respect to training activities. Possible land use options exercised through TRI are listed in **Table 6.**

TABLE 6. LAND USE OPTIONS EXERCISED THROUGH TRI

PRINCIPLE	
1	Re-designate the parcel's use to an alternative training, mission, or non-mission activity to permit natural recovery; prolong sustainable use; or allow for rehabilitation, repair and maintenance.
2	Re-design or reinforce a given parcel to support higher impact training.
3	Alter likely training use of a given parcel by redesigning and reconfiguring the parcel.
4	Accept training-related degradation of a given parcel.
5	Cease training temporarily on a given land parcel to permit rehabilitation, repair^ and maintenance.
6	Cease training permanently on a given parcel of land due to severe impacts and initiate restoration of that parcel.

Source: (Department of the Army [DA], 1999)

1.5.2.3 LAND REHABILITATION AND MAINTENANCE (LRAM)

LRAM is the component of the ITAM Program that provides preventive and corrective land rehabilitation and maintenance to reduce long-term impacts of training on an installation. It includes training area redesign and/or reconfiguration to meet training requirements. Training-damaged lands can be repaired and land construction technology can be used to avoid future damage.

Land Rehabilitation and Maintenance (LRAM)

Provides training-related mitigation and land rehabilitation.

Projects are specifically designed to maintain quality military training lands, minimize long-term costs associated with land rehabilitation or additional land purchase, ensure compliance with environmental laws and regulations, and reduce erosion. The LRAM process begins with identification of potential LRAM projects, which may be planned and conducted in-house or through contract. RTLA data and GIS technology are typically used to help identify projects. Two common types of LRAM projects are training area rehabilitation and hardened sites.

Training area rehabilitation uses a wide array of techniques to correct erosion features, minimize disturbance, and revegetate denuded areas. Rehabilitation areas may also be temporarily "off-limits" or protected through other restrictions. Techniques are specific to each project. Revegetation techniques use native plant species proven effective for erosion control.

Hardened sites are areas that have been resurfaced with a base material, often overlaid with gravel. Sensitive areas within hardened sites may also be protected using barriers. Hardened sites are created in areas that receive repetitive training within a small area to the point where vegetation is damaged and "realism" is already drastically compromised. Potential locations include bivouac sites, firing points, and troop assembly areas.

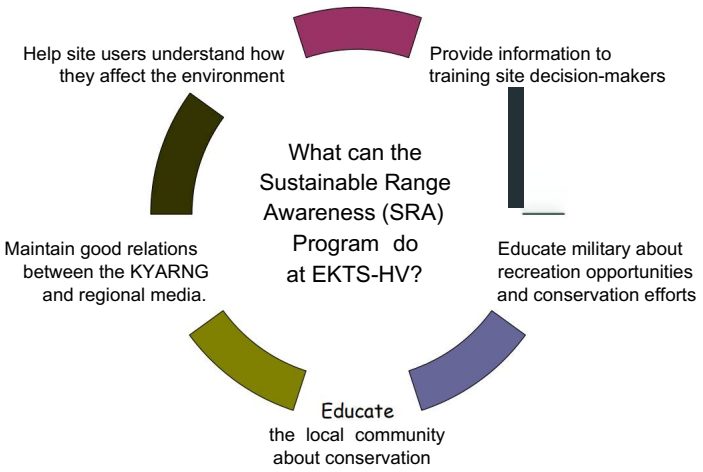
1.5.2.4 SUSTAINABLE RANGE AWARENESS (SRA)

Awareness is crucial to protecting diverse resources, such as sensitive species and wetlands. SRA is an educational program that promotes environmental stewardship and responsible use of natural resources on military lands. The KYARNG SRA program focuses on all land users including soldiers, leaders, civilians, and the local community. SRA serves to educate the public on the military mission's natural resources needs and impacts.

Military Personnel Awareness - The SRA program particularly focuses on developing and distributing awareness materials, such as soldier's handbooks, leader's handbooks, field cards, training videos, and posters. Site-specific information can be provided to training site users to prevent unnecessary damage to the environment and, in particular, training lands. Through dissemination of information, site users can improve their understanding of the effects of their mission and training activities on natural resources.

Sustainable Range Awareness (SRA)

Promotes awareness of environmentally sensitive issues and fosters stewardship ethic among unit commanders, ground troops, neighboring communities, and other concerned or involved parties.



The KYARNG issues SOPs through Range Control to troops using any training site. These SOPs address fire protection, hazardous materials spills, restricted areas, pyrotechnics use, and environmental considerations. Restricted areas can include impact areas and sensitive ecological and cultural resource areas with use restrictions.

Briefings are usually informal, conducted as needed. For instance, Environmental Office personnel or the trainer will brief a military unit preparing to bivouac near a sensitive area or a contractor preparing to work near a wetland on environmental requirements. The unit commander will ensure troops compliance. Resource awareness training may include: a briefing on wetland locations; rare, threatened, and endangered species locations; cultural resources; restricted areas; pest management; information on dangerous or toxic plants and animals on the site such as poison ivy, poisonous snakes, and ticks; and any other pertinent information that helps reduce the risk of negative impacts to resources on the site and dangers to representatives at the site.

Public Awareness - The KYARNG is committed to cultivating a conservation ethic in the community, especially local youth. Natural resources personnel work with community and youth groups on conservation programs whenever possible. Scouts, in particular, often need support with projects, merit badges, and conservation talks. The KYARNG will continue to work with community and youth groups whenever possible.

Articles published in local newspapers and public service announcements on television and radio are excellent means of promoting new or existing programs involving training sites. Educating and informing the public of management practices generally increases support rather than opposition of the public. Such media reaches a diverse audience, and can be specifically designed to promote the KYARNG mission within the context of stewardship. Awards presented to training site personnel are a good topic for such articles/announcements, and can highlight a “good neighbor” ethic. All media reports should be coordinated through the PAO in Frankfort, Kentucky.

1.6 CONDITIONS FOR IMPLEMENTATION AND REVISION

1.6.1 IMPLEMENTATION

The Environmental Office is responsible for directing natural resource management and developing and implementing the updated INRMP. Successful INRMP implementation requires:

- Administrative and technical support,

- Agency cooperation and technical assistance,
- Funding,
- Priorities and scheduling,
- Production of project scopes and budgets,
- The ability to amend and revise this document as necessary.

These resources are discussed in **Section 6.1.**

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

1.6.2 EFFECTIVENESS

The primary measure of INRMP effectiveness is whether it helps prevent "net loss in the capability of military lands to support the military mission." The KYARNG is preserving the EKTS-HV's capability to support training through its natural resource management practices outlined in the 2003 INRMP and in this revision. Long-term management effectiveness is also evaluated through periodic inventories of species populations, habitat quantity and quality, and habitat values through the recurring PLSs. Trends can be used to indicate the degree of success. The KYARNG will evaluate these recurring data as they become available. The KYARNG continues to work with USFWS, KDFWR, NRCS, and Kentucky Division of Forestry (KDOF) etc., to manage the forest, preserve sensitive areas, and practice effective soil conservation. These activities are coordinated through ongoing INRMP implementation.

A practical evaluation of INRMP implementation includes reviewing whether planned projects have been accomplished. Overall, the EKTS-HV has benefited from using the INRMP as a management tool. The goals articulated in the 2003 INRMP are being addressed through implementation of management actions recommended in the updated INRMP. Most of the specific management actions have been implemented through projects. A large number of the projects are recurring actions that are continued in this updated INRMP. **Appendix A** contains an evaluation of goals, objectives, and status of projects from the 2003 INRMP A summary of the completion status of 2003 INRMP projects is provided in **Table 1.**

1.6.3 AGENCY AND PUBLIC PARTICIPATION

This updated INRMP has been developed in cooperation with the USFWS and the KDFWR. Developed using an interdisciplinary approach, information has been gathered from the KYARNG Environmental Office and military trainers, as well as other Federal, State, and local agencies and special interest groups with an interest in management of natural resources at the EKTS-HV. Agency coordination and response letters have been included in **Appendix B.**

1.6.4 REVISIONS

Per DoD policy, the KYARNG reviews the INRMP annually in cooperation with the USFWS and KDFWR. The KYARNG will converse with the agencies annually to determine if changes or issues indicate the need for a meeting. If warranted, a meeting will be held with the USFWS and the KDFWR and be documented by meeting minutes. If a meeting is not necessary, the conversation will be documented via email correspondence or record of conversation.

If not already determined in previous annual meetings, a determination will be jointly made to continue implementation of the existing INRMP with minor updates or to proceed with a revision by the forth year annual review. If the parties feel the annual reviews have not been sufficient to

evaluate operation and effect and they cannot determine if the INRMP implementation should continue or it should be revised, a formal review for operation and effect will be initiated. The determination on how to proceed with INRMP implementation or revision will be made after the parties have had time to complete this review.

Section 1.4.2 describes how the EMS of Plan, Do, Check, and Act is tied into INRMP reviews and updates / revisions. **Section 8.3** provides specific guidance on the INRMP review process including review for operation and effect and annual reviews.

1.6.5 RECORD OF ENVIRONMENTAL CONSIDERATION (REC)

This INRMP includes, as **Appendix C,** a REC. The EA for the 2003 INRMP presented the Proposed Action (implementation of the INRMP) and alternatives, summarized the affected environment, and assessed the environmental consequences of implementation. The assessment concluded the known and potential impacts of the Proposed Action on the physical, biological, and cultural environment will generally be of a positive nature. Implementing this INRMP will not result in significant adverse environmental effects. This NEPA analysis is still valid, and adequately covers the actions in this updated INRMP. The REC describes the Proposed Action and explains why further environmental analysis is not needed.

SECTION 2: INSTALLATION OVERVIEW

2.1 LOCATION AND AREA

The EKTS-HV is a KYARNG facility encompassing 542 acres located in northwestern Powell County, near the community of Westbend, Kentucky. The entire western boundary of the site is formed by Lulbegrud Creek, which flows in a southwesterly direction until it joins the Red River. Kentucky Highway 1 5 and the Bert T. Combs Mountain Parkway pass approximately 0.5 miles to the east of the site **(Figure 2).** The site may be accessed from Turley Road or Hidden Valley Road[1].

2.2 HISTORY OF KYARNG AND EKTS-HV

2.2.1 HISTORY OF THE KYARNG

Throughout her history, Kentucky has cherished the tradition of rendering military duty with zeal when called upon. Kentucky's history teems with incidents of self-sacrifice unsurpassed in daring and achievement. Kentuckians have answered the call to arms in all wars of our country. The present-day KYARNG began as part of the Virginia militia in 1 775 during the American Revolution. When Kentucky became a state in 1792, provisions were made to maintain a militia force. The Kentucky militia played a major part in the War of 1812, and also supported the War for Texas Independence (1 836) and the Mexican War (1846-1848). When the Civil War began in 1861, the Kentucky militia, then known as the State Guard, was split between loyalty to the South and the North. Many men left the State Guard to join either the Union or Confederate armies, with those remaining known as the Home Guard. The Kentucky State Guard served during the Spanish-American War of 1898. In 1903, the State Guard was federalized, meaning standards of uniformity were enforced, and federal monies would be used to train and arm the men.

During World War I (1917-1918), men from the Kentucky National Guard were assigned to replace fallen soldiers from the regular Army. Most of these men were sent overseas to serve in the LeMans area of France. The Kentucky National Guard was called up again for World War II. Once again, every organized National Guard unit was involved in active service during the war. The majority of National Guardsmen fought in the Pacific Theater. The men who fought in the Pacific Theater were stationed in the ZigZag Pass region of Luzon Island. During their time in the region, they earned the nickname, “Avengers of Bataan.” During the Korean War, men from the 1/623rd Field Artillery were in support of other regular Army units. Kentucky Guard troops were there from 1 951-1952, and spent roughly a one-year tour of duty in support of the Tenth Corps, and 1st and 7th South Korean Infantry Division. Only the 2nd Battalion, 1 38th Field Artillery (2/1 38th) of the KYARNG was sent to Vietnam. This regiment, along with a Battalion from West Virginia, was the only National Guard Battalion in the country to serve in Vietnam.

In 1 990-91, KYARNG units were mobilized for active duty to Saudi Arabia in support of Operations Desert Shield and Desert Storm. The 217th Quartermaster Detachment (Water Purification unit), 1/623rd Field Artillery, 438th and 223rd Military Police and 2123rd Transportation companies were sent to active duty. Following September 11, 2001, and in conjunction with the war effort in Iraq and Afghanistan, the training mission of KYARNG units has shifted from one of heavy armor/maneuver training to Military Police, infantry, and dismounted/wheel training. However, the overall mission of the EKTS-HV has not changed, and training usage of the EKTS-HV is expected to remain consistent.

[1] An old county road named Westbend-Snow Creek Road on topographic maps; also called Engineer Road by KYARNG units.

2.2.2 HISTORY OF EKTS-HV

The 542-acre site, now known as the EKTS-HV, was previously used as a tourist resort facility, and was referred to as "Hidden Valley Resort." The resort facilities included a lodge, clubhouse, tennis courts, golf course, and riding stables. Although no buildings or recreational developments from Hidden Valley Resort remain on the property, other remnants, such as roads, ponds (impoundments), and parking lots still exist and are used during training operations. The training site is often referred to as "Hidden Valley" or "Powell County" by KDMA/KYARNG personnel.

The Commonwealth of Kentucky Corrections Department obtained ownership of the property, and in 1981 under the Corrections Department's ownership, the KYARNG first began using the Eastern Kentucky Training Site for weekend training exercises. In 1 983, the KDMA obtained ownership of the property from the Corrections Department, and has since operated the property for the KYARNG. Because KYARNG has no staff stationed at the training site, public access for recreational purposes is currently managed by the KDFWR under a memorandum of understanding (MOU). A copy of this MOU, which is renewed on an annual or biannual basis, is included in **Appendix D.**

2.3 MILITARY MISSION

2.3.1 KYARNG MILITARY MISSION

Per DoD Supplemental Guidance, the 2003 INRMP was reviewed "as to operation and effect," to determine whether it is developed per NGB and Army policy, meets the intent of the Sikes Act, and contributes to the conservation and rehabilitation of natural resources on military installations. Revisions required because of this review have been included within this INRMP.

The primary federal mission of the KYARNG is to maintain properly trained and equipped units available for prompt mobilization for war, national emergency, or as otherwise needed. At the Federal level, the National Guard provides decisive land power for major war and essential combat support and service support units for contingency operations. The KYARNG Federal mission is to provide National Command Authority with units capable of performing their wartime mission. In their Federal role, members of the KYARNG are also part of the US Army Reserve Component, and can be called to active duty by the President.

The state mission is to provide trained and disciplined forces for domestic emergencies or as otherwise required by state law. At the state level, the National Guard provides a return on the Federal investment through domestic support capabilities embedded in its units. The KYARNG is a resource to assist local law enforcement and emergency management agencies at the direction of the Governor.

2.4 EKTS-HV USAGE AND TRAINING ACTIVITY

Approximately 90 percent of all authorized training site utilization is by military users. Military users include units of the ARNG, Active U.S. Army Components, U.S. Army Reserves, and U.S. Marine Corps Reserves. The 201st and 206th Engineer Battalions, a Mechanized Infantry Company, and the 299/298 CM are the main users of the training site. KYARNG units primarily use the EKTS-HV during weekend and annual training events throughout the year.

Non-military and civilian users account for a small portion (10 percent) of total training site use. Groups that use the EKTS-HV year-round include Boy Scouts, Junior and Senior Reserve Officers Training Corp (ROTC), and the KDFWR.

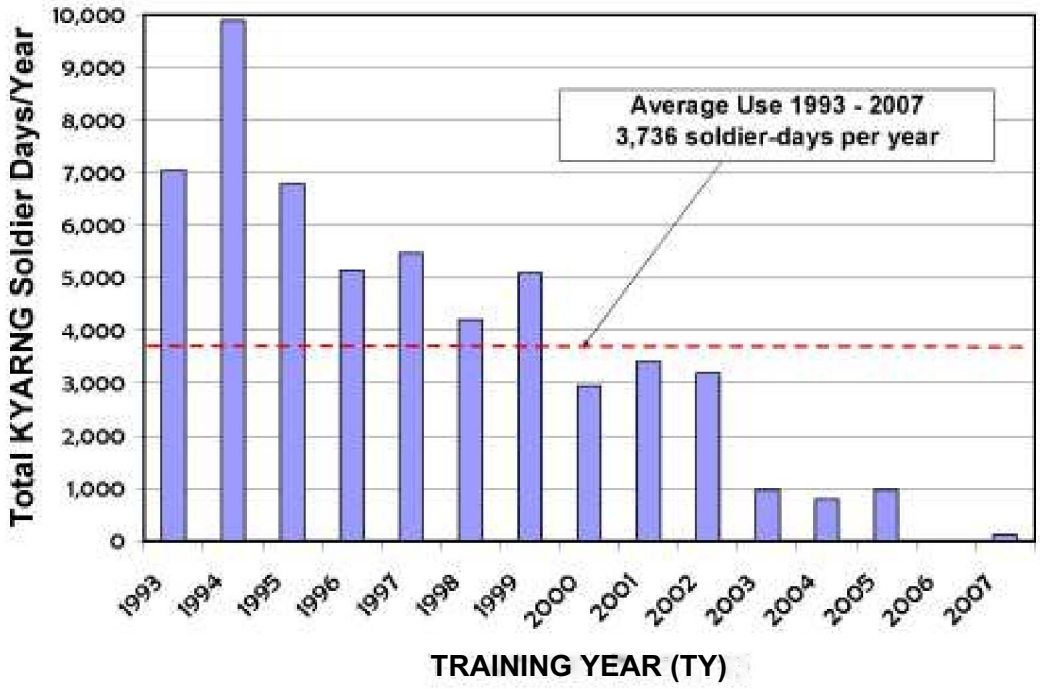
Training activities conducted at EKTS-HV are considered field training exercises (FTX). These exercises include wheeled and tracked vehicle maneuvers, troop maneuvers, foot maneuvers,

bivouacking, construction of fortifications, land navigation, emplacements and obstacles, Nuclear/Biological/Chemical (NBC) training, smoke training, and aircraft operations (rotary wing only). **No live firing occurs on the site from military operations.**

Requests for use of the training area are submitted on the Range Request form to the Training Site NCOIC, located at the DTC. Additionally, requests for use of the EKTS-HV may be submitted to the Training Site NCOIC via e-mail or telephone. Requests are approved, partially approved, or not approved, and a copy of the request is returned to the requesting unit not later than 1 5 days after receipt. The unit must coordinate with the Training Site NCOIC no later than two working days prior to usage date to ensure all aspects of the intended training are coordinated.

Unit Commanders who desire to train at EKTS-HV are required to complete an Environmental Pre-Activity Survey for training activities. A sample form is provided in **Appendix E.** The survey must be sent through the Training Site Manager to the Environmental Program Manager before the planned training may be conducted. The Environmental Program Manager will evaluate the survey, determine ways to minimize the impacts of the training, and determine if permits are needed to conduct the described training. The survey is signed and sent to the unit with a list of requirements to conduct the training while minimizing impacts to the environment. If significant changes or additions are made to the training plans, an additional survey must be submitted describing the new training. This system emphasizes preventing rather than repairing damage to the training site.

Historical use of EKTS-HV for the time-period from Fiscal Year (FY) 1993-2007 in soldier-days per year[2].is shown in **Chart 1.** Average training site usage during the time-period FY 1993-2007 was 3,736 soldier-days per year. Site usage has been limited since 2003 due to deployment.



[2] A soldier day is one person per day. Thus, 10 people who train at EKTS-HV for 10 days are equal to 100 soldier days.

CHART 1. EKTS-HV SITE USAGE TY1993-2007
(KENTUCKY NATIONAL GUARD USERS ONLY)

Heaviest site usage occurs during annual training periods in April, August, and October. Units that conduct their annual training period at EKTS-HV participate in a two-week training activity. Weekend training generally involves several units training together in the same exercises. Average seasonal distribution of training site use during FYI 993 through FY2007 is shown in **Chart 2.** During the 1 5-year period, approximately half (49 percent) of KYARNG training occurred during the driest months of the year Oune through October), 19 percent occurred during the winter (November through February), and 32 percent occurred when soils are moist and evaporation is low (March through May).

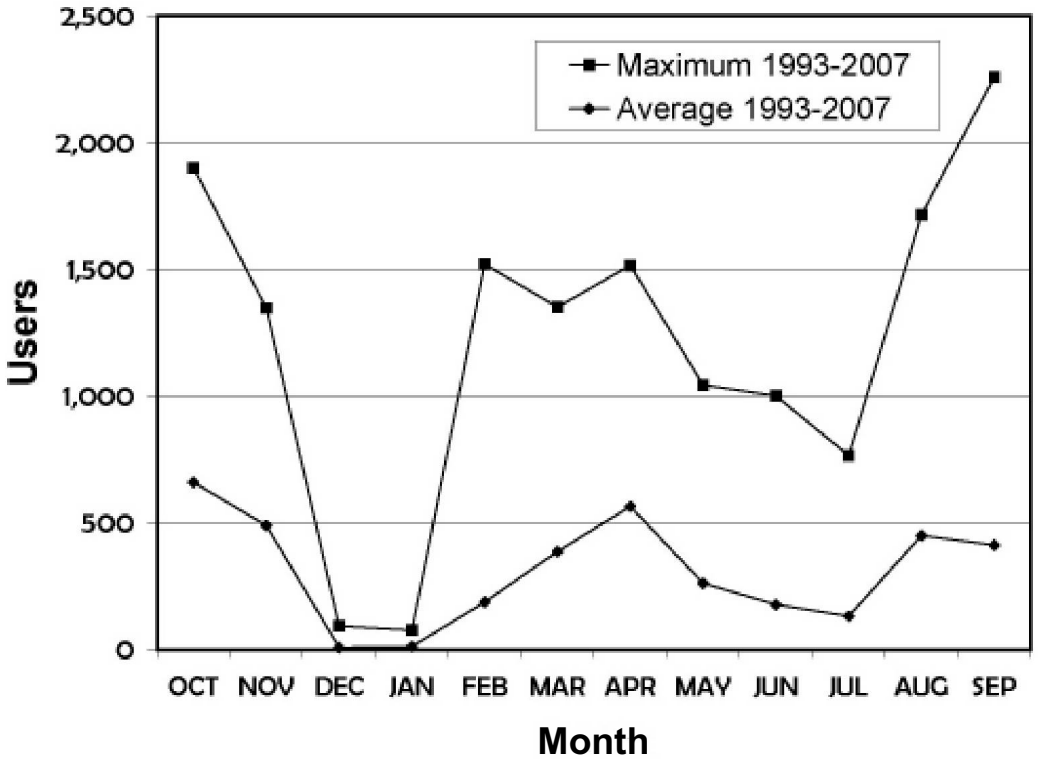


CHART 2. AVERAGE AND MAXIMUM MONTHLY TRAINING SITE UTILIZATION TY 1993-2007
(KENTUCKY NATIONAL GUARD USERS ONLY)

2.5 LAND USE

The 542-acre EKTS-HV provides areas for various training activities including maneuver areas for wheeled vehicle, tracked, and dismounted training at the squad, platoon, and company levels. No structures are present on the site. Due to the small size of the EKTS-HV, training areas have not been delineated at the site, and the entire site is available to using units.

Training support facilities on the site include three bivouac sites. Bivouac Site 1 is hardened. Bivouac Site 1 is located to the north of Hidden Valley Road on a wooded ridge overlooking the valley. Bivouac Site 2 occupies a hilltop further west and to the north of Hidden Valley Road.

Bivouac Site 3, which is in a shrub-dominated field, is not used frequently and lies to the south of Falls Branch in the southern "arm" of the property.

In FY 2002-2003, a small arms firing range on the northeast side of the training site was closed and removed. The range was continually vandalized and as a result, no longer met military standards. Closure and removal of the range included demolition of the wood and steel structure associated with the range, excavation of soil containing lead projectiles, recycling lead at a regional smelter, and grading the earthen berm to near original grade. The Kentucky Department of Environmental Protection (KDEP) and Kentucky Division of Waste Management reviewed the closure.

2.6 FORCE STRUCTURE AND UNIT CHANGES

The Kentucky National Guard is comprised of over 7,000 soldiers and airmen in the Army and Air National Guard. The KYARNG provides combat ready units and equipment in support of the Federal military strategy. On the state level, the KYARNG provides units and equipment to protect life and property, preserve peace and order, and ensure the public safety of Kentucky's citizens as ordered by the Governor of Kentucky. Major commands include the following:

- State Area Command
- 75th Troop Command
- 1 38th Field Artillery Brigade
- 149th Armored Brigade
- 63rd Aviation Group
- 301 st Chemical Co

Among the ARNG units stationed in Kentucky are Armor, Infantry, Engineering, Transportation, Medical, Aviation, and Maintenance specialties.

2.7 FUTURE LAND USE

The KYARNG would like to increase EKTS-HV site usage by encouraging units to use the site for training rather than Local Training Areas (LTAs). Site usage is driven by unit requests. Planned future actions include:

- Construct a forward operating base (FOB) - large scale bivouac area. This would involve maintaining existing paved areas are used as tent pads. Because the military is adopting a new, modular tent that will be larger than current tents, improvements may be made to existing tent pads. In addition, earthen berms will be built around the FOB to enhance force protection and realistic training scenarios.
- Improve existing roads to accommodate increased usage.
- Contract with a local farmer to harvest hay from the site to accommodate the need for mowing and maintenance at little or no cost to the KYARNG. The area needs preparation (mowing, brush removal, fertilization) to make it acceptable for haying.

2.8 SURROUNDING COMMUNITIESAND LAND USE

The EKTS-HV is surrounded by rural, heavily forested, and steep lands not suitable for large-scale agricultural operations, although some smaller farms are present in the region. Surrounding land uses to the south and east of EKTS-HV include forest, small agricultural and livestock farms, an abandoned claypit, residences along KY Highway 15, and county roads. The settlement of

Westbend lies directly to the east; and Lulbegrud Creek lies due west on the border between Powell and Clark Counties. Several private homes are located adjacent to the northern entrance (Turley Road) and along the main entrance (Hidden Valley Road).

Powell County ranked 82nd in population of 120 Kentucky counties, with a 2000 population of 1 3,237 The nearest population centers to EKTS-HV are Clay City, population 1,300 (including Westbend), and Stanton, population 3,029. (U.S. Census Bureau, 2006a) Major metropolitan population centers nearest the site are Winchester and Lexington, 23 and 43 miles to the northwest, respectively.

2.9 NATURAL AREAS

The Pilot Knob State Nature Preserve is located approximately three miles northeast of the EKTS-HV. This 308-acre preserve is owned and managed by the Kentucky State Nature Preserves Commission (KSNPC) for the Commonwealth of Kentucky. The preserve protects a second growth forest and Pilot Knob, thought to be the place Daniel Boone first looked upon the Bluegrass Region in 1769. The preserve's proximity to the training site adds significance to the forested tracts of the training site. Together, the forested preserve and training site contribute to maintenance of the forest ecosystem within the Knobs region.

Powell County is also home to Natural Bridge State Park and the Red River Gorge Geologic Area.

SECTION 3: THE PHYSICAL ENVIRONMENT

3.1 CLIMATE

Kentucky lies within the hot continental division of the humid temperate domain (Bailey, 1996) and is characterized by hot summers and cool winters. Average monthly temperature and precipitation data between 1948 and 2005 was obtained from Station 1 55640 in Mount Sterling, Kentucky (SERCC 2007) and is summarized in **Chart 3.**

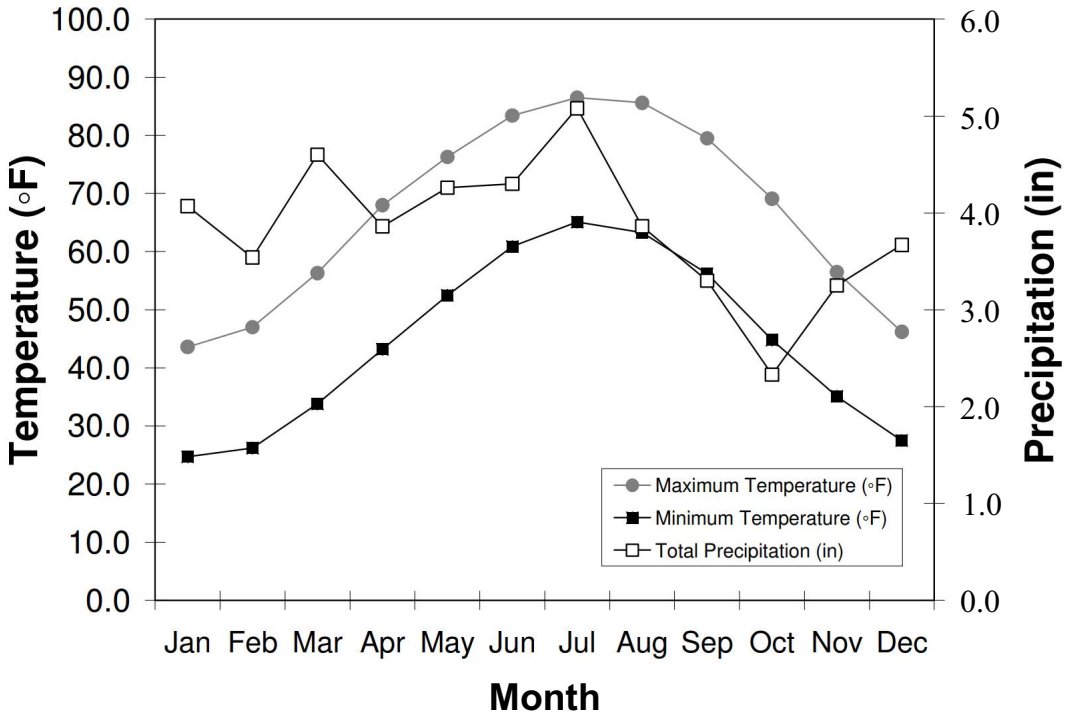


CHART 3. AVERAGE MONTHLY TEMPERATURE 1948 - 2005, MOUNT STERLING, KENTUCKY (SOURCE, SERCC, 2007)

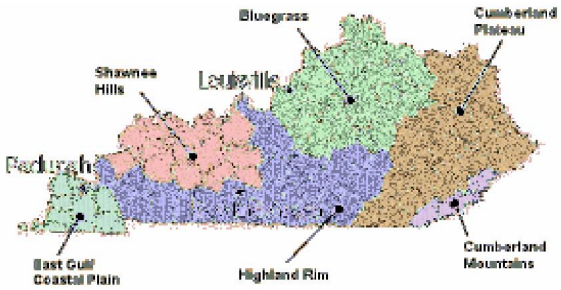
The mean annual maximum and minimum temperatures are 66.5 and 44.4 degrees Fahrenheit (°F), respectively. On average, July is the warmest month and January is the coldest. The lowest temperature on record is -20°F, which occurred on 24 January 1 953 and 22 December 1989. The highest recorded temperature in Mount Sterling is 106°F, which occurred on 14 July 1954.

The total mean annual precipitation is 46.1 inches. Of the total annual precipitation, approximately 27 percent falls between March and May. The months between August and October are the driest on average. The average annual snowfall (usually between the months of November and March) is 9.2 inches, with the greatest snow depth at any one time during the period of record being 28 inches in January 1978. The growing season or frost-free period continues for five to six months between mid-April and mid-October.

The prevailing winds are from the west, and the average windspeed is highest, about eight miles per hour, early in spring. The wind changes direction frequently. Winds are usually lighter early in the morning and stronger early in the afternoon (USDA-NRCS 1 994). Clouds cover less than 60 percent of the sky, on average, between sunrise and sunset. Average cloud cover varies annually

from about 70 percent in summer to about 45 percent in winter. As a result, sunshine is abundant, especially during the growing season. The average relative humidity in mid-afternoon is about 60 percent. Humidity is higher at night, and the average at dawn is about 85 percent.

3.2 PHYSICAL SETTING AND TOPOGRAPHY



The EKTS-HV lies in the southeast region of the state along the eastern boundary of the Bluegrass subsection of the Interior Low Plateaus Physiographic Province, which borders the Cumberland Plateau (Fenneman 1938; Quarterman and Powell 1978). The Cumberland Plateau is a maturely dissected plateau of varying altitude and relief. The boundary between the Bluegrass subsection and the Cumberland Plateau is more or less defined by a highly dissected escarpment, the outlying components of which are a series of knobs that rise abruptly from the floodplains of streams draining the region (White et al., 1 995).

The area surrounding the EKTS-HV is characterized by long and narrow ridgetops with steep side slopes, and narrow to broad valleys. Elevation varies from approximately 600 feet along Lulbegrud Creek to just over 840 feet along the northern and eastern ridgetops surrounding the training site. Land along Hidden Valley Road within the training site is relatively flat with an elevation of 720 feet **(Figure 3).**

3.3 GEOLOGY AND SOILS

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

3.3.1 GEOLOGY

3.3.1.1 GEOLOGIC FORMATIONS

Although alluvium has been recently deposited along Lulbegrud Creek within the last one million years, the most prevalent formations underlying the site were formed 350 to 450 million years ago. The site lies along the eastern flank of the Cincinnati Arch, resulting in rock strata dipping gently to the east. Faults within the eastern Kentucky region are inactive. The Kentucky River Fault zone lies approximately five miles to the north, and the Irvine-Paint Creek fault zone lies approximately seven miles to the south. No fault lines are known within or adjacent to the EKTS-HV property.

At the site, the stratigraphic section in descending order is Quaternary Alluvium, Lower Mississippian (Nancy and Farmers Members of the Borden Formation), Middle and Upper Devonian (New Albany Shale and Boyle Dolomite), Lower and Middle Silurian (Crab Orchard Formation and Brassfield Dolomite) and Upper Ordovician (Preachersville Member of the Drake Formation). The

geology of the EKTS-HV is summarized in **Table** 7 (McDowell 1978). Colluvial slopes related to the Crab Orchard Formation tend to be unstable due to the plasticity of the green shale.

TABLE 7. GEOLOGIC FORMATIONS WITHIN EKTS-HV AND SURROUNDING VICINITY

GEOLOGIC FORMATION	CHARACTERISTICS
Quaternary alluvium	The youngest unit exposed at the site. It is composed of silt, clay, sand, and gravel confined to the flood plain of the Lulbegrud Creek
Nancy and Farmers Members of the Borden Formation	Composed mainly of shale and siltstone and sandstone and shale respectively. This unit caps the higher elevations within the site (approximately 840 feet and above). The Nancy Member is rich in siderite concretions up to several inches across. The basal contact of the Farmers Member with the New Albany Shale is sharp and well exposed.
New Albany Shale Formation	Underlies the Farmers Members and crops out over the majority of the site. It is composed of a dark-gray to black carbonaceous shale, sparsely piritic. It contains interbeds of gray silty clay, shale, and a clayey and silty dark-gray dolomite. The basal contact with the underlying Boyle Dolomite is sharp, conformable, and well exposed, except where the basal dolomite is not present.
Boyle Dolomite Formation	A fossiliferous, coarse-grained, vuggy, petroliferous, and cherty dolomite. It varies between light- to dark gray to brownish-gray in color. Commonly well exposed, it forms ledges.
Upper Part of the Crab Orchard Formation	Occurs below the Boyle Dolomite, and is composed of greenish-gray to gray shale and gray dolomite. The shale is clayey, poorly fissile, relatively impermeable, and plastic when wet. The basal contact with the Brassfield Dolomite is gradational.
Lower Part of the Crab Orchard and Brassfield Dolomite Formation	Composed of medium-light-gray to yellowish-brown dolomite and a greenish-gray to gray shale. The shale is clayey, poorly fissile, relatively impermeable, and plastic when wet. The basal contact with the Preachersville Member is sharp.
Preachersville Member	Composed by a greenish-gray shale and gray to reddish-brown dolomite. The shale is poorly bedded, poorly fissile, clayey, dolomitic in part, plastic when wet, and unfossiliferous. The dolomite is commonly mottled, medium to coarse-grained, vuggy, petroliferous and dominant in the lower part of the unit. The highest southern and eastern points on the training site are capped by Mississippian sandstones and shales of the Borden Formation. Most of the slopes above 720 feet are eroded and underlain by Devonian New Albany Shale, while slopes below 720 feet are underlain by Silurian and Ordovician shale and dolomite of the Crab Orchard and Drakes Formations.

Source: McDowell 1978

3.3.1.2 SEISMICITY

The EKTS-HV is located approximately 400 miles to the east of the New Madrid Seismic Zone (NMSZ), the most seismically active zone east of the Rocky Mountains. The NMSZ has produced damaging earthquakes in historical time including at least three earthquakes estimated to have had magnitudes of 8.0 or greater during the years from 1811 to 1812. An earthquake of magnitude 6.0 or larger is expected somewhere in the zone about every 70 years. Considering that a magnitude 6.0 or larger earthquake has not occurred in the NMSZ since 1 895, Johnston and Nava (1984) estimated a 40-63 percent chance of a magnitude 6.0 or larger earthquake in the NMSZ by the year 2000, and an 86-97 percent chance of this size earthquake by the year 2035.

The training site lies in eastern Kentucky, which could experience New Madrid Fault earthquakes of magnitudes greater than 4.5 on the Richter scale (Modified Mercalli intensity of VI). An earthquake of Richter magnitude 7.0 to 7.9 can occur again in the New Madrid, Missouri epicenter (Center for Earthquake Studies [CES], 1994); however, there are no buildings at EKTS-HV that would be affected by such an earthquake.

A magnitude 5.2 earthquake occurred in the Wabash Valley Fault on 18 April 2008, centered about 120 miles east of St. Louis, Missouri. Three magnitude 5 or higher earthquakes have been recorded on the Wabash Valley Fault within the past 20 years, according to Douglas Wiens,, Ph.D. a seismologist at Washington University in St. Louis (Science Daily, 2008).

3.3.1.3 ECONOMIC GEOLOGICAL RESOURCES

Powell County is rich in iron. The first iron forges west of the Alleghenies were near Clay City in 1 785, and operated until 1874 (Powell County, 2006). Other nonagricultural pursuits include natural gas, oil, and clay for brick making. Improved rail transportation during the late nineteenth century helped provide a market for the county's other natural resources and agricultural products.

Oil and gas are produced from the Big Sandy pool in southeastern Powell County. No oil or gas is known from or produced on the training site.

High quality beds of shale rock that produce clay occur in great quantities in Powell County. The original name of Clay City was derived from the clay-bearing formations south of Clay City's present location (Powell County, 2006). The U.S. Brick Company, located north of Stanton, produces millions of bricks annually. No clay or iron deposits are known from the training site.

3.3.2 SOILS

The United States Department of Agriculture (USDA) NRCS (then named the Soil Conservation Service) completed a soil survey of Powell and Wolfe Counties in 1993 (Hayes 1993). Information that follows was taken from Hayes (1 993).

3.3.2.1 SOIL DESCRIPTIONS

Eight soil series that occur either singly or in combination with other series in six distinct map units were identified **(Table 8** and **Figure 4).** The eight series were divided into three major groups based on deposition (USDA-NRCS 1 994). No mapped soil units within the boundary of the Training Site are included as hydric soil map units or as map units that may have hydric soil inclusions on the county hydric soil list.

Eighty-two percent (442 acres) of the soils on the training site are colluvial and residual soils. Colluvial soils, which formed primarily in material moved down slope by gravity, include the Muse and Woolper soils, which are deep, fine textured, and well-drained. Muse soils formed in material

weathered from black acid shale, and Woolper soils formed in material weathered from limestone and calcareous shales. Residual soils, which weathered in place from the underlying bedrock, include Jessietown and Rohan soils, which formed in material weathered from black acid shale. Jessietown soils are moderately deep, and Rohan soils are shallow. Westbend soils are deep, and formed in material weathered from interbedded soft siltstone and greenish gray shale. Shrouts soils are moderately deep, and formed in material weathered from dolomite, limestone, and calcareous shales.

Seventeen percent (93 acres) are alluvial soils, which were deposited by water, and include the Allegheny and Grigsby soils. The Allegheny soils are on old high stream terraces, which are not associated with the present drainage system of the area. The more recent Grigsby soils occur along the floodplains of Lulbegrud Creek. Both of these soils are deep, loamy, and well-drained. The remaining 1 percent (7 acres) of the training site is made up of water bodies.

TABLE 8. SOIL TYPES ON THE EKTS-HV

SYMBOL	SOIL NAME	K-FACTOR	T-FACTOR	HYDROLOGIC SOIL GROUP	CAPABILITY CLASS	ACREAGE
AgB*	Allegheny loam, 2 to 6 percent slopes	**0.32**	**4**	**B**	lie	43.4
AgD3	Allegheny loam, 1 5 to 25 percent slopes, severely eroded	**0.32**	**4**	**B**	Vie	32.0
Gs	Grigsby silt loam, frequently flooded (*where not frequently flooded)	**0.32**	**5**	**B**	llw	19.7
JaB	Jessietown silt-loam, 2 to 6 percent slopes	**0.37**	**3**	**B**	lie	2.1
JoF	Jessietown-Muse-Rohan complex, 20 to 45 percent slopes	**0.37**	**3**	**B/C/D**	Vile	250.3
SeE	Shrouts-Woolper complex, 1 5 to 35 percent slopes	**0.43**	**2**	**D/C**	Vie	1 58.7
WbE2	Westbend silt loam, 20 to 45 percent slopes, eroded	**0.37**	**4**	**B**	Vile	22.8
	Water					12.9
					Total GIS acreage	541.9

(*) Indicates a prime farmland soil type

Hydrologic Soil Group:
A = Low runoff potential, high infiltration rates
B = Moderate infiltration rates
C = Low infiltration rates
D = Highest runoff potential, very low infiltration rates

Capability Class:
1 = Few limitations
II = Moderate limitations
III = Severe limitations requiring special conservation practices
IV = Severe limitations requiring very careful management
V = Not likely to erode, but limited use
VI = Severe limitations, generally unsuitable for cultivation
VII = Severe limitations, unsuitable for cultivation
VIII = Limitations preclude commercial crop production
Subclass:
e = erosion is main hazard
w = water in soil interferes with plant growth

Source: Hayes, 1 993

33.2.2 SOIL EROSION POTENTIAL

It is important to consider the ability of the soil to withstand or recover from the effects of the wheeled vehicular training that occurs at the EKTS-HV. Tracked and wheeled vehicles should be used where most appropriate on the training site, such as the open grasslands. A number of physical and chemical factors contribute to susceptibility of a soil to damage from military training. These include texture, organic matter content, permeability, clay mineralogy, structure, and depth. There are several indices that incorporate the physical and chemical factors into numeric scales or broad categories that are more easily related to the potential effects of wheeled and tracked vehicle training: K-factor, T-factor, Hydrologic Soil Groups, and Land Use Capability Class. An in depth review of these factors can be found in the Soil Survey for the Eastern Kentucky Training Site (USDA-NRCS 1 994) and the soil survey for Powell County (Hayes 1 993).

Of the 542 acres surveyed by the USDA-NRCS (1994), 87 percent of all soils are found on slopes with inclination greater than 12 percent. These slopes become highly erodible when vegetative cover is damaged. Of the 542 acres of soils surveyed, 82 percent of all soils have high K-factor or "erodibility factor" values (>0.34) and low T-factor or "soil loss tolerance" values (< 4.0), which indicate that the soils are highly erodible.

Since intensive tracked vehicle training can also cause severe disruption to and compaction of the soil surface (similar to the effects of cultivation), the Land Use Capability Classification System can be used as an index for military training as well (USA-CERL, no date). In this system, the class numerals (I-VIII) indicate progressively greater limitations and narrower choices for practical use. The subclass letter (e, w, or s) designates limitations due to erosion, water, shallowness, droughtiness, or stoniness. The capability class/subclasses from the soil survey reveal that 87 percent of all soils require very careful management due to risk of erosion (almost equal to K- and T-factor results); and 5 percent of all soils require special conservation practices due to wetness.

In total, approximately 82 to 87 percent of all soils on the training site will require special treatment and consideration when planning for land rehabilitation. See **Section 6.0** for a discussion of rehabilitation techniques and guidelines that will be implemented during the planning period.

Hydrologic soil group classifications refer to soils grouped according to their runoff-producing characteristics. Because infiltration rate generally is inversely related to runoff and erosion, the hydrologic soil group is an indirect index to site erodibility. Group A soils have high infiltration rates when thoroughly wet, and have a low runoff potential (i.e., they are the least erodible of all soils). Group B soils have moderate infiltration rates when thoroughly wetted. Group A and group B soils are most desirable for military training activities (USA-CERL no date). Group C soils have slow infiltration rates when thoroughly wetted, and are borderline for military training activities. Group D soils have a very slow infiltration rate when thoroughly wetted, and are undesirable for military training activities. Of all soils, 23 percent are in Group B; 45 percent are in Group "B/C"; and 30 percent are in Group "C/D" (Hayes 1 993).

3.3.23 PRIME FARMLAND AND UNIQUE SOILS

Approximately 65 acres (12 percent) of the EKTS-HV soils are recognized as potential prime farmland soils (Allegheny loam, 2 to 6 percent slopes); however, they are not currently managed to produce food, feed, forage, fiber, or oilseed crops (see Table 3-2). The KYARNG uses the site for the primary purpose of military training, which takes precedence over agricultural land uses at this time. It is possible that certain areas of the EKTS-HV would be out-leased for hay production (see section 6.10 for more information on the details of this agreement).

3.4 HYDROLOGY

3.4.1 SURFACE WATER RESOURCES

Most of Powell County falls within the Central Sub-basin of the Upper Kentucky Hydrologic Unit (HUD #05100204), which covers approximately 1,082 acres. The training site is within the Lulbegrud Creek drainage (watershed #05100204180). Lulbegrud Creek is a fourth order stream that originates in southwestern Montgomery County and flows approximately 25 miles southwest to its confluence with the Red River at river mile 10.3, draining 53.4 square miles (Bower and Jackson 1 981). Lulbegrud Creek forms the western boundary of the EKTS-HV along the Clark and Powell County line for 1.7 miles.

Approximately 3.4 miles of regulated intermittent and perennial streams were mapped on the EKTS-HV (Gravatt et al., 1 999). The Ordinary High Water Mark (OHWM) identifies the jurisdictional limits of lakes, streams, and ponds under Section 404. One named intermittent stream, Falls Branch, and several smaller unnamed intermittent streams cross the training site and drain into Lulbegrud Creek **(Figure 5).** In total, approximately 0.7 miles of regulated intermittent stream channels are present on the training site. The streams on the EKTS-HV generally have non-vegetated, defined beds and banks, with bedrock or recently deposited sediments in the streambed. There are approximately 0.58 acres of un-vegetated open water bodies (Palustrine Open Water [POW]). Generally, these are the result of impounded seasonal streams. Rain and ground water largely supply the intermittent and perennial streams. Blocked drainages due to road crossings may have altered the upstream portions, generally increasing hydroperiod in some areas and creating small backwater wetlands.

There are 4 ponds larger than 1 5,000 square feet, and 3 ponds smaller than 15,000 square feet on the property. An unnamed tributary of Falls Branch, which parallels Engineer Road, has been impounded, forming 2 small reservoirs (Ponds 3 and 4) within its watershed (White et al., 1995). Two additional ponds are located to the north of Engineer Road (Ponds 1 and 2). Of the 4 ponds larger than 1 5,000 square feet, the largest is approximately 3 acres and the smallest is less than 1 acre.

3.4.2 FLOODPLAINS

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

EO 11988 *(Floodplain Management)* requires agencies to assess the effects their actions may have on floodplains and consider alternatives to avoid adverse effects and incompatible development on floodplains.

Flood-prone areas are identified by the Federal Emergency Management Agency (FEMA) on Flood Insurance Rate Maps (FIRM) based on historic, meteorological, hydrologic, and hydraulic data. Open space conditions, flood control works, and development are also taken into account in creating the maps. Base flood areas, or 1 00-year floodplain, are delineated on the maps. An area within the 100-year floodplain has a one percent chance of flooding each year or a 26 percent chance of flooding over a 30-year period. Based on the Flood Insurance Rate Maps, the 100-year floodplain occurs on 25.9 acres of the EKTS-HV, along the east side of Lulbegrud Creek.

3.4.3 WETLANDS

The U.S. Army Corps of Engineers (USACE) and the U.S. Environmental Protection Agency (USEPA) define wetlands as those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

Federal and State laws and regulations protect Waters of the State, which include wetlands. The Clean Water Act (CWA) is the primary law protecting U.S. waters. Section 404 of the CWA (33 USC 1 344) prevents discharge of dredged or fill material into Waters of the U.S. without a permit from the USACE. Generally, whenever a Section 404 permit is required, a Section 401 Water Quality Certification (WQC) issued by the Commonwealth of Kentucky is also required.

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

In 1999, the US Army Research and Development Center conducted a PLS at EKTS-HV to locate and map Waters of the US that would potentially be regulated (i.e., jurisdictional) by the USACE under Section 404 of the CWA (Gravatt et al., 1999). All features were delineated either to the limits of the OHWM or by wetland protocols identified in the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory [EL], 1987). Wetlands and shallow water habitats were also classified according to the USFWS's Cowardin classification system (Cowardin et al., 1979).

Areas identified in the EKTS-HV wetland PLS that are potentially subject to Section 404 CWA jurisdiction include 3.5 miles of intermittent and perennial streams, 0.58 acre of POW (e.g., lakes or ponds), and 1.72 acres of palustrine emergent marsh (PEM) wetlands **(Table 9, Figure 5).** The wetland areas were generally found in association with stream corridors and shallow depressional areas adjacent to agricultural fields on the relatively level floodplain of Lulbegrud Creek.

TABLE 9. POTENTIAL WETLANDS AND OTHER WATERS OF THE US AT EKTS-HV

COWARDIN CLASSIFICATION	DESCRIPTION	AMOUNT
POW	Open Water - Palustrine, Open Water/Unknown Bottom 4 ponds (0.35 to 3.61 acres)	0.58 acres (25 %)
PEM	Vegetated - Persistent Emergent Wetlands 7 areas (0.03 to 0.73 acres in size)	1.72 acres (75%)
	Total Area	2.3 acres
R2UB	Riverine - Lower Perennial, Unconsolidated Bottom - Non-vegetated flowing waterways in the R2 category (1 to 4 acres), such as open ditches.	2.8 miles
R4SB	Riverine - Intermittent, Streambed — Non-vegetated flowing waterways in the R4 categories (1 to 4 acres), such as open ditches.	0.7 miles
	Total Length	3.5 miles

Prior to impacting wetlands or other Waters of the U.S. at the EKTS-HV, the KYARNG will conduct a wetland delineation and obtain a jurisdictional determination from the USACE. KYARNG will coordinate with the appropriate USACE District office regarding wetland impacts and permitting.

3.4.4 GROUNDWATER RESOURCES

Groundwater in the area can be obtained from wells drilled in valley bottoms, while wells drilled on hillsides and ridge tops probably do not yield water (Hall and Palmquist Jr. 1960). Water obtained from most hand pumped and drilled wells is hard to very hard, and may contain salt, hydrogen sulfide, or iron, especially at depths greater than 100 feet (Hall and Palmquist Jr. 1 960). Water from dug wells and springs is soft and has a low dissolved-solids content.

3.4.5 WATER QUALITY

A preliminary water quality investigation was conducted between 1998 and 2000. The study recommended a long term water quality monitoring program be established on the site to 1) establish a baseline for future reference, 2) allow for making appropriate pollution-control decisions, and 3) track water-quality changes at the site. Three sites were proposed for the long-term surface water monitoring program.

As a result of this recommendation, surface water monitoring was conducted at the EKTS-HV between 2000 and 2003 (Cumbie et al., 2004). Surface water quality on the installation was found to be generally well-buffered (pH between 6.5 and 7.5), with low concentrations of dissolved ions when compared to primary and secondary drinking water standards. Seasonal variations observed were attributed to climate patterns. For example, during wet seasons (e.g., spring), ion concentrations tended to decrease as they became diluted by fresh water.

According to this study, military activities at the EKTS-HV do not appear to impact overall water quality on site. However, data at one of the three monitoring sites (located adjacent to the former small arms firing range) indicated a trend of decreasing pH along with an increase of dissolved metals (aluminum, iron, magnesium, and manganese). The source of this trend was not determined, but may be attributed to the fill material used to create the firing range pad and subsequent soil disturbance during range decommissioning in the summer of 2003 (Cumbie et al., 2004). Additional surface water monitoring will be conducted as necessary, depending on military usage or special issues.

SECTION 4 : ECOSYSTEMS AND THE BIOTIC ENVIRONMENT

Several studies have been conducted to describe the biotic environment of the EKTS-HV. **Table 10** lists natural resources-related studies conducted at EKTS-HV. Many species of flora and fauna are now known from the site as a result of these studies. This section of the INRMP will describe natural vegetation communities and the flora and fauna that inhabit them using an ecosystem classification.

TABLE 10. NATURAL RESOURCE STUDIES AT EKTS-HV

YEAR	STUDY	STUDY COMPLETED BY
1984	Preliminary Woodland Examination	Kentucky Division of Forestry
1993	Aquatic Investigation	Laudermilk et al.; Kentucky State Nature Preserves Commission
1993	Terrestrial Vertebrate Survey	Palmer-Ball; Kentucky State Nature Preserves Commission
1993	Soil Survey of Powell and Wolfe Counties	Hayes, RA, USDA Natural Resources Conservation Service
1994	Resource Inventory and Conservation Plan	USDA-Natural Resources Conservation Service
1995	Biological Inventory	White et al., Kentucky State Nature Preserves Commission
1999	Delineation of Wetlands and Other Regulated Waters	U.S. Army Engineer Research and Development Center, Waterways Experiment Station, CEERD-ER-W
2001	Water Quality Investigation	Galceran and Dinger; Kentucky Geological Survey
2002	Update of Biological Inventory	Kentucky State Nature Preserves Commission
2004	Water Quality Investigation	Cumbie et al., Kentucky Geological Survey
2006	Update of Biological Inventory	Littlefield and Yahn, Kentucky State Nature Preserves Commission

4.1 ECOSYSTEM CLASSIFICATION

The U.S. Forest Service (USFS) identifies ecoregions used to classify geographical locations based on four general levels of order[3]. From the broadest to the most specific, these orders are: Domain - consisting of groups of related climates; Division - consisting of climates within domains; Province - based on vegetation or natural land covers (includes influences of elevation); and Section - based on local terrain features.

EKTS-HV is located within the Eastern Broadleaf Forest (Continental) Province of the Hot Continental Division of the Humid Temperate Domain as described by Bailey (1995). This region is also called the Ozark/Interior Plateaus (Harker et al., 1 993).

4.2 VEGETATION

Vegetation communities at the EKTS-HV were surveyed and classified during the 1995 biological inventory (White et al., 1995) and 2002 and 2006 updates (KSNPC, 2002; White and Yahn, 2006).

[3] In some instances, more specific sub-divisions of these levels can be made.

A complete list of flora identified at the EKTS-HV is provided in **Appendix F.** Vegetation communities at the EKTS-HV are summarized in **Table 11** and shown in **Figure 6.** The subsections following describe these communities in greater detail.

TABLE 11. VEGETATION COMMUNITIES ON EKTS-HV

COMMUNITY[1]	ACRES	VEGETATION*	WILDLIFE*
Natural Wetland Community			
Marsh	4	Cattail, green bulrush, sedges	Beaver, muskrat, ducks, crayfish
Ponds[2]	6	Aquatic plants, Slender waternymph or naiad	Fish, frogs, insects, waterfowl
Streams[2]	-	Aquatic plants	Fish, mollusks, frogs, salamanders, insects, waterfowl
Riparian Ecosystem			
Alluvial Forest	4.5	Black walnut, box elder, American elm, American sycamore, river birch, silver maple, Guyandotte beauty	Wild turkey, quail, dove, teal, rail, gallinule, turkey, snipe, woodcock, owls
Natural Upland Communities			
Acidic Subxeric Forest (Oak Hickory Forest)	119	White oak, rock chestnut oak, chinquapin oak, mockernut hickory, Virginia pine, American beech, black huckleberry, sparkleberry.	White-tailed deer, squirrels, mice, rabbits, foxes, raccoons, grackles, wild turkey, grouse, quail, blue jays, woodpeckers, waterfowl
Acidic Mesophytic Forest	68	Tuliptree, red oak, red maple, slippery elm, American beech	Bobcat, eastern chipmunk, white-tailed deer, gray fox, red fox, mink, muskrat, opossum, cottontail rabbit, raccoon, fox squirrel, gray squirrel, weasel, eastern woodchuck
Hemlock-Mixed Forest	2	Eastern hemlock	Wild turkey, quail
Anthropogenic Upland Communities			
Disturbed Deciduous Forest	177	Black cherry, white ash, red maple, winged elm, Nepalese browntop, southern blackberry, Japanese honeysuckle, multiflora rose, sassafras, persimmon	Cottontail rabbit, mice, red fox, gray fox
Pine Forest	19	Virginia pine, red maple, sourwood, black locust, sassafras	Waxwings, bobwhite, quail, ruffed grouse, pheasant, wild turkeys, rabbits, foxes, raccoons, skunks, opossums, and coyotes
Non-Native Grassland	142.5	Orchard grass, tall fescue, timothy, ragweeds, Canada goldenrod, Chinese lespedeza, Japanese honeysuckle, yellow sweetclover, daisy fleabane, and hairy white oldfield aster	White-tailed deer, raccoon, quail, mice, cottontail rabbit

'"Scientific names are cataloged in Appendix F
[1]As defined by the Biological Inventory (White and Yahn, 2006)
[2]A habitat type; not a natural vegetation community type.

4.2.1 RIPARIAN ECOSYSTEM

Alluvial Forest forms a narrow band along Lulbegrud Creek. It occurs on a natural levee or shelf that is periodically flooded. Common trees are black walnut *(Juglans nigra),* box elder *(Acer neg undo)* and American elm *(Ulmus americana).* American sycamore *(Plata nus occidentalis)* and river birch *(Betula nigra)* are good indicators of this community. This forest is best developed along the stream terrace of Lulbegrud Creek across from the old firing range (White and Yahn, 2006).

4.2.2 NATURAL UPLAND COMMUNITIES

Acidic Mesophytic Forest occurs on lower protected slopes on the EKTS-HV. The best examples of this type of forest occur along the tributaries of Lulbegrud Creek that are east and south of the old firing range and occur on rich well-drained soils at lower elevations. Characteristic canopy species include tuliptree *(Liriodendron tulipifera),* red oak *(Quercus rubra),* red maple *(Acer rubrum)* and slippery elm *(Ulmus rubra).* American beech *(Fagus grandifolia)* increases in importance at mid-elevations and below into the acidic mesophytic forest type. The understory has a very diverse spring flora (White and Yahn, 2006).

Acidic Sub-xeric Forest occurs on dry shaley soils on the mid to upper slopes and ridges of the hills on EKTS-HV. Common canopy trees include white oak *(Quercus alba),* rock chestnut oak *(Quercus prinus),* chinquapin oak *(Quercus muhlenbergii),* and mockernut hickory *(Carya tomentosa).* Virginia pine *(Pinus virginiana)* occurs scattered on the ridges throughout this forest type. Two species in the heath family, black huckleberry *(Gaylussacia baccata)* and sparkleberry *(Vaccinium arboreum),* are common in the understory and shrub layer (White and Yahn, 2006).

Hemlock-Mixed Forest occurs on the steep north-facing slopes adjacent to where the firing range was previously located. Eastern hemlock trees *(Tsuga canadensis)* are characteristic in the canopy, and the understory flora is diverse and similar to that of the acidic mesophytic forest. This community type transitions between the acidic mesophytic forest along this elevation of the slope and with the acidic sub-xeric forest at upper elevations (White and Yahn, 2006).

4.2.3 ANTHROPOGENIC[4] UPLAND COMMUNITIES

Disturbed Deciduous Forest community (formerly the Successional Shrub/Tree Mix community of 1995) is characterized by having a history of intense disturbance but more recently succeeding back to forest. These areas surround intermittent and perennial stream drainages and relatively low-elevation uplands. Dominant canopy species include black cherry *(Prunus serotina),* white ash *(Fraxinus americana),* red maple, and winged elm *(Ulmus alata).* Nepalese browntop *(Microstegium vimineum),* southern blackberry *(Rubus argutus),* Japanese honeysuckle *(Lonicera Japonica),* and multiflora rose *(Rosa multiflora)* are common constituents of these thickets and young forests. Early successional areas can also be dominated by sassafras *(Sassafras albidum)* and persimmon *(Diospyros virginiana).* Occasionally, evergreen Virginia pine and eastern redcedar *(Juniperus virginiana)* can be intermixed within the canopy (White and Yahn, 2006).

Pine Forest consists primarily of Virginia pine. These areas are probably seeded in from naturally occurring populations of this pine on the dry ridges in and around the site (White, et al., 1995). One of the occurrences is found on the south side of the road to the falls and extends along the upper elevations of the unnamed tributary. Another occurs on the slope above the floodplain terrace of Lulbegrud Creek south of the main access road. The associated flora in these areas is extremely depauperate due to the pine needles and roots, which exude chemicals into the soil and inhibit other plant's growth (White and Yahn, 2006).

The Non-native Grassland community (formerly the Mixed Grass/Forb community of 2002) represents open non-native grasslands that are mowed annually (if a contractor is available) to allow for better troop movement and visibility. Agricultural grasses, such as orchard grass *(Dactylis glomerata),* tall fescue *(Lolium arundinaceum),* and timothy *(Phleum pretense)* have been planted in these areas, and these species have mixed with invasive weedy plants including other grass, sedge, and forb species over time. Common forb and semi-woody species include ragweeds *(Ambrosia artemisiifolia* and *A. trifida),* Canada goldenrod *(Solidago canadensis),* Chinese lespedeza *(Lespedeza cuneata),* Japanese honeysuckle, yellow sweetclover *(Melilotus*

[4] Relating to, or influenced by the impact of humans on nature.

officinalis), daisy fleabane *(Erigeron annuus),* and hairy white oldfield aster *(Symphyotrichum pilosum var. pilosum).* Recently, select areas within this community have been planted to warm season grasses Indiangrass *(Sorghastrum nutans)* has been a successful colonizer as a result of these efforts (White and Yahn, 2006).

4.2.4 TURF AND LANDSCAPED AREAS

Currently, no turf or landscaped areas are maintained on the EKTS-HV. However, because EKTS-HV was previously used as a resort facility that included a golf course, many areas of the site are undergoing successional development. These areas are primarily those used as the golf course, which have reverted to grassland and are beginning to incur encroachment of woody vegetation.

4.3 FISH AND WILDLIFE

Many common species of mammals, birds, reptiles, amphibians, insects, fish and benthic invertebrates were identified by KSNPC biologists and are listed in **Appendix F.** The little spectaclecase *(Villosa lienosa),* a state special interest mollusk, was identified in Lulbegrud Creek during the 1993-1995 biological inventory. To date no other rare, threatened, or endangered animal species have been observed at the EKTS - HV (see **Section 4.4.2).**

4.3.1 MAMMALS

Only nine mammal species have been formally identified at EKTS-HV **(Appendix F).** These species include white tailed deer *(Odocoileus virginianus),* coyote *(Canis latrans),* southern flying squirrels *(Glaucomys volans),* big brown bat *(Eptesicus fuscus),* eastern pipistrelle *(Pipestrellus subflavus),* eastern red bat *(Lasiurus borealis),* northern bat *(Myotis septentrionalis)* shrew *(Blarina spp.),* and smokey shrew *(Sorex fumeus)* (White et al., 1995; Laudermilk et al., 1993). Other species that have been observed by training site staff and the Environmental Office staff include common mammals typical of Eastern Kentucky and Boone National Forest.

The EKTS-HV is open to archery deer hunting on a walk-in basis, under a MOU with the KDFWR. A copy of this MOU is presented in **Appendix D.** Additional information on hunting access is presented in **Section 6.12.2.**

4.3.2 BIRDS

Sixty-six species of birds were identified by direct observation or song identification during walkover surveys of the EKTS-HV in 1995 (see **Appendix F;** White et al., 1995, Laudermilk et al., 1993). The EKTS-HV falls within the Interior Low Plateaus Plain physiographic area, where approximately 1 50 bird species occur annually as nesting species, post nesting dispersal species, transients, and/or wintering residents. The site is also on the edge of the Northern Cumberland Plateau Region (American Bird Conservancy [ABC], 2000). Species identified at the EKTS-HV and are priority species within the Interior Low Plateaus and/or Northern Cumberland Plateau Bird Conservation Plans (ABC, 2000; ABC, unpublished report) are listed in **Table 12.**

TABLE 12. PRIORITY BIRD SPECIES IDENTIFIED AT EKTS-HV DURING 1995 SURVEY	
COMMON NAME	SCIENTIFIC NAME
Louisiana waterthrush	*Seiurus motacilla*
Whip-poor-will	*Caprimulgus vociferus*
Wood Thrush	*Hylocichla mustelina*
Acadian Flycatcher	*Empidonax virescens*
Kentucky Warbler	*Oporornis formosus*
Prairie warbler	*Dendroica discolor*
Source: White et al., Kentucky State Nature Preserves Commission, 1995	

The EKTS-HV provides habitats and open space for a wide variety of migratory birds that migrate annually within and beyond North America (see **Appendix F).** Regardless of how these migratory birds use the EKTS-HV, their presence provides important ecological services and an important indicator of ecosystem health. No formal bird conservation plans encompass the EKTS-HV.

4.3.3 REPTILES AND AMPHIBIANS

Eight reptile and eight amphibian common species were identified during terrestrial vertebrate surveys and biological inventories (Palmer-Ball, 1993; White et al., 1995; KSNPC, 2002). No rare, T&E reptile and amphibian species have been identified to date at the EKTS-HV.

4.3.4 BUTTERFLIES AND MOTHS

No rare, threatened, or endangered insect species have been identified during surveys to date at the EKTS-HV. However, KSPC surveys have identified only three insect species including the hoary-edge skipper *(Achalarus lydiades),* great spangled fritillary *(Speyeria Cybele),* and little wood satyr *(Megisto cymela).*

4.3.5 FISH AND BENTHIC INVERTEBRATES

Thirty-one fish species and six benthic invertebrate species have been identified during previous biological inventories and aquatic surveys at the EKTS-HV (White et al., 1995, Laudermilk, et al., 1993). Small and largemouth bass *(Micropterus dolomieu)* and *Micropterus salmoides,* respectively), rock bass *(Ambloplites rupestris),* spotted bass *(Micropterus punculatus),* and sunfish *(Lepomis spp.)* are some common species found in Lulbegrud Creek. Information on fishing access at EKTS-HV can be found in **Section 6.12.2.**

The little spectaclecase, a state special interest mollusk, was identified within Lulbegrud Creek during the 1 993-1 995 biological inventories (see **Section 4.4.2)** (White et al., 1 995).

4.4 THREATENED AND ENDANGERED SPECIES

4.4.1 THREATENED, ENDANGERED, AND RARE PLANT SPECIES

No federally listed plants have been identified during biological inventories conducted on the training site (White et al., 1995; KSNPC, 2002; KSNPC, 2006). The federally listed white-haired goldenrod *(Solidago albopilosa)* and candidate globe bladderpod *(Lesquerella globosa)* are known to occur in Powell County. However, no habitat for either plant species is present on the EKTS-HV. These plants are listed in **Table 13.**

One KSNPC listed special concern plant, slender naiad *(Najas gracillima),* was found during the biological inventory in 1 993-1 995, but was not found during subsequent inventories. This aquatic flowering plant was found in the northern half of the lower (southwestern-most) impoundment on the site **(Figure 5).** This species has been reported from relatively nutrient-free soft-water lakes in other parts of the United States, and is intolerant of pollution. The slender naiad is a submersed aquatic annual plant, and grows from seed deposited in the lake or pond bottom each year.

TABLE 13. DOCUMENTED AND/OR POTENTIAL THREATENED, ENDANGERED, AND RARE PLANT SPECIES AT EKTS- HV.

SPECIES		ECOSYSTEM				STATUS/RANKING		
COMMON NAME	SCIENTIFIC NAME	G	F/C	R	W/A	FEDERAL	STATE	GLOBAL
SPECIES DOCUMENTED AT EKTS-HV								
Slender waternymph or Threadlike Naiad	Najas gracillima				X	-	S	G57/S2S3
SPECIES DOCUMENTED IN POWELL COUNTY, BUT NOT PREVIOUSLY AT EKTS-HV								
(moss)	Herzogiella turfacea		X			-	E	G4G5/S1
Canby's mountain-lover	Paxistima canbyi		X	X		-	T	G2/S2
Crossleaf milkwort	Polygala cruciata		X	X		-	E	G5/S1
Downy arrowwood	Viburnum rafinesquianum		X			-	T	G5T4T5/S2
Drooping bluegrass	Poa saltuensis		X			-	E	G5/S1S2
Globe beaked-rush	Rhynchospora recognita	X	X			-	S	G57/S3
Globe (Short's) bladderpod	Lesquerella globosa		X			C	E	G2/S1
Grass pink	Calopogon tuberosus		X			-	E	G5/S1
Loesel's twayblade	Liparis loeselii		X			-	T	G5/S2S3
Mountain maple	Acer spicatum		X	X		-	E	G5/S1S2
Nodding mandarin	Prosartes maculata	X	X			-	S	G3G4/S3?
Ovate catchfly	Silene ovata	X	X			-	E	G3/S1
Running pine	Lycopodium clavatum	X	X			-	E	G5/S1
Shining ladies'-tresses	Spiranthes lucida		X			-	T	G5/S2S3
Slender marsh-pink	Sabatia campanulata		X			-	E	G5/S17
Small purple-fringed orchid	Platanthera psycodes				X	-	E	G5/S1
Small yellow ladies-slipper	Cypripedium parviflorum			X	X	-	T	G5/S2
Sweet pinesap	Monotropsis odorata		X			-	T	G3/S2
White rattlesnake-root	Prenanthes alba			X		-	E	G5/S1
White-haired goldenrod	Solidago albopilosa		X			LT	T	G2/S2
Wood Lily	Lilium philadelphicum		X			-	T	G5/S2S3

FEDERAL STATUS
E = Endangered = Endangered throughout range
T = Threatened = Threatened throughout range
C = Candidate for Listing

GLOBAL RANK DEFINITIONS
Basic Rank:
G1 = Critically imperiled
G2 = Imperiled
G3 = Vulnerable
G4 = Apparently secure
G5 =Secure
7 = Rank Uncertain
T# = Infraspecific Taxon rank

KENTUCKY STATE NATURE PRESERVES COMMISSION STATUS
E = endangered
T = threatened
S = special concern
H = historic
X = extirpated
N = none
SI = Critically Imperiled
S2= Imperiled
S3= Vulnerable
S4= Apparently Secure
S5 = Secure

ECOSYSTEM
G = Grasslands
F/C = Forests/Cliffflines
R = Riparian
W/A = Wetland/Aquatic

Source: Calibre Systems 2002, KSNPC 2007, NatureServe 2007, USFWS, 2007

4.4.2 THREATENED, ENDANGERED AND RARE ANIMAL SPECIES

During the biological inventory in 1993-1995, KSNPC searched for federal and state listed animal species. No federally-listed animals were identified in the inventory. However, potential habitat was found for several rare species to exist on the site, including the federally and state listed Virginia big-eared bat, Indiana bat, and fanshell mussel. **Table 14** lists the federal and state listed rare, threatened, and endangered animal species listed by KSNPC as occurring in Powell County.

Habitat for the little spectaclecase mollusk could exist in Lulbegrud Creek. KSNPC reported shells of little spectaclecase from Lulbegrud Creek at a site approximately 2.3 stream kilometers downstream from the Falls Branch confluence (outside EKTS-HV boundaries). This specimen was weathered-dry, and not recently living. This species may no longer be found in Lulbegrud Creek. In Kentucky, the little spectaclecase is a freshwater mussel found occasionally in Kinniconick Creek; sporadically in the upper Green, Salt, and Kentucky Rivers; and is known from single collections in the Big Sandy, Licking, Little Sandy, and Tennessee Rivers. It is generally found in sand or gravel of small to medium-sized streams. Management goals and objectives for this species can be found in **Section 6.4.2.**

TABLE 14. THREATENED, ENDANGERED, AND RARE ANIMAL SPECIES DOCUMENTED IN POWELL COUNTY, KENTUCKY BUT NOTATEKTS-HV

SPECIES		ECOSYSTEM				STATUS/RANKING		
COMMON NAME	SCIENTIFIC NAME	G	F/C	R	W/A	FEDERAL	STATE	GLOBAL
AMPHIBIANS								
Eastern hellbender	*Cryptobranchus alleganiensis alleganiensis*				X	-	S	G3G4T3T4/S3
REPTILES								
Corn snake	*Elaphe guttata guttata*		X			-	S	G5T5/S3
Northern coal skink	*Eumeces anthracinus anthracinus*		X			-	T	G5/S2
BIRDS								
Bobolink	*Dolichonyx oryzivorus*				X	-	S	G5/S2S3B
Sedge wren	*Cistothorus platensis*	X				-	S	G5/S3B
MAMMALS								
Black bear	*Ursus americanus*			X		-	T	G5/S2
Eastern small-footed myotis	*Myotis leibii*			X		-	T	G3/S2
Eastern spotted skunk	*Spilogale putorius*	X				-	S	G5/S2S3
Evening bat	*Nycticeius Humeralis*		X	X		-	T	-
Indiana bat	*Myotis sodalis*					LE	E	G2/S1S2
Rafinesque's big-eared bat	*Corynorhinus rafinesquii*		X			-	S	G3G4/S3
Virginia big-eared bat	*Corynorhinus townsendii virginianus*		X			LE	E	G4T2/S1
MOLLUSCS								
Little spectaclecase	*Villosa lienosa*				X	-	S	G5/S2S4
Elktoe	*Alasmidonta marginata*				X	-	T	G4/S2
Fanshell	*Cyprogenia stegaria*				X	LE	E	G1Q/S1
Pocketbook	*Lamsilis ovata*				X	-	E	G5/S1
Salamander mussel	*Simpsonaias ambigua*				X	-	T	G3/S2S3
Snuffbox	*Epioblasma triquetra*				X	-	E	G3/S1
FISHES								
American brook lamprey	*Lampetra Appendix*				X	-	T	G4/S2
Northern brook lamprey	*Ichthyomyzon Fossor*				X	-	T	G4/S2

FEDERAL STATUS
E = Endangered = Endangered throughout range
T = Threatened = Threatened throughout range
GLOBAL RANK DEFINITIONS
Basic Rank:
G1 = Critically imperiled
G2 = Imperiled
G3 = Vulnerable
G4 = Apparently secure
G5 =Secure
? = Rank Uncertain
T# = Infraspecific Taxon rank

KY STATE NATURE PRESERVES COMMISSION STATUS
E = endangered
T = threatened
S = special concern
H = historic
X = extirpated
N = none
ECOSYSTEM
G = Grasslands
F/C = Forests/Clifflines
R = Riparian
W/A = Wetland/Aquatic

Source: Calibre Systems 2002, KDFWR 2007, NatureServe 2007, USFWS, 2007

SECTION 5: MISSION IMPACTS ON NATURAL RESOURCES

5.1 CURRENT POTENTIAL IMPACTS

5.1.1 MINIMUM IMPACTTRAINING

Types of training activities that generally have a minimal impact on natural resources at the EKTS-HV include: small unit infantry tactics; reconnaissance; terrain and map analysis; escape and evasion tactics; infiltration tactics; land navigation; patrolling; and engineer maintenance, repair, and minor construction project training. Some of these types of training require undisturbed cover to conceal movements. Others use existing roads, hardened trails, and infrastructure. As such, the disturbance is no greater than walking through the woods or open areas or driving down a road, and would normally require no extraordinary precautions, limitations or restrictions. Aviation training (rotary wing only) is also considered minimum impact training. Aviation operations tend to be of short duration and relatively quick moving.

5.1.2 MAXIMUM IMPACTTRAINING

Training that disturbs soils and/or vegetation has more potential to affect natural resources at EKTS-HV. Impacts to soil and water resources may have secondary impacts to water quality, fish populations, and wildlife. Such disturbances may require corrective actions such as leveling ruts; adding soil; seeding; mulching; and/or installing erosion control devices, sedimentation structures, or other management practices. Training activities at the EKTS-HV that have potential to cause soil or vegetation disturbance include: tactical concealment/ bivouac, off-road cold or wet weather operations, certain cover and concealment training, field fortifications, obstacle training, Nuclear/Biological/Chemical (NBC) training, and smoke training. **No live firing occurs on the site from military operations.**

5.2 FUTURE POTENTIAL IMPACTS

Planned future actions at EKTS include improving existing roads; constructing a FOB; and mowing, brush removal, and fertilization of areas intended for agricultural outleasing (see **Section** 2.7). Improving existing roads, while causing limited short-term disturbance, would help to avoid future disturbance from training site use. Construction and operation of the FOB may result in some vegetation and soil disturbance. The training site will be managed in accordance with the land and ecosystem ability to support such disturbance. Agricultural outleasing is intended as an active, beneficial land management measure.

Natural resource management techniques, policies, and procedures identified in this plan will be used to facilitate future site development for military training while minimizing environmental impacts. The KYARNG's active ecosystem management program accommodates the training mission while emphasizing an adaptive management style focused on maintaining biological diversity. Adequate advance planning and design in support of training site development will minimize impacts from the military mission on natural resources and provide for long term sustainability of the land to support training.

As training site usage increases, this document and the expertise of the KYARNG Environmental Office may be used to identify locations best suited for certain types of training. Future mission planning requirements can be determined through a multidisciplinary team approach that identifies potential impacts, management goals, objectives to meet those goals, and specific practices to be implemented to achieve the objectives and goals. Since the INRMP is a living document, guidance on specific natural resources in specific locations may be modified, goals and objectives added, and the document updated as needed.

Non-training future activities that could disturb natural resources include facility maintenance and new construction. Maintenance consists of vegetation control (mostly mowing) around fence lines, roadside ditches, and road surfaces. Herbicides could be used to augment and support vegetation control efforts and in areas where mowing is not possible or appropriate. The KYARNG does not plan to use controlled burning as a management technique at EKTS-HV.

Other than the FOB, no new construction is planned at this time for the EKTS-HV. New construction has a permanent impact on natural resources by totally modifying the landscape within the construction zone and facility footprint. Temporary impacts to soil and surface water quality could result from erosion. Should a need for additional construction arise, erosion Impacts would be expected to be negligible because Best Management Practices (BMP) for erosion control would be implemented during construction. The impacts of any future construction would be analyzed through the NEPA process.

5.3 NATURAL RESOURCES NEEDED TO SUPPORTTHE MILITARY MISSION

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

5.4 NATURAL RESOURCES CONSIDERATIONS FOR MISSION PLANNING AND INITIATION

The primary goal of this INRMP is to manage natural resources ***to support the military mission*** in a manner consistent with sound conservation principles and in compliance with Federal and State laws, Army regulations and policies. Training success at EKTS-HV is only possible through a supportive, proactive natural resource management program. The KYARNG natural resource management program aims to minimize the impacts of normal training use on EKTS-HV natural resources, and complements the doctrinally-required military training conducted. Proper execution of the INRMP provides sustainable training lands, and provides adaptive means of dealing with normal training impacts, thereby protecting natural resources. Many features of this plan contribute to its ability to provide sustainable training lands. Some of these features are techniques, practices and procedures, which include immediate repair and restoration of terrain damage, "resting" repaired terrain while vegetation is re-established, minimizing off-road vehicle activity when soil is saturated, posting wetlands as no-go areas, and establishing rotational use of field bivouac sites. Other features provide for "hardening" of areas frequently used for training, to minimize impacts on natural resources within the surrounding areas. Permanent stream crossing sites are another example of these BMPs, which minimize damage to vegetation, soil loss, erosion, and sedimentation. Natural resources management will facilitate the accomplishment of the military mission.

Ideal times to schedule training from a climate perspective would be from May to October, when rainfall is at its lowest for the year. Maneuver damage (ruts, disturbed vegetation, and bare soils) caused during this training period would be exposed to minimal erosion factors (wind and rain) during these months. Areas needing rehabilitation can then be revegetated in the late fall, when rainfall increases and soils are trafficked less.

Refer to **Section 6.0** for additional information on how to properly manage natural resources limitations during mission planning. Laws and regulations that pertain to these natural resources are also incorporated into **Section 6.0.**

SECTION 6: NATURAL RESOURCES PROGRAM MANAGEMENT

6.1 NATURAL RESOURCES PROGRAM MANAGEMENT

Per DoD Supplemental Guidance, the 2003 INRMP was reviewed "as to operation and effect," to determine whether it is developed per NGB and Army policy, meets the intent of the Sikes Act, and contributes to conservation and rehabilitation of natural resources on military installations. Intra- and inter-agency cooperation, coordination, and communication at the Federal, State and local levels (for example, USFWS and KDFWR) are requisite to the success of the updated INRMP. The USFWS and KDFWR review the plan and concur with its contents. Concurrence from the USFWS on this updated INRMP is provided in a letter dated April 1 8, 2008. Concurrence from the KDFWR on this updated INRMP is provided in a letter dated April 11, 2008 **(Appendix B).**

6.1.1 ADMINISTRATIVE AND TECHNICAL SUPPORT

The Natural Resources Program at the EKTS-HV is administered by the KYARNG Environmental Program Manager, located in Frankfort, KY, whose responsibilities are listed in **Table 15.** The Environmental Program Manager also receives support from the Environmental staff, each of whom has significant duties in addition to natural resources support.

TABLE 15. RESPONSIBILITIESOFTHE KYARNG ENVIRONMENTAL PROGRAM MANAGER

RESPONSIBILITY	
1	Implement this updated INRMP.
2	Provide oversight and coordination with other agencies.
3	Coordinate with the SRP Coordinator to ensure sustainable management of training lands.
4	Develop and implement programs to ensure inventory, delineation, classification, and management of wetlands, scenic areas, endangered and threatened species, sensitive and critical habitats, and other natural resource areas of special interest.
5	Provide for training of natural resources personnel.
6	Maintain natural resources management records.
7	Review NEPA documents, remedial action plans, construction designs, and proposals to ensure adequate natural resource protection and consideration of technical guidance presented in this updated INRMP.
8	Evaluate training mission impacts and provide guidance to trainers.
9	Coordinate the Cultural Resources program and Section 106 compliance.
10	Coordinate with local, State, and Federal governmental and civilian conservation organizations with respect to the EKTS-HV natural resources management program.
11	Coordinate hunting and fishing programs.
12	Implement and execute AR 200-1.
13	Assist the Adjutant General in prioritizing natural resources and compliance funding.

Source: KYARNG

6.1.2 COOPERATIVE AGREEMENTS AND TECHNICAL ASSISTANCE

Specialized expertise is often required to adequately manage KYARNG natural resources. Technical assistance will be sought from Federal and State agencies, universities, and special interest groups. Intra- and inter-agency cooperation, coordination, and communication at the

Federal, State and local levels are requisite to the success of the INRMP. The Environmental Program Management Office has a strong relationship with such groups. Additional labor resources may include Federal and State agencies, State agencies; local and regional universities; scouting groups; and special interest groups (for example, Audubon Society, Boy Scouts, and sportsmens' clubs).

6.1.2.1 FEDERAL AGREEMENTS

The DoD and subcommand entities have memoranda of agreement (MOA), MOUs and other cooperative agreements with other federal agencies, interest groups, and various state agencies in order to provide assistance with natural resources management at installations across the United States. Generally, these agreements allow installations and agencies or interest groups to obtain mutual conservation objectives. The DoD agreements applicable to the EKTS-HV are listed in **Table 16.** A copy of these agreements is maintained by the Environmental Program Manager.

TABLE 16. DEPARTMENT OF DEFENSE COOPERATIVE AGREEMENTS APPLICABLE TO EKTS-HV

TYPE		COOPERATING AGENT	SUBJECT
1	MOU	U.S. Fish and Wildlife Service	Ecosystem-based management offish, wildlife, and plant resources on military lands
2	Cooperative Agreement	The Nature Conservancy	Assistance in natural resources inventory
3	MOA	National Biological Service of the Department of the Interior	Professional and Technical Assistance Conducting Biological Surveys, Research, and Related Activities
4	MOU	U.S. Environmental Protection Agency	Integrated Pest Management (IPM)
5	MOA	Over 110 Federal and State agencies and non-governmental organizations	Federal Neotropical Migratory Bird Conservation Program (Agreement is among DoD, and through each of the Military Services)
6	MOU	U.S. Department of Agriculture, Natural Resources Conservation Service	Watershed and Environmental Enhancement of U.S. Army Installations (Agreement is with U.S. Army Environmental Center)
7	Interagency Agreement	U.S. Department of the Interior, United States Forest Service	Natural and Cultural Resources Support to ARNG Installations (Agreement is with ARNG)
8	MOU	Ducks Unlimited, Inc.	Cooperative development of selected wetlands and associated uplands to maintain and increase waterfowl populations and fulfill objectives of the North American Waterfowl Management Plan, within the context of DoD's environmental security and military missions
9	MOU	Bureau of Land Management, USFWS, National Park Service (NPS), Bureau of Reclamation, USFS, Defenders of Wildlife, Izaak Walton League, National Audubon Society, National Wildlife Federation.	Watchable Wildlife Programs

6.1.2.2 STATE AND LOCAL AGREEMENTS

The EKTS-HV INRMP is reviewed and signed by the KDFWR, and in a sense functions as a cooperative agreement. It is a cooperative plan that identifies how the KDFWR and the KYARNG

will work together to meet mutual conservation objectives. Additionally, the KDFWR provides enforcement of access, and hunting and fishing regulations at EKTS-HV under a MOU. The MOU is included as **Appendix D.**

6.1.2.3 FEDERAL AGENCY COORDINATION AND TECHNICAL ASSISTANCE

U.S. Army Corps of Engineers - The USACE issues Section 401 and 404 permits. The KYARNG will work closely with the USACE-Louisville District in any permitting or planning efforts during FY 2008-2013. The Waterways Experiment Station (WES) is headquarters for the U.S. Army Engineer Research and Development Center (ERDC). WES assists KYARNG with wetland management and mapping. The WES produced a comprehensive planning level wetland delineation of EKTS-HV, including values and functions of wetlands and recommendations for management.

U. S. Fish and Wildlife Service - The USFWS is the principal federal agency responsible for conserving, protecting, and enhancing fish and wildlife and their habitats for the continuing benefit of the American people. The agency also enforces federal wildlife laws, manages migratory bird populations, conserves and restores wildlife habitat such as wetlands, and administers the ESA. USFWS is a cooperating agency in development of this plan. The agency is responsible for reviewing the INRMP and providing guidance on federally listed species, species of management concern, and wetland management. **Appendix B** contains coordination with agencies for the protection and management offish and wildlife at the EKTS.

Natural Resources Conservation Service - The NRCS has been an active partner in assisting the KYARNG to manage the natural resources on the training site. In 1994, the NRCS developed a resource conservation plan for the site. After identifying problem areas, the NRCS then produced an engineering design, construction/material specifications, and estimated costs for the highest priority erosion site on the EKTS. NRCS will continue to be a major partner in the LRAM program. This support is provided through the MOU listed in Section 6.1.2.1.

U.S. Forest Service (USFS) - The USFS can assist the KYARNG in conducting timber inventories and developing tree planting specifications through the Interagency Agreement between the ARNG and the USFS. The USFS will assist the KYARNG in conducting a forest inventory for EKTS-HV and providing guidance for forest management.

National Weather Service - The National Weather Service provides federal and state land management agencies fire weather information for prevention, suppression, and management of forest and rangeland fires. The National Weather Service Forecast Office in Jackson (http://www.crh.noaa.gov/jkl/) provides year-round weather forecasts for eastern Kentucky. Routine fire weather forecasts are issued daily for Powell County, in which EKTS-HV is located, and are available at: http://www.crh.noaa.gov/jkl/firewx/fire_weather.html.

6.1.2.4 STATE AGENCY COORDINATION AND TECHNICAL ASSISTANCE

Kentucky Environmental and Public Protection Cabinet - The Environmental and Public Protection Cabinet protects Kentucky's environment and manages natural resources through the programs of the Department for Environmental Protection (KDEP) and Department for Natural Resources (KDNR).

- ***Department for Environmental Protection -*** The Division of Water, Division for Air Quality, Division of Waste Management, and Division of Environmental Services make up the Kentucky Department of Environmental Protection. The Division of Water issues “Water Quality Certification Permits” for any activity that involves the alteration of Waters of the State. The Division for Air Quality issues air quality permits.

- ***Department for Natural Resources -*** Within the KDNR, the Division of Forestry can provide forest stewardship assistance to the KYARNG staff in case of wildfire on the property. The KDOF has assisted, and will continue to assist, the KYARNG in conducting timber inventories and developing tree planting specifications.

The Division raises native tree seedlings that may be suitable for KYARNG planting needs. Tree seedlings available in Kentucky include white oak ***(Quercus velutina),*** northern red oak, pin oak ***(Quercus palustris),*** cherrybark oak ***(Quercus pagoda),*** black walnut, white and green ash ***(Fraxinus pennsylvanica),*** sycamore, yellow poplar, black locust ***(Robinia pseudoacacia),*** bald cypress ***(Taxodium distichum),*** shortleaf pine ***(Pinus echinata),*** white pine, and Virginia pine. Also within the KDNR, the Division of Conservation provides assistance to implement sound soil and water management practices.

Kentucky Department of Fish and Wildlife Agency Resources - The KDFWR is within the Kentucky Tourism Cabinet. KDFWR and USFWS were both consulted during development of this plan. The KDFWR District Ranger assists the KYARNG in enforcing state game regulations, including the MOU discussed in **Section 6.1.2.2.** Appendix B contains coordination letters from both federal and state fish and game agencies for protection of fish and wildlife resources at EKTS-HV.

Kentucky State Nature Preserves Commission - The KSNPC has a mission to protect Kentucky's natural heritage by (1) identifying, acquiring, and managing natural areas that represent the best known occurrences of rare native species, natural communities, and significant natural features in a statewide nature preserve system; (2) working with others to protect biological diversity; and (3) educating Kentuckians as to the value and purpose of nature preserves and biodiversity. The KSNPC will continue to assist KYARNG in performing rare species and natural community consultations. KSNPC provides necessary expertise to the RTLA program by assisting with plant and animal identification.

Kentucky Heritage Council - The Kentucky Heritage Council will ensure this plan is implemented in accordance with cultural resources management laws and regulations. This agency and the State Historic Preservation Officer (SHPO) have reviewed this plan, and will provide a letter of cooperation following the final review. **Appendix B** contains coordination with agencies for protection and management of cultural resources at the EKTS-HV.

The University of Kentucky - Through the University of Kentucky, the Kentucky Geological Survey (KGS) assists the KYARNG in conducting surface and ground water quality and quantity monitoring at all Kentucky training sites. The KYARNG also coordinates closely with the State Archaeologist and staff at the Kentucky Archaeological Survey at the University of Kentucky.

6.2 GEOGRAPHIC INFORMATION SYSTEMS (GIS)

6.2.1 BACKGROUND

GIS is a computer system capable of assembling, storing, manipulating, and displaying geographically referenced information. Within the ITAM Program, GIS technology is used to create, analyze, display, and print information about training land in support of training (DA, 1999).

GIS is most commonly used to create maps by overlaying multiple data layers, for example training area boundaries, roads, streams, wetlands, and so forth. However, a more valuable application of GIS software (ArcView, Arcinfo, or ArcGIS, for example) is the ability to perform data analysis. Simple analyses on data layers have the ability to generate reports that might, for example, show the number of acres of wetlands within a training area. Analyses that are more detailed can also involve using multiple data layers and numeric functions to create new data

layers. For example, in order to select the most appropriate location for a trail, a data layer could be produced showing all areas excluding wetlands or areas within streamside management zones.

GIS is a tool that natural resource managers use to analyze and evaluate the condition and capabilities of training lands. GIS also allows the information collected by the environmental office to be communicated to the trainer via computer (and vice versa). This supports the planning and scheduling component of military training.

The data entered into the training site's database has many different uses. Of primary interest to the users of EKTS-HV is the application of data to produce overlays of particular areas of the training site to get a snapshot of what is happening within that portion of the site. Satellite imagery and aerial photography can be used to create a geo-referenced raster image and be superimposed on a map of the site's training areas and training facilities using GIS. Trainers can use GIS-generated maps to plan maneuvers since terrain, topography, and vegetation can be portrayed on each map at or above the original scale of the input data.

6.2.2 KYARNG GIS

The KYARNG is in the process of developing its GIS capabilities and skills at the Environmental Office in Frankfort and the Wendell H. Ford Regional Training Center, both of which will serve the KYARNG throughout the entire Commonwealth of Kentucky.

The KYARNG GIS program was implemented in 1997, when ArcView software and computer hardware for data management were acquired in the Environmental Office in Frankfort, Kentucky. To date, most core databases, or map layers, for EKTS-HV have been completed [aerial photography, contour lines, grid scale, installation boundary, political boundary (county), roads, hydrology (rivers, streams, and ponds), wetlands inventory, soils, and vegetation cover. Additional data layers needed include: erosion control structures, bivouac sites, constraints to training, crossing sites/ ford sites, LRAM projects, and sensitive species locations. Computer hardware and software have been acquired for statewide use.

6.3 FISH AND WILDLIFE MANAGEMENT

The KYARNG does not administer a formal fish or wildlife management program at the EKTS-HV, because no KYARNG personnel are stationed at the training site. Public access for hunting is managed by the KDFWR under a MOU (see **Appendix D).** The KYARNG will maintain optimum and diverse fish and wildlife habitat by integrating fish and wildlife management strategies with other ecosystem management activities such as training area and forest management. Laws, regulations, and EOs pertaining to fish and wildlife management are listed in **Table 17.** These documents are described in **Appendix G.**

TABLE 17. LAWS, REGULATIONS, AND EXECUTIVE ORDERS APPLICABLE TO FISH AND WILDLIFE MANAGEMENT AT EKTS-HV

REQUIREMENT	TITLE
Law	Clean Water Act (33 USC §1341)
	Endangered Species Act, 7 U.S.C. 1 36; 1 6 U.S.C. 460 et seq. (1 973) as amended
	Fish and Wildlife Conservation Act (USC §2901 et seq.)
	Fish and Wildlife Coordination Act, as amended (16 USC §661 et seq.)
	The EKTS-HV is a state-owned facility and is not directly subject to the Sikes Act *"Conservation Programs on Military Reservations"* (1 6 U.S. Code (USC) §670a et seq.), as amended. However, Army policy is to follow DoD and ARNG guidance on state-owned facilities.
	Migratory Bird Treaty Act, as amended (16 USC §703-71 2)
	National Environmental Policy Act (42 USC §4321 et seq.)
Code of Federal Regulations	50 CFR 21, Migratory Bird Permits
Executive Order	EO 11990, Protection of Wetlands
	EO 11988, Floodplain Management
	EO 1 31 86, Responsibilities of Federal Agencies to Protect Migratory Birds
Kentucky Regulations	KRS 146 Natural Resources
	KRS 1 50 Fish and Wildlife Resources
	KRS 224 Environmental Protection

6.3.1 GAMEAND FISH POPULATIONS

General fish and wildlife management is accomplished in conjunction with the military mission and training activities. Inventory and monitoring of terrestrial habitats, wetlands and aquatic habitats, fish and game populations, non-game populations, and T&E species are primarily conducted as PLSs.

Public access to the site for hunting is managed by KDFWR (see **Appendix D).** The training site is located within Kentucky Hunting Zone 5. Game species hunted within Powell County are deer, wild turkey ***(Meleagris gallopavo),*** dove, quail, rabbit, squirrel, groundhog ***(Marmota monax),*** bobcat, crow ***(Corvus*** spp.), opossum ***(Didelphis virginiana),*** snipe ***(Gallinago gallinago),*** waterfowl, woodcock ***(Scolopax minor),*** raccoon ***(Procyon lotor),*** fox, and coyote. More information on public hunting access is provided in **Section 6.12.2.**

6.3.2 MIGRATORY AND BREEDING BIRDS AT EKTS-HV

Considerations with regard to migratory bird management are: compliance with the Migratory Bird Treaty Act (MBTA); implementation of migratory bird management actions in accordance with EO 13186, ***Responsibilities of Federal Agencies to Protect Migratory Birds;*** and support, contribution and compatibility with the goals and efforts of numerous regional migratory and game bird conservation programs.

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

Incidental taking of migratory birds is regulated in 50 CFR 21, Migratory Bird Permits. Part 21.1 5, Authorization of Take Incidental to Military Readiness Activities, effective 28 February 2007, allows incidental take by DoD in the course of military readiness activities under certain conditions specified in Paragraph (a) Take Authorization and Monitoring:

Except to the extent authorization is withdrawn or suspended pursuant to 50 CFR 21, the Armed Forces may take migratory birds incidental to military readiness activities provided that, for those ongoing or proposed activities the Armed Forces determine may result in a significant adverse effect on a population of a migratory bird species. The Armed Forces must confer and cooperate with the USFWS to develop and implement appropriate conservation measures to minimize or mitigate such significant adverse effects.

When conservation measures implemented under paragraph (a)(1) of this section require monitoring, the Armed Forces must retain records of any monitoring data for five years from the date the Armed Forces commence their action. During INRMP reviews, the Armed Forces will also report to the USFWS migratory bird conservation measures implemented and the effectiveness of the conservation measures in avoiding, minimizing, or mitigating take of migratory birds.

It is DoD policy to promote and support a partnership role in the protection and conservation of migratory birds and their habitat by protecting vital habitat, enhancing biodiversity, and maintaining healthy and productive natural systems on DoD lands consistent with the military mission. The Partners in Flight (PIF) program is an umbrella network of which DoD's bird conservation program is a vital part. DoD works with the National Fish and Wildlife Foundation to develop cooperative programs and projects with other Federal, State, and non-governmental organizations. Migratory birds include species with at least some populations breeding in the United States and/or Canada, for example songbirds, shorebirds, waterbirds, and waterfowl. Attention has centered on migrants, since this group is experiencing steep rates of population declines. However, decreasing populations have also been observed in resident bird species, which do not migrate, and temperate-zone migrants, which only migrate within North America.

PIF encourages state and federal agencies and non-governmental organizations to participate in Breeding Bird Surveys (BBS), off-road point counts, Monitoring Avian Production Survivorship (MAPS), and migration monitoring stations. It is important to note that breeding bird surveys record birds only seen during the nesting season, and do not account for birds in the area at other times of the year. Also, birds occurring in extremely low densities, or in cyclic years, may be missed.

6.3.3 NUISANCE WILDLIFEAND WILDLIFE DISEASES

When an animal causes damage to government property, it can be a health or safety risk to humans or other animals, a disruption to normal ecosystem function, or considered a nuisance. Currently, no species is considered a nuisance at the EKTS-HV. Nuisance control will be initiated, if needed, to maintain the nuisance species population at acceptable levels. Common nuisance animals in the region are feral cats ***(Felis sylvestris Cetus'),*** brown-headed cowbirds ***(Molothrus ater),*** pigeons ***(Columba livia),*** starlings ***(Sturnus vulgaris),*** raccoons, muskrats ***(Ondontra zibethicus),*** coyotes, feral hogs ***(Sus scrofa),*** and beaver ***(Castor canadensis).*** With the exception of feral cats, these animals are not always considered a nuisance.

Ticks can sometimes be a serious problem at training sites. The best means to prevent tick-borne disease transmission to soldiers is to implement personal protective measures, such as insect repellents, body checks, tick avoidance, and tick elimination where practicable. Tick testing kits are available through the 1163rd Medical, and should be sent to the U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM).

6.4 MANAGEMENT OF THREATENED AND ENDANGERED SPECIES

This section presents information about the management of sensitive species that are located or may be located at the EKTS-HV, and requirements and strategies for management. No federally-listed endangered, threatened, or candidate species have been observed to date at EKTS-HV, and no designated critical habitat for any species is located on the site. However, suitable habitat exists for the federally-endangered Virginia big-eared bat, Indiana bat, and fanshell mussel. The training site does not have suitable habitat for the federally-threatened white-haired goldenrod, or candidate globe bladderpod, both with known occurrences in Powell County, Kentucky.

Laws and regulations pertaining to management of T&E species are included as **Table 18.** These laws and regulations are described in **Appendix G.**

TABLE 18. LAWS, REGULATIONS, AND EXECUTIVE ORDERS APPLICABLE TO THREATENED AND ENDANGERED SPECIES MANAGEMENT AT EKTS-HV

REQUIREMENT	TITLE
Law	Endangered Species Act, 7 U.S.C. 1 36; 1 6 U.S.C. 460 et seq. (1 973) as amended
	The EKTS-HV is a state-owned facility and is not directly subject to the Sikes Act *"Conservation Programs on Military Reservations"* (1 6 U.S. Code (USC) §670a et seq.), as amended. However, Army policy is to follow DoD and ARNG guidance on state-owned facilities.
	Migratory Bird Treaty Act, as amended (16 USC §703-71 2)
	Bald Eagle Protection Act of 1 940 (16 U.S.C. 668-668d, 54 Stat. 250);
Code of Federal Regulations	50 CFR 21, Migratory Bird Permits
Executive Order	EO 11990, Protection of Wetlands
	EO 11988, Floodplain Management
Kentucky Regulations	KRS 146 Natural Resources
	KRS 1 50 Fish and Wildlife Resources
	KRS 224 Environmental Protection

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

This updated INRMP is intended to provide a benefit to, and gain a critical habitat exemption for the following federally-endangered species, should they be found on site: Virginia big-eared bat, Indiana bat, and fanshell mussel. The KYARNG will manage threatened and endangered species and Kentucky Species of Conservation Concern primarily by avoiding sensitive areas during training, preventing damage to sensitive areas, and rehabilitating damaged areas. Informal consultation is completed with the USFWS on activities at EKTS-HV as required. Neither a separate biological assessment nor a separate formal consultation is necessary for this updated INRMP.

In cases where endangered species management and mission activities conflict, consultation with the USFWS and the KDFWR (as appropriate) would be initiated to avoid jeopardizing any listed

species. The KYARNG is required to manage federally listed T&E species. Failure to protect Federally-listed species could lead to an ESA violation, which could negatively impact training land availability.

6.4.1 FEDERALLY LISTED SPECIES

There are no known federally listed species at the EKTS-HV at this time. Federally-listed fauna species with known occurrences in Powell County, Kentucky include the endangered Virginia big-eared bat, the endangered Indiana bat, and the endangered fanshell mussel. One federally threatened plant species, the white-haired goldenrod, and one federal candidate species, the globe bladderpod, have known occurrences in Powell County, Kentucky. However, no habitat for either plant species is present on the EKTS-HV.

The need for an installation-wide bat survey and/or brood tree netting surveys will be determined in consultation with the USFWS based on planned site activity. No surveys have been conducted to date, because no trees have been cut. The surveys will be coordinated with the USFWS to ensure adequate sampling. Surveys should be designed and conducted in coordination with the USFWS Endangered Species Coordinator. Cutting of trees will be conducted between November 15 and March 31 to avoid potential direct impact to bats.

Management of these species includes implementing appropriate water resource protection and soil conservation techniques (see Section 6.5), protection of on-site forest habitat (see **Section 6.8),** and proper use of pesticides (see **Section 6.1**1)

6.4.1.1 VIRGINIA BIG-EARED BAT

General information for species is from the Kentucky Bat Working Group. The Virginia big-eared bat is a medium-sized bat, about 3.5 to four inches long. Characteristic features are the large ears (more than one inch long) and the presence of two large lumps (glands) on the muzzle. Virginia big-eared bats can be distinguished from Rafinesque's big-eared bats, the only similar species in Kentucky, by fur color and toe hairs. Virginia big-eared bats are pale to dark brown on the back and light brown underneath. In contrast, Rafinesque's big-eared bats are gray-brown on the back with whitish underparts. Also, Rafinesque's big-eared bats have hairs on their feet that extend past the toes, while Virginia big-eared bats have short toe hairs. Virginia big-eared bats occur in isolated populations in eastern Kentucky, eastern West Virginia, southwestern Virginia, and northwestern North Carolina.

Virginia Big-Eared Bat
Source: John MacGregor, Kentucky Bat Working Group, 2007

Virginia big-eared bats prefer caves in karst regions (areas underlain with limestone bedrock and many caves and sinkholes) dominated by oak-hickory or beech-maple-hemlock forest. These bats usually hibernate in tight clusters near entrances of caves that are well-ventilated and where temperatures range from 32 to 54 degrees F. In summer, maternity colonies are found in the relatively warm parts of caves.

This nonmigratory bat resides in caves year round. Mating occurs in fall and winter, and females store sperm over winter. Ovulation and fertilization take place in spring shortly after females

arouse from hibernation. In summer, females congregate to form what are known as maternity colonies, where they bear their young. It is not known where most males spend the summer. Each female gives birth to a single pup in June. Young can generally fly within three weeks. Moths are the most important prey of Virginia big-eared bats.

Human disturbance is probably the biggest factor contributing to the decline of these bats. Disturbance during hibernation causes bats to lose stored fat reserves, and repeated disturbance can cause the bats to die before spring (when insect prey are again available). If female bats are disturbed during the maternity season, they may drop their young to their deaths or the whole colony may abandon a roost for a less suitable location (Kentucky Bat Working Group, 2007).

6.4.1.2 INDIANA BAT

General information for this species is from the Kentucky Bat Working Group. The Indiana bat is a small bat, less than two inches in length, with dark gray to brownish black fur. Characteristics that help distinguish it from similar species include a pinkish nose, small hind feet with sparse, short hairs that do not extend beyond the toes, and a calcar (the spur extending from the ankle) that has a slight keel. Its hair is less glossy in appearance than that of little brown bats. The Indiana bat is found throughout much of the eastern United States from Oklahoma, Iowa, and Wisconsin, east to Vermont and south to northwestern Florida.

Indiana Bat
Source: John MacGregor, Kentuckv Bat Working Grouo. 2007

For hibernation, Indiana bats prefer limestone caves with stable temperatures of 39 to 46 degrees F. As with the gray bat, few caves meet the specific roost requirements of the species. Subsequently, more than 85 percent of the population hibernates in only 9 sites. Summer habitat requirements are not completely known for the Indiana bat. Although floodplain and riparian forests are important habitats for foraging and roosting, other habitats are used. Indiana bats typically roost under loose bark during the summer.

Indiana bats mate in the fall and begin entering hibernation in October. Males tend to be active longer in the fall, but are hibernating by late November. During hibernation, Indiana bats cluster tightly together and, as a result, are sometimes called the social bat. Having stored sperm over the winter, female bats become pregnant soon after emergence in late March and early April. Females emerge from hibernation and migrate to summer habitats before the males. During summer, maternity colonies can be found under loose tree bark and usually consist of fewer than 100 individuals. Some males to not migrate and spend the summer near the hibernacula; others roost in similar habitats as the females but in smaller numbers. Females bear a single pup in late June or early July. Young bats are able to fly within one month after birth. Small moths are a major part of the diet of Indiana bats, but many different kinds of flying insects are taken.

Decreases in Indiana bat populations have been caused by several factors. Unfortunately, most are the result of human activity. Indiana bats suffered losses in the past because humans altered cave entrances. Structures built to restrict human access to caves have also hindered the movement of bats. These structures also cause changes in air flow, temperatures, and humidity levels, and make caves less suitable for bats. Human disturbance is always a factor with hibernating bats, and because Indiana bats gather together in large numbers during the winter,

they are even more vulnerable to disturbance. Thousands of Indiana bats have also died at the hands of vandals. The most important hibernacula are now protected. However, Indiana bat numbers continue to decline. Some bats are lost periodically to flooding caused by natural events or human activity. Loss of forest habitat may be affecting maternity and foraging areas. As with all bats that feed primarily on insects, Indiana bats have probably suffered declines due to use of pesticides (Kentucky Bat Working Group, 2007).

6.4.1.3 FANSHELL MUSSEL

The fanshell has a medium-sized, subcircular shell which seldom exceeds 3.2 inches (80 millmeters) in length. The exterior of the shell has green rays on a light green or yellow surface ornamented with green mottling. Strong concentric ridges cover the shell's lower surface. The interior of the shell is usually silvery white, sometimes flesh-colored. The fanshell's specific food habits are unknown, but likely to be similar to other freshwater mussels. Freshwater mussels are known to feed on detritus, diatoms, phytoplankton, and zooplankton, which they filter out of the water (USFWS, 1 997).

Fanshell Mussel
Source: USFWS, 1990

Although the fanshell's reproductive biology is unknown, it probably reproduces like other freshwater mussels. Males release sperm into the water column. The sperm are taken in by the females through their siphons during feeding and respiration. The fertilized eggs are retained in the gills until the larvae (glochidia) fully develop. When the glochidia are released into the water, they attach and encyst on the gills or fins of a fish host. When metamorphosis is complete, they drop to the streambed as juvenile mussels. The species of fish host used by the fanshell and the habitat used by the juveniles are unknown (USFWS, 1997).

Since the turn of the century, the fanshell has undergone a substantial range reduction. It was historically widely distributed in the Ohio, Wabash, Cumberland, and Tennessee Rivers and their larger tributaries in Pennsylvania, Ohio, West Virginia, Illinois, Indiana, Kentucky, Tennessee, Alabama, and Virginia. The fanshell inhabits medium to large rivers. It has been reported primarily from relatively deep water in gravelly substrate with moderate current. The distribution and reproductive capacity of this species has been seriously impacted by construction of impoundments and navigation facilities, dredging for channel maintenance, sand and gravel mining, and water pollution (USFWS, 1 997).

In the event that the fanshell is identified within the EKTS-HV, the KYARNG will initiate consultation with the USFWS to identify appropriate conservation and management strategies.

6.4.2 STATE-LISTED SPECIES

One KSNPC listed special concern plant, slender naiad ***(Najas gracillima),*** was found during the biological inventory in 1993-1995, but was not found during subsequent inventories. Several state-listed plants potentially occur on the site, but were not located during the surveys **(Table 13).** One state special concern mollusk, little spectaclecase, was identified from Lulbegrud Creek.

6.4.2.1 THREAD-LIKE WATERNYMPH/SLENDER NAIAD

This aquatic flowering plant was found in the northern half of the lower (southwestern-most) impoundment on the site. This species has been reported from relatively nutrient-free soft-water

lakes in other parts of the United States, and is intolerant of pollution. The slender naiad is a submersed aquatic annual plant, and grows from seed deposited in the lake or pond bottom each year. Proper management of aquatic/wetland habitats will benefit this species.

6.4.2.2 LITTLE SPECTACLECASE

The specimen identified in Lulbegrud Creek (outside EKTS-HV boundaries) was weathered-dry and not recently living. This species may no longer be found in Lulbegrud Creek. It is generally found in sand or gravel of small to medium-sized streams. Proper management of water resources and aquatic habitats will benefit this species if it exists at EKTS-HV (see **Section 6.5).**

6.5 WATER RESOURCE MANAGEMENT

Roads and the impoundment of several small ponds are the only modifications to hydrology on the site. Refer to **Section 3.4** for information on-site hydrology. The EKTS-HV has no permanent structures. No wastewater or stormwater management issues presently exist at the EKTS.

Laws and regulations that are associated with control and abatement of pollution in U.S. waters, erosion control, and soil conservation are listed in **Table 19.** These laws and regulations are described in **Appendix G.**

TABLE 19. LAWS, REGULATIONS, AND EXECUTIVE ORDERS APPLICABLE TO WATER RESOURCE MANAGEMENT AT EKTS-HV

REQUIREMENT	TITLE
Law	The EKTS-HV is a state-owned facility and is not directly subject to the Sikes Act *"Conservation Programs on Military Reservations"* (1 6 U.S. Code (USC) §670a et seq.), as amended. However, Army policy is to follow DoD and ARNG guidance on state-owned facilities.
	Federal Water Pollution Control Act as amended by the CWA of 1 977 (33 USC §1251);
	U.S. Fish and Wildlife Coordination Act (16 USC §661);
	NEPA (42 USC §4321);
	Soil Conservation Act (1 6 USC §590a et seq.);
Code of Federal Regulations	32 CFR 651, Environmental Analysis of Army Actions
Army Regulations	AR 200-1, Environmental Protection and Enhancement
Executive Order	EO 11 989, Off-road Vehicle Use;
	EO 11990, Protection of Wetlands;
	EO 1 1 752, Prevention, Control, and Abatement of Environmental Pollution;
	EO 1 2088, Federal Compliance with Pollution.
Kentucky Laws and Regulations	KRS 146 Natural Resources
	KRS 1 51 Geology and Water Resources
	KRS 224 Environmental Protection
	401 KAR 5, Water Quality

6.5.1 PERMITTING

For KYARNG construction at EKTS-HV, units should coordinate with the Training Site NCOIC and the Environmental Office 60 days in advance to review proposed activities for applicable permit requirements. Even when a permit is not required, KYARNG BMPs must be followed.

Under the CWA, Section 319 requires each state to prepare a Nonpoint Source Management Program. The Kentucky Division of Water (KDOW) is responsible for administering the state's stormwater management program. Kentucky's stormwater program is closely modeled after the federal National Pollution Discharge Elimination System (NPDES) program, which requires stormwater be treated to the maximum extent practicable. KDEP's stormwater program requires any construction or other land-disturbing activity of more than one acre of soil disturbance to obtain a Kentucky Pollutant Discharge Elimination System (KPDES) permit. The KPDES permit establishes the required erosion control and revegetation standards. The construction general permit does not require runoff sampling, but there is a requirement for preparing and implementing a storm water pollution prevention plan prior to start of construction. This plan should be available for review by the KDOW upon site inspection, although it does not need to be submitted to or approved by the agency prior to permitting.

Physical disturbances to Waters of the U.S. are regulated by the CWA under Sections 404 and 401 and are discussed in **Section 6.6.1.**

6.5.2 EROSION CONTROL AND SOIL CONSERVATION

Erosion control and soil conservation are important water resource conservation issues. Accelerated erosion, continued compaction, or removal of topsoil can drastically alter soils. Sediment resulting from erosion affects surface water quality and aquatic organisms. Two main types of soil erosion exist - wind erosion and water erosion. According to the soil survey, none of the soil components or mapping units has significant erosion potential from wind. However, many of them are susceptible to water erosion. Specific information regarding erosion potential of the soils at EKTS-HV is provided in Section 3.3.2.2.

Warning signs for trails or areas on site in need of maintenance include:

- Disturbed vegetation (i.e., trampled, crushed, or vegetation missing, "the soil is visible").
- Puddling of the trail surface.
- Gullies and deep wheel ruts in the trail or road.
- Accumulation of sediment into nearby areas (sides of trails, bases of slopes).

Soil conservation provisions include routine trail maintenance (e.g., backfill ruts and stabilize soils as needed), regular inspection, and repair of disturbed areas. The Environmental Office staff will identify areas needing maintenance or repair annually in late spring, following heavy spring rains. Damaged areas will be evaluated and prioritized. Land rehabilitation projects, including revegetation, will be scheduled and performed as soon as possible following disturbance, allowing sufficient time for soils to recover. All necessary rehabilitation work, best management practices, and associated costs will be included in project proposals and construction contracts and specifications.

BMPs to be implemented during these activities to maintain soil and water quality are provided in **Section 6.5.3.** Soil management techniques that will be used at the EKTS-HV are provided in **Section 6.5.4.**

6.5.3 BEST MANAGEMENT PRACTICES FOR EROSION CONTROL AND CONSTRUCTION

The KYARNG will follow BMPs for erosion control developed by KD0W in the Kentucky Best Management Practices for Controlling Erosion, Sediment, and Pollutant Runoff from Construction Sites: Planning and Technical Specifications Manual (KD0W, 2007) and the Kentucky Erosion Prevention and Sedimentation Control Field Guide (KDOW, 2006) as detailed in **Table 20.** This section has been adapted from these materials. The KYARNG will incorporate these BMPs into all construction and natural resources management activities. Units must contact the Environmental Office for planning and documenting BMPs to comply with permit requirements.

TABLE 20. GENERAL BEST MANAGEMENT PRACTICES FOR EROSION CONTROL DURING REVEGETATION AND CONSTRUCTION PROJECTS

TYPE	BEST MANAGEMENT PRACTICE
CONSTRUCTION	■ Clearing and grubbing must be held to the minimum necessary for grading and equipment operation. ■ Construction must be sequenced to minimize exposure time of cleared surface area. Grading activities must be avoided during periods of highly erosive rainfall. ■ Construction must be staged or phased for large projects. Areas of one phase must be stabilized before another phase can be initiated. Stabilization shall be accomplished by temporarily or permanently protecting the disturbed soil surface from rainfall impacts and runoff. ■ Erosion and sediment control measures must be in place and functional before earth moving operations begin, and must be properly constructed and maintained throughout the construction period. ■ Regular maintenance is vital to the success of an erosion and sediment control system. All control measures shall be checked weekly and after each rainfall. During prolonged rainfall, daily checking is necessary. ■ Construction debris must be kept from entering any stream channel. ■ Stockpiled soil shall be located far enough from streams or drainageways so that runoff cannot carry sediment downstream. ■ A specific individual shall be designated responsible for erosion and sediment controls on each project site.
VEGETATIVE EROSION CONTROL	■ A buffer strip of vegetation at least as wide as the stream shall be left along any stream bank whenever possible. On streams less than 1 5 feet wide, the buffer zone shall extend at least 1 5 feet back from the water's edge. ■ Temporary soil stabilization with appropriate annual vegetation (ex. annual ryegrass) shall be applied on areas that will remain unfinished for more than 30 calendar days. ■ Permanent soil stabilization with perennial vegetation shall be applied as soon as practicable after final grading.
STRUCTURAL EROSION CONTROL	■ Sediment barriers such as a silt fence must be installed along the base of all fills and cuts, on the downhill sides of stockpiled soil, and along stream banks in cleared areas to prevent erosion into streams. Barriers may be removed at the beginning of the workday, but must be replaced at the end of the work day. ■ All surface water flowing toward the construction area shall be diverted around the construction area to reduce its erosion potential, using dikes, berms, channels, or sediment traps, as necessary. Temporary diversion channels must be lined to the expected high water level and protected by non-erodible

TABLE 20. GENERAL BEST MANAGEMENT PRACTICES FOR EROSION CONTROL DURING REVEGETATION AND CONSTRUCTION PROJECTS

TYPE	BEST MANAGEMENT PRACTICE
	material to minimize erosion. Clean rock, log, sandbag, or straw bale check dams shall be properly constructed to slow runoff and trap sediment. ■ Sediment basins and traps shall be properly designed according to the size of disturbed or drainage areas. Water must be held in sediment basins until at least as clear as upstream water before it is discharged to surface waters. Water must be discharged through a pipe or lined channel so that the discharge does not cause erosion and sedimentation. ■ Streams shall not be used as transportation routes for equipment. Crossings must be limited to one point. A stabilized pad ofclean and properly sized shot rock must be used at the crossing point. ■ All rocks shall be clean, hard rocks containing no sand, dust, or organic materials.
ROAD AND TRAIL MAINTENANCE	Maintain access roads and trails in such a way as to prevent sediment from entering water bodies. Use methods such as: ■ Water bars or other drainage structures should be constructed. ■ Remove sediment and debris from dips, ditches and culverts; and revegetate problem areas. ■ Use lime, fertilizer, mulch, and/or seed when needed to prevent soil erosion. Amounts should be based on recommendations from the USDA-NRCS or the Kentucky Agricultural Extension Service.
STREAMSIDE MANAGEMENT ZONES (SMZ)	Streamside management zones shall be designed and managed along perennial and intermittent streams, lakes, and impoundments to prevent sediment from entering Waters of the State. Methods to prevent sedimentation to streams include, but are not limited to, the following: ■ Establish SMZs along any stream or water body where the potential exists for movement of sediment into stream or waterbody. The width of SMZs should be a minimum of 50 feet from the disturbed area to the stream for zero percent slope and 20 additional feet for each additional 10 percent of slope. This applies to both sides of the stream (total minimum width of 100 feet). In association with wetlands, establish SMZs at least 50 feet in width along all sides of wetlands and open water. ■ Do not remove any trees within an SMZ if such removal would result in soil potentially getting into a stream or wetland. If trees can be harvested without risk of soil loss, maintain 50 to 75 percent of the vegetation canopy shading a perennial stream; however, see restrictions on tree removal in Table 4-2, #8. ■ Avoid operating any vehicles within an SMZ.

6.5.4 SOIL MANAGEMENTTECHNIQUES

For more information on soil management techniques, consult KDOW guides mentioned above in **Table 20.**

6.5.4.1 REVEGETATION

Seedbed Preparation. To control erosion on bare soil surfaces, plants must be able to germinate and grow. Seedbed preparation is essential. The following guidelines will be used for revegetation projects:

■ Existing Vegetation: When seeding warm season species into areas dominated by exotic cool season grasses, all existing vegetation should be weakened or destroyed, if possible,

with herbicide or a combination of tillage and herbicide. In areas dominated by native species, use less damaging techniques to prepare the seedbed, such as prescribed fire.

- Soil Amendments: All soils on the site are known to be highly acidic, and lime should be applied at the rate of two tons of pulverized agricultural limestone per acre (Hayes 1993). Fertilizer should be applied as 450 pounds per acre of 10-20-20 (10 pounds per 1,000 square feet) or equivalent when soils are dry. Lime and fertilizer shall be incorporated into the top two to four inches of the soil. If establishing a stand on bare soils, apply lime to obtain a pH of 6.4. Avoid applying nitrogen at the time of seeding, as it will stimulate growth of weedy plants and cool season grasses. Use of fertilizers should not be necessary after planting native grasses.
- Surface Roughening: If the area has been recently loosened or disturbed, no further roughening is required. When the area is compacted, crusted, or hardened, the soil surface shall be loosened by discing, raking, harrowing, or other acceptable means.
- Tracking: Tracking with bulldozer cleats is most effective on sandy soils. This practice often causes undue compaction of the soil surface, especially in clayey soils, and does not aid plant growth as effectively as other methods of surface roughening.

Invasive Species. The KYARNG will avoid using plant species considered invasive by the Southeast Exotic Pest Plant Council or as defined in Executive Order 13112 “Invasive Species” in revegetation projects (see **Section 6.8).** For special circumstances, consult the Environmental Office.

Native Species. The KYARNG will use native non-invasive seeds such as those recommended in **Table 21** when feasible, effective, and economical. Local, native species are best for revegetation. The KYARNG will coordinate with other agencies as necessary to choose the most appropriate seed mixtures for application at EKTS-HV. Optimal seeding dates for warm season grasses are 15 April to 1 June. When planting native grasses, include non-persistent grasses that act as a cover crop for the first two or three years to minimize erosion before native species become established; for example, red top, timothy, winter wheat, and grain sorghum. Soil pH should be in the range of 5.8 to 6.4.

TABLE 21 RECOMMENDED NATIVE VEGETATION FOR REVEGETATION PROJECTS AT EKTS

COMMON NAME	SCIENTIFIC NAME	FORM
GRASSES		
Big bluestem	*Andropogon gerardii*	Grass
River oats, Spangle grass	*Chasmanthium latifolium*	Grass
Wild rye	*Elymus virginicus*	Grass
Switch grass	*Panicum virgatum*	Grass
Little bluestem	*Schizachyrium scoparium*	Grass
Indian grass	*Sorghastrum nutans*	Grass
Gamma grass	*Tripsacum dactyloides*	Grass
MOSAIC FOR FULL SUN		
Big blue stem	*Andropogon gerardii*	Grass
New England aster	*Aster novae-angliae*	Forb
White wild indigo	*Baptisia alba*	Forb
Partridge pea	*Chamaecrista faciculata*	Forb
Tall coreopsis	*Coreopsis tripteris*	Forb
Joe Pye weed	*Eupatorium fistulosum*	Forb
Purple bee balm	*Mon a rd a fistulosa*	Forb
Grey headed coneflower	*Ratibida pinnata*	Forb
Blackeyed susan	*Rudbeckia hirta and R. triloba*	Forb
Sedum, stonecrop	*Sedum ternatum*	Forb
Rose vervain	*Verbena Canadensis*	Forb
Ironweed	*Vernonia altissima*	Forb
MOSAIC FOR SHADE		
Thimbleweed	*Anemone virginiana*	Forb
Wild Ginger	*Asarum canadense*	Forb
Ebony Spleenwort	*Asplenium platyneuron*	Fern
Shooting Star	*Dedecatheon meadia*	Forb
Alumroot	*Heuchera Americana*	Forb
Pachysandra	*Pachysandra procumbens*	Forb
Christmas Fern	*Polystichum acrostichoides*	Fern
Broad Beech Fern	*Phegopteris hexagonaptera*	Fern
Golden ragwort	*Senecio g la bell us*	Forb
Foam-flower	*Tiarella cordifolia*	Forb
Spiderwort	*Tradescantia virginiana*	Monocot
Violets	*Violet spp.*	Forb
Woodsia	*Woodsia obtuse*	Forb

Seeding. Seed shall be evenly applied with a cyclone seeder, drill, cultipacker seeder or hydroseeder. Small grains shall be planted no more than one inch deep. Grasses and legumes shall be planted no more than % inch deep. Seeding will be done during optimum seeding periods for individual species to the extent practicable.

Mulching. All seedings made in fall for winter cover shall be mulched. At other times of the year, seedings made on slopes in excess of 4:1, or on adverse soil conditions, or during excessively hot or dry weather, shall be mulched. For seedings made during optimum spring and summer seeding dates, with favorable soil and site conditions, mulching may be optional.

Re-seeding. Areas that fail to establish vegetative cover adequate to prevent rill erosion (caused by water running over the surface of the soil) will be re-seeded as soon as such areas are identified and weather permits.

Temporary Seeding Planting Dates. Use temporary erosion control methods (such as cover crops) during rainy periods to provide cover to soils. Temporary plants should be planted at the following rates and dates: rye at 3 bushels per acre from 1 5 August through 1 November; wheat at 2-3 bushels per acre from 1 September through 1 November; annual ryegrass at 30 pounds per acre from 1 5 August through 1 November.

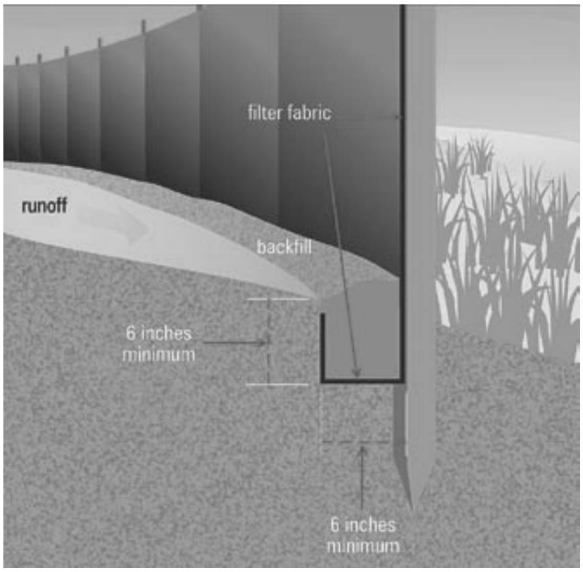
6.5.4.2 SEDIMENT BARRIERS

In addition to seeding and mulching areas greater than 1 50 square feet, use sediment barriers to prevent silt from leaving the site. Silt fences, rock filters, or other commercial sediment barriers are required below (downhill from) areas of bare soil. Hay or straw bales must not be used as sediment filters due to their inherent weakness and tendency to fall apart (KDOW, 2006).

Place filters on downhill edge of bare soil areas. Make sure the filter catches all the muddy runoff. The goal is to pond runoff, to filter and settle it out. Multiple units are needed for long slopes. Spacing on long slopes is every 60 to 110 feet. Put filters across slopes, on the contour (level).

Silt Fences. Silt fences should be installed on the contour below bare soil areas. Use multiple fences on long slopes 60 to 80 feet apart. Silt fencing should not be installed up and down hills, above (uphill from) areas of bare soil, or in ditches, channels, or streams. Each 100-foot section of silt fence can filter runoff from about 1/4 acre (about 110 feet uphill). To install a silt fence correctly, follow these steps:

- Note the location and extent of the bare soil area.
- Mark silt fence location just below bare soil area.
- Make sure fence will catch all flows from area.
- Dig trench six inches deep across slope.
- Unroll silt fence along trench.
- Join fencing by rolling the end stakes together.
- Make sure stakes are on downhill side of fence
- Drive stakes in against downhill side of trench.
- Drive stakes until 8 to 10 inches of fabric is in trench.
- Push fabric into trench; spread along bottom.
- Fill trench with soil and tamp down.



Silt Fence
Source: KDOW 2006

Inspect the silt fence frequently, and repair or replace promptly as needed. Sediment collecting behind silt fences must be removed before it is halfway up the fence. Move collected sediment to a vegetated area or other place where it will not wash into ditches, channels, or streams. Re-trench and tamp down fencing that is undercut by gullies. Remove the silt fence when it has served its usefulness to avoid blocking storm flow or drainage.

Other Sediment Barriers. Brush cleared from the site can make an excellent sediment filter if it is properly placed (see previous illustration) and built up well. Brush barriers are installed on the contour and are 2 to 5 feet high and 4 to 10 feet wide at the base. Walk them down slightly with a loader or dozer to compress the material in the brush barrier. Stuff additional brush on the uphill side where bypasses or undercutting are evident.

Fiber rolls and other commercial products made from coconut fiber, plastic, wood shavings, or other material can also be used as sediment barriers on slopes flatter than 10:1. Follow manufacturers' installation instructions and ensure sediment filter spacing on slopes is correct. Make sure runoff does not bypass brush barrier, coconut rolls, or other barriers underneath or around the ends.

6.5.4.3 ROADWAYSAND DITCHES

Provide V-shaped side ditches as shown in Field Manual (FM) 5-35 ***Engineer Field Data*** (DA, 1987). Size and shape the ditches according to this manual, generally with a 2:1 slope. Slopes should not be too steep to avoid bank sloughing. Provide properly sized and installed culverts according to FM 5-35 to protect roadways and prevent erosion. In erosive areas, use rip rap to stabilize the ditches. On steep erosive slopes, construct V-ditches with geotextile fabric and rip rap to add stability. Shape and crown roads to drain water. Install culverts to improve drainage and minimize shrinking, swelling, and frost damage. Add crushed rock or gravel to prevent road damage caused by low strength. Use sediment barriers in sloping areas where road ditches have a tendency to wash.

6.6 WETLANDS, FLOODPLAINS, AND OTHER AQUATIC HABITAT MANAGEMENT

The western boundary of the EKTS-HV is located in the 1 00-year flood plain of Lulbegrud Creek. No structures currently exist in this flood prone area and no construction is planned. Refer to **Section 3.4** for information pertaining to wetlands, floodplains, and other aquatic habitats existing at the EKTS - HV. Laws, regulations, and EOs pertaining to wetlands and floodplain protection and policies are listed in **Table 22** and described in **Appendix G.**

TABLE 22. LAWS, REGULATIONS, AND EXECUTIVE ORDERS APPLICABLE TO AQUATIC HABITAT MANAGEMENT AT EKTS-HV

Requirement	Title
Law	Rivers and Harbors Act of 1 899;
	Fish and Wildlife Coordination Act of 1 967;
	Land and Water Conservation Fund Act of 1 968;
	Federal Water Pollution Control Act as amended by the CWA of 1 977 (33 USC §1251);
	The EKTS-HV is a state-owned facility and is not directly subject to the Sikes Act *"Conservation Programs on Military Reservations"* (1 6 U.S. Code (USC) §670a et seq.), as amended. However, Army policy is to follow DoD and ARNG guidance on state-owned facilities.
Executive Order	EO1 1 988, Floodplain Management;
	EO 11990, Protection of Wetlands;
Kentucky Laws and Regulations	200 KAR 6:040 and 401 KAR 4:060, Floodplain Management and Flood Control
	KRS Chapter 224; 401 KAR 5:031, Water Resources Protection
	405 KAR 16:1 80 and 405 KAR 1 8:1 80, Wetland Protection

6.6.1 PERMITTING

Projects that involve discharging dredged or fill materials into Waters of the United States, including wetlands, are regulated by the USACE under CWA Section 404 and require Section 401 WQC. Units should contact the Environmental Office regarding any activities that could potentially affect waterbodies. The Environmental Office will review proposed activities for applicable permit requirements and will coordinate regulatory permits. Even when a permit is not required, KYARNG BMPs must be followed. When a permit is required, a pre-application meeting with the USACE and KDOW is recommended, particularly for large-scale projects. The meeting should be held well in advance of the onset of a project (at least three months). Agencies should be notified by letter (KYARNG letterhead). A written meeting agenda is recommended. A sign-in sheet is required. After the meeting, a written meeting summary should be prepared and provided to attendees and the Environmental Office.

Examples of activities that may require a Section 404 permit and Section 401 WQC are stream relocations, road crossings, stream bank protection, construction of boat ramps, placing fill, grading, dredging, ditching, mechanically clearing a wetland, building in a wetland, constructing a dam or dike, and stream diversions. General or individual permits may be required for such activities.

General permits issued by the USACE authorize various types of development projects in Waters of the U.S. Activities authorized under general permits are considered similar in nature, causing minimal adverse effects to the environment. The USACE uses general permits for certain activities to minimize regulatory burdens and administrative costs by allowing landowners to proceed without having to obtain individual permits in advance. One type of general permit is known as a Nationwide permit. There are currently 49 Nationwide permits issued by the USACE in March 2007covering a variety of subjects. Nationwide permits authorize certain activities, and are valid only if the conditions applicable to the permit are met. A summary table of these permits is included as **Appendix H.** Additional information on these permits can be found at http://www.usace.army.mil/cw/cecwo/reg/nationwide_permits.htm.

In general, individual permits are required for disturbances that exceed thresholds for disturbances covered by general permits. Permitting requirements vary depending on type, location, and extent of disturbance. A Section 404 individual permit, issued by the USACE, may be required prior to significant impacts.

The CWA Section 401 WQC is authorized by the CWA and KRS Chapter 224. The KDOW is responsible for implementing the Section 401 program. The WQC program ensures activities involving a discharge into Waters of the State and requiring a federal permit or license are consistent with Kentucky's water quality standards in 401 KAR 5. For wetland and stream disturbances, the applicant must complete and submit the Combined Application for Permit to Construct Across or Along a Stream and/or Water Quality Certification along with appropriate attachments. For stream-related impacts, detailed plan and profile drawings must be submitted along with the permit application. Impacts in streams or lakes designated as Special Use Waters always require an individual WQC and a detailed sediment and erosion control plan.

For wetland-related impacts involving greater than one acre of wetland loss, the KDOW Wetland Mitigation Guidelines must be followed. Wetland losses involving less than one acre may be regulated by the USACE. The USACE is responsible for making official jurisdictional wetland determinations.

The KDOW also has authority over, and issues permits for, placement of debris (e.g., including logging during tree cutting) and/or construction activities within the floodplains of perennial streams that have a drainage area larger than one square mile. Activities that occur in a regulated floodplain may also require a Stream Construction Permit from the KDOW.

6.6.2 MANAGEMENT STRATEGIES

The KYARNG will maintain riparian habitats along streams by implementing riparian buffer zones (also called a SMZ[5]) from the water's edge back on both sides of streams. These areas need the protection of a permanent vegetative cover to reduce erosion into adjacent waterways. Maintaining connectivity between drainages will facilitate wildlife migration, provide habitat cover for small and large mammals, shade stream banks, and ultimately allow for reduced erosion into Lulbegrud Creek. The KYARNG will use the following habitat management techniques for maintenance of the riparian, wetland, and aquatic ecosystems on the EKTS-HV:

- Maintain a 100-foot SMZ (or riparian buffer zone) around intermittent streams and Lulbegrud Creek. Do not dig for training purposes, mowing, or construction activities in these SMZs without prior review and permission from the Training Site NCOIC and the Environmental Office. Do not remove trees within an SMZ without prior approval from the Training Site NCOIC and an inspection to ensure the tree is not being used as a roosting site by Indiana bats. Avoid vehicle operations within SMZs, and cross intermittent streams only at established trail and road culvert crossings.
- Maintain a 50-foot wetland buffer zone around wetlands, marked with Siebert stakes or equivalent, where necessary, to sustain the quality of soils, vegetation, aquatic systems, and habitat qualities. Wetlands are off-limits to tracked and wheeled vehicles and fox-hole digging. Foot traffic is permissible at any time of the year; however, excessive foot traffic can cause soil instability, which can result in sediments entering Lulbegrud Creek. If construction or other land-disturbing activity on-site could result in dredging or fill of

[5] The width of SMZs should be a minimum of 50 feet from the disturbed area to the stream for zero percent slopes and 20 additional feet for each additional 10 percent of slope. This applies to both sides of the stream (total minimum width of 100 feet). Because of slopes at EKTS-HV, a 1 OO-foot SMZ is needed on both sides of streams. In association with wetlands, establish SMZs at least 50 feet in width along all sides of wetlands.

wetlands or other Waters of the U.S., the KYARNG will conduct a jurisdictional wetland delineation and obtain all appropriate permits prior to initiating these activities.

- Monitor and maintain wetland, floodplain, and other aquatic ecosystems through periodic PLSs, troop awareness, and implementation of soil and water conservation management techniques (see **Section 6.5).**
- Follow the Guidelines for Management of Floodplains, Wetlands, and Aquatic Areas:
  - Caution should be taken within 1 OO-feet of either side of a stream for the presence of small isolated wetlands (Gravatt et al., 1 999).
  - Avoid net loss of size, function, or value of wetlands. Avoid modification of flood plains and wetlands where there are practical alternatives. Where no practicable alternatives exist, obtain necessary permits from the USACOE, KDFWR, and KDOW, and implement mitigating measures to minimize potential harm to life, property, and the natural values of flood plains and wetlands.
  - Present all construction project plans to the Environmental Office for review as far in advance as possible. Special permits are required when disturbing federal jurisdictional wetlands, perennial or intermittent streams.
  - Maintain wetland and floodplain riparian vegetation buffers to reduce build-up of sediments and delivery of chemical pollutants to streams and wetlands.
  - Monitor and direct location and use of toxic substances, such as pesticides, petroleum products, and other hazardous substances to minimize the risk of water contamination.
  - Monitor erosion along the intermittent streams within the training site boundaries. Walk the streambanks annually during the winter months when erosion is most visible. Mark erosion sites on a map and take appropriate corrective measures.
- Aquatic, Riparian, and Wetland Ecosystem Management Policies in **Table 23** will be implemented.

TABLE 23. EKTS - HV AQUATIC HABITAT MANAGEMENT POLICIES

TOPIC	POLICY
Streamside Management Zones or Riparian Buffer Zones	Streamside management zones shall be designated and managed along perennial and intermittent streams and ponds to prevent sediment from entering Waters of the Commonwealth. Methods to prevent sedimentation to streams include, but are not limited to, the following: a. No digging for training purposes, mowing, or construction activities is allowed 100-feet on either side of intermittent streams and Lulbegrud Creek without prior review and permission from the Training Site NCOIC and the Environmental Office. b. Trees will not be removed within an SMZ without prior approval from the Training Site NCOIC and an inspection prior to removal operations to ensure the tree is not being used as a roosting site by Indiana bats. c. Avoid operating any vehicles within an SMZ, and cross intermittent streams only at established trail and road culvert crossings...
Wetland Buffer Zones	Tracked and wheeled vehicles shall not be driven within 50-feet of wetlands (marked with Siebert stakes or equivalent where necessary). Foot traffic in wetlands is permissible at any time of the year; however, excessive foot traffic can cause soil instability, which can increase sedimentation of Lulbegrud Creek. No soil disturbance may occur within a 50-foot zone around wetlands without first notifying the KYARNG Environmental Office. Permits may be necessary for all soil disturbing activities within 50 feet of wetlands on the site.
Vehicle Movement and Training Activities	No tank traps, foxholes, hull downs, tent drainages, or similar excavations are permitted on dams or emergency spillways of any water impoundments. Vehicle traffic on the dams will be confined to existing roads. Movement of any soil must be approved. Digging/excavation will have prior approval of the Training Site Manager. No soil disturbance may occur within a 50-foot zone around wetlands without first notifying the KYARNG Environmental Office. Permits may be necessary for all soil disturbing activities within 50 feet of wetlands on the site. Cross intermittent streams only at established trail and road culvert crossings. Avoid operating any vehicles within a SMZ. Tracked and wheeled vehicles shall not be driven within 50-feet of wetlands (marked with Siebert stakes or equivalent). Foot traffic in wetlands is permissible at any time of the year; however, excessive foot traffic can cause soil instability, which can increase sedimentation of Lulbegrud Creek. Vehicle refueling on range firing lines or in training areas is prohibited. Units will clean up any petroleum, oil spills, and lubricant contamination before clearing the training area. Report all hazardous materials/petroleum spills to the Training Site NCOIC immediately. Reportable quantity spills must be reported to KDEP immediately. Manage spills in accordance with the KYARNG Hazardous Materials/Waste Management Plan.
Wildlife and Natural Resources Protection:	Should any of the potential rare, threatened, or endangered species listed in Section 4.4 be encountered on the training area at any time, contact the KYARNG Environmental Program Manager, who will contact the Kentucky State Nature Preserves Commission, Kentucky Department of Fish and Wildlife Resources, and/or the U.S. Fish and Wildlife Service, depending on jurisdiction.

6.7 TERRESTRIAL HABITAT MANAGEMENT

Terrestrial habitat at EKTS-HV includes approximately 390 acres of forested land (72 percent of training site) and approximately 142 acres of grassland (26 percent of training site). **Section 4.2** provides a complete summary and description of the community types found on the installation, which include six distinct forest community types and a grassland community type **(Figure 5).** According to White and Yahn (2006), invasion of non-native species is currently the most detrimental factor affecting the health of the natural vegetation communities on EKTS-HV. Invasive/exotic species management is addressed in **Section 6.8.**

Laws, regulations, and EOs pertaining to terrestrial habitat management are listed in **Table 24** and described in **Appendix G.**

TABLE 24. LAWS, REGULATIONS, AND EXECUTIVE ORDERS APPLICABLE TO WETLANDS MANAGEMENT AT EKTS-HV

REQUIREMENT	TITLE
Law	Federal Insecticide, Fungicide, and Rodenticide Act (6 USC §1 36)
	Forest and Rangeland Renewable Resources Planning Act (16 USC §1601 *et seq.)*
	Sale of Certain Interests in Land, Logs (10 USC §2665)
	Migratory Bird Treaty Act, as amended (16 USC §703-71 2)
	The EKTS-HV is a state-owned facility and is not directly subject to the Sikes Act *"Conservation Programs on Military Reservations"* (1 6 U.S. Code (USC) §670a et seq.), as amended. However, Army policy is to follow DoD and ARNG guidance on state-owned facilities.
Army Regulation	AR 200-1, *Environmental Protection and Enhancement*
Kentucky Laws and Regulations	200 KAR 6:040 and 401 KAR 4:060, Floodplain Management and Flood Control
	KRS Chapter 224; 401 KAR 5:031, Water Resources Protection
	405 KAR 16:1 80 and 405 KAR 1 8:1 80, Wetland Protection

6.7.1 FOREST MANAGEMENT

The Forested habitat occurs on approximately 72 percent (389.5 acres) of the training site. Natural forest communities on the EKTS-HV are distributed according to a moisture gradient from upland hardwood forests (oak-hickory) on drier sites to acidic mesophytic forests and hemlock-mixed forests on moister soils near streams to alluvial forests on wetter soils. Anthropogenic forest communities include disturbed deciduous and pine forests.

Because a forest inventory has not been conducted since 1984 (KDOF, 1984) and no previous forest management plan prepared, forest management strategies focus on providing habitat for troop concealment purposes and avoiding potential impacts to bat habitat. No federally listed bats have been captured at the EKTS-HV to date; however, no surveys have been conducted.

As part of this INRMP update, a preliminary Forest Management Plan has been developed for the KYARNG and is provided in **Appendix I.** This plan outlines specific goals, objectives management policies, and projects to manage forest land at the EKTS-HV.

6.7.2 GRASSLAND MANAGEMENT

The grassland ecosystem, which includes mixed grass/forb, occurs on approximately 26 percent (142.5 acres) of the training site along Hidden Valley Road to Lulbegrud Creek **(Figure 5). Section** 4.2.3 describes the grassland ecosystem and the species dependent on this particular ecosystem. Grasslands (open treeless areas) are especially important to the military mission for tracked and wheeled maneuver exercises. Without some type of human intervention, open areas will continue to close in and become unusable for military purposes over time. The creek running parallel to Engineer Road and adjacent drainages provides patchy distribution of shrubs and small trees throughout the grassland areas and provides cover for wildlife as well as military vehicles (tactical concealment).

Maintenance of a healthy grassland ecosystem will provide vital maneuver opportunities for FTXs at the training site, and vital habitat for ground-nesting birds and other grassland dependent species. Within the Interior Low Plateaus Plain and Northern Cumberland Plateau physiographic regions, the prairie warbler *(Dendroica discolor)* is a priority bird species (ABC, 2000; ABC, unpublished). This species and other grassland or early successional birds, including field sparrow and Eastern meadowlark could benefit from grassland habitat management on the training site.

If left unmanaged, grasslands would succeed to shrub communities and then to acidic mesophytic forest or alluvial forest along Lulbegrud Creek. During the planning period, the KYARNG will use the following grassland habitat management techniques at the EKTS-HV:

- **Mowing and bushhogging** EKTS-HV grasslands occurs as needed within time and access parameters. KYARNG is currently seeking an agricultural lease with a local farmer to accommodate mowing needs at EKTS-HV. See **Section 6.10** for more information pertaining to this agreement.
- **Conduct PLS** (floristic, faunal, migratory bird, and erosion surveys).
- **Manage riparian areas and wetlands adjacent to grasslands.** Allow riparian areas and wetlands adjacent to Lulbegrud Creek and intermittent streams that are currently in mixed grass/forbs to succeed to shrub communities and then to riparian forest by ceasing mowing within 100 feet of Lulbegrud Creek, 50 feet of intermittent streams, and 50 feet of wetlands. Mark areas with Siebert stakes or equivalent as needed.
- Monitor grasslands regularly for areas needing rehabilitation and after implementing management practices. Rehabilitate any loss of soils or vegetation in areas where vegetation does not recover naturally and/or soils have been disturbed during military training exercises.
- Discontinue mowing vegetation on Grigsby silt loam soils (in the floodplain) and within 100 feet of streams and wetlands, so riparian vegetation remains established around wetlands and stream banks.
- Delay mowing during the breeding season for grassland birds to enhance brood survival. Recommended time to exclude mowing within the grasslands is from April to September. Late March or November is the best time to mow. Vegetation management during these times allows for sufficient plant growth, which provides nesting for bird species and winter cover for other wildlife.
- Mowing days must be coordinated with KDFWR and the Training Site NCOIC to avoid conflicts with military training and hunting MOA arrangements.
- Minimize pesticide use in the grasslands. Pesticides can affect insect species and the birds that rely on them for food. Pesticide use on grasslands is also expensive because of the large areas that must be treated.
- Do not plant KY 31 Fescue *(Festuca arundinacea)* or Chinese, Korean, or Kobe lespedezas *(Lespedeza bicolor, L. cuneata,* and *L. stipulacea),* as these species provide very little benefit to wildlife and may even be detrimental. Instead, use other locally grown (or developed) native grasses and native lespedezas. The only exception is when Kobe lespedeza is used for quail management.
- Large, non-fragmented tracts of quality habitat are required as territory for survival and maintenance of neotropical migratory bird and large mammal populations. Configuration of protected habitats should conform to shapes that minimize edge-to-area ratios (Reese and Ratti, 1988). Circular shapes are preferable in achieving this goal. Narrow, linear, or small protected habitats should be avoided if possible.

- Educate all military personnel about species dependent on grasslands and their habitats. Ensure any sensitive species that may be recorded during future PLSs are included in Environmental Awareness training materials and monitored (especially ground-nesting birds).
- Implement Grassland Habitat Management Policies in **Table 25.**

TABLE 25. EKTS - HV GRASSLAND HABITAT MANAGEMENT POLICIES

TOPIC	POLICY
1	Many small (0.5 - 1 acre) wildlife clearings are scattered throughout the training sites, either as isolated clearings within the forest or as cultivated areas in the tactical training space. While these areas are not off limits, they should be protected from heavy vehicular traffic to the maximum extent possible, particularly when freshly plowed or in early development (green) stages.
2	Should any of the potential rare, threatened, or endangered species in Tables 3-8 and 3-9 be encountered on the training area at any time, contact the KYARNG Environmental Program Manager, who will contact the Kentucky State Nature Preserves Commission, Kentucky Department of Fish and Wildlife Resources, and/or the U.S. Fish and Wildlife Service, depending on jurisdiction.
3	Movement of any soil must be approved. Digging/excavation will have prior approval of the Training Site NCOIC.

6.7.3 FIRE MANAGEMENT

Wildfire has the potential to cause severe damage to property and natural resources and to endanger human life. The effects of wildfire on the military mission are twofold; primarily the destruction of natural vegetative communities, training structures, and equipment; and secondarily, exposing sensitive areas to weather events, which could result in soil erosion.

The KYARNG has prepared a Statewide Integrated Wildland Fire Management Plan (IWFMP) for its training areas (see **Appendix K).** Army policy requires that an IWFMP be developed for installations with unimproved grounds that present a wildfire hazard and/or installations that use prescribed burns as a land management tool. Responsibility for implementation of the IWFMP falls on TAG, who designates a Wildland Fire Program Manager (WFPM) to administer the plan.

The IWFMP complies with principles, policies, and recommendations articulated in the revised INRMP, Integrated Cultural Resources Management Plan (ICRMP), and installation fire and emergency service program plans, and in accordance with relevant Federal, State, and local regulations.

The purpose of the IWFMP is to reduce wildfire potential, effectively protect and enhance valuable natural resources, integrate applicable state and local permit and reporting requirements, and implement ecosystem management goals and objectives on Army installations (Department of the Army [DA], 2002). Responsibility for implementation of the IWFMP falls on the TAG, who designates a WFPM to administer the plan.

The goals of the IWFMP reflect the KYARNG's commitment to safety and sustainable use of training land, as well as its long-term vision for terrestrial habitat.

- **GOAL** 1: **SAFETY -** Provide first and foremost for firefighter, military personnel, and public safety. Ensure all fire management activities implement suppression and control practices and technologies that minimize resource damage and unnecessary suppression and rehabilitation costs.
- **GOAL** 2: **MILITARY MISSION** - Support the military training mission by managing wildland fire to sustain military training areas.
- **GOAL 3: ECOSYSTEM MANAGEMENT -** Maintain, protect, and improve ecological integrity.

Major components of the IWFMP include a general description of the installation, information pertaining to the causes and management of wildfires that occur on site, and prescribed burning program(s).

Prescribed fire will not be used as a management tool at the EKTS-HV. To ensure fire control agencies are familiar with the training site and its mission, the KYARNG will provide the KDOF, KDFWR and local volunteer fire departments training site information. This information includes directions to the site, how to access various areas of the site, natural fire breaks that exist on the site, natural resources concerns (for example, wetlands and rare species habitats), and fire hazards. If necessary, a meeting will be held with these agencies to discuss wildfire suppression at the site.

In the event a wildfire arises during training-related activities (i.e., trip flares) at the EKTS-HV, following protocol will be followed:

- Training is to cease immediately and the Training Site NCOIC and his immediate supervisor are to be notified.
- If it is safe to do so (wildfire is small or easily contained), military personnel are to attempt to extinguish the fire using appropriate fire suppression gear. **If the unit cannot safely extinguish or contain the wildfire, they are to back off and immediately move to a safe location.**

If it is determined the wildfire cannot be safely restricted to the desired area, and/or life or property is threatened, the KDOF Kentucky River District Forester is to be called immediately at 606-435-6073.

In addition to the above listed guidance, fire protection policies have been developed for the EKTS- HV. These policies are provided in **Table 26.**

TABLE 26. EKTS-HV FIRE PROTECTION POLICIES

TOPIC	POLICY
1	When a grass or brush fire occurs, training will immediately be halted and all available personnel will be used to extinguish the fire. Training will not be resumed until the officer in charge is confident the fire will not re-ignite.
2	Open burning is not allowed.
3	The periods commencing 1 5 February and ending 30 April, and commencing 01 October and ending 1 5 December of each year are hereby declared and established as fire hazard seasons. During the fire hazard seasons, even though the precautions required by KRS 149.375 shall have been taken, it shall be unlawful for any person to set fire to, or to procure another to set fire to, any flammable material capable of spreading fire located in or within one 1 50 feet of any woodland or brushland, except between the hours of 1 800 and 0600, prevailing local time, or when the ground is covered with snow (This rule applies except when noted in KRS 149.400).
4	**No person shall:** Within or adjacent to timberland, dispose of a lighted match, cigarette, cigar, ashes, or other flaming or glowing substance, or any other substance or thing in such condition that it is likely to ignite a forest, brush, grass, or woods fire. Nor shall anyone throw or drop any of the aforesaid objects or substances from a moving vehicle or drop or leave any of the aforesaid objects or substances within the limits of the right-of-way of any road or highway in such timberland. The driver of a moving vehicle shall be deemed prima facie liable where it cannot be determined which of the occupants of the moving vehicle threw or dropped any of the aforesaid objects or substances (KRS 149.370 (1)).

6.7.4 AGRICULTURAL OUTLEASING

Agricultural outleasing at the EKTS-HV would provide a mechanism by which the KYARNG could maintain open areas as training lands without incurring labor or equipment costs. Although a variety of agricultural interests are feasible at the EKTS-HV, hay production would be most conducive to training activities. Currently, no agricultural outleasing occurs at the EKTS.

6.8 INTEGRATED PEST MANAGEMENT

Integrated Pest Management (IPM) is “a comprehensive approach to pest control or prevention that considers various chemical, physical, and biological suppression techniques; the habitat of the pest; and the interrelationship between pest populations and the ecosystem” (AR 200-1). Laws, regulations, and executive orders pertaining to integrated pest management are listed in **Table** 27 and discussed in **Appendix G.**

TABLE 27. LAWS, REGULATIONS, AND EXECUTIVE ORDERS APPLICABLE TO INTEGRATED PEST MANAGEMENT AT EKTS-HV

REQUIREMENT	TITLE
Federal Law	Federal Noxious Weed Act of 1 974 (7 USC §2801 et seq.)
	Federal Insecticide, Fungicide, and Rodenticide Act (7 USC §1 36)
	Federal Pest Plant Act (7 USC §1 50a et seq.)
	National Aquatic Invasive Species Act of 2003 (NAISA)
Executive Order	EO 1 2865, Reduction of Pesticide Application by 50 percent by Fiscal Year (FY) 2000
	EO 13112, Invasive Species
Kentucky Laws and Regulations	KRS Chapter 224; 401 KAR 5:031, Water Resources Protection Laws
	KRS Chapters 21 7.541 et seq., 249; 250: Noxious Weed Control
	405 KAR 16:1 80 and 405 KAR 1 8:1 80, Wetland Protection

6.8.1 STATEWIDE PEST MANAGEMENT PLAN

The Statewide IPM Plan (U.S. Army Center for Health Promotion and Preventive Medicine - North [USCHPPM], 1999) governs pest management operations at EKTS. EKTS-HV has no dedicated pest management personnel, because the site has no full-time staff. The KYARNG Pest Management Coordinator is responsible for overall program administration, oversight, quality assurance, scope of work reviews, record keeping, and reporting. Pest management files are kept in the KYARNG Environmental Office in Frankfort. The KYARNG Pest Management Coordinator periodically evaluates ongoing pest control operations, and will evaluate all new pest management operations to ensure compliance with the ESA and MBTA.

The Statewide IPM Plan describes the KYARNG's pest management requirements; outlines the resources necessary for surveillance and control; and describes the administrative, safety, and environmental requirements of the program. A copy of the Statewide IPM Plan is available for review in the KYARNG Environmental Office in Frankfort.

6.8.2 KYARNG PEST MANAGEMENT APPROACH

The Statewide IPM Plan sets forth a three-step approach to controlling an unwanted plant or animal, as shown in **Table 28.**

TABLE 28. KYARNG APPROACH TO PEST SPECIES MANAGEMENT

STEP		DESCRIPTION
1	**Assess Species Level**	Assess species abundance before using any control approach. In most cases, periodic visual inspections should be sufficient to determine population levels of invasive species. Maps, permanent plots, or photographs can be used to help determine levels of specific plant or animal species. A determination of how much a plant is spreading will be made before control is attempted.
2	**Attempt Control ***	**Cultural Control:** Manipulate environmental conditions to suppress or eliminate pests. For example, removing trash from the training areas will eliminate a source of food for predators and, through good sanitary practices, may prevent pest populations from becoming established. ***Cultural controls should always be the first attempt at controlling pests at the training site.***
		Mechanical/Physical Control: Alter the environment in which a pest lives by mechanically removing or trapping pests from where they are not wanted or preventing their entrance. Another type of cultural control for weedy vegetation is the use of hot water treatment using a steam unit to eliminate weeds and seed production. Perennial weeds may need subsequent treatment to provide complete control.
		Biological Control: Use predators, parasites, or disease organisms to control pest populations. Biological control may be effective by itself, but is often used in conjunction with other types of control.
		Chemical Control: Chemicals were once considered to be the most effective control available, but pest resistance rendered many pesticides ineffective. In recent years, the trend has been to use pesticides that have limited residual action. While this has reduced human exposure and lessened environmental impact, the cost of chemical control has risen due to requirements for more frequent application. Since personal protection and special handling and storage requirements are necessary with the use of chemicals, using chemicals as a sole means of control can be quite costly when compared with nonchemical control methods. ***Whenever possible, chemical control will be considered the last option when performing control operations, and most likely will be used in conjunction with other control methods.***
3	**Monitor Results**	Monitor control method efficiency after control methods have been undertaken. Periodic visual inspections, interpretation of aerial photos, and photo point monitoring should be sufficient to monitor most invasive plant and animal species. Populations of invasive exotic plant or animal species will be resurveyed and compared to the baseline determination of a species level after control efforts are implemented. This can be accomplished during routine site inspections. Units should report suspected rabid or injured animals to their field commander, who will report the occurrence to the KDFWR District Biologist at (606) 864-9358.

* Attempt control using these general means. Specific control prescriptions are contained in the Kentucky IPM Plan. Source: KYARNG Statewide IPM Plan

6.8.3 PEST SPECIES MANAGEMENT

The Statewide IPM Plan provides detailed management information on the following topics, which will not be duplicated in this plan, with the exception of noxious and invasive plants identified at EKTS-HV, discussed in **Sections 6.8.6 and 6.8.7.** Forest pest management is discussed in **Appendix I.**

- **Disease Vectors and Public Health Pests:** mosquitoes (encephalitis, dengue fever, malaria); field rodents (hanta virus); ticks (lyme disease, lyme-like illness, Rocky Mountain spotted fever, Human ehrlichiosis, and tularemia); black-widow spiders *(Latrodectus mactans);* fire ants; bees, hornets, yellow jackets, and wasps; scorpions; poisonous snakes; skunks, raccoons, foxes, and bats (rabies)
- **Pest of Real Property:** subterranean termites; birds and bats roosting in structures; squirrels and rats
- **Stored Food Product Pests:** beetles, moths, and rodents
- **Noxious and Invasive Plants:** Multi-flora rose, kudzu, etc.
- **Ornamental Plant and Turf Pests:** insect pests such as white grubs, webworms, tent caterpillars, and hemlock woolly adelgid
- **Other Undesirable Vegetation:** Weeds on firing ranges, around targets, along fence lines, on road shoulders, paved surfaces (including runways), etc.
- **Animal Pests:** mice and rats; skunk and raccoon; stray dogs and cats
- **Household and Nuisance Pests:** mice, crawling insects (ants, cockroaches, etc.) and spiders
- **Other Pest Management Requirements:** carcass removal; odor control

6.8.4 USE OF CHEMICALS AT EKTS-HV

Herbicides can be used to control unwanted vegetation in areas where mechanical mowing is difficult or not cost effective. A wide range of USEPA-registered herbicides are available for use at the EKTS-HV, but only those herbicides pre-approved by the KYARNG Pesticide Coordinator and included in the KYARNG IPM Plan may be used. Herbicides can also be used to conduct TSI and to control invasive plants and noxious weeds through subcontracted projects. Aquatic weed control, if necessary, would be done by KYARNG or subcontracted. Treatment is typically done to control non-native invading species, and to control weeds in designated fishing ponds. The Kentucky Department of Agriculture is available for technical support.

6.8.5 INTEGRATED PEST MANAGEMENT POLICIES

It is the policy of the KYARNG to minimize use of all pesticides, including herbicides, at the EKTS-HV. Aquatic ecosystems and native species of plants and animals can be negatively affected by pesticide use. For example, Neotropical migratory birds, bats, and wading birds, which pass through and/or nest on the training site, feed primarily on insects and/or fish. Pesticides sprayed to kill insects can accumulate in the tissues of higher mammals that eat the insects and fish. This process is called “bioaccumulation,” and can eventually lead to the death of the “bioaccumulator.” In addition to aquatic habitats, sensitive areas also include habitats important to listed plant and animal species (see **Section 4.4).**

Whenever possible the KYARNG will use those families of pesticides that degrade rapidly in the environment in order to minimize potential for soil and water contamination. KYARNG pest management policies are listed in **Table 29.**

TABLE 29. KYARNG INTEGRATED PEST MANAGEMENT POLICIES

TOPIC		POLICY
1	Permitted Pesticides and Herbicides	a. Only those pesticides/herbicides pre-approved by the KYARNG Pesticide Coordinator and included in the KYARNG IPM Plan may be used. b. No pesticide/herbicide will be used whose registration has been suspended or canceled by the EPA or the Commonwealth of Kentucky. c. When more than one formulation is available for a specific application, the pesticide/herbicide that is the least persistent and most non-leaching, which will provide the desired control, will be selected.
2	Monitoring and Reporting Requirements	a. An annual report characterizing pesticide/herbicide applications, including types, amounts, locations, and dates of applications and habitats effects by applications (e.g., standing water, grasses, etc.) will be kept in the Environmental Office.
3	Application of Pesticides and Herbicides	a. The use of pesticides will be in accordance with manufacturer's directions and the label. This includes, but is not limited to mixing instructions, application guidelines, storage requirements, and disposal guidelines. b. Pesticides will not be applied directly into waterbodies, or be applied in a manner that might result in runoff (within 24 hours of rainfall) or drift into waterbodies, unless indicated as appropriate on pesticide label/ instructions. c. Pesticides and fertilizers shall not be applied in riparian buffer zones. d. Consult with the Environmental Office before spraying pesticides aerially on the training site. An aerial application validation statement is required from NGB.
4	Pesticide/ Herbicide Applicator Training and Certification Requirements	a. All KYARNG personnel (State or Federal) who apply pesticides classified as restricted-use or state limited-use by either the EPA or State have received and maintained DOD or State commercial certification or they are applied under direct supervision of a DOD or State certified pesticide applicator. b. Federal employees of the KYARNG must be certified by the DoD or State plan for certification when applying restricted or state limited-use pesticides on Federal property. State employees of the KYARNG must receive certification from the Commonwealth of Kentucky certification program prior to applying restricted-use or state limited-use pesticides on Federal or State property. c. To comply with DoD Instruction 41 50.7, individuals who evaluate the quality of work of pest control contracts (Quality Assurance Evaluators) must also be trained in the pest management category or categories of work being performed.
5	Requirements for Contractors conducting pest control on EKTS-HV	Contractors conducting pest control on EKTS-HV must: a. Show proof of liability insurance. b. Have State commercial certification and licensing in the category or categories of work to be performed. c. Use only EPA or State registered pesticides or herbicides. d. Furnish KYARNG personnel with legible copies of specimen labels and the Material Safety Data Sheets of all pesticides proposed for use. e. Furnish KYARNG personnel with information required for pest management record keeping. Facility personnel will record pest management operations on the Pest Management Maintenance Record (DD Form 1 532-1) for the building or site where the work was performed. f. Pesticides must be mixed, stored, and disposed of in accordance with Federal, State, and local regulations, and with procedures established by the KYARNG.

6.8.6 Noxious WEEDS

Noxious weeds are defined as "any living stage (including, but not limited to seeds and reproductive parts) of any parasitic or other plant of a kind, or subdivision of a kind, which is of

foreign origin, is new to or not widely prevalent in the United States, and can directly or indirectly injure crops, other useful plants, livestock, or poultry or other interests of agriculture, including irrigation, or navigation or the fish and wildlife resources of the United States or the public health *(Federal Noxious Weed Act of 1974)."*

The Federal Noxious Weed Act of 1974 and EO 13112 require Federal agencies to control exotic species on Federal lands. The USDA has designated 104 species as Federally-listed Noxious Weeds. None have been identified at EKTS-HV to date. The Kentucky Department of Agriculture is authorized to prevent importation and spread of pests that are injurious to the public interest and for the protection of the agricultural industry. Of the eight Kentucky-listed Noxious Weeds species, four have been identified at EKTS-HV (see **Table 30).** Recommendations for these four species are presented in the following sections.

TABLE 30. KENTUCKY STATE-LISTED NOXIOUS WEEDS

COMMON NAME	SCIENTIFIC NAME	CODE	U.S. NATIVITY
musk thistle	*Carduus nutans*	CANU4	Invasive
Canada thistle	*Cirsium arvense*	CIAR4	Invasive
kudzu	*Puereria lobata*	PULO	Invasive
multiflora rose*	*Rosa multi flora*	ROMU	Invasive
giant foxtail*	*Setaria faberi*	SEFA	Invasive
burr cucumber*	*Sicyos angulatus*	SIAN	Native
black nightshade*	*Solanum ptycanthum*	SOPT7	Native
johnsongrass	*Sorghum halepense*	SOHA	Invasive

* designates species which have been identified at EKTS-HV (White and Yahn, 2006).

6.8.6.1 MULTIFLORA ROSE

Multiflora rose is an introduced, thorny shrub that can form impenetrable thickets in successional fields, pastures, roadsides, and in dense forests, particularly near natural disturbances such as treefall gaps and along streambanks. A single mature plant can produce up to half a million seeds annually. If well established, a huge seed bank develops that can continue to produce seedlings for at least 20 years after removal of mature plants. Control is difficult in areas where steep slopes prevent mowing access (KYDOF, 2007). Control through cut stump application of glyphosate, piclorum, or triclopyr herbicides.

MULTIFLORA ROSE

Source: James H. Miller, USDA Forest Service, Bugwood.org

Such applications are most effective late in the growing season (July-September), and also during the dormant season. Alternatively, repeated cutting or mowing (i.e., three to six times during the growing season), in more than one growing season, can result in high plant mortality. Removal of individual plants by pulling or grubbing is generally not effective, as new plants will readily sprout from remaining roots. The routine use of prescribed fire has been shown to hinder expansion (MDC, 2006; White and Yahn, 2006).

6.8.6.2 GIANT FOXTAIL

Giant Foxtail
Source: Robert H. Mohlenbrock,
USDA-NRCS PLANTS Database

Giant foxtail *(Setaria faberi),* also called Japanese bristlegrass, is a common annual grassy weed. It arrived in North America in the 1 930s from Asia. Stems can grow 6 to 1 2 feet, and the leaf blades can be 20 inches long. The inflorescence, or support system for the flowers, looks like a bushy tail. Giant foxtail is a weed in gardens or field crops, but to wildlife the large seeds are a food source (MU Extension, 2007).

A number of herbicides are effective on giant foxtail; however, repeated use has led to resistance (CDFA, 2007).

6.8.6.3 BURR CUCUMBER

Burr cucumber *(Sicyos angulatus)* is a climbing weed found in forests and shady, damp places, and along streams and roads. Vines are slightly fuzzy, and can reach lengths of 15-25 feet. Leaves are relatively circular in shape, and resemble cultivated cucumber leaves with three to five shallow lobes. Its flowers range from white to green. Fruits are borne in clusters of 3 to 10. Each fuzzy, yellow fruit is only about 1/2 to 3/4 inches long and about 1/4 inch thick, and covered with prickly bristles. Inside each fruit is a single, flat, egg-shaped seed (UMN Extension, 2007).

BURR CUCUMBER
Source: Robert H. Mohlenbrock,
USDA-NRCS PLANTS Database

Repeatedly pulling or cultivating young plants before they have set seed will reduce the number of seeds in the area over time.

Dicamba, the active ingredient in some post-emergent herbicides, will control burr cucumber, but it should not be used under the canopy of trees and shrubs because rain or irrigation water can wash it into the root zone where it will be a problem (UMN Extension, 2007). Glyphosate, the active ingredient in post-emergent herbicides such as Round-Up, can be sprayed or painted onto young plants early in the season. This product may be used around trees, as it will not be absorbed by the roots or bark.

6.8.6.4 BLACK NIGHTSHADE

BLACK NIGHTSHADE
Source: William S. Justice,
USDA-NRCS PLANTS Database

Black nightshade *(Solarium ptycanthum)* is a dark green, slender-branched, hairless annual growing as tall as three feet. The oval leaves have smooth margins. White or purple- tinged flowers are about 0.25 inch in diameter. They give rise to small clusters of round, green fruit that turn black at maturity. The fruit of black nightshade can be toxic due to the presence of glycoalkaloids. Its fruit is suspected to be more toxic when green than when ripe. Poisonings occur only when large amounts are consumed.

In some areas, black nightshade has been shown to have developed a resistance to ALS herbicides. If possible, pulling or mowing plants prior to seed development is preferred to herbicide treatment (Weedscience.org, 1999).

6.8.7 NON-NATIVE/ INVASIVE PLANTS AT EKTS-HV

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

The Kentucky Exotic Pest Plant Council (KY-EPPC), as part of the Southeast EPPC, considers numerous plant species in Kentucky to be invasive (KY-EPPC, 2006). The KY-EPPC was established in 2000 to raise awareness and promote public understanding regarding the threat posed by invasive exotic pest plants to native plant communities in Kentucky. KY-EPPC maintains a list of invasive exotic pest plants for the state of Kentucky.

Biological inventories (White et al., 1995, White and Yahn, 2006) identified 29 plant species at EKTS-HV considered invasive exotic pest plants by the KY-EPPC (KY-EPPC, 2006). These species are listed in **Table 31.**

TABLE 31. INVASIVE/EXOTIC PEST PLANT SPECIES AT EKTS-HV

KY-EPPC MANAGEMENT PRIORITY	COMMON NAME	SCIENTIFIC NAME	KY-EPPC RATING
Severe Threat	Chinese lespedeza	*Lespedeza cuneata*	High-monitor, control, do not plant
	Multiflora rose	*Rosa multi flora*	
	Purple crownvetch	*Coronilla varia*	
	Tall fescue	*Festuca elatior*	
	Amur (bush) honeysuckle	*Lonicera maackii*	Medium-monitor, control if needed, do not plant
	Japanese honeysuckle	*Lonicera japonica*	
	Nepal grass/Japanese stilt grass	Microstegium vimi"	
	Silverberry/autumn olive	*Eleagnus umbelata*	
	White sweet clover	*Melilotus alba*	
	Yellow sweet clover	*Melilotus officinalis*	
Significant Threat	Common chickweed	*Stellaria media*	Medium-monitor, control if needed, do not plant
	Ground ivy	*Glecoma hederacea*	
	Ivy-leaved morning-glory	*Ipomoea hederacea*	
	Kentucky bluegrass	*Poa pratensis*	
	ri ntal lad QmVrtweedy Sth Umb (S)	*Polygonum caespitosum var. longisetum*	
	Queen Anne's lace	*Daucus carota*	
	Star-of-Bethlehem	*Ornithagallum umbellatum*	
Lesser Threat	Barnyard grass	*Echinochloa crus-galli*	Low-monitor, do not plant
	Black medic	*Medicago lupulina*	
	Cocklebur	*Xanthium strumarium var. glabratum*	
	Common self-heal	*Prunella vulgaris var. vulgaris*	
	Dayflower	*Commelina communis*	
	Dead nettle; hen bit	*Lamium amplexicaule*	
	Deptford pink	*Dianthus armeria*	
	Garden yellow rocket	*Barbarea vulgaris*	
	Red clover	*Trifolium pratense*	
	Red sorrel	*Rumex acetosella*	
	White clover	*Trifolium re pens*	
	Whitestar	*Ipomoea lacunosa*	

Kentucky Exotic Pest Plant Council (KY-EPPC, 2006)

RANK 1. "SEVERE THREAT". Exotic plant species that possess characteristics of invasive species and spread easily into native plant communities and displace native vegetation; includes species that are or could become widespread in Kentucky.

RANK 2. "SIGNIFICANT THREAT". Exotic plant species that possess characteristics of invasive species but are not presently considered to spread as easily into native plant communities as those species listed as Rank 1.

RANK 3. "LESSER THREAT". Exotic plant species that spread in or near disturbed areas; and are not presently considered a threat to native plant communities.

Control is only legally required for species also found on the USDA federal noxious weed list, none of which have been identified at EKTS-HV. However, the KY-EPPC recommends Rank 1 (severe threat) and Rank 2 (significant threat) species be controlled and managed in the early stages of detection when possible. The "Lesser Threat" and "Watch List" species may become problems in the future, and should be monitored. This approach is consistent with EO 13112.

The KYARNG's primary approach to control undesirable vegetation is by mowing in areas where vegetation growth is unwanted or would interfere with military operations. The following sections

provide specific management strategies for the invasive/exotic pest plants identified by White and Yahn (2006) of particular concern at EKTS-HV. Multiflora rose, discussed in **Section 6.8.6.1,** was also noted as a species of particular concern at EKTS-HV.

Additional management recommendations to control or eradicate invasive pest plants on the EKTS-HV are available from the Plant Conservation Alliance Alien Plant Working Group's internet-based project "Alien Plant Invaders of Natural Areas: Weeds Gone Wild" (http://www.nps.gov/plants/alien/).

6.8.7.1 CROWN VETCH

CROWN VETCH
Source: Jim Stasz
USDA-NRCS PLANTS Database

Trailing crown vetch *(Coronilla varia)* is a perennial, herbaceous legume that flowers from May to August. Flowers are in clusters and range from pinkish lavender to white. This plant spreads rapidly by seed and by its creeping root system. Trailing crown vetch is distinguished by its compound leaves with an odd number of leaflets (1 5 to 25), the presence of leaves and flower stalks arising from the main stem, and the occurrence of flowers in an umbel. The preferred habitat of this plant is open, sunny areas. It occurs along roadsides and in open fields (INPC, 2007).

For small infestations of mature plants, hand pulling can be effective. Mowing during the flower bud stage for two to three years may reduce vigor and control spread. Be sure to cut plants low to the ground before they seed. Application of triclopyr and glyphosate subsequent to mowing can also be effective. Repeat treatments are necessary to control this species effectively (White and Yahn, 2006).

6.8.7.2 SILVERBERRY

Silverberry *(Elaeagnus spp.),* woody shrubs often capable of nitrogen fixation, typically occurs within disturbed areas, successional fields, pastures, and roadsides where it crowds out other native vegetation. Young branches are often covered with a silvery gray or golden-brown hairy pubescence, but with age develop a scaly gray-brown bark. In some species the branches are armed with spines. Plants are capable of flowering and producing fruit after reaching only three years of age. The yellowish fragrant flowers appear in June and July, and are later replaced by abundant silvery fruit. Bird species are probably the primary vector for dispersal although raccoons, skunks, and opossums also feed on the fruit. Some vegetative propagation has been reported. Once established, *Elaeagnus* spp. are highly invasive and difficult to control (Plant Conservation Alliance [PCA], 2007).

SILVERBERRY
Source: Herman, D.E. et al.
USDA-NRCS PLANTS Database

For areas containing large thickets of silverberry, a foliar spray with triclopyr or glyphosate when air temperature exceeds 65 degrees F is recommended. When dealing with single trees, a basal bark treatment with triclopyr and 2,4-D should be considered (White and Yahn, 2006).

6.87.3 CHINESE LESPEDEZA

CHINESE LESPEDEZA
Source: G.A. Cooper
USDA-NRCS PLANTS

Chinese lespedeza *(Lespedeza cuneata)* is a warm season, perennial herbaceous plant. It has an erect growth form, ranging from about 3 to 5.5 feet in height, and leaves that alternate along the stem. Each leaf is divided into 3 smaller leaflets, about 0.5 to one inch long, which are narrowly oblong and pointed, with awl-shaped spines. Leaflets are covered with densely flattened hairs, giving a grayish-green or silvery appearance. Mature stems are somewhat woody and fibrous, with sharp, stiff, flattened bristles. Small (about 0.25 inch) creamy white to pale yellow flowers emerge either singly or in clusters of 2 to 4, from the axils of the upper and median leaves (PCA, 2007).

Hand pulling is impractical. Mowing plants in the flower bud stage for two to three consecutive years may reduce vigor and prevent further spread. Plants should be cut as close to the ground as possible. Chemical treatment includes a foliar spray. A foliar treatment with a two percent glyphosate herbicide mixture has proven effective from late June until seed set (White and Yahn, 2006).

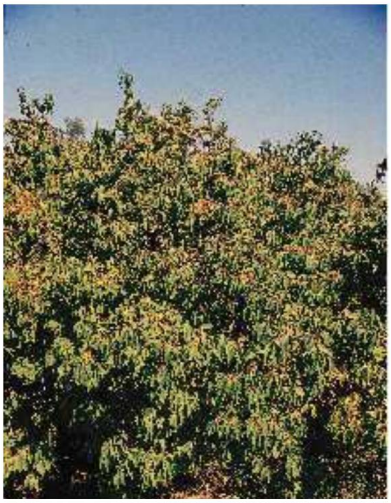
6.87.4 JAPANESE HONEYSUCKLE

Japanese honeysuckle is a perennial vine that climbs by twisting its stems around vertical structures, including limbs and trunks of shrubs and small trees. Leaves are oblong to oval, sometimes lobed, have short stalks, and occur in pairs along the stem. In southern and mid-Atlantic states, Japanese honeysuckle often remains evergreen - its leaves remain attached through the winter. In colder northern climates, the leaves may fall off after exposure to prolonged winter temperatures. Flowers are tubular, with five fused petals, white to pink, turning yellow with age, very fragrant, and occur in pairs along the stem at leaf junctures. Stems and leaves are sometimes covered with fine, soft hairs. Japanese honeysuckle blooms from late April through July and sometimes into October, Small black fruits are produced in autumn, each containing 2 to 3 dark brown seeds about 1/4 inch across (PCA, 2007).

JAPANESE HONEYSUCKLE
Source: Jil M. Swearingen
National Park Service,
Washington D.C

White and Yahn (2006) recommended the following methods of control for Japanese honeysuckle: (1) hand pulling, (2) grubbing, (3) prescribed burning, and/or (4) a late summer foliar spray of two percent glyphosate. Repeat treatments and monitoring are necessary for effective control of this species.

6.87.5 AMUR (BUSH) HONEYSUCKLE



AMUR HONEYSUCKLE
Source: Herman, D.E. et al.
USDA-NRCS PLANTS Database

Amur (bush) honeysuckle *(Lonicera maackii)* is an upright, deciduous shrub that grows to be 6 to 1 5 feet tall, and has dark green leaves that end in a sharp point at the tip and the underside of the leaf has hair along the veins. Bush honeysuckles have a broad tolerance to a variety of moisture regimes and habitats including lake and stream banks, wetlands, prairie, and upland forest communities. Fruits are usually red to yellow. Birds are the main contributors of the spread of these species. Bush honeysuckles compete with native species by shading them. These shrubs have a longer leaf out period than most native species. In addition, they appear to produce an allelopathic chemical that enters the surrounding soil and inhibits native plant growth (INPC, 2007).

For small infestations, hand removal of seedlings or small plants may be used for small populations; however, it is important to remove all portions of the root to avoid resprouting. For chemical control, use a foliar spray with a 2 percent glyphosate or triclopyr mixture where risk to non-target species is minimal and when air temperatures are above 65 degrees F. Treatment of a 25 percent solution of glyphosate or triclopyr immediately after cutting stumps is also effective (White and Yahn, 2006).

6.87.6 SWEET CLOVER

White and yellow sweet clover *(Melilotus alba,* and *M. officinalis),* native to Europe and Asia, were used as a forage crop and soil builder during their initial introduction, and are now used as a wildlife cover crop and in production of honey. These biennial herbs have adapted to a variety of temperatures and light levels. In the first year, they put all energy reserves toward developing a strong root system, and in the second season they flower, set seeds and die. Thus, seed production is essential in proliferation. The leaves of both sweet clovers are alternate and trifoliate. Leaflets are finely-toothed and oblong. Mature plants (second-year) may appear bushy and have small pea-like flowers that are yellow or white, which produce one or two seeds each. Areas most likely to contain sweet clover include roadsides, abandoned fields, railroad ballasts, pastures and any unflooded, open natural community such as a prairie (INPC, 2007).

YELLOW SWEET CLOVER
Source: Patrick J. Alexander
USDA-NRCS PLANTS Database

For small infestations, hand pulling of first year stems in late summer/early fall is a feasible method that can be used to control white and yellow sweet clover. Mowing in late spring/early summer may reduce, but not prevent seeds from setting. Burning two years in a row has also been found to reduce the size of sweet clover populations. If chemical control is required, use a foliar application of 2,4-D on young seedlings.

6.8.77 NEPAL GRASS, JAPANESE STILT GRASS

JAPANESE STILT GRASS
Source: Ted Bodner,
USDA-NRCS PLANTS Database

Japanese stiltgrass *(Microstegium vimineum),* or Nepal grass, is an annual grass with a sprawling habit. It germinates in spring and grows slowly through the summer months, ultimately reaching heights of 2 to 3.5 feet. The leaves are pale green, lance-shaped, asymmetrical, one to three inches long, and have a distinctive shiny midrib. Slender stalks of tiny flowers are produced in late summer (August through September-early October) and dry fruits called achenes are produced soon afterwards (PCA, 2007).

Small, isolated patches can be managed by repeated hand pulling, especially when plants are in bloom (late summer). It is important to control small infestations quickly. For large populations, plants may be cut with a weed whacker just before plants produce seeds (late summer). Chemical control using glyphosates (Roundup) have also been proven successful. When infestations are within or adjacent to wetland or other waterbodies, be sure to use a glyphosate herbicide that has been approved for water use (e.g., Habitat, Aquamaster, Aqua Neat, and Eagre) (White and Yahn, 2006).

6.9 OUTDOOR RECREATION MANAGEMENT

AR 200-1 provides guidance for access to military lands and waters by recreational users, stating that "such access will be within manageable quotas, subject to safety, military security, threatened or endangered species restrictions, and the capability of the natural resources to support such use; and at times as such can be granted without bona fide impairment of the military mission, as determined by the installation commander." This section provides details on public access and enforcement at the EKTS-HV. Laws and regulations pertaining to site access and use are listed in **Table** 32 and discussed in **Appendix G.**

TABLE 32. LAWS, REGULATIONS, AND EXECUTIVE ORDERS APPLICABLE TO OUTDOOR RECREATION AT EKTS-HV

REQUIREMENT	TITLE
Law	The EKTS-HV is a state-owned facility and is not directly subject to the Sikes Act *"Conservation Programs on Military Reservations"* (1 6 U.S. Code (USC) §670a et seq.), as amended. However, Army policy is to follow DoD and ARNG guidance on state-owned facilities.
Executive Order	EO 12960, Recreational Fisheries;
Army Regulation	AR 200-1, *Environmental Protection and Enhancement*
Kentucky Laws and Regulations	KRS Chapter 56:010, Action for Trespass or Injury to State Property
	KRS Chapter 149, Forest Protection Laws of Kentucky
	KRS Chapter 1 50, Fish and Wildlife Protection
	KRS Chapter 235.00, Boating Statutes
	KAR Title 301, Tourism Development Cabinet Department Of Fish And Wildlife Resources

6.9.1 PUBLICACCESS

Outdoor recreation activities are permitted on the EKTS-HV, and are open to the public on a walk-in basis only. Military training supersedes recreational access to the site. Recreational access is managed by KDFWR under an agreement which is subject to annual renewal (see **Appendix D).**

Access to EKTS-HV must be controlled during training exercises for military troop and public safety. Limitations on public access will be enforced during training exercises due to the presence of hazards related to training activities. Some possible threats to public safety related to training activities include: training residue (e.g., concertina wire) and training mechanisms (e.g., vehicles). All of these are potential hazards within the training site.

In the past, the KDMA has attempted to gate the entrances of the training site, only to have the steel gates destroyed soon after their installation. Regardless of the lack of barriers at the entrances to the site, the EKTS-HV is state property and illegal use of or entry to the site is subject to state regulations (KRS 51 1.090).

Any person entering the training site for any purpose prohibited by law or lawful regulation is trespassing (KRS 511, 512, 513, 514). Trespassing is a serious matter, in that it may endanger the life of the person entering the training site as well as potentially endangering lives of Kentucky Army National Guardsmen and interfering with training. According to KRS Chapter 56.010, "Action for Trespass or Injury to State Property," the Finance and Administration Cabinet shall institute civil proceeding in the name of the Commonwealth for any trespass or injury to any state property under its control.

6.9.2 HUNTING AND FISHING

Public fishing, and archery and crossbow deer hunting is permitted at EKTS-HV when military training does not present a conflict. The KDFWR manages public access to the EKTS-HV under a MOU and coordinates with the KYARNG to restrict public access during military training. The details of this agreement are presented in **Appendix D.** All hunting and fishing activities at EKTS-HV are regulated in accordance with Kentucky laws and wildlife regulations. Any person hunting or fishing at the EKTS-HV must carry on their person a valid Kentucky hunting or fishing license and any appropriate permit(s) (KDFWR, 2006).

6.9.3 ALL-TERRAIN VEHICLE USE

All-terrain vehicles (ATVs) have great potential for damage to natural resources. Army policy on ATVs is very restrictive (AR 200-1). No vehicular access for recreational purposes is permitted on EKTS-HV. A person shall not operate an all-terrain vehicle on public property unless the governmental agency responsible for the property has approved the use of all-terrain vehicles (KRS 189.51 5).

6.10 CULTURAL RESOURCES PROTECTION

Cultural resources include sites, buildings, structures, or objects that may have significant archeological and historic value, or properties that may play a significant traditional role in a community's history, beliefs, customs, and practices. Cultural resources, thus, encompass a wide range of sites and buildings from prehistoric Native American campsites to military buildings constructed during the Cold War, as well as traditional cultural properties still used today.

Sections 106 and 110 of the National Historic Preservation Act (NHPA, Public Law (PL) 89-655) provide the framework for federal review and protection of cultural resources, and to ensure that they are considered during federal project planning and execution. The implementing regulations for the Section 106 process (36 CFR Part 800) have been developed by the Advisory Council on

Historic Preservation (ACHP). The Secretary of the Interior maintains a National Register of Historic Places (NRHP), and sets forth significance criteria (36 CFR Part 60) for inclusion in the register. Cultural resources may be considered "historic properties" for the purpose of consideration by a federal undertaking if they meet NRHP criteria. Historic properties may be those that are formally placed in the National Register by the Secretary of the Interior, those that meet the criteria and are determined eligible for inclusion, and historic properties that are yet undiscovered but may meet eligibility criteria.

The DoDI 4710.02 provides guidance for interacting and working with federally recognized American Indian and Alaska Native governments or tribes. This Instruction implements DoD policy, assigns responsibilities, and provides procedures for DoD interactions with federally recognized tribes. The policy requires that government agencies communicate with tribes on a government-to-government basis in recognition of their sovereignty. Addressing tribal concerns between tribes and military installations requires communication at both the tribal leadership-to-installation commander and the tribal staff-to-installation staff levels. The effect of a proposed DoD action that may have the potential to significantly affect protected tribal resources, tribal rights, and Indian lands must be assessed before decisions are made.

The laws, regulations, executive orders and policies governing the protection of cultural resources are are listed in **Table 33** and discussed in **Appendix G.**

TABLE 33. LAWS, REGULATIONS, AND EXECUTIVE ORDERS APPLICABLE TO CULTURAL RESOURCES MANAGEMENT AT EKTS-HV

REQUIREMENT	TITLE
Law	Archaeological and Historic Preservation Act of 1 974 (AHPA)
	American Indian Religious Freedom Act of 1978 (AIRFA)
	National Historic Preservation Act (NHPA, PL 89-655)
	National Historic Preservation Act (NHPA, PL 89-655)
Army Regulation	Army Regulation 200-4
Federal Regulation	Section 106 of the National Historic Preservation Act (NHPA) of 1966 as amended, its implementing regulation (36 CFR 800)
Executive Order	EO 13007 *Indian Sacred Sites*
	EO 1 1 593 *Protection and Enhancement of the Cultural Environment*
	EO 13175 *Consultation and Coordination with Indian Tribal Governments*
DoD Instruction	DoD Interactions with Federally-Recognized Tribes (DoDI 471 0.02)
Kentucky Regulations	KRS Chapter 1 64.705-.735, Archaeology
	KRS Chapter 381.765, Human Burials
	KRS Chapter 525.1 1 5, Violating Graves

6.10.1.1 CULTURAL RESOURCES MANAGEMENT

The KYARNG completed a statewide Integrated Cultural Resource Management Plan (ICRMP) for all property managed by the KDMA, including the EKTS-HV (Brent, 2003). An ICRMP is a five-year plan required by AR 200-1 and DoDI 4715.3 for compliance with applicable federal laws and regulations concerning cultural resources. The ICRMP is a component of the installation master plan, and functions as a decision document for cultural resources management actions and specific compliance procedures. The plan's purpose is to integrate cultural resources requirements with ongoing mission activities so the availability of mission-essential properties and

acreage is maintained and compliance with requirements is achieved. The ICRMP is currently being updated for the next five-year period.

A Phase I cultural resources survey was conducted at the EKTS-HV that determined extensive disturbance had occurred at the site as result of past land use. There was previously a resort, complete with a hotel and golf course. In a letter dated 10 September 1997, the Kentucky SHPO concurred with this finding and stated that no further archaeological surveys were needed at EKTS- HV (see copy of letter in **Appendix B).**

Cultural resources management policies are described in **Table 34.** SOP 4 and 6 in the Kentucky statewide ICRMP apply to natural resources management at EKTS-HV.

TABLE 34. KYARNG CULTURAL RESOURCES STANDARD OPERATING PROCEDURES APPLICABLE TO NATURAL RESOURCES MANAGEMENT AT EKTS-HV

TOPIC	POLICY
SOP #4: Inadvertent Discovery	In the event archaeological deposits are encountered during any construction or excavation activities, the activity must stop and the Environmental Program Manager/Cultural Resources Manager (EPM/CRM) must be notified. If bone is present within the deposit, the EPM/CRM will ensure that a qualified professional accompanies him/her to the work site to assist in identifying the materials as human remains. Because of the potential for archaeological deposits to contain Native American human remains or cultural materials, failure to report discovery of archaeological deposits may result in violation of Native American Graves Protection and Repatriation Act (NAGPRA), American Indian Religious Freedom Act (ARPA), and other related federal and state laws, resulting in fines and penalties against the KYARNG/KDMA. **Follow Procedures in the ICRMP for:** Situation #2: Construction and maintenance activities, including but not limited to digging, bulldozing, clearing-and-grubbing, maintaining earth berms, and roadwork conducted by KYARNG troops. Situation #3: Construction and maintenance activities, including, but not limited to digging, bulldozing, clearing-and-grubbing, maintaining earth berms, and roadwork conducted by contractors. Situation #4: Artifacts found in eroded areas, gullies, dirt trails, or road cuts on KDMA property.
SOP #6: New Construction	Ensure no disturbance or destruction of significant archaeological resources. Known archeological sites should be managed as avoidance areas (no digging). Follow Procedures in the ICRMP.

6.10.1.2 NATIVE AMERICAN CONSULTATION

If the existence of Traditional Cultural Properties (TCP) becomes known, the KYARNG will comply with EO 13175 *(Consultation and Coordination with Indian Tribal Governments),* EO 1 3007 *(Indian Sacred Sites),* and the NHPA of 1 996 as amended.

6.11 NATURAL RESOURCES LAW ENFORCEMENT

Many aspects of integrating the training mission with natural resources management require effective enforcement if they are to be successful. Such programs as hunting/fishing access controls, protection of wetlands, water pollution prevention, rare species protection, and others are very dependent on law enforcement.

The EKTS-HV is within the jurisdiction of TAG of Kentucky. The Criminal Laws of the Commonwealth of Kentucky are in effect within the boundaries of the training site. The Training Site NCOIC has jurisdiction and responsibility over the training site. All of the EKTS-HV, local state, and federal laws and regulations discussed in previous sections will be enforced. KYARNG

personnel may call upon KDFWR or the Kentucky State Police to issue hunting and fishing citations. Public safety and enforcement of laws and regulations is provided primarily by KDFWR under a MOU. The details of this agreement are provided in **Appendix D.**

6.11.1 ENVIRONMENTAL STEWARDSHIP

Environmental Stewardship at EKTS-HV is a moral and legal obligation for all users to carefully and responsibly use and manage the land and resources of the training site. When leaders and soldiers can adopt an attitude of ownership and environmental stewardship of the training site, the natural resources will be more effectively conserved and sustained for future training use. True environmental stewardship and awareness must trickle down from TAG through the Training Directorate to each Commander and soldier within the KYARNG. Command emphasis is necessary to convey the seriousness of environmental stewardship.

6.11.2 ENVIRONMENTAL AWARENESS

Environmental Awareness, through the distribution of educational materials, is a useful natural resources management tool, as it educates land users on the sound environmental stewardship of natural and cultural resources and reduces the potential for inflicting avoidable impacts and/or incurring legal violations. Environmental Awareness applies to soldiers, other services using Army lands, installation staff, other land users, and the public. It also encompasses efforts to inform environmental professionals of Army and installation mission and training activities (DA, 1999). These efforts are designed to improve their understanding of the effects of their mission, training, or activity on natural resources and environmental sensitive areas at the EKTS - HV.

Environmental Awareness also serves to educate the public and garner their support by effectively communicating the nature of the military mission at EKTS-HV and the level of success of natural resources management at the site. When military users and the public are informed and educated about “easily understood” management practices (such as reseeding) as well as “misunderstood” management practices (such as restrictions on field operations or access), they tend to lend more support than opposition to the practice.

Environmental Awareness will be employed at the EKTS-HV by promoting troop awareness, through the distribution of educational materials, maintaining and/or developing strong community relations, and encouraging public involvement

6.11.2.1 TROOP AWARENESS

The policies and guidelines set forth throughout this INRMP as well as any of the established KYARNG SOPs were designed to educate troops training at EKTS-HV about natural resources on the training site, including water, air, noise, and plant and animal life. The Training Site NCOIC conducts advance party environmental briefings and post-training reviews to ensure that troops training at EKTS-HV adhere to the appropriate policies and guidelines. Each unit environmental compliance officer will be involved in incorporating the information in this INRMP into training plans to minimize effects of troop activities on natural resources.

6.11.2.2EDUCATIONAL TRAINING TOOLS

A *Leader and Soldier Field Card* will be developed and maintained for EKTS-HV for use by trainers in the field. The field card will consist of condensed information contained in other Environmental Awareness materials, such as the INRMP or any other applicable KYARNG SOPs. The field card should include a brief description of the installation and a list of “Dos and Don’ts” with particular emphasis on training area protection, erosion control, and cultural resources protection.

During the planning period, state and federal agencies (e.g., the NRCS, USFWS, KDFWR, and KSNPC) will be a valuable source of information for the Environmental Office and Training Site Personnel through fact sheets, site visits, and regular workshops offered throughout Kentucky. Annual updates from these agencies can be a source of new technology and management techniques to aid in implementing a successful natural resources management program.

6.11.2.3C0MMUNITY RELATIONSAND PUBLIC INVOLVEMENT

There are many different ways to educate the public about activities at EKTS-HV and promote good community relations at the same time. The local newspaper, *The Clay City Times,* and local radio stations are excellent means of sharing information and promoting new programs.

Newspaper articles and public service announcements can reach a diverse audience, and can be specifically designed to impress one or more categories of receivers. Awards presented to KYARNG personnel are a good topic for such articles/announcements. Newspaper picture features can enhance understanding of the natural resources and be easily understood by most people. Specific examples of article topics include: natural communities on the training site; use of native species for revegetation and habitat enhancement; working with other agencies, etc. All contact with media staff should be coordinated with the PAO in Frankfort.

SECTION 7: MANAGEMENT GOALS AND OBJECTIVES

Per DoD Supplemental Guidance, the 2003 INRMP was reviewed "as to operation and effect," to determine whether it is developed per NGB and Army policy, meets the intent of the Sikes Act, and contributes to the conservation and rehabilitation of natural resources on military installations. Goals and objectives presented within this chapter for future natural resources management at the EKTS-HV were updated in accordance with this review. Previous chapters that presented important background information on resources, current conditions, and management issues at the EKTS-HV were used to formulate natural resources management goals. Goals listed in **Table** 35 below express the KYARNG's vision of the desired condition of the EKTS-HV's natural resources. These goals are supported by objectives and projects, which provide management strategies and specific actions to achieve these goals. **Table 36** in **Section 8.0** presents a list of planned projects and how they relate to following goals and objectives. All projects are subject to funding availability.

TABLE 35. MANAGEMENT GOALS AND OBJECTIVES FOR EKTS - HV

MANAGEMENT GOAL		OBJECTIVES
1	Manage natural resources to ***support the military mission*** in a manner consistent with the KYARNG Environmental Management System and in compliance with Federal and State laws, Army regulations and policies.	OBJECTIVE 1.1: Initiate programs and projects that enhance the training land and training opportunities and/or do not unnecessarily limit training land availability. OBJECTIVE 1.2: Continue to educate EKTS-HV users regarding the natural resources at the EKTS-HV and their part in ensuring sustainable use of the site. OBJECTIVE 1.3: Maintain sustainable, realistic terrain for military training and identify environmental constraints to land use so that military training can be matched to ecosystem carrying capacity. OBJECTIVE 1.4: Ensure that KYARNG activities at the EKTS-HV remain in compliance with environmental, cultural, and historic regulations as well as INRMP policies. OBJECTIVE 1.5: Implement this INRMP within the framework of Army policies and regulations using the NEPA process to make informed decisions regarding conservation and mitigation of natural resources. OBJECTIVE 1.6: Ensure feedback from training officers is incorporated into natural resource planning and management.
2	Continue to ***develop and maintain a GIS system*** providing efficient data storage, retrieval, and presentation to facilitate fully informed management decisions.	OBJECTIVE 2.1: Continue to collect GIS data throughout the training site, and revise existing files within the GIS database as more current data becomes available. OBJECTIVE 2.2: Update GIS hardware/software as technology advances and performance demands necessitate. OBJECTIVE 2.3: Ensure adequate technical staff are available and trained in new methods to maintain current GIS databases and manage information needs.
3	Manage ***fish and wildlife resources*** in a manner compatible with the military mission and within the limits of the natural habitat.	OBJECTIVE 3.1: Maintain natural ecosystems favorable for indigenous fish and wildlife populations. OBJECTIVE 3.2: Conduct planning level surveys to monitor flora and fauna species at EKTS-HV.

TABLE 35. MANAGEMENT GOALS AND OBJECTIVES FOR EKTS - HV

MANAGEMENT GOAL		OBJECTIVES
4	Protect, restore, and maintain populations of ***rare plant and animal species*** in compliance with Federal and State laws and regulations.	OBJECTIVE 4.1: Coordinate and conduct threatened and endangered species surveys and survey methodologies with appropriate state and federal agencies through master cooperative agreements. OBJECTIVE 4.2: Maintain updated records and maps of rare, threatened, and endangered plant and animal species locations at the EKTS-HV. OBJECTIVE 4.3: Schedule only compatible training activities in areas known to contain federally threatened and endangered species, if any. OBJECTIVE 4.4: When appropriate, identify site-specific habitat requirements and develop short and long-range management strategies for threatened and endangered species.
5	Protect, maintain, and improve ***soil and water quality*** in accordance with State and Federal laws and regulations to sustain the overall condition of the EKTS-HV training lands.	OBJECTIVE 5.1: Plan, design, and implement activities in cooperation with federal, state, and local regulatory authorities to minimize soil loss and site degradation. OBJECTIVE 5.2: Implement BMPs when conducting land management activities. OBJECTIVE 5.3: Control or eliminate runoff and erosion, and rehabilitate eroded areas through sound vegetative and land management practices.
6	***Protect and maintain riparian, wetland and aquatic habitats*** in accordance with state and federal laws and regulations while adhering to the principles of ecosystem management for the purposes of water quality enhancement, wildlife food and cover, and aquatic habitat.	OBJECTIVE 6.1: Proactively manage for wetlands during the environmental planning process, avoiding potential impacts to the maximum extent possible. OBJECTIVE 6.2: Protect riparian forests and wetlands from disturbance during routine land management projects and military training activities on the site by maintaining SMZs and buffer zones. OBJECTIVE 6.3: Monitor effects of military training on wetlands through annual visual monitoring to ensure compliance with SMZs is being met. OBJECTIVE 6.4: Maintain current maps of wetlands at the EKTS-HV. OBJECTIVE 6.5: Conduct planning level surveys as needed.
7	Maintain ***grassland habitats*** for purposes of military training, wildlife food and cover, and soil stabilization.	OBJECTIVE 7.1: Conduct flora and vegetation community planning level surveys as needed. OBJECTIVE 7.2: Monitor grassland bird populations to ensure management goals are being met. OBJECTIVE 7.3: Monitor and rehabilitate, as needed, grassland communities at EKTS-HV periodically for training impacts. OBJECTIVE 7.4: Use tree/shrub removal, mowing, and fertilizer application to prepare grassland areas for hay production. OBJECTIVE 7.5: Develop and implement a mowing/haying program at EKTS-HV in conjunction with a site-specific agricultural lease agreement. OBJECTIVE 7.6: Control invasive exotic species using IPM methods and strategies for the purpose of improving and sustaining training area lands and eradication of exotic species. Objective 7.7: Use environmental awareness and training site SOPs to educate troops about sustaining grassland ecosystems.

TABLE 35. MANAGEMENT GOALS AND OBJECTIVES FOR EKTS - HV

MANAGEMENT GOAL		OBJECTIVES
8	Maintain ***forest resources*** for purposes of military training, wildlife food and cover, and watershed protection.	OBJECTIVE 8.1: Maintain forests in a condition that minimizes threat to safety and human health. OBJECTIVE 8.2: Maintain current stand conditions in forest ecosystems along and around waterways with SMZs that meet state standards for BMPs. OBJECTIVE 8.3: Monitor animal and plant populations dependent on the forest resources in cooperation with KSNPC, KDFWR, and PIF (i.e., neo-tropical migrants and other landbirds) to ensure management goals are being met. OBJECTIVE 8.4: Protect potential bat roosting and foraging habitat by enforcing the policies and management guidelines within this INRMP, which require consultation with the USFWS prior to cutting living or dead standing trees. OBJECTIVE: 8.5: Manage and monitor for non-native and invasive insect species that pose a threat to forest resources. OBJECTIVE 8.6: Implement Timber Stand Improvement to improve access fortraining purposes, reduce stocking rates to healthy levels, remove trees that are diseased or of poor quality, and improve the overall monetary value of timber resources at the EKTS-HV.
9	***Use IPM practices*** that maximize safety and minimize pesticide use and potential hazards to humans, wildlife and their environments.	OBJECTIVE 9.1: Comply with all federal, state, and local laws and regulations pertaining to pest management and pesticide use on the training site. OBJECTIVE 9.2: Support and adhere to the KYARNG Pest Management Plan. OBJECTIVE 9.3: Apply the most effective management strategies when populations of invasive exotic species exceed defined levels. Pest management will be achieved by non-chemical control (e.g., using mechanical or biological methods) whenever feasible and economical. OBJECTIVE 9.4: Prevent the further introduction of noxious plant and animal species to the training site to the greatest extent possible.
10	***Maintain public access*** within the constraints of the military mission and site security needs consistent with sound ecological principles.	OBJECTIVE 10.1: Provide hunting and fishing opportunities on the EKTS-HV for public and military users, compatible with the military mission. OBJECTIVE 10.2: Maintain MOU with KDFWR on an annual basis.
11	***Coordinate mission reauirements and land maintenance activities*** to minimize land impacts from training,	OBJECTIVE 11.1: Evaluate potential impacts of proposed training events, and modify training if necessary to prevent impacts to natural resources. OBJECTIVE 11.2: Maintain records of the type of training that occurs in various areas so correlations among site conditions and training may later be established.
12	***Educate site users*** about environmental concerns and responsibilities while using the site to minimize resource damage and instill a sense of pride and stewardship responsibility.	OBJECTIVE 1 2.1: Brief decision-makers about EKTS-HV natural resources program. OBJECTIVE 1 2.2: Develop and distribute information to units, leaders, soldiers, civilian employees, and other installation users to improve their understanding of impacts of their activities on the environment. OBJECTIVE 1 2.3: Conduct advance party briefings and post-training reviews to ensure troops training at EKTS-HV adhere to the appropriate policies and guidelines.

TABLE 35. MANAGEMENT GOALS AND OBJECTIVES FOR EKTS - HV

MANAGEMENT GOAL		OBJECTIVES
13	***Form communication links*** with other agencies, organizations, and the public to share information and aid in decision-making.	OBJECTIVE 1 3.1: Involve the surrounding community in the EKTS natural resources program. OBJECTIVE 1 3.1: Ensure the EKTS - HV natural resources program is coordinated with other agencies and conservation organizations with similar interests.
14	***Protect and Preserve Cultural Resources*** in accordance with State and Federal laws and regulations.	OBJECTIVE 14.1: Comply with federal, state, and local laws and regulations pertaining to cultural resources found on the training site. OBJECTIVE 14.2: Adhere to guidelines presented in the KYARNG ICRMP and in particular SOPs 4 and 6.

SECTION 8: NATURAL RESOURCES PROGRAM IMPLEMENTATION

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

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

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

8.1 ANNUAL WORK PLANS

8.1.1 WORKPLANS

Natural resources management includes recurring activities and special projects. KYARNG Environmental staff generally performs recurring activities. Projects can be done by Environmental staff, agencies such as KSNPC, or contracted. Planned projects to be funded during this planning period (2008-201 2) are detailed in **Table 36.**

The Environmental staff performs site reconnaissance biannually, which includes the following recurring activities, among others.

- Winter Site Reconnaissance - Note eroded areas and rehabilitate them if they are in need of repair; maintain and/or add Siebert staking or equivalent for riparian areas and wetlands; note diseased or damaged trees that could pose a safety hazard and address.
- Summer Site Reconnaissance - Inspect hemlock stands for hemlock woolly adelgid; Inspect Virginia pine stands for pine bark beetle activity; note eroded areas and rehabilitate them if they are in need of repair; note diseased or damaged trees that could pose a safety hazard and address.

TABLE 36. 2008-2012 PLANNED IMPLEMENTATION PROJECTS (Subject to Funding Availability)

PROJECT		LOCATION	OBJECTIVE# (CHAPTER 7)	DESCRIPTION	LEGAL DRIVERS	FUNDING TYPE	PROGRAM DATE
1	Recurring Maneuver Damage Costs	Throughout	1.1, 1.3, 1.4, 3.1, 5.1, 5.2, 5.4	Funds will be used as necessary to restore disturbed or eroding areas as a result of training activities. Efforts will include replanting vegetation to include native grasses and other species recommended by KDFWR and NRCS. Funds will also be used to purchase fertilizer, lime, seed and mulch for proactive and continuous maintenance of areas damaged by military maneuvers.	CWA, AR 200-1	ITAM	2008-2012
2	Environmental Awareness	Throughout	1.1, 1.2, 1.6 4.2, 13.1, 13.2, 13.3	Funds will be used to produce a Leader and/or Soldier Field Card and other environmental awareness related materials for EKTS-HV as needed.	Army Policy, AR 200-1, ESA, CWA	VENN * /ITAM	2008-2012
3	Vegetation Control	See Figure 6 for grassland areas	1.1, 1.3, 3.1, 5.2, 7.4, 7.5, 9.3	Funds will be used for mowing and brush plowing to maintain areas used for maneuver training and other areas inhibited and/or restricted by vegetation.	Federal Noxious Weed Act, Noxious Weed Control (KRS 217.541 et seq. 249; 25), Army Policy, AR 200-1	VENN * /ITAM	2008-2012
4	Agricultural Outlease	See Figure 6 for grassland areas	1.1, 1.3, 3.1, 5.2, 7.4, 7.5, 9.3, 13,1	KYARNG will attempt to establish an agricultural outlease with a local farmer for hay production. Agricultural outleasing would provide a mechanism by which the KYARNG could maintain open areas as training lands without incurring labor or equipment costs (i.e., reduce costs associated with Project 3).		VENN *	2008-2012
5	Planning Level Surveys	Throughout	1.1, 3.2, 4.1, 4.2, 7.1	Funds will be used to conduct biological inventories (small mammals, herptiles, insects, fish) and update rare species lists. If threatened or endangered species are found at EKTS-HV, the Environmental Office will evaluate whether further work is needed.	ESA, AR 200-1	VENN *	2008-2012
6	Forest Inventory and Management Plan Update	See Figure 6	1.1, 3.1, 5.1, 8.1, 8.2, 8.3, 8.4, 8.5, 8.6, 14.1	Conduct a Forest Inventory at the EKTS-HV. The inventory will be used to aid in developing specific forest management prescriptions and identify areas needing rehabilitation or restoration.	Army Policy, AR 200-1	VENN *	FY 2010
7	Bat Survey	Throughout	3.1,4.1,4.2, 7.1, 8.4, 14.1	Conduct mist net surveys to determine if Virginia big-eared bats or the Indiana bats uses EKTS-HV forests. Mist net surveys will be conducted in consultation with the USFWS. *(Project will be implemented only if trees need to be cut on the training site.)*	ESA, 50 CFR 402, SAIA, 16 USC 67A, AR 200-1, Policy Memo DAIM-ED-N, March 21,1997	VENN *	N/A *

*** VENN is** the Army Management Decision Package Name assigned to the Conservation Pillar in the Defense Finance and Accounting System Indianapolis Center Manual 37-100-08 for conservation/natural resources funds.

8.1.2 FUNDING

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

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

8.1.2.1 FEDERAL NGB FUNDS

The NGB is the primary source of funding to support management of natural resources at the EKTS-HV through a master cooperative agreement with the KYARNG.

For some projects, the installation requests project validation and funding through the NGB-ARE STEP program, with requests completed by the KYARNG Environmental Office in Frankfort, KY. The NGB provides funding for natural resource surveys, environmental monitoring projects, and compliance-related projects.

The NGB Army Installations Division (NGB - ARI) provides funding for the personnel, equipment, and supplies in support of the KYARNG CFMO. This office is involved in planning, scheduling, and oversight of training; maintenance of roads and trails, vegetation management and pest management; facilities infrastructure; and military construction planning; all of which are critical to the natural resources management program.

A five-year ITAM Work Plan is used to channel ITAM funding requests from the KYARNG, through NGB, to the U.S. Army's Office of the Deputy Chief of Staff for Operations (ODCSOPS). In addition to maintaining key personnel and natural resources data collection efforts, the ITAM work plan budget will fund a number of projects of major importance to maintaining, preserving, and protecting the natural resources at EKTS-HV. The annual ITAM Work Plan is the basis for identifying installation ITAM resource requirements and for allocating funding to support installation core capabilities. ITAM funds cannot be used for:

- correcting environmental statutory compliance requirements;
- performing routine range maintenance, modifications, or Sustainment, Restoration, and Maintenance (SRM) responsibilities;
- performing Army Conservation Program requirements, such as PLSs; and;
- adding additional GIS data layers that are not a part of the ITAM requirement (DA, 2005).

8.1.2.2 OTHER FEDERAL FUNDS

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

Program initiatives under the CWA provide funding through several sources. The USEPA's Office of Water sponsors those projects related to the CWA. Available funding may support programs such as cost-sharing for overall water-quality management (e.g., monitoring, permitting, and enforcement), lake water quality assessments and mitigation measures, and implementation of

non-point source pollution control measures. Refer to the USEPA's Office of Water funding website for potential sources of funding: http://www.epa.gov/ ater/funding.html.

8.1.3 PRIORITIES AND SCHEDULING

The STEP database will be used to validate projects and determine funding priority. Projects need to be funded consistent with timely execution to meet future deadlines. Projects are generally prioritized with respect to compliance. Highest priority projects are projects related to recurring or current compliance, and these are generally scheduled earliest. The EKTS-HV projects and schedules are listed in **Table 36.**

Recurring requirements include projects and activities needed to cover the recurring administrative, personnel, and other costs necessary to meet applicable compliance requirements (Federal and State laws, regulations, Presidential EOs, and DoD policies), or that are in direct support of the military mission. Recurring costs include manpower, training, and supplies; hazardous waste disposal; operating recycling activities; permits and fees; testing, monitoring, and/or sampling, and analysis; reporting and record keeping; maintenance of environmental conservation equipment; and, compliance self-assessments.

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

- Environmental analyses, monitoring, and studies required to assess and mitigate potential effects of the military mission on conservation resources;
- Planning documents;
- Baseline inventories and surveys of natural and cultural resources (historical and archaeological sites);
- Biological assessments, surveys, or habitat protection for a specific listed species;
- Mitigation to meet existing regulatory permit conditions or written agreements;
- Wetland delineations in support of subsequent jurisdictional determinations and consequent permitting;
- Efforts to achieve compliance with requirements with deadlines that have already passed;
- Initial documenting and cataloging of archaeological materials.

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

- Compliance with future requirements that have deadlines;
- Conservation and GIS mapping to be in compliance;
- Efforts undertaken in accordance with non-deadline specific compliance requirements of leadership initiatives;
- Wetlands enhancement to achieve the EO for "no net loss" or enhancement of existing degraded wetlands;
- Public education programs on the importance of protecting archaeological and natural resources;

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

Examples of lower priority projects include:

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

8.2 NATURAL RESOURCES MANAGEMENT STAFFING

Natural resources program oversight and INRMP implementation is conducted through the KYARNG Environmental Office. Training for KYARNG personnel, as well as others participating in the management of natural resources, will be practical and job-related. All training programs will involve at minimum a review of legal compliance requirements, applicable DoD/DA regulations, pertinent State and local laws, and current scientific and professional standards as related to the conservation of natural resources. The following annual workshops, professional conferences, and classes are excellent means of obtaining interdisciplinary training for natural resources managers:

- North American Wildlife and Natural Resources Conference http://www.wildlifemanagementinstitute.org/pages/main.html
- Defense Environmental Network Information Exchange (DENIX) http://www.denix.mil/;
- Army Training Support Center - http://www.atsc.army.mil/;
- National Military Fish and Wildlife Association - http://www.nmfwa.org/;
- USACE Wetland Delineation Courses - http://www.hnd.usace.army.mil/to/pindex.html;
- Locally available training through the Cooperative Extension Service, universities, professional and trade organizations, State government, and commercial businesses.

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

8.3 INRMP REVIEWS

8.3.1 REVIEW FOR OPERATION AND EFFECT

Not less than every five years, the INRMP will be reviewed for operation and effect to determine if the INRMP is being implemented to meet the intent of the Sikes Act and contributing to the conservation and rehabilitation of natural resources at the EKTS-HV. The review will be conducted by the three cooperating parties to include the commander responsible for the INRMP, the

Regional Director of the USFWS, and Director of the KDFRW. These agencies all have technical representatives who actually conduct the review.

The review for operation and effect will either conclude the INRMP is meeting the intent of the Sikes Act and it can be updated and implementation can continue, or that it is not effective in meeting the intent of the Sikes Act to conserve natural resources while providing for no net loss in training capability and it must be revised. Mutual agreement of the review for operation and effect must be obtained from the Regional Director of the USFWS, and Director of the KDFRW. This may be achieved via a signed letter, a jointly executed memorandum, or in some other way that reflects mutual agreement.

If only minor updates are needed, they will be done in a manner agreed to by all parties. The updated INRMP will be reviewed by USFWS and KDFWR. A new NEPA review is not necessary for an update and the continued implementation of an existing INRMP that has previously undergone NEPA review. In this case, an Environmental Checklist and REC citing the previous NEPA document is needed.

If a review of operation and effect concludes that an INRMP must be revised, there is no set time to complete the revision. The existing INRMP remains in effect until the revision is complete and USFWS and KDFWR concurrence on the revised INRMP is received. The KYARNG will endeavor to complete such revisions within 18 months, depending on funding availability. Revisions to the INRMP will go through a more detailed review process similar to development of the initial INRMP to ensure KYARNG military mission, USFWS, and KDFWR concerns are adequately addressed and the plan meets the intention of the Sikes Act. Per DoD guidance, an INRMP update only needs to be available for public review if proposed actions “are expected to result in biophysical consequences materially different from those anticipated in the existing INRMP and are analyzed in an existing NEPA document”. The KYARNG may make this decision and provide public availability as deemed necessary.

8.3.2 ANNUAL REVIEWS AND COORDINATION

Per DoD policy, the KYARNG reviews the INRMP annually in cooperation with the USFWS and KDFWR. The KYARNG will converse with the agencies annually to determine if changes or issues indicate the need for a meeting. If warranted, a meeting will be held with the USFWS and the KDFWR and documented by meeting minutes. If a meeting is not necessary, the conversation will be documented via email correspondence or record of conversation.

At this annual review, the need for updates or revisions will be discussed. If minor updates are needed, the requesting party will initiate the updates, and after agreement of all three parties they will be added to the INRMP. If it is determined that major changes are needed, all three parties will provide input and an INRMP revision and associated NEPA review will be initiated with the KYARNG acting as the lead coordinating agency. The annual meeting will be used to help expedite the more formal review for operation and effect, and if all parties agree and document their mutual agreement, it can fulfill the requirement to review the INRMP for operation and effect.

If not already determined in previous annual reviews, by the fourth year annual review a determination will be jointly made to continue implementation of the existing INRMP with minor updates or to proceed with a revision. If the parties feel the annual reviews have not been sufficient to evaluate operation and effect and they cannot determine if the INRMP implementation should continue or be revised, a formal review for operation and effect will be initiated. The determination on how to proceed with INRMP implementation or revision will be made after the parties have had time to complete this review.

In accordance with the Army Guidance for Implementation of the SAIA, dated 25 May, 2006, annual reviews shall at minimum verify that:

- Current information on INRMP conservation metrics as described in Army Environmental Database Environmental Quality Module (AEDB-EQ) is available.
- All "must fund" projects and activities have been budgeted for and implementation is on schedule.
- All required trained natural resources positions are filled or are in the process of being filled.
- Projects and activities for the upcoming year have been identified and included in the INRMP. An updated project list does not necessitate revising the INRMP.
- All required coordination has occurred.
- All significant changes to the installation's mission requirements or its natural resources have been identified.
- The INRMP goals and objectives are still valid.
- No net loss of training capability has occurred due to implementation of the INRMP in accordance with the Sikes Act.

As part of the annual review the KYARNG will specifically:

- Invite feedback from the USFWS and KDFWR on the effectiveness of the INRMP;
- Inform the USFWS and KDFWR which INRMP projects and activities are required to meet current natural resources compliance needs; and
- Document specific INRMP action accomplishments from the previous year.

Information for the annual reviews comes from the KYARNG environmental staff, KYARNG military leadership, cooperating agencies, project files, and Army Environmental Database Environmental Quality (AEDB-EQ) as applicable. Natural resources data and program and project information are available to cooperating agencies. They may request to see project folders or to have a site visit to view natural resources projects in progress at anytime.

8.4 MONITORING INRMP IMPLEMENTATION

The DUSD *Updated Guidance for Implementation of the Sikes Act Improvement Act* updated Conservation Metrics for Preparing and Implementing INRMPs. Progress toward meeting these measures of merit is reported in the annual Environmental Quality Report (EQR) to Congress. Reporting requirements include:

- The installation name and state.
- The year the most recent INRMP was completed or revised.
- Date planned for the next revision.
- Was the INRMP coordinated with appropriate military trainers and operators?
- Were projects added to the INRMP as a result of comments from military trainers and operators?
- Were segments of the INRMP concerning the conservation, protection, and management of fish and wildlife resources agreed to by the USFWS Regional Director? (FWS coordination)

- Were projects added to the INRMP as a result of FWS comments?
- Has annual feedback been requested from the FWS?
- Has annual feedback been received from the FWS?
- Were segments of the INRMP concerning conservation, protection, and management of fish and wildlife resources agreed to by the State fish and wildlife agency Director? (State coordination)
- Were projects added to the INRMP as a result of State comments?
- Has annual feedback been requested from the State fish and wildlife agency?
- Has annual feedback been received from the State fish and wildlife agency?
- Does the INRMP contain a list of projects necessary to meet plan goals and objectives, as well as timeframes for implementation of any such projects?
- Amount of money spent during reporting FY to implement the INRMP.
- Did the installation seek public comment on the draft INRMP?
- Were projects added to the INRMP as a result of public comments?

SECTION 9: BIBLIOGRAPHY

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