

# FORT MCCOY

## INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN

Prepared by

Directorate of Public Works

Environmental Division

Natural Resources Branch

Fort McCoy, Wisconsin

Effective  
2012 until revised

FORT MCCOY  
INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN

2012

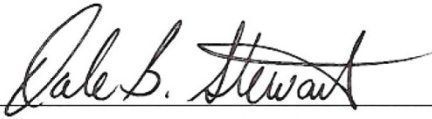
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INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN (INRMP)

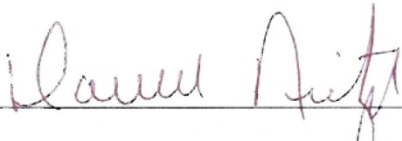
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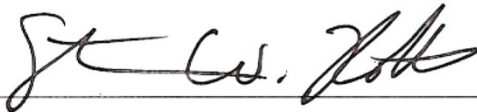
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Fort McCoy Director of Plans, Training, Mobilization and Security



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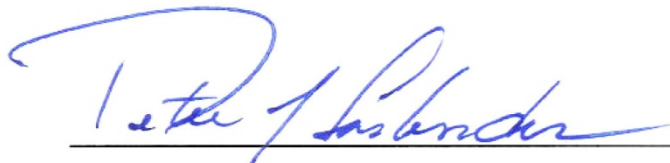
Fort McCoy Director of Public Works



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Fort McCoy Garrison Commander

**In Agreement with the INRMP:**



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US Fish and Wildlife Service



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Wisconsin Department of Natural Resources

## CONTENTS

LIST OF FIGURES AND TABLES .....	i
EXECUTIVE SUMMARY .....	iii
<b>1.0 OVERVIEW .....</b>	<b>1</b>
<b>1.1 AUTHORITY .....</b>	<b>1</b>
<b>1.2 PURPOSE.....</b>	<b>1</b>
1.2.1 <i>Compliance Requirements.....</i>	<i>1</i>
1.2.2 <i>Stewardship Requirements .....</i>	<i>2</i>
<b>1.3 SCOPE .....</b>	<b>2</b>
<b>1.4 GOALS .....</b>	<b>3</b>
<b>1.5 RESPONSIBILITIES.....</b>	<b>4</b>
1.5.1 <i>Directorate of Public Works (DPW).....</i>	<i>4</i>
1.5.2 <i>Directorate of Plans, Training, Mobilization, and Security (DPTMS).....</i>	<i>5</i>
1.5.3 <i>Directorate of Emergency Services (DES).....</i>	<i>7</i>
1.5.4 <i>Directorate of Family and Morale, Welfare and Recreation (DFMWR).....</i>	<i>7</i>
1.5.5 <i>Other Defense Organizations .....</i>	<i>7</i>
1.5.6 <i>Other Federal Agencies .....</i>	<i>8</i>
1.5.7 <i>State Agencies .....</i>	<i>9</i>
1.5.8 <i>Universities.....</i>	<i>9</i>
1.5.9 <i>Contractors.....</i>	<i>9</i>
1.5.10 <i>Monroe County Land Conservation Department (LCD).....</i>	<i>10</i>
1.5.11 <i>Other Interested Parties.....</i>	<i>10</i>
<b>1.6 REVIEW AND REVISION PROCESS.....</b>	<b>10</b>
1.6.1 <i>Annual Review .....</i>	<i>10</i>
1.6.2 <i>Major Revision.....</i>	<i>10</i>
<b>1.7 MANAGEMENT STRATEGIES.....</b>	<b>10</b>
1.7.1 <i>Ecosystem Management .....</i>	<i>11</i>
1.7.2 <i>Biodiversity.....</i>	<i>11</i>
1.7.3 <i>Landscape .....</i>	<i>11</i>
1.7.4 <i>Multiple-use .....</i>	<i>11</i>
1.7.5 <i>Science and Data Collection.....</i>	<i>11</i>
<b>1.8 OTHER PLAN INTEGRATION .....</b>	<b>11</b>
<b>2.0 CURRENT CONDITIONS AND USE .....</b>	<b>12</b>
<b>2.1 INSTALLATION INFORMATION.....</b>	<b>12</b>
2.1.1 <i>Description .....</i>	<i>12</i>
2.1.2 <i>Area Information .....</i>	<i>12</i>
2.1.3 <i>Land Use History .....</i>	<i>12</i>
2.1.4 <i>Fort McCoy History .....</i>	<i>13</i>
<b>2.2 FACILITIES .....</b>	<b>14</b>
2.2.1 <i>Overview.....</i>	<i>14</i>
2.2.2 <i>Cantonment.....</i>	<i>14</i>
2.2.3 <i>Housing.....</i>	<i>14</i>
2.2.4 <i>Recreation Areas.....</i>	<i>16</i>
2.2.5 <i>Transportation Systems .....</i>	<i>16</i>
2.2.6 <i>Water.....</i>	<i>16</i>
2.2.7 <i>Projected Changes in Facilities.....</i>	<i>18</i>
<b>2.3 MILITARY MISSION.....</b>	<b>18</b>
2.3.1 <i>Overview.....</i>	<i>18</i>
2.3.2 <i>Natural Resources Needed to Support the Military Mission .....</i>	<i>19</i>
2.3.3 <i>Effects of the Military Mission on Natural Resources .....</i>	<i>20</i>
2.3.4 <i>Effects of Natural Resources Management on the Mission.....</i>	<i>21</i>
2.3.5 <i>Future Military Mission Impacts on Natural Resources.....</i>	<i>21</i>

2.4	PHYSICAL ENVIRONMENT .....	22
2.4.1	<i>Topography and Geology</i> .....	22
2.4.2	<i>Glacial Influence</i> .....	22
2.4.3	<i>Climate</i> .....	22
2.4.4	<i>Air Quality</i> .....	23
2.4.5	<i>Soils</i> .....	23
2.5	ECOSYSTEMS.....	25
2.5.1	<i>Fort McCoy Ecosystem</i> .....	25
2.5.2	<i>Tension Zone</i> .....	25
2.6	GENERAL BIOTIC ENVIRONMENT .....	25
2.6.1	<i>Water Resources</i> .....	25
2.6.2	<i>Flora</i> .....	31
2.6.3	<i>Floral Inventories</i> .....	38
2.6.4	<i>Fauna</i> .....	38
2.6.5	<i>Threatened and Endangered Species</i> .....	39
3.0	ENVIRONMENTAL MANAGEMENT STRATEGY AND MISSION SUSTIANABILITY ..	40
3.1	LAND USES .....	40
3.1.1	<i>Standard Training Areas</i> .....	40
3.1.2	<i>Special Training Areas</i> .....	40
3.1.3	<i>North Impact Area (NIA)</i> .....	43
3.1.4	<i>Developed Areas</i> .....	44
3.1.5	<i>Wetlands and Fort McCoy Natural Areas</i> .....	45
3.1.6	<i>Experimental Plots and Study Areas</i> .....	45
3.1.7	<i>Recreation Areas</i> .....	46
3.1.8	<i>Wellhead Protection Area</i> .....	47
3.1.9	<i>Outleases and Easements</i> .....	47
3.1.10	<i>Shale Quarries and Sand Pits</i> .....	48
3.1.11	<i>Stump Disposal Areas</i> .....	48
3.2	MANAGEMENT UNITS .....	49
3.2.1	<i>Training Areas</i> .....	49
3.2.2	<i>Forestry Compartments</i> .....	50
3.2.3	<i>Special Management Areas</i> .....	50
3.3	NATURAL RESOURCES CONSULTATION REQUIREMENTS .....	50
3.4	NATIONAL ENVIRONMENTAL POLICY ACT (NEPA) REVIEW .....	50
3.4.1	<i>NEPA Goals</i> .....	50
3.4.2	<i>NEPA Categories</i> .....	51
3.5	PARTNERSHIPS AND COLLABORATIVE RESOURCE PLANNING .....	51
3.6	PUBLIC ACCESS AND OUTREACH .....	52
3.6.1	<i>Outreach Objectives</i> .....	52
3.6.2	<i>Military Personnel Awareness</i> .....	52
3.6.3	<i>Public Awareness</i> .....	52
3.6.4	<i>Volunteer Programs</i> .....	52
3.6.5	<i>Environmental Education</i> .....	53
3.6.6	<i>Research Opportunities</i> .....	53
3.7	ENCROACHMENT PARTNERING .....	53
3.8	STATE COMPREHENSIVE WILDLIFE PLAN.....	53
3.8.1	<i>Additional Documents Citing Fort McCoy's Ecological Significance</i> .....	54
3.9	CLIMATE CHANGE VULNERABILITY ASSESSMENT.....	54
3.9.1	<i>Wisconsin Climate Trends</i> .....	54
3.9.2	<i>Wisconsin Climate Projections</i> .....	54
3.9.4	<i>Affected Resources on Fort McCoy</i> .....	55
3.9.5	<i>Fort McCoy Management Actions</i> .....	55
4.0	PROGRAM ELEMENTS.....	56
4.1	THREATENED AND ENDANGERED SPECIES MANAGEMENT .....	56
4.1.1	<i>Management Activities</i> .....	56
4.1.2	<i>Karner Blue Butterfly Surveys and Management</i> .....	56

4.1.3	<i>Gray Wolf Surveys and Management</i> .....	57
4.1.4	<i>Blanding's and Wood Turtle Surveys and Management</i> .....	58
4.1.5	<i>Red-tailed Prairie Leafhopper Survey and Management</i> .....	59
4.1.6	<i>Phlox Moth Survey and Management</i> .....	59
4.1.7	<i>Bullsnake Surveys and Management</i> .....	59
4.1.8	<i>Regal Fritillary Surveys and Management</i> .....	59
4.1.9	<i>Bald Eagle Surveys and Management</i> .....	60
4.1.10	<i>Osprey Surveys and Management</i> .....	60
4.1.11	<i>Rough White Lettuce Surveys and Management</i> .....	60
4.1.12	<i>Cerulean Warbler Surveys and Management</i> .....	60
4.1.13	<i>Henslow's Sparrow Surveys and Management</i> .....	60
4.2	<b>LAW ENFORCEMENT OF NATURAL RESOURCES LAWS AND REGULATIONS</b> .....	61
4.2.1	<i>History and Authority</i> .....	61
4.2.2	<i>Jurisdiction</i> .....	61
4.2.3	<i>Enforcement Activities</i> .....	61
4.2.4	<i>Training</i> .....	61
4.3	<b>WETLANDS MANAGEMENT</b> .....	61
4.3.1	<i>Management Activities</i> .....	62
4.4	<b>FISHERIES PROGRAM – WATERSHED MANAGEMENT</b> .....	63
4.4.1	<i>Management Activities</i> .....	63
4.4.2	<i>Watershed Management - Lake Resources</i> .....	63
4.4.3	<i>Watershed Management – Stream Resources</i> .....	64
4.5	<b>WILDLIFE MANAGEMENT</b> .....	67
4.5.1	<i>White-tailed Deer Management</i> .....	67
4.5.2	<i>Hunting and Trapping Seasons</i> .....	68
4.5.3	<i>Habitat Management</i> .....	69
4.5.4	<i>Grassland (Prairie) Management</i> .....	70
4.5.5	<i>Game Species Surveys</i> .....	70
4.6	<b>FORESTRY</b> .....	71
4.6.1	<i>Forest Inventory</i> .....	71
4.6.2	<i>Timber Harvest</i> .....	71
4.6.3	<i>Forest Health</i> .....	72
4.6.4	<i>Timber Stand Improvement</i> .....	74
4.6.5	<i>Reforestation</i> .....	74
4.7	<b>VEGETATIVE MANAGEMENT</b> .....	75
4.7.1	<i>Vegetative Inventories</i> .....	75
4.7.2	<i>ITAM Vegetation Management</i> .....	76
4.7.3	<i>Grounds Vegetation Management</i> .....	77
4.8	<b>MIGRATORY BIRD MANAGEMENT</b> .....	77
4.8.1	<i>Management Activities</i> .....	77
4.9	<b>INVASIVE PLANT CONTROL</b> .....	78
4.9.1	<i>Management Activities</i> .....	78
4.9.2	<i>Invasive Plant Species Monitoring</i> .....	78
4.10	<b>PEST MANAGEMENT</b> .....	78
4.10.1	<i>Management Activities</i> .....	79
4.11	<b>LAND MANAGEMENT (SOIL EROSION)</b> .....	79
4.11.1	<i>Management Activities</i> .....	79
4.12	<b>AGRICULTURE/GRAZING OUTLEASES</b> .....	79
4.12.1	<i>Management Activities</i> .....	79
4.13	<b>GEOGRAPHIC INFORMATION SYSTEMS (GIS) MANAGEMENT</b> .....	79
4.14	<b>OUTDOOR RECREATION</b> .....	79
4.14.1	<i>Military Mission Considerations</i> .....	80
4.14.2	<i>Public Access</i> .....	80
4.14.3	<i>Hunting, Fishing, and Trapping Programs</i> .....	80
4.14.4	<i>Other Natural Resources Oriented Outdoor Recreation</i> .....	81
4.14.5	<i>Safety and Security</i> .....	81

4.15	BIRD/ANIMAL AIRCRAFT STRIKE HAZARD (BASH) PROGRAM.....	81
4.16	WILDLAND FIRE MANAGEMENT.....	81
4.16.1	Wildfire Partnerships.....	82
4.16.2	Priority Actions.....	82
4.16.3	Reducing Wildfire Potential.....	82
4.16.4	Management Activities.....	83
4.16.5	Wildland Fire Training.....	83
4.16.6	Prescribed Burns.....	83
4.17	NRB TRAINING.....	85
4.18	COASTAL/MARINE MANAGEMENT.....	85
4.19	FLOODPLAINS MANAGEMENT.....	86
4.20	OTHER LEASES.....	86
4.20.1	Management Activities.....	86
4.21	FORT MCCOY NATURAL AREAS MANAGEMENT (FMNA).....	86
4.21.1	Management Activities.....	86
4.22	MILITARY LAND USE AREAS MANAGEMENT.....	86
4.22.1	North Impact Area (NIA).....	86
4.22.2	Drop Zones (DZ), Air Assault Strip and Landing Zones (LZ).....	87
4.22.3	Improved Ranges.....	87
4.23	DEVELOPED AREAS MANAGEMENT.....	87
4.23.1	Cantonment and Housing Area Management.....	87
4.23.2	Airport Management.....	88
4.23.3	Roads and Railroads.....	88
4.24	CULTURAL RESOURCES MANAGEMENT (CRM).....	88
4.24.1	Cultural and Historic Resources.....	89
4.25	RTL A BIRD AND SMALL MAMMAL SURVEYS.....	89
4.26	SOIL RESOURCES INVENTORY AND MONITORING.....	90
4.27	DATA STORAGE, RETRIEVAL AND ANALYSIS.....	90
5.0	IMPLEMENTATION OF THE PLAN.....	91
5.1	PROJECT DEVELOPMENT.....	91
5.1.1	Determine Project Need.....	91
5.1.2	Project Details.....	91
5.1.3	Project Approvals.....	91
5.1.4	Project Completion.....	91
5.2	ACHIEVING NO NET LOSS.....	91
5.2.1	Internal Constraints.....	92
5.2.2	External Constraints.....	94
5.3	USE OF COOPERATIVE AGREEMENTS (CAS).....	94
5.4	FUNDING.....	94
5.4.1	Budget Requirements Worksheet.....	94
5.4.2	Reimbursable Funds.....	95
5.4.3	Un-Resourced Requirements.....	96
5.5	NRB STAFFING.....	96
5.5.1	Volunteers.....	96
5.6	MONITORING PROGRESS.....	96
5.6.1	INRMP Implementation Assessment.....	96
6.0	ENVIRONMENTAL ASSESSEMENT.....	98
6.1	INTRODUCTION.....	98
6.2	PURPOSE AND NEED FOR THE PROPOSED ACTION.....	98
6.3	DESCRIPTION OF THE PROPOSED ACTION.....	98
6.4	ALTERNATIVES CONSIDERED.....	98
6.5	AFFECTED ENVIRONMENT.....	98
6.6	ENVIRONMENTAL CONSEQUENCES.....	99
6.7	CUMULATIVE EFFECTS.....	99
6.8	CONCLUSIONS REGARDING SIGNIFICANCE OF IMPACTS.....	99
6.8.1	Context.....	99

6.8.2	<i>Intensity</i> .....	99
6.9	<b>LIST OF PREPARERS AND AGENCIES AND PERSONS CONSULTED</b> .....	100
6.9.1	<i>Preparers</i> .....	100
6.9.2	<i>Persons Consulted</i> .....	100
	<b>Bibliography</b> .....	101

APPENDIX A Acronyms

APPENDIX B Implementation Schedule

APPENDIX C Fish and Wildlife Cooperative Agreement

APPENDIX D Training Restrictions

APPENDIX E Streams, Lakes and Impoundments

APPENDIX F Species Lists

APPENDIX G Mound Prairie Sacred Area Management Plan

APPENDIX H Sample Prescribe Burn Management Plan

APPENDIX I Finding of No Significant Impact

APPENDIX J Public Review Comments and NRB Replies



## LIST OF FIGURES AND TABLES

Figure 1. Fort McCoy regional location.....	12
Figure 2. Public land near Fort McCoy.....	13
Figure 3. Facilities.....	15
Figure 4. Wellhead protection areas.....	17
Table 1. Fort McCoy construction projects.....	18
Figure 5. Soil types on Fort McCoy.....	24
Figure 6. Major watersheds on Fort McCoy.....	26
Figure 7. Reduction in time required for Eurasian Watermilfoil removal.....	27
Figure 8. Dredging operations on Hazel Dell Lake .....	28
Figure 9. Streams, lakes, impoundments, wetlands and natural areas.....	29
Figure 10. Fort McCoy trout trends.....	30
Figure 11. Land Cover Types.....	32
Figure 12. Succession model for dry upland plant communities.....	34
Figure 13. Oak savanna.....	35
Figure 14. Northern red oak forest.....	37
Figure 15. Succession model for dry mesic upland plant communities.....	38
Figure 16a. Land Uses on North Post of Fort McCoy.....	41
Figure 16b. Land Uses on South Post of Fort McCoy.....	42
Figure 17. Female Karner blue butterfly.....	56
Figure 18. Student with Blanding's turtle.....	58
Figure 19. Remote Water Sampling Devices.....	66
Figure 20. Streambank restoration and habitat improvement project.....	68
Figure 21. Prescribed burning.....	70
Figure 22. Gypsy moth trap.....	74

Table 2. Grass mowing requirements.....	77
Table 3. Permit sales information.....	81
Figure 23. Prescribe burn locations.....	84

## EXECUTIVE SUMMARY

### PURPOSE

The purpose of the Integrated Natural Resources Management Plan (INRMP) is to support the military mission at Fort McCoy from 2012 until revised by prescribing natural resources conservation measures that are integrated and consistent with federal stewardship requirements. It provides goals to guide natural resource programs and serves as a reference manual for understanding the management of Fort McCoy natural resources. It is also a support tool for the Fort McCoy Integrated Training Area Management (ITAM) program. Embedded within the INRMP is the Environmental Assessment for natural resources management on Fort McCoy.

### ENVIRONMENTAL COMPLIANCE

Installations are required to prepare and implement an INRMP according to Army Regulation (AR) 200-1, the Sikes Act (16 U.S.C. 670a et. Seq.), the Under Secretary of Defense (DUSD ES)/EQ-CO memorandum, 8 August 1994 and 10 October 2002, and Department of Defense (DoD) Instruction 4715.03 (Natural Resources Conservation Program), 14 Feb 2011.

This INRMP has the signatory agreement of the US Fish and Wildlife Service (USFWS) and the Wisconsin Department of Natural Resources (WDNR). This agreement signifies that the INRMP complies with the Endangered Species Act. Review of the INRMP is considered informal consultation with regard to the Endangered Species Act.

The Sikes Act, as amended in November 1997, requires that INRMPs include:

- fish and wildlife management, land management, forest management, and wildlife-oriented recreation;
- fish and wildlife habitat enhancement or modifications;
- wetland protection, enhancement, and restoration where necessary for support of fish, wildlife, or plants;
- integration of, and consistency among, the various activities conducted under the Plan;
- establishment of specific natural resource management goals and objectives and time frames for proposed action;
- sustainable use by the public of natural resources to the extent that the use is not inconsistent with the needs of fish and wildlife resources;
- public access to the military installation that is necessary or appropriate for sustainable use by the public of natural resources to the extent that the use is not inconsistent with the needs of fish and wildlife resources, subject to requirements necessary to ensure safety and military security;
- enforcement of applicable natural resource laws;
- no net loss in the capability of military installation lands to support the military mission of the installation;
- regular review of this INRMP and its effects, not less often than every five years;
- provisions for spending hunting and fishing permit fees exclusively for the protection, conservation, and management of fish and wildlife, including habitat improvement, and related activities in accordance with the INRMP;
- exemption from procurement of services under Office of Management and Budget Circular A-76 and any of its successor circulars; and
- priority for contracts involving implementation of this INRMP to state and federal agencies having responsibility for conservation of fish and wildlife.

This INRMP includes these items if they are applicable to natural resources management and land use at Fort McCoy.

### SCOPE

The INRMP will provide the basis and criteria for protecting and enhancing natural resources using ecosystem management principles that are consistent with the military mission. The publication “Our

Plan For Success” (Fort McCoy 2010) defines the Fort McCoy Strategic Plan for 2011-2015. Requirements in the INRMP apply to all activities, whether they are under the Fort McCoy command or a tenant organization, as well as units training or mobilizing on the installation. This INRMP is integrated with the Fort McCoy Master Plan, the Range Complex Master Plan, the Integrated Cultural Resources Plan, and other plans that address the land on Fort McCoy. Implementation of the INRMP is subject to the availability of funding and manpower and to the mission requirements. The Natural Resources Branch (NRB) will request the required funding through appropriate channels. When INRMP projects are not completed due to inadequate funding, manpower, a change in mission requirements, or other circumstances, NRB will review the INRMP’s goals to determine where adjustments are necessary.

## **RELATIONSHIP TO THE MILITARY MISSION**

Fort McCoy serves as a Total Force Training Center that annually supports the year round training of approximately 120,000 reserve and active component US military personnel from all branches of the armed services. Fort McCoy’s Mission Statement is “Underpin readiness of the force by serving as a training center and a support site for power projection missions.” Fort McCoy supports power projection missions responsible for deploying military forces in support of contingency operations for war and goodwill missions. To accomplish this mission, realistic and quality training opportunities are necessary. The mosaic of natural communities found on Fort McCoy and climate extremes ranging from warm summers to cold winters provides the military with a variety of realistic training scenarios.

This INRMP supports the military mission by outlining management objectives protecting and enhancing training lands upon which the mission is critically dependent. The INRMP also describes recreational opportunities associated with natural resources that are available to the Fort McCoy, local, and regional communities.

The INRMP describes the impacts of the military mission upon natural resources and means to mitigate these impacts. However, this INRMP does not evaluate Fort McCoy’s military mission, nor does it replace any requirement for environmental documentation of the military mission. Nothing in this INRMP will result in any net loss of land available for military training. The implementation of the INRMP will ultimately achieve mission support of the Fort McCoy Strategic Plan (2011-2015).

## **PARTNERSHIPS**

This document was prepared in partnership and cooperation with the US Fish and Wildlife Service and the Wisconsin Department of Natural Resources, representing the federal and state Sikes Act cooperating agencies, respectively. Other partners in this effort include universities, in addition to other federal, state, and local agencies. The INRMP Partnerships are essential for successful natural resource management and will help fulfill the Fort McCoy Strategic Plan Command Imperative to “Foster strategic partnerships to attain mutually beneficial mission results.”

## **PLANNED MAJOR INITIATIVES**

This INRMP includes a description of ongoing and planned natural resource programs and projects at Fort McCoy. These major initiatives support three of the Strategic Plan Objectives: 1) Enhance Fort McCoy’s military value through improved training area utilization and land use initiatives; 2) Acquire, effectively use, and continuously conserve resources; and 3) Provide well-being programs that improve the quality of life for Soldiers, families, and employees. Most of these will either be continued or completed. The most significant projects within this INRMP include:

- a. Maintain existing areas of the oak savanna vegetation community and increase the acreage where compatible with military training.
- b. Control and eliminate (when possible) invasive/exotic plants and animals that threaten native ecosystems, rare species, and training lands.
- c. Conduct hunting and trapping seasons to maintain wildlife populations within the carrying capacity of the land.
- d. Maintain and improve aquatic ecosystem integrity.

- e. Manage the forest resource according to ecosystem management principles while providing a sustained yield of forest products.
- f. Manage and protect all state and federal Threatened and Endangered (T&E) species using ecosystem management techniques while allowing the successful completion of the military mission.
- g. Support Land Rehabilitation and Maintenance (LRAM) Program to rehabilitate, reconfigure, and sustain realistic and relevant training land resources.
- h. Partner with Range and Training Land Assessment (RTLA) to monitor short- and long-term vegetation trends and responses to military training and natural resources management activities.
- j. Manage and protect Fort McCoy natural areas and wetlands by avoiding all aspects of long- and short-term impacts and creating initiatives to enhance their natural value.
- k. Coordinate and cooperate with other federal agencies, state agencies, and private environmental organizations to manage Fort McCoy's natural resources.
- l. Support the development of an Army Compatible Use Buffer (ACUB) program.
- m. Support the implementation of a Joint Land Use Study (JLUS).
- n. Identify restrictions to the military training mission resulting from environmental/natural resource program management or policy and develop proposals to reduce these restrictions.

## **INRMP ORGANIZATION**

This INRMP is organized in distinct categories.

- Chapter 1 introduces the purpose, scope, goals, and objectives of the INRMP and includes responsible parties and their roles in implementation of this INRMP. It lists compliance requirements, describes the review and revision process, management strategies, and integration with other plans.
- Chapter 2 focuses on the current conditions and use. It describes the regional land uses, the history and military use of Fort McCoy, and the physical environment and ecosystems.
- Chapter 3 addresses the environmental management strategy and mission sustainability portion of the INRMP. This includes consultation requirements with outside agencies, National Environmental Policy Act (NEPA) compliance, public access and outreach, and encroachment partnering.
- Chapter 4 describes the natural resource programs, including program goals and objectives.
- Chapter 5 covers how the INRMP will be implemented, including the funding process.
- Chapter 6 includes the embedded Environmental Assessment for the INRMP.

## **MONITORING INRMP IMPLEMENTATION**

The INRMP will be evaluated through monitoring programs including the Environmental Program Assessment System, Army Environmental Database-Environmental Quality, and reviews by the Installation Management Command and the Army Environmental Command. The implementation schedule at Appendix B can provide a basis for evaluating plan implementation. The Environmental Management System (ISO 14001) is another monitoring system used.

The success of individual programs included in the INRMP will be evaluated by the effectiveness of programs in question. For example, white-tailed deer management will be evaluated by the estimated deer per square mile and lack of an obvious browse line in the forest.

## **FUNDING AND BENEFITS**

Funding is primarily supplied by environmental funds secured through annual program budget submissions. However, the Department of Defense is reviewing current and future cost avoidance initiatives to reduce overhead, and realize cost reductions through efficiencies. Because of this, future budget submissions will be reviewed to incorporate as many cost savings efficiencies into our current business practices as possible. Forestry, fisheries and wildlife bring in revenue from timber sales and permit sales to supplement and support those programs. There are significant social-economic benefits from hunting and fishing to the local community and Fort McCoy recreation and housing programs. Timber

harvests also benefit Monroe County by providing a payment of 40% of timber sale profits to the county for roads and school use.

Implementation of this INRMP will improve the quality of training land. It will enhance mission realism through more realistic training lands. It will reduce maintenance costs and improve health and safety and the ability for long range planning at Fort McCoy. Nothing in this INRMP will result in any net loss of land available for military training.

The INRMP provides the basis for the conservation and protection of natural resources. It will help reduce vegetation loss and soil erosion due to military activities. It will reduce the potential for environmental pollution. It will provide biodiversity conservation. Plan implementation will increase overall knowledge of the operation of Fort McCoy ecosystems through surveys and research.

Both community relations and Fort McCoy's environmental image, internal and external to the Department of Defense, will be enhanced. Quality of life for the Fort McCoy community and its neighbors will be improved. INRMP implementation will decrease long-term environmental costs and reduce personal and installation liabilities from environmental noncompliance.

## **SUMMARY**

The INRMP outlines steps required to meet Department of Defense, US Army, and Fort McCoy legal obligations to provide for the stewardship of the natural resources on Fort McCoy, while enabling the accomplishment of the military mission. The INRMP has been developed through cooperation with appropriate regulatory agencies. This plan will not resolve all existing and/or future environmental issues. It does, however, provide the guiding strategy, personnel requirements, and means to minimize and work toward resolution of such issues. Implementation of this INRMP is subject to the availability of annual funding, availability of manpower and subject to mission requirements. Fort McCoy will make best efforts to request funding through appropriate channels. Fort McCoy will review the plan's goals and objectives to determine whether adjustments are necessary when projects identified in the plan are not implemented due to lack of funding, availability of manpower, mission requirements or other compelling circumstances.

## 1.0 OVERVIEW

### 1.1 Authority

Installations are required to have an Integrated Natural Resources Management Plan (INRMP) according to the following directives:

- Army Regulation (AR) 200-1, Environmental Protection and Enhancement.
- The Sikes Act (16 USC §670a *et seq*), as amended.
- Office of the Deputy Under Secretary of Defense (DUSD), Updated Guidance for the Implementation of the Sikes Act, 5 November 2004.
- Department of Defense Instruction 4715.03, Natural Resources Conservation Program.
- Environmental Effects of Army Actions, 32 Code of Federal Regulations (CFR) 651.
- 32 CFR 190, Appendix-Integrated Natural Resources Management.
- Memorandum, Deputy Assistant Secretary of the Army for Environment, Safety and Occupational Health (DASA-ESOH), 18 Sep 2006, INRMP Template.

### 1.2 Purpose

The purpose of the INRMP is to support the military mission at Fort McCoy from 2012 until revised by prescribing natural resource conservation measures that are integrated and consistent with federal stewardship requirements. It provides goals to guide programs and serves as a reference manual for understanding the management of Fort McCoy natural resources. It also serves as a support tool for the Fort McCoy Integrated Training Area Management (ITAM) program. With the encouragement of the Department of Defense (DoD) to adopt ecosystem management principles on all DoD lands, the NRB has developed this plan to integrate ecosystem management concerns into all natural resource management decisions. Embedded within the INRMP is the Environmental Assessment for natural resources management on Fort McCoy by containing the required documentation.

#### 1.2.1 Compliance Requirements

Fort McCoy is Federally-owned property and must comply with all laws, mandates, and regulations concerning land management. In most cases it is necessary to document compliance. The NRB, along with other organizations from the Environmental Division of the Directorate of Public Works, oversee compliance with the following laws and regulations:

- The Clean Water Act
- Migratory Bird Treaty Act
- The National Environmental Policy Act
- The Endangered Species Act
- Energy Independence and Security Act (EISA) 42 U.S.C. § 17094
- Federal Noxious Weed Act as amended, 1990
- Clean Air Act
- DoD Directives 4700.4 and 4150.7
- Department of Army (DA) regulations such as AR 200-1, 200-2, 350-4
- Fort McCoy regulations
- National Historic Preservation Act of 1966
- Archaeological Resources Protection Act
- Native American Graves Protection and Repatriation Act
- American Indian Religious Freedom Act
- Fish and Wildlife Conservation Act
- Hunting, Fishing, and Trapping on Military Lands (Public Law 86-337)
- Wisconsin Best Management Practices for Water Quality
- SIKES Act (Sikes Improvement Act of 1997- Public Law 105-85)
- Wisconsin Administrative Rule; NR27, NR102, NR104 and NR105
- Executive Order (EO) 12962, 7 June 1995, concerning recreational fisheries
- EO 13007 concerning cultural resources
- EO 13112 Invasive Species
- EO 13352 Facilitation of Cooperative Conservation

- EO 11988 and 11990 concerning wetlands and floodplains
- Noise Control Act of 1972
- Quiet Communities Act of 1978
- Department of Defense (DoD) Guidance of 1977
- 32 Code of Federal Regulations (CFR) Part 651 – Environmental Analysis of Army Actions
- 36 CFR 800 concerning historic resources
- 36 CFR 79 concerning curation of historic artifacts

### **1.2.2 Stewardship Requirements**

The INRMP directs natural resources management on Fort McCoy to assure sound stewardship of the public lands entrusted to the Army. Stewardship goes beyond the compliance requirements by committing Fort McCoy to protect, conserve, and enhance native flora and fauna. Specific examples of stewardship activities include:

- Monitor and manage the biotic and abiotic resources on Fort McCoy for the long-term sustainability of the military mission and ecosystem functions.
- Provide opportunities for extracting products of renewable resources in a sustainable fashion without significant impacts to the military mission or the environment. Examples include firewood, timber harvests, fishing, hunting, and trapping.
- Provide guidelines to support professional enforcement of natural resource laws.
- Involve the surrounding community in Fort McCoy's natural resources program.
- Ensure that Fort McCoy natural resources management is coordinated with other agencies and conservation organizations.

### **1.3 Scope**

The INRMP will provide the basis and criteria for protecting and enhancing natural resources using ecosystem management principles that are consistent with the military mission. Requirements in the INRMP apply to all activities, whether they are under the Fort McCoy command or a tenant organization, as well as units training or mobilizing on the installation. This INRMP is integrated with the Fort McCoy Master Plan, the Range Complex Master Plan (RCMP), the Integrated Cultural Resources Management Plan, the Integrated Wildland Fire Plan, and other plans that address the land on Fort McCoy. Implementation of the INRMP is subject to the availability of funding and manpower and to the mission requirements. NRB will request the required funding through appropriate channels. When INRMP projects are not completed due to inadequate funding, manpower, a change in mission requirements, or other circumstances, NRB will review the INRMP's goals to determine where adjustments are necessary.

#### **1.3.1 INRMP Background**

Natural resources management plans on Fort McCoy (then Camp McCoy) started with a forest fire agreement with the State of Wisconsin Conservation Department in 1948. In 1953 the US Forest Service prepared a timber management plan and in 1963 a Cooperative Agreement for managing fish and wildlife was signed by the State of Wisconsin, US Fish and Wildlife Service and Camp McCoy. Various fish and wildlife management plans and forest management plans were written and approved to guide natural resource management on the installation. The first INRMP was approved in 2000 with a first major revision in 2005. This document is the second major revision and will guide natural resources management from 2012 until revised.

#### **1.3.2 Determination for Major Revision**

A major revision is needed when there are significant changes to the installation's mission requirements, its natural resources, or goals and objectives of the present INRMP. It was determined to undergo a major revision based on a few key changes in the past five years.

##### **1.3.2.1 Strategic Objectives and Military Mission**

In the past five years the mission focus was directed towards counter-insurgency operations. This centered on the use of forward operating bases and convoy defense and reaction training with very little overland maneuvering. It is anticipated that future training scenarios will involve more large-scale maneuver elements involved in a more conventional force-on-force field exercises, to include continued



counter-insurgency training. This means Fort McCoy most likely will see more mounted (wheeled and tracked vehicle) and dismounted (soldiers on foot) training and maneuvering across the landscape. It is expected there will be more brigade level exercises annually in the next few years with increased numbers of Soldiers training at Fort McCoy. These exercises may keep soldiers in the field for up to three weeks at a time.

#### **1.3.2.2 Reduction of Training Restrictions**

Internal training restrictions have reduced the amount of acres available for military training exercises. Reducing the amount and type of restriction will effect a change in natural resource management activities. Some changes under consideration include reducing or eliminating the maneuver set-back from wetlands and water bodies; removing Karner blue butterfly core areas, and reducing the limitations within Fort McCoy Natural Areas. Any of these changes may require more monitoring or mitigation measures to reduce negative effects to the natural resources.

#### **1.3.2.3 Expected Funding Cuts**

Funding cuts for all government programs are expected for the next five years. To prepare for less funding this INRMP identifies the projects that are critical to maintain a high quality military training environment as well as the natural resources that make Fort McCoy a valuable asset to the military.

#### **1.3.2.4 Maintaining Oak Savanna**

One of the major initiatives in the previous two INRMPs was to create and maintain oak savanna habitat. It has been determined that 16,730 acres of Fort McCoy (including the North Impact Area) are considered under savanna management with 13,675 acres (including the North Impact Area) can be considered high quality savanna. Investigations are on-going to determine the appropriate amount of savanna habitat for Fort McCoy. For the present time the goal is to maintain the amount of savanna present (approximately 27% of the installation).

#### **1.3.2.5 Other**

Other factors that lead to the decision to complete a major revision of the INRMP include:

- Installation reorganization that required moving natural resources management from Directorate of Plans, Training, Mobilization and Security (DPTMS) to the DPW.
- Updating the five year Cooperative Plan with the US Fish and Wildlife Service and the Wisconsin Department of Natural Resources.
- Reducing the amount of information about the Integrated Training Area Management Program (ITAM) and Cultural Resources to rely on the ITAM Five-Year Plan and Integrated Cultural Resources Management Plan to cover those programs.
- Adapting the INRMP to the DoD template for INRMPs.

### **1.4 Goals**

The primary goals of the INRMP are:

- To ensure the installation operational mission will continue on a sustainable basis.
- To ensure that Army activities and natural resource conservation measures on Fort McCoy are integrated and meet or exceed Federal stewardship requirements.
- To address state and local concerns with regards to actions and management of Fort McCoy natural resources.
- To explain the background for natural resource management decisions, provide goals to guide programs, and serve as a reference manual for understanding the management of Fort McCoy natural resources.
- To provide natural resources support to the ITAM program.
- To serve as a basis for measuring the success or accomplishment of ecosystem management practices implemented on Fort McCoy.
- To serve as the Environmental Assessment for natural resources management on Fort McCoy.
- To enhance the quality of life for Fort McCoy personnel and the public in general.

- To provide an outline of management objectives to other internal and external programs associated with Fort McCoy to reduce multiple-use and long-term planning conflicts.

## **1.5 Responsibilities**

The Garrison Commander of Fort McCoy is ultimately responsible for implementation of the INRMP. The proponent for developing and implementing the INRMP is NRB, Environmental Division, Directorate of Public Works (DPW). Other organizations that have a large interest in the INRMP include: Training Division within the DPTMS; Fire Prevention and Protection Division and Fort McCoy Police Department within the Directorate of Emergency Services (DES); and Community Recreation within the Directorate of Family and Morale, Welfare and Recreation (DFMWR).

### **1.5.1 Directorate of Public Works (DPW)**

The DPW is responsible for providing and managing Fort McCoy's facilities and real property. It includes five divisions; Housing, Operations and Maintenance, Environmental, Master Planning, and Engineering. Services such as facility maintenance, snow removal, grass cutting, tree care, and custodial have been contracted. Since DPW oversees the contracted services, all references to the services will be termed as DPW.

DPW has five strategic objectives that provide direction and focus to the organization. These strategic objectives are listed below:

- Provide quality facilities and services to the organizations that support military training and force projection.
- Make environmental compliance and pollution prevention an integral part of our operational processes and maintain positive community relations.
- Conserve energy, seek alternative energy sources, and expand the opportunities to recycle and the use of recycled materials.
- Provide quality housing facilities for our assigned military population.
- Manage the natural and cultural resources in a way that will support the military training mission.

#### **1.5.1.1 Environmental Division (ED)**

The Environmental Division is comprised of three branches and is responsible for the NEPA, natural resources, cultural resources, hazardous waste, recycling, asbestos, air emissions, storm water pollution protection, oil/water separators, ozone depleting chemicals, radon gas monitoring, lead hazard reduction, site cleanup and closure, storage tank management, wellhead protection, landfill inspection, environmental noise management, pest management, Emergency Planning and Community Right-To-Know Act (EPCRA), military munitions and range response, drinking water, waste water, energy and others. This organization obtains all state and Federal environmental permits.

##### **1.5.1.1.1 NRB**

The NRB manages Fort McCoy's natural resources and is comprised of Fisheries, Wildlife, Forestry, Threatened and Endangered Species (T&E), Cultural Resources and Pest Management. The NRB operates under the team concept to facilitate integrated land management. Decisions are reviewed by the NRB to ensure that management practices will fully benefit all resources and land uses. Recommendations are then provided to the Chief of the NRB for review. As needed, recommendations and decisions are sent forward to the Chief of the Environmental Division for review and approval.

##### **1.5.1.1.1.1 NRB Mission**

The mission of the NRB is to foster the wise stewardship of natural resources which will support and sustain:

- A realistic and relevant training environment.
- A productive operational base.
- Biological diversity.
- Commercial and recreational opportunities.
- Healthy biotic communities (i.e. minimize wildlife disease issues, tree health issues, at appropriate population levels, etc).

#### **1.5.1.1.1.2 NRB Goals**

All NRB activities and responsibilities support the mission through the following goals:

- Enhance military mission opportunities through deliberate and responsible management activities when needed and through education and guidance.
- Comply with all Federal and state laws, mandates, and regulations that apply to Fort McCoy lands.
- Make ecosystem management the basis for land management decisions.
- Generate revenue to support future land management practices.
- Foster and maintain positive community relations.

#### **1.5.1.1.2 Facilities and Grounds**

The DPW contractor is responsible for the maintenance of grounds in developed areas (to include ranges and real property assets in the training areas, natural occurring erosion, fire breaks, etc.) and along right-of-ways. This includes, but not limited to, mowing, urban forest tree care, gardening and other miscellaneous grounds work.

#### **1.5.1.1.3 Pest Control**

Pest control operations on Fort McCoy are conducted by the DPW contractor and guided by the Integrated Pest Management Plan (IPMP), (last review and approval 2009) as required in AR 200-1. All pesticides used on Fort McCoy are reported to Pest Control for inclusion in the monthly report. Pest Control occasionally works outside the Cantonment Area to control nuisance plants (e.g. weeds), insects (e.g. wasps, ants), and animals (e.g. beavers, raccoons, mice). The NRB provides input to the IPMP.

### **1.5.2 Directorate of Plans, Training, Mobilization, and Security (DPTMS)**

The DPTMS oversees four divisions: Plans, Operations and Security Division, Airfield Division, Management Support Division and Training Division.

#### **1.5.2.1 Training Division**

Functions of the Training Division include: Range Branch, Training Support, Program Management, and Quality Assurance.

##### **1.5.2.1.1 Range Branch**

The Range Branch is comprised of the Range Officer, Range Safety, Range Operations Section, the Range Maintenance Section, and Integrated Training Area Management Program.

##### **1.5.2.1.1.1 Range Officer**

The Range Officer is responsible for the overall safe and efficient utilization of the Range Complex and for the maintenance and range management program; supervises internal operations of Range Branch which includes Range Operations, Range Safety, Range maintenance, and the ITAM program.

##### **1.5.2.1.1.2 Range Operations**

Controls and supervises the overall operation of the Range Complex to include scheduling, Range Control and Range Inspection section. Operates and maintains Range Facility Management Support System (RFMSS) for scheduling training facilities. Operates the Range Branch Radio Room (Range Control) during all scheduled range complex activities. Inspects, in-processes, and clears all ranges and training facilities within the Range Complex. Manages Restricted Air Space R6901A/B, in Accordance With (IAW) this regulation, AR 95-2, and Federal Aviation Administration (FAA) guidance. Maintains the Officer in Charge and Range Safety Officer Range Safety Certification and Training Program. Provides hunting area closures for posting on the Fort McCoy game line IAW conflicts list and locks and unlocks access gates, as indicated on the game line IAW Range Gate Standard Operating Procedures (SOP). Maintains the Range Branch web site. Processes all unit special site and non-standard training requests. Ensures the Range Officer is fully briefed on Range Complex and Training Facility operational status, incidents and accidents.

##### **1.5.2.1.1.3 Range Maintenance Section**

Operates automated ranges and supervises the maintenance and upkeep of ranges and training facilities within the Range Complex. Maintains range target systems, devices and communications equipment.

#### **1.5.2.1.1.4 Integrated Training Area Management (ITAM) Program**

The ITAM is comprised of Range and Training Land Assessment (RTLTA), Land Rehabilitation and Maintenance (LRAM), Training Requirements Integration (TRI) and Sustainable Range Awareness (SRA) Components. The Geographical Information System (GIS) is a supporting component to ITAM and DPTMS as a whole. The ITAM coordinator is the major player in keeping INRMP activities compatible with military training needs. The ITAM provides a management and decision making process to integrate Army training and other mission requirements for land use with sound natural resources management. It integrates elements of operational, environmental, master planning and other programs that identify and assess land use alternatives. The intent is to manage the lands in a sound manner to ensure no net loss of training capabilities and support current and future training and mission requirements. The ITAM program supports sound natural and cultural resources management practices and stewardship of land assets to support training, testing, and other installation missions.

##### **1.5.2.1.1.4.1 RTLA**

The RTLA component gives managers a standard method of collecting and analyzing land condition and trend data to make good land management decisions that promote sustained training and multiple-use of military lands. It incorporates relational database and GIS technologies to spatially maintain training load information, land conditions, and natural resources inventories. Such technology and data is then made as available as possible to all decision-making authorities related to Fort McCoy and to military units as needed for training events and environmental compliance.

##### **1.5.2.1.1.4.2 LRAM**

The LRAM component provides a preventive and corrective land rehabilitation and maintenance procedure to reduce the long-term impacts of training on Fort McCoy. It also focuses on the redesign or reconfiguration of existing training areas as needed to meet current and anticipated future training needs. These efforts help installations maintain quality lands and reduce costs associated with land rehabilitation, additional land purchases or environmental litigation issues. The LRAM includes programming, planning, designing, and executing land rehabilitation, maintenance, and reconfiguration projects based on requirements and priorities identified in the TRI and RTLA components of the ITAM. Usual maintenance work is done with chainsaws, severe-duty shredder, bulldozers, tractor and disk. The NRB reviews the annual and emergency work-plans to make sure environmental laws are being followed and natural resources are protected or enhanced.

##### **1.5.2.1.1.4.3 TRI**

The TRI component provides a decision support procedure that integrates training requirements with land management, training management, and natural and cultural resources management processes and data derived from RTLA and NRB programs. The integration of all requirements occurs through continuous consultation between the NRB and other components of DPTMS and the environmental staff. This INRMP is an implementing document and requires TRI input. The TRI also involves coordination with external agencies and Federal departments. The "Training-Environmental" interface ensures wise land-use planning and management decisions that meet regulatory compliance and training activity requirements. Information provided by TRI will help quantify training land carrying capacity.

##### **1.5.2.1.1.4.4 SRA**

The SRA component educates land managers on the military mission requirements for an installation as well educating land users on environmental limitations and sensitivity of the land resources. Land users include military units, personnel within installation directorates, recreationalists, adjacent landowners, and any other agencies or persons that can impact installation activities associated with training or the land resources. Education focuses on identifying potential impacts to the land and ways that users can avoid or minimize the effects. The SRA can help to improve public relations by communicating the successes at sustaining mission activities while preserving Army land. This is done with help from the Public Affairs Office (PAO). Formats for SRA includes; Soldier field cards, leader handbooks, posters/photos, news articles, briefings, pamphlets/brochures, Fort McCoy website, maps, overlays and other media.

#### **1.5.2.1.1.4.5 GIS**

The GIS is a supporting element of ITAM and the Range Branch overall. It provides spatial and tabular representation of training land and range assets both digitally and in hard copy. The GIS is a key element in all land management and planning activities. It provides a readily available analytical tool and is a major resource to archive actions taken within the training areas. The component also provides support projects to using units in the form of maps, photo imagery, and layouts of available ranges / training sites.

#### **1.5.3 Directorate of Emergency Services (DES)**

The DES oversees two divisions; Fire Prevention and Protection (FPP) and Fort McCoy Police Department. Both divisions are involved with INRMP issues.

##### **1.5.3.1 Fire Prevention and Protection**

The FPP oversees all fire protection and prescribed burning on Fort McCoy. Any prescribed burns planned by NRB require the review and approval of the Fire Chief. The FPP is the proponent for the Integrated Wildland Fire Management Plan (IWFMP). The IWFMP was completed in July 2008 and ties in closely with the INRMP. Reduction of fuel loads and fire hazards within the training areas of Fort McCoy is a key concern of FPP. The FPP and NRB work together to identify these sites and implement prescribed burns specifically for this purpose.

##### **1.5.3.2 Fort McCoy Police Department**

The Fort McCoy Police Department provides support and enforcement of firewood, fishing, hunting and trapping regulations. They provide input and recommendations for the yearly update and review of the Fort McCoy Hunting, Fishing, Trapping Laws and Regulations (FM Regulation 420-29) and are also responsible for controlling access to Fort McCoy. Close coordination between NRB program managers and the Fort McCoy Police Department is essential in achieving INRMP goals.

#### **1.5.4 Directorate of Family and Morale, Welfare and Recreation (DFMWR)**

The DFMWR oversees three divisions; Business Activities, Management Support, and Community Recreation (CR). The CR includes Whitetail Ridge Ski Area, Pine View Recreation Area (PVRA), Fort McCoy Community Club, The Recreation Center, Rumble Fitness Center and other activities. They assist NRB by serving as a registration station for archery and turkey hunting seasons. The PVRA store also provides customer service to anglers and hunters purchasing Fort McCoy hunting and fishing permits through the Automated License Issuance System (ALIS).

#### **1.5.5 Other Defense Organizations**

##### **1.5.5.1 US Army Corps of Engineers (USACE)**

The USACE is responsible for any transactions involving real estate. Standing trees are considered real estate so the Omaha District-USACE administers the commercial timber sales that occur on Fort McCoy. The NRB forestry staff does all the planning and fieldwork for timber sales and submits maps and information to the USACE. The USACE creates and sends an invitation for bid to interested logging and pulpwood contractors. The bid opening, depositing sale income, and closing out the sale are some of the USACE responsibilities. A Memorandum of Understanding (MOU) between Fort McCoy and the Omaha District was approved in February 2006 (MOU # DACA45-9-05-6046) to detail the responsibilities, authorities, support services, and procedures of each organization.

The Minneapolis District-USACE issues permits involving wetlands and navigable waters projects through the local office in La Crescent, Minnesota. The Waterways Experimental Station provides research support for projects related to fish and wildlife management and military training.

##### **1.5.5.2 Installation Management Command (IMCOM)**

Fort McCoy is under the command and control of the Installation Management Command (IMCOM) – Central Region.

##### **1.5.5.2.1 Army Environmental Command (AEC)**

The AEC is a subordinate command of IMCOM and is responsible for administering the reimbursable programs covered by the INRMP. They include timber sales, permit sales, and

agricultural/grazing outlease income and disbursements. The AEC uses a web-based program called Reimbursable Program Tracking Software (RPTS) to keep track of the income and requirements for each installation. Installations annually submit their funding requirements for commercial forestry, agricultural/grazing and permit sales to RPTS. Each quarter the installations update income and obligations from the reimbursable programs. RPTS is intended to closely monitor the income and spending to avoid obligating more funds than received.

**1.5.5.3 Assistant Chief of Staff for Installation Management, Army Reserve Division (ACSIM-ARD)**

Fort McCoy submits its annual budget requirements to ACSIM-ARD who in turn determines the amount of funding that Fort McCoy will receive for the year. The Army Reserve Installation Management Office distributes the environmental funds to Fort McCoy.

**1.5.5.4 United States Army Public Health Command (Provisional)**

US Army Public Health Command completes Fort McCoy's Environmental Noise Management Plan and assists Fort McCoy with zoonotic disease issues (Lyme's Disease, West Nile Virus, etc.).

**1.5.6 Other Federal Agencies**

**1.5.6.1 United States Department of Interior (USDOJ)**

The USDOJ manages America's Federally-owned natural and cultural resources. Two of its eight bureaus are involved with the Fort McCoy INRMP implementation; The United States Fish and Wildlife Service and the United States Geological Survey.

**1.5.6.1.1 United States Fish and Wildlife Service (USFWS)**

The USFWS is a signatory partner of this INRMP. They have reviewed and provided input to the management of T&E species and have had the opportunity to provide input on the management of game and nongame species, fish management, fish health certifications, fish propagation, fish stocking, and water quality monitoring. Fort McCoy routinely consults with the USFWS, in accordance with section 7 of the Endangered Species Act (as amended in 1973) on military and non-military activities that may adversely affect federally listed threatened and endangered species. More specific information is provided in the section on T&E species and the Cooperative Plan at Appendix C.

**1.5.6.1.2 United States Geological Survey (USGS)**

The USGS provides scientific information for the management of water resources. The USGS conducts water quantity and water quality studies of surface waters, ground waters, and lakes throughout Wisconsin. They are available to conduct specific studies on Fort McCoy if there is a need.

**1.5.6.2 United States Department of Agriculture (USDA)**

The USDA focuses on the nation's food, agriculture, natural resources and rural development. Three of its agencies assist with the Fort McCoy INRMP implementation; the United States Forest Service, Natural Resources Conservation Service, and Animal and Plant Health Inspection Service.

**1.5.6.2.1 United States Forest Service (USFS)**

The USFS provides assistance with forest health issues. Funding for forest pest control is authorized through a Memorandum of Understanding (MOU) between the Department of Agriculture and the DoD. Since 1993, \$110,000 has been provided to Fort McCoy to control oak wilt disease.

**1.5.6.2.2 Natural Resources Conservation Service (NRCS)**

The NRCS is an active partner in plant and water management in the La Crosse and Black River Basins.

**1.5.6.2.3 Animal and Plant Health Inspection Service (APHIS)**

The APHIS assists Fort McCoy with questions and concerns involving Federal quarantines on plant or animal species. A permit from APHIS is required before biological controls can be introduced on

Fort McCoy for use in the invasive species control program. This has been done to release insects for spotted knapweed and leafy spurge control.

### **1.5.6.3 US Environmental Protection Agency (EPA)**

The EPA has been a partner for initiatives to correct waters listed on the US Impaired Water List (303d List). These efforts are specific to Squaw and Stillwell Creek. The EPA also teams with Fort McCoy to manage stormwater runoff for the implementation of Federal requirements under Section 438 of the Energy Independence and Security Act (EISA).

## **1.5.7 State Agencies**

### **1.5.7.1 Wisconsin Department of Natural Resources (WDNR)**

The WDNR oversees all natural resources management and compliance issues in Wisconsin. The State of Wisconsin maintains ownership of the fish and wildlife and relies on Fort McCoy to manage natural resources in accordance with the INRMP. Fort McCoy is included within the Wisconsin Basin Plans for water resource management and implementation. The WDNR are a signatory partner of this INRMP and have reviewed and provided input to the management of T&E species, isolated wetlands, game and nongame wildlife species, fish management and water quality testing. Any issues involving state environmental laws are administered by the WDNR. More specific information is provided in the section on T&E species (Para. 4.1) and the Cooperative Plan at Appendix C.

### **1.5.7.2 Wisconsin Department of Agriculture, Trade and Consumer Protection (WDATCP)**

The WDATCP is the state agency responsible for food safety, animal and plant health, protecting water and soil, and monitoring fair and safe business practices. The WDATCP oversees the Wisconsin portion of the nationwide “Slow the Spread” gypsy moth control program. They focus on slowing the westward advance of the moth and use trapping to identify areas of high populations and aerial spraying to reduce populations in those areas. The WDATCP historically places 100 traps on Fort McCoy and in 2007 one of the spray areas included the installation (the spray program used pheromone flakes and a biological control, Nucleopolyhedrosis Virus (NPV), that does not affect other butterflies or moths). The agency established and enforces quarantine areas for gypsy moths and emerald ash borers. They also license and certify the NRB contractors to apply pesticides on the installation.

### **1.5.7.3 State Historic Preservation Officer (SHPO)**

The SHPO provides views and consultation on issues pertaining to Section 106 of the National Historic Preservation Act (NHPA) and 36 CFR 800.

## **1.5.8 Universities**

### **1.5.8.1 University of Wisconsin-La Crosse (UWL)**

The UWL’s curation facility houses all of the curated archaeological materials from Fort McCoy. A Memorandum of Understanding is in place between UWL and Fort McCoy regarding the treatment of these artifacts.

### **1.5.8.2 University of Wisconsin-Madison (UWM)**

Cooperative efforts with UWM include: graduate student projects, field trips, studies on invasive plants, and other research projects conducted on the fort.

### **1.5.8.3 Michigan State University (MSU)**

The MSU has conducted several graduate research projects related to Lyme disease. A 3-year multi-university study started in 2010 to examine Lyme disease variations in the eastern US.

## **1.5.9 Contractors**

Contractors accomplish most of the technician level work in NRB. The NRB relies on DPW to direct their contractor to accomplish tasks such as pest control, grass and vegetation mowing, urban tree care and facilities maintenance.

#### **1.5.10 Monroe County Land Conservation Department (LCD)**

Fort McCoy is the largest landowner within Monroe County; therefore the Installation is included as an entity for resource management within the Monroe Co. Land and Water Plan. The LCD partners with Fort McCoy to resolve land and water issues to improve portions of the La Crosse and Black River Basins.

#### **1.5.11 Other Interested Parties**

##### **1.5.11.1 Ho-Chunk Nation**

The Ho-Chunk Nation is a Federally-recognized Native American Indian tribe whose aboriginal homeland is part of the land occupied by Fort McCoy. EO 13007 requires agencies to do two things: accommodate Indian tribe's requirements for access to and ceremonial use of sacred sites on public lands and avoid damaging the physical integrity of such sites.

##### **1.5.11.2 The Nature Conservancy (TNC)**

A two-year Cooperative Agreement was approved between the Wisconsin TNC and Fort McCoy in 2002 to allow cooperation in a Central Wisconsin Fire Partnership. The partnership also included the Black River State Forest. Its goal was to address fire management issues in the project area that covers about 1,000,000 acres, including Fort McCoy. The TNC has been cooperating with Fort McCoy on various ecosystem related projects, primarily fire management and savanna restoration for over 10 years.

##### **1.5.11.3 Trout Unlimited (TU)**

The TU provides annual support improving stream habitat and also serves as a financial partner for projects within the La Crosse and Black River Basins.

##### **1.5.11.4 Wild Turkey Federation**

The local chapter, Monroe County Longspurs, have provided funding to enhance turkey habitat.

##### **1.5.11.5 Ruffed Grouse Society (RGS)**

The RGS has provided funding for aspen management to improve ruffed grouse habitat.

##### **1.5.11.6 Whitetails Unlimited (WU)**

The WU has provided funding for deer habitat management.

#### **1.6 Review and Revision Process**

The INRMP undergoes an annual review and may be revised every five years if needed.

##### **1.6.1 Annual Review**

The NRB is required to complete an annual review of the INRMP and include the USFWS and WDNR in the review process. The review is intended to demonstrate to the Army and outside agencies that the INRMP is effectively implemented. The review will identify that projects are funded, future projects are identified, and significant changes to the mission are identified. It gives the agencies a chance to provide feedback on an annual basis. Appendix B summarizes the annual projects and is used to determine the degree to which the INRMP is implemented.

##### **1.6.2 Major Revision**

The INRMP may require a major revision if the current INRMP has been in effect for five or more years or if there has been any major changes in the Fort McCoy mission or natural resources management activities. If the INRMP has been in effect for five years and all signatory parties agree there are no major changes, the current INRMP will stay in effect until an annual review determines the need for a major review.

#### **1.7 Management Strategies**

The NRB bases its management of Fort McCoy's natural resources on the concepts of ecosystem management, biodiversity, landscape scale management, and multiple-use management. It is also recognized that science and data collection are important to realize these management concepts.



### **1.7.1 Ecosystem Management**

“Ecosystem management is a goal-driven approach to environmental management that is at a scale compatible with natural processes; is cognizant of nature’s time frames; recognizes social and economic viability within functioning ecosystems; and is realized through effective partnerships among private, local, state, tribal, and federal interests. Ecosystem management is a process that considers the environment as a complex system functioning as a whole, not as a collection of parts, and recognizes that people and their social and economic needs are a part of the whole” (DoD Ecosystem Management Principles).

“There are two inherent features of natural ecosystems which must be understood before ecosystem management can be successfully attempted: 1) ecosystems are incredibly complex and 2) our understanding of them involves a great deal of uncertainty” (Leslie et al, 1996).

### **1.7.2 Biodiversity**

“Ecosystem management dictates managing the land for a high level of natural biodiversity. Biodiversity includes the variety of genetic combinations, species functions, and associations occurring in an area, and the degree representative of the indigenous flora and fauna. It is a dynamic principle that contains highly interdependent components at many organizational levels” (DA 1994).

### **1.7.3 Landscape**

“To fully understand the importance of an ecosystem’s response to any influence, the spatial and temporal context of the event must be considered at the landscape level. Many processes occur across a landscape, which can be regional in scope. A landscape contains many ecosystems, and many spatially distinct occurrences of those ecosystems. The landscape perspective is essential since events that impact particular ecosystems may originate in part or in whole outside their boundaries” (Trame et al, 1995).

### **1.7.4 Multiple-use**

Multiple-use was and still is the focus of natural resources management on Fort McCoy. Multiple-use is an obvious management philosophy for military installations, offering military training plus wildlife, fisheries, forestry and recreation values. Multiple-use land values are consistent with ecosystem management principles as they incorporate people and their needs. The general philosophy of ecosystem management is if the health of the ecosystem or landscape is maintained, the land will be in the best condition to support a diversity of species, products, and uses.

### **1.7.5 Science and Data Collection**

“Science and the information it generates are integral to ecosystem management and must be fully incorporated into decision making. Wise decisions are supported by credible, objective, unbiased, relevant, and timely information that is widely available, easily accessible, and usable. Ecosystem management uses data from many sources, including inventories, surveys, assessments, classifications, and research. This information is required for baseline determinations, monitoring, evaluations, and adaptive management approaches. Ecosystem management integrates scientific and experiential knowledge across a spectrum of ecological, economic, and social values and opportunities. Successful ecosystem management depends upon a clear role for science and scientists in the decision-making process as well as a clear path for scientific information to flow to and from all participants. Comprehensive monitoring is essential to a successful “feedback loop,” and thus to adaptive management” (Keystone Center, 1996).

### **1.8 Other Plan Integration**

The INRMP is fully integrated with other plans developed for Fort McCoy. These plans include the; Integrated Pest Management Plan, Installation Master Plan, Integrated Cultural Resources Management Plan, Range Complex Master Plan, Integrated Training Area Management Five-Year Work Plan, Installation Design Guide, Integrated Wildland Fire Management Plan, and other planning processes that may occur.

## 2.0 CURRENT CONDITIONS AND USE

### 2.1 Installation Information

#### 2.1.1 Description

Fort McCoy is located in west central Wisconsin, approximately 30 miles east of the Mississippi River (Figure 1). Of Fort McCoy's approximately 60,000 acres, 45,864 acres are available for maneuver and training. A full spectrum of facilities are available for training, including; ranges, training areas and classrooms, an air-to-ground impact area, three airborne drop zones, an airport and a tactical landing site.

#### 2.1.2 Area Information

Fort McCoy is in Monroe County and borders Jackson County. The population density of this region is low, and predominantly rural. The closest major population center is La Crosse, with a population of about 50,000, and is located 30 miles west of Fort McCoy. The towns of Sparta and Tomah, with a population of about 8,000 each are approximately 3 miles to the west and east of Fort McCoy, respectively. The Black River State Forest, Necedah National Wildlife Refuge, Meadow Valley and Sandhill State Wildlife Areas, and various county forests, along with Fort McCoy, comprise about 460,000 acres of public lands within a 30-mile radius of Fort McCoy (Figure 2).

#### 2.1.3 Land Use History

##### 2.1.3.1 Pre-Settlement

Native American activity in the Fort McCoy area dates back 10,000 years. Influences on vegetation were likely limited to setting fires and small areas of plant cultivation. Native Americans burned the land to aid hunting and gathering (Higgins 1986) in the northern Great Plains. It is likely that the fire dependent ecotype of this area was greatly influenced by this practice. More information on presettlement history is available in the Fort McCoy Integrated Cultural Resources Management Plan, 2003.

##### 2.1.3.2 Logging

Fort McCoy lies just south of the historic northern Wisconsin pineries. The lumber period was relatively short lived but intense in Wisconsin. Fort McCoy most likely saw some of this lumbering activity. There were sawmills located on the La Crosse River on land that is now Fort McCoy. Since the pine harvesting operations generally floated their logs down river to large sawmills, the small mills located on the La Crosse River were probably set up to accommodate the pioneer need for timber to build houses, farm buildings, and businesses. A variety of tree species were probably harvested for the small mills, including quality oak. Trees were also harvested during pioneer times for firewood. Trees cleared from new farm fields were probably used for heating and cooking fuel. During the period 1942 to 1946, a sawmill was in operation that cut local oak and pine into railroad ties, blocking for vehicle shipping and utility lumber. All logs were cut on the installation with some of the labor being provided by prisoners of war. While there is no record of which areas were harvested or the volume removed, it is estimated that over 100,000 board feet a year were processed and used during each of the five years.

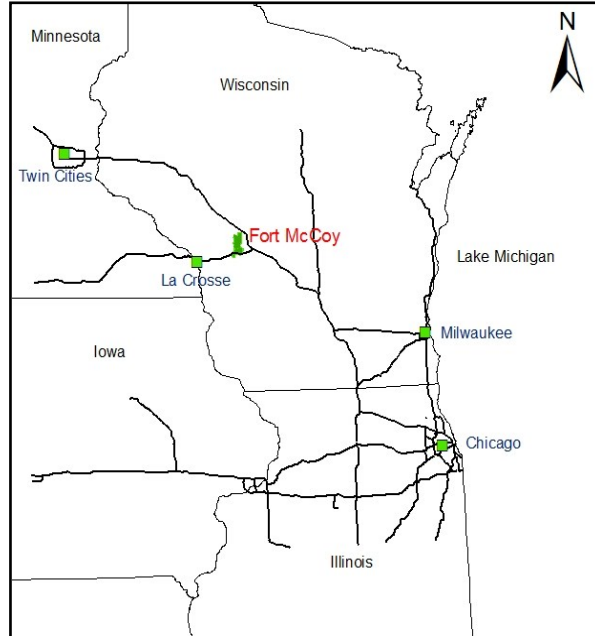


Figure 1. Fort McCoy regional location.

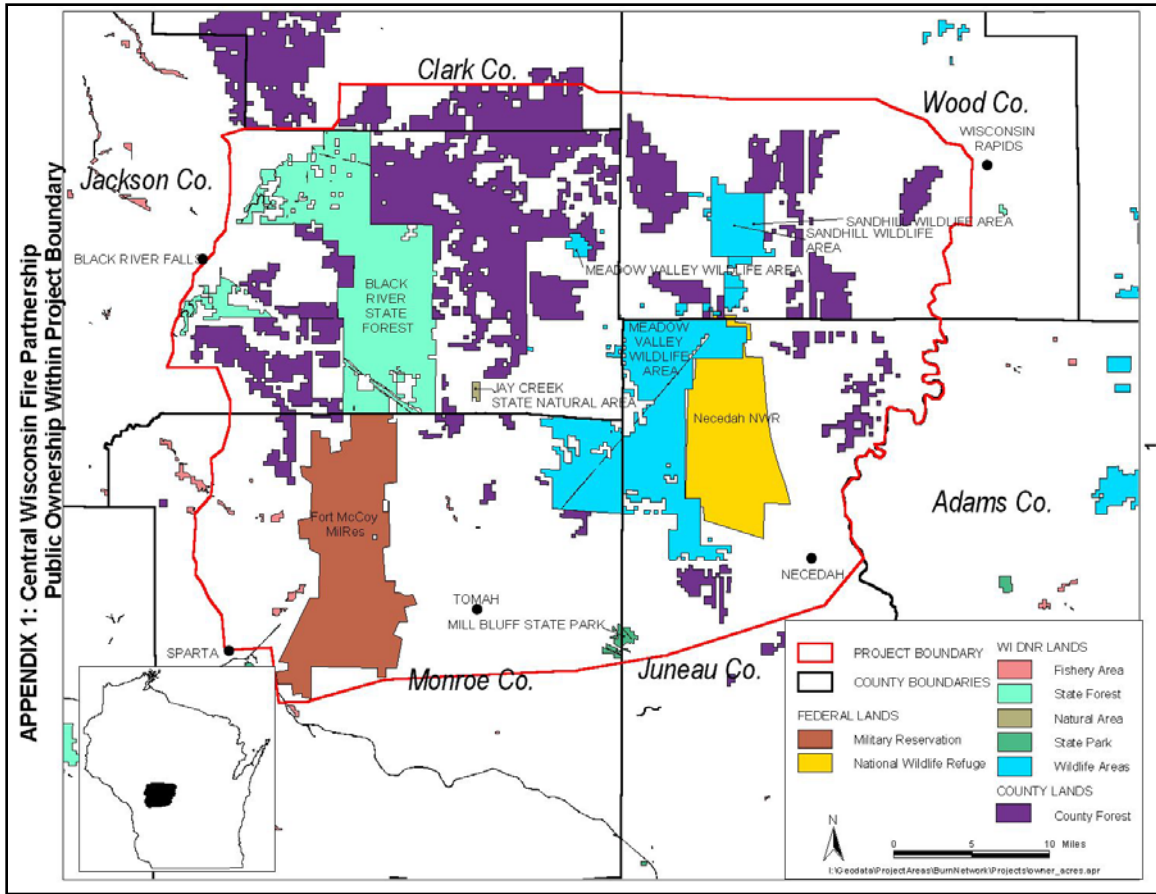


Figure 2. Public lands near Fort McCoy.  
Courtesy of The Nature Conservancy.

The first record of the Army taking action to manage the forest was a record of a forest fire control agreement with the Wisconsin Conservation Department (WCD) in 1948. In the early 1950's, the United States Forest Service conducted a timber survey and prepared a timber management plan. Commercial harvests started on Fort McCoy in 1954 with the WCD setting up the sales. In 1966, Fort McCoy hired its first professional forester to manage the resource. Forest management and commercial harvests of jack pine, red pine, white pine, oak and aspen continue to the present.

### 2.1.3.3 Farming

The first settlers of the area cleared fields to grow wheat. As the wheat farms of the west became connected to the railroad lines, farming in Wisconsin turned to dairying, especially in the Driftless Area. The lush herbaceous cover type of the barrens and the steep terrain were ideal for cattle. Historic south-post was originally a ranch owned by Robert Bruce McCoy. McCoy had amassed 4,000 acres by 1909 when his property was purchased by the government for military training.

The intense property-line to property-line farming that is standard in most of the Midwest is not possible in the Driftless region because of the steep terrain. Some farmlands surrounding Fort McCoy are less than fifty percent plowed fields. The remaining land is woodlot and pasture. Several hardscrabble farms existed on north post prior to being purchased for military use in 1941. Fort McCoy is unique within the Driftless Area because the nearly level to gently sloping areas of the landscape have been left with the original vegetative communities relatively intact.

### 2.1.4 Fort McCoy History

Colonel Robert Bruce McCoy, the installation's namesake, started buying land in the Sparta area for the purpose of eventually becoming an Army installation. By 1905, he had acquired approximately

4,000 acres of land that was sold as part of a 14,000 acre purchase by the Army in 1909 and made into two camps, Camp Emory Upton and Camp Robinson. Field artillery and some infantry units were trained there during World War I through 1918. In 1926, the name was changed to Camp McCoy. In the 1930's, the camp served as a Quartermaster Supply Base for the Civilian Conservation Corps.

Between 1938 and 1942, Camp McCoy added 46,900 acres in preparation for World War II (WWII). Construction for the new Cantonment Area began in 1942 and was completed in the same year. The first unit to train at "new" Camp McCoy was the 100<sup>th</sup> Infantry Battalion, composed of Hawaiian National Guardsmen. The 100<sup>th</sup> Infantry Battalion fought with distinction up the "boot" of Italy while suffering extremely high casualties. Both Japanese and European prisoners of war were interred at Camp McCoy during WWII. At the end of the war, 247,779 Soldiers were processed through the Reception and Separation Center at Camp McCoy.

From 1951 to 1953, Camp McCoy was activated to train Soldiers for the Korean conflict. In 1974, the installation was redesignated as Fort McCoy. During the 1980's the Reserve and National Guard mission of Fort McCoy continued to grow, reaching a milestone of training 100,000 Soldiers. In 1985, increases in the number of units and Soldiers scheduled to mobilize at Fort McCoy gave the post the distinction of being the largest single reserve component center in the US Army.

In 1990, Operation Desert Storm, supporting Saudi Arabia's response to Iraq aggression became Fort McCoy's primary mission. Mobilization started in August 1990 and continued until March 1991. In total, 74 units from nine states, accounting for nearly 9,000 Soldiers processed through Fort McCoy.

Fort McCoy serves as one of the Army's 15 Power Projection Platforms. The installation supported mobilization missions for eight operations around the globe. From 11 September 2001 through June 2010, Fort McCoy's role as a Power Projection Platform has involved supporting the mobilization/demobilization needs of approximately 116,168 military personnel from 2,100 units.

## **2.2 Facilities**

### **2.2.1 Overview**

The developed areas on post include the Cantonment Area, transportation corridors, airport, recreation areas, housing, and water systems (Figure 3). These areas, with the exception of some transportation corridors are considered "Non-Operational Areas" by the military trainers. The Real Property Planning Board decides upon land uses within these areas. The Fort McCoy Master Plan has divided the Cantonment Area into zones where like activities will be grouped. Activities identified include; classroom training, operations and maintenance, supply and storage, hospital, administration, family housing, troop housing, community facilities, and recreation.

### **2.2.2 Cantonment**

The Cantonment Area is the main developed area of post and includes the administrative center of Fort McCoy along with clusters of barracks and support buildings. The original WWII design for post featured a low-density arrangement that allowed large open spaces between clusters of buildings. For this reason there is a significant amount of undeveloped land within the Cantonment Area. There are tracts of land, which have forestry and wildlife potential, and waterways with significant fishery potential within the Cantonment Area. The past fifteen years have seen an increase in construction on Fort McCoy along with an initiative to demolish or renovate WWII-era wooden buildings. The majority of new construction is occurring on previously undeveloped areas with subsequent acreage losses in forest, wildlife habitat and training land. To reduce mowing costs, there are designated no-mow areas. These no-mow areas are in low use areas and allowing the vegetation to grow has not adversely affected Fort McCoy's mission.

### **2.2.3 Housing**

Housing is located in old Camp McCoy which served as the administrative center and barracks area from 1916 to 1942. The existing buildings were converted into housing units and mobile homes were placed on cement tent pads for additional units. In 1998, 12 single-family units were completed and open for occupancy.

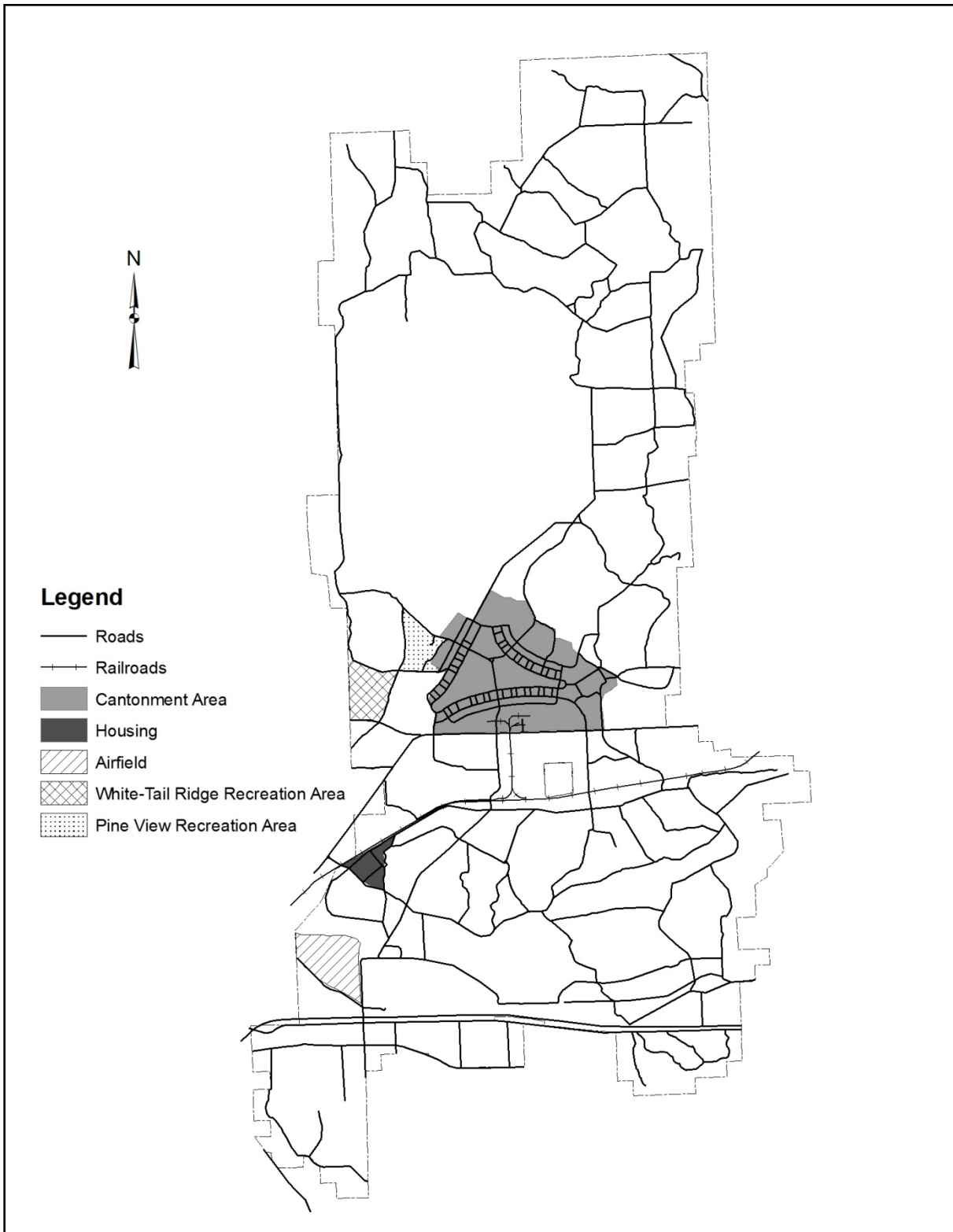


Figure 3. Facilities.

In 2008, an additional 12 single family units were completed and occupied. The majority of housing was available via a long-term contract for 80 units within the Wood Ridge subdivision in Tomah. This contract is ending in 2012 and Fort McCoy has implemented the policy to replace these units by building new units within the Fort McCoy Housing area. Twelve old apartments, housing units, and mobile home pads were demolished as part of the 2008 project. In 2011, a 23 unit construction project was completed. There are a total of 48 housing units available, all single-family homes. The housing area has recreational facilities including a playground, walking path, basketball court, tennis courts, and a skate park.

#### **2.2.4 Recreation Areas**

Recreation areas include the Pine View and White-Tail Ridge Recreation areas. More information about these areas is located in section 3.1.7.

#### **2.2.5 Transportation Systems**

##### **2.2.5.1 Airfields**

The Sparta/Fort McCoy Airfield includes two military hangars and 12 civilian hangers, control tower, crash station, military and civilian fuel depot and administrative facility. The Sparta municipal airport merged with Fort McCoy in 1987 to reduce the danger of having two airfields within one mile of each other. The airfield has two runways, one orientated north-south and one east-west. Expansion of the runways to accommodate larger aircraft is hampered by a high ridge to the north, Silver creek on the north, west and east, and a county highway and wetland to the south.

The La Crosse Municipal Airport is the only commercial airport in the region. It is located off Interstate Highway 90 (I-90), about 30 miles west of Fort McCoy. The Volk Field Air National Guard Base is located about 26 miles southeast of Fort McCoy off I-90 and provides Fort McCoy with air support for mobilization as required.

##### **2.2.5.2 Road System**

Fort McCoy is served by many state and local roads. State Highway 21 bisects Fort McCoy into roughly equal portions, termed south post and north post. The main gate is located off Highway 21. I-90 bisects Fort McCoy at the southern edge of south post with the closest off ramp at the west side of the installation onto State Highway 16 that runs parallel to I-90. A historic gated entrance to Fort McCoy is located off Highway 16. Both Highway 16 and 21 connect Fort McCoy with the nearest towns of Sparta and Tomah.

Fort McCoy has an extensive network of roads. The Cantonment Area has a dense network of paved roads while the range and training areas are served by main supply routes. Many of the main supply routes have been “chip sealed” to reduce maintenance costs associated with gravel roads and to decrease the amount of dust caused by vehicles. Since 1994, two north-south access roads were constructed to increase convoy movement between north and south post, avoiding the Cantonment and housing areas. The training areas are also served by a network of tank trails and unimproved maneuver trails. There are approximately 254 miles of improved roads and tank trails maintained by DPW and 224 miles of unimproved trails maintained by DPTMS.

##### **2.2.5.3 Railway System**

Fort McCoy is served by the Canadian Pacific Railroad with tracks running east-west through south post. Fort McCoy has its own switching engine to move rail cars within the installation. The Fort McCoy rail line accesses the Canadian Pacific Railroad and provides service to the industrial and warehouse areas near State Highway 21. Fort McCoy has an engine house for storing and servicing the switch engine.

#### **2.2.6 Water**

##### **2.2.6.1 Water System**

Fort McCoy’s drinking water is derived from the Cambrian Sandstone aquifer. The installation operates three water systems: North Post (Cantonment Area), South Post (family housing area), and the airfield (figure 4). Eleven additional wells provide water to the ranges and training areas. The installation lies within three principal surface water drainage basins including the Lower Wisconsin River, Central

Wisconsin River Basin, and the Trempealeau-Black River Basin. The unconsolidated deposits beneath the installation consist mainly of sand, with some silt and gravel, with clay present in isolated locations. Thickness of the unconsolidated deposits ranges from 0 to 120 feet. The unconsolidated materials are underlain by Ordovician dolomite on ridge tops, and Cambrian sandstone, siltstone, and shale in the valley areas.

The two main aquifers are present beneath the installation: the unconsolidated alluvial aquifer, and the Cambrian sandstone aquifer. The upper portion of the Cambrian sandstone aquifer is interconnected with the unconsolidated aquifer. Depth to groundwater beneath the post ranges from zero in the marshy areas to as much as 20 feet in the valleys, and may be greater at some locations on ridge tops. Regional groundwater flow in the upper sandstone and unconsolidated material is generally to the southwest, toward the La Crosse River, with shallow flow toward local streams and rivers.

Fort McCoy receives its drinking water from nine wells in three general locations. Water use ranges from 0.5 to 1.5 MGD. This amount of water is adequate to meet present and future needs. The La Crosse River basin has good groundwater quality with no evidence of contamination or potential health problems. The water is pumped from the wells, treated to adjust the pH, disinfected, and sent to a reservoir. The airfield system adds a blended polyphosphate.

MAP DELETED

Figure 4. Wellhead protection areas, 5 year recharge area.

#### **2.2.6.2 Wastewater System**

The Installation operates a Wastewater Treatment Plant (WWTP) located north of Wisconsin Highway 21 and southwest of the Cantonment Area. The WWTP consists of a laboratory, influent channel, primary and secondary treatment, trickling filters, sludge digesters, and drying beds. The WWTP treats 0.25 to 1.5 MGD and maintains a Wisconsin Pollutant Discharge Elimination System (WPDES) permit. The WPDES permit authorizes the WWTP to discharge its effluent to the La Crosse River. The effluent is analyzed to ensure biochemical oxygen demand, suspended solids, pH, dissolved oxygen, fecal coliform,

and total phosphorous adhere to permit limitations. The majority of ranges and field training sites have vaulted latrines or in some cases septic systems to provide facilities for using units. Multi-Purpose Field Training Sites (MPFTS) have septic systems to handle field shower and bath units. Other transient training areas and sites utilize porta-potties in most cases as needed.

**2.2.7 Projected Changes in Facilities**

In the next five years there are 13 new installation projects planned for a total cost of \$159,150,000. Nine of the projects are located within the Cantonment Area, two projects will increase the amount of on-post housing, and two projects are training range upgrades and construction. Table 1 shows the projects listed by year.

Locations have not been determined for many of the Cantonment Area projects. These projects will go through the NEPA review process to locate them where there is the least impact to wetlands, T&E species, and native vegetation. The family housing projects will add more houses to the existing housing area. The environmental assessment that has been completed for those projects determined that there would be no serious impacts to the environment. The two range projects are located on the perimeter of the north impact area and overlap existing ranges. Impacts to the natural resources from these ranges are expected to be minimal.

	Project Description	Cost (\$000)
2012	NCO Academy Billeting	12,400
2012	Container Loading Facility	5,500
2012	Modified Record Fire Known Distance Range	5,700
2012	Automated Record Fire Range	4,750
2013	Family Housing New Construction	8,000
2013	Central Issue Facility	11,000
2013	Equipment Concentration Site Tactical Equipment Maintenance Facility	27,000
2013	Unaccompanied Personnel Housing Barracks	8,600
2014	NCO Academy Dining Facility	6,600
2014	Dining Facility	8,600
2014	Access Control Point/Mail/Freight Center	19,000
2014	Garrison Administration Facility	19,000
2016	Family Housing New Construction	23,000

Table 1. Fort McCoy construction projects.

**2.3 Military Mission**

**2.3.1 Overview**

The mission of Fort McCoy is: “Underpin readiness of the force by serving as a training center and a support site for power projection missions.” The Fort McCoy motto is “Total Force Training Center.” Fort McCoy is known as the Total Force Training Center because this installation supports the training and mobilization of reserve and active component military personnel from all branches of America’s armed forces. Fort McCoy has become the training site of choice for satisfying both individual and collective training requirements. The installation’s varied terrain, state-of-the-art ranges, new and renovated facilities, and extensive support infrastructure combine to afford our military personnel with an excellent environment in which to develop and sustain the skills necessary for their mission success. Fort McCoy annually supports the year round training of approximately 120,000 reserve, national guard, and active component US military personnel from all branches of the armed services. It is the only US Army installation in Wisconsin, as well as the only Army facility in the upper Midwest that is capable of providing the full spectrum of individual and collective training for combat, combat service, and combat service support personnel. It serves as a support installation which involves supporting the needs of all units training here, the other activities on the installation, and various government agencies located off-post.



### **2.3.1.1 Tenant Organizations**

Tenant organizations are located on Fort McCoy but are not within the Fort McCoy organizational structure. They might support the Fort McCoy mission such as the Army/Air Force Exchange Services and the Defense Military Pay Office, or be completely independent of Fort McCoy such as the Wisconsin State Patrol Academy. These organizations include:

- 2<sup>nd</sup> Battalion/84<sup>th</sup> Division (Institutional Training)
- 2<sup>nd</sup> Brigade, 85<sup>th</sup> Division (Training Support)
- 10/84<sup>th</sup> Battalion (OD)
- 14<sup>th</sup> Battalion Regiment (NUSACES)
- 84<sup>th</sup> United States Army Reserve Training Command (Leader Readiness)
- 86<sup>th</sup> Training Brigade
- 88<sup>th</sup> Regional Support Command
- 4/100<sup>th</sup> Battalion
- 181<sup>st</sup> Infantry Brigade, 1<sup>st</sup> Army East
- 181<sup>st</sup> Infantry Brigade, 2/411<sup>th</sup> LSB
- 416<sup>th</sup> Facility Engineer Center-NW
- A Company, 3/339 Logistics Battalion – 7<sup>th</sup> Brigade 84<sup>th</sup> Division
- B Company, 6<sup>th</sup>/52<sup>nd</sup> Aviation Regiment
- Detachment 1, 1152<sup>nd</sup> Trans Co.
- Detachment 1, 6015<sup>th</sup> Garrison Support Unit
- American Federation of Government Employees Union
- Army/Air Force Exchange Services
- Army Corps of Engineers Resident Office
- Army Material Command
- Army Reserve Civilian Personnel Advisory Center
- Army Reserve Equal Employment Opportunity Office
- Defense Commissary Agency
- Defense Military Pay Office
- Defense Logistics Agency Disposition Services Sparta
- Defense Logistics Agency, Document Services
- Equipment Concentration Site 67
- Installation Contracting Office Fort McCoy, Mission and Installation Contracting Command
- Medical Support Activities
- Medical Maintenance
- Maneuver Area Training Equipment Site
- Naval Mobile Construction Battalion - 25
- Non-Commissioned Officers Academy
- Regional Training Site-Maintenance
- Regional Training Site-Medical
- TMDE Support Center
- United States Army Reserve Command Pay Center
- United States Army Reserve/RA RCTG Command
- Veterans Assistance Center
- Wisconsin Military Academy
- Wisconsin National Guard Challenge Academy
- Wisconsin State Patrol Academy

### **2.3.2 Natural Resources Needed to Support the Military Mission**

The natural resources on Fort McCoy which support the military mission are:

- Trees and vegetation for concealment, cover, and rough construction timbers.
- Native plant species and communities adapted to soil conditions to maintain soil stability and reduce maneuver damage.
- Lakes for water purification, water points, air-to-lake rescues, and bridge crossings.

- Streams for fording sites.
- Project sites for troop surveyor and engineer design projects involving wetland mitigation and creation, and dam renovation designs.
- Open areas for parachute drop zones, landing zones, engineer training sites, and maneuver areas.
- Stable soil for maneuvers.
- Steep terrain for wheeled and tracked vehicle difficult driving courses.
- Natural topography and various vegetative cover types for land navigation training and strategic tactical mounted and dismounted maneuver training.
- Recreational opportunities for temporarily stationed or permanent party members.
- Low occurrence of natural safety hazards such as poisonous plants or venomous animals.
- Wildlife populations within carrying capacity of native habitats to minimize impacts to native vegetation and the occurrence of wildlife and zoonotic diseases.

### **2.3.3 Effects of the Military Mission on Natural Resources**

With proactive natural resource management, the current military mission at Fort McCoy has had a minor negative impact on the natural resources. Some areas that experience continual high use are losing tree cover through oak wilt and oak decline. Unimproved trails and scarified firebreaks in the steep terrain are the largest erosion threat that may impact surface water resources. Many of these sites are located far from surface water and have excessively drained sandy soils which allow water to quickly seep into the soil, preventing large amounts of sediment from washing into streams, lakes, and wetlands. The LRAM and the previous Training Area Rehabilitation Program have been fixing eroded areas since 1989, minimizing the erosion threat. Invasive, exotic plant species are spread by foot traffic, vehicle movement and soil disturbance and are having an increasing impact on the native plant communities.

Bivouac sites are located throughout Fort McCoy. The amount of ground vegetation in these areas may be significantly reduced due to trampling by foot traffic and vehicle use. For low frequency use areas the coarse sandy soils are not as susceptible to compaction as heavier loamy or clay soils, therefore much of the impacts are temporary. Bivouac and support activities may also produce litter. Waste materials must be recycled or properly disposed of in accordance with FM Reg-395. The use of portable latrines is strongly encouraged to prevent contamination of the environment. If they are unavailable, a special site request has to be made to establish field latrines in accordance with the environmental overlay map. Portable latrines are required during all winter field operations.

Oak wilt infestation is unnaturally high at Fort McCoy because the highest levels of military training coincide with the oak wilt infection period. Any break in the bark of oak trees from 1 April to 30 July can result in the tree contracting oak wilt through an insect vector that is attracted to the sap flow. Once infected, the tree can spread oak wilt to its neighbors via underground root grafts. This results in a pocket of dead trees. In some areas the oak wilt pockets have grown together, causing a significant loss of overhead concealment.

Military training has had some beneficial effects on natural resources at Fort McCoy. Wild lupine, the only host plant for the Federally-endangered Karner blue butterfly (KBB), thrives from many of the disturbances created by military training. Fort McCoy is believed to have one of the largest remaining populations of KBBs. Wildfires are often caused by training activities when dry conditions exist. The highest incidence of fire is during the spring before plant growth. These fires may damage commercial timber or may benefit natural resources by setting back succession. The need to maintain open areas for firing points, drop zones, etc. has helped to maintain large complexes of barrens plant communities as well as native grassland bird species which depend on these characteristics for suitable habitat. Relatively limited access and maintenance of contiguous natural vegetation have enabled rare or endangered species to survive or repopulate the area.

Since 2005 the mission on Fort McCoy focused on training for counter-insurgency operations. This relied heavily on exercises involving Forward Operating Bases (FOB), convoy training, and urban fighting. To provide this type of training, more FOBs/Tactical Training Bases, mock villages, Mounted Operation Urban Training (MOUT) sites, and Logistical Support Areas (LSA) have been constructed or are in the planning stages for construction. This will result in less natural habitat and outdoor recreation opportunities in the immediate areas around those facilities.

To ensure installations can support military training requirements and balance environmental stewardship responsibilities, staffing and program funding often provide greater support to sustain the

natural resources components than on other federal, state, and county or municipal lands without military training activities. This provides for a greater intensive monitoring, inventory and management of public entrusted lands.

#### **2.3.4 Effects of Natural Resources Management on the Mission**

Natural and cultural resources programs provide specific requirements for military units to consider when training at Fort McCoy. These requirements may appear as a training distracter or viewed as training encroachment, or quantified as physically limiting to the amount of land available to support the training mission (see Appendix D for list and explanation of training distracters). However, by avoiding sensitive resources, no training days have been lost due to special constraints to include natural and cultural resources requirements into their training mission. To date, the Endangered Species Act has not had a large impact on the mission. Fort McCoy consulted with the USFWS concerning the KBB and was granted an annual allowable take that has allowed most training activities to continue as usual or required only minor adjustments in planning. There are nine sites covering approximately 57 acres collectively that are restricted to “foot training only” to protect designated KBB “Core Areas”. A Biological Assessment concerning activities affecting bald eagles and gray wolves was submitted to the USFWS in 2003. Any land use changes, such as new ranges, or permanent construction require coordination with the NRB to eliminate or minimize impacts to endangered species.

The effect of cultural resources protection on the mission is seen in two primary ways: 1) Prior to any project that could adversely affect a historic property, areas that have not been inventoried for historic properties will need to be inventoried, which can result in delays to that proposed project; and 2) Projects located near protected cultural resources, such as National Registered Historic Property (NRHP)-eligible archaeological sites and Native American sacred sites, will be restricted to activities that will not adversely affect those resources.

Timber harvests and other forestry activities can have a temporary negative impact on the mission by restricting vehicle maneuvers with logging debris (slash) and stumps. Timber sale contract requirements that require low stump heights along with in-house shredding of woody debris remaining within the area after the sale are designed to minimize this problem. Biomass harvesting to generate energy is increasing and can help to minimize residue debris after logging takes place. Coordinated timber harvest also help to transition high tree density sites into more accessible lands for vehicles maneuvers on a case-by-case basis is associated with proper follow up management.

Buffer zones surrounding lakes, streams and other wetland areas reduce the amount of maneuver space available. Fort McCoy Regulation 350-1 prohibits vehicular movement within 25 meters of streams, lakes and wetlands, unless a special request is made and approved. Steep terrain can also limit vehicular movement. Three natural areas on Fort McCoy are limited to foot training scenarios. Other training scenarios are authorized upon special request.

Wellhead protection areas and restrictions within areas of shallow ground water limit certain training activities that could affect Fort McCoy’s drinking water supply and aquatic environments. Some of the prohibited activities include; vehicle storage and staging areas, liquid motor fuel dispensing areas, vehicle maintenance activities, petroleum product storage tanks, field sanitation activities, release of grey water, and vehicle painting activities.

The LRAM areas are sometimes off-limits to training in order to allow specific areas time to rehabilitate. Limitations are often set to allow for vegetation to reestablish before training is allowed to resume. In some cases specific areas may be manipulated to reduce or limit future access where rehabilitation will not ensure long-term sustainability of training loads (i.e. log or earthen berms/dams along eroding trails located on steep terrain). Appendix D shows the areas where restrictions on mission or training may occur and the areas where there are little to no training and mission restrictions.

#### **2.3.5 Future Military Mission Impacts on Natural Resources**

The Range Complex Master Plan for Fort McCoy has identified the need to modernize existing ranges and develop new ranges. Modernizing existing ranges should not have a significant impact on natural resources when compared with constructing new ranges that will likely clear forests and native vegetation, reduce wildlife habitat and temporarily erode the soil during construction. Predicting future impacts is difficult as the mission is dynamic. To reduce future impacts to the training mission; Fort McCoy will consider mitigating impacts to KBBs from projects occurring on the installation, off of the installation. It may be possible to accomplish this in coordination with the Black River State Forest by

assisting them in reaching their conservation goals. Additionally, Fort McCoy could implement an Army Compatible Use Buffer (ACUB) program to help mitigate other internal encroachments to off post lands or minimize increasing restraints as unique nearby resources face greater losses to development and urbanization.

The Fort McCoy/Sparta Airfield may be expanded in the next five years to accommodate increased air traffic. If this occurs then airport expansion would result in significant impacts to wetlands and adjoining water resources.

The DPTMS expects to continue counter-insurgency training into the future and include a return to training for fighting conventional forces. The amount of training will continue to increase, both in length of time, frequency of coordinated exercises, and numbers of Soldiers the field, and this will impact the amount of time an area has to rest between training exercises. The NRB programs will see a reduction in the time available to complete field projects such as timber sales or invasive species control.

Proactive natural resource management should look at means to minimize expansion of ranges and Cantonment Area into wetlands and other sensitive areas. Using GIS as a tool to do queries to find the most suitable location for development will ultimately minimize the threat of expansion on specific cultural resources or threatened and endangered species. The Army might investigate acquiring lands or options to utilize non-DoD lands to ensure responsible installation development and growth as the military mission changes and expands. Many communities are looking at comprehensive plans for expansion such as “smart-growth”.

A Joint Land Use Study (JLUS) is a way to reduce potential conflicts between military installations and stakeholders while sustaining economic growth and development, protecting public health and safety, and protecting military missions. A JLUS for Fort McCoy and Monroe County is being planned.

## **2.4 Physical Environment**

### **2.4.1 Topography and Geology**

Ancient seas laid the geologic material of Fort McCoy down 500 million years ago. Layers of sandstone and limestone formed and experienced a geologic uplift. This uplift formed the Western Upland of Wisconsin. The Western Upland is a thoroughly dissected cuesta plateau with its major slope to the south-southwest. A cuesta is a geographical formation that has a long gentle slope on one side and a short steep slope on the backside. The thorough dissection is a result of millions of years of slow erosion creating long valleys or “coulees” as they are known locally. It is a rugged landscape with several hundred feet of elevation change from stream bottom to ridge top. Fort McCoy is located on the eastern edge of the Western Upland. The ridge that defines the highest point of the cuesta (1450 feet elevation) lies just east of Fort McCoy and is associated with the ridge system that runs throughout post. The upper geologic stratas of the area consist of harder limestones that are found in small deposits in the vicinities of Greenfield tower and Pikes Peak, both of these areas are located on the eastern boundary of post. The upland deposits of limestone have eroded away, leaving softer sandstone and shale deposits, the alluvium of which is the parent material for most soils on post. Windblown loess, a material derived from the glacial period, also has an influence on much of the soil on post.

### **2.4.2 Glacial Influence**

A major portion of the Western Upland of Wisconsin has the unique distinction of never having been glaciated during the most recent glacial periods in the Pleistocene Epoch. There is some evidence of glacial coverage during the earlier glacial periods. Most of the Midwestern landscape received large deposits of glacial material, or drift. The Driftless Area escaped direct influence from the series of glaciers that scoured the Midwestern landscape. While the Driftless Area is surrounded by glacial deposits, it was never completely surrounded by glaciers at any one time. Separate glaciers from different periods influenced the surrounding landscape at different times. The Driftless Area is considered an ancient landscape and has been eroding into an intricate system of ridges and coulees for millions of years.

### **2.4.3 Climate**

“The climate of Fort McCoy is continental. Frequent pressure systems that move across the continent from west to east are a major influence on the area’s weather. A variety of weather can be expected in all seasons. Spring is often late in coming and is a mixture of warm and cold periods. As spring advances, precipitation increases, reaching a peak in June. Summers are warm, with several hot and humid

spells. Cool periods generally occur during any summer month. Fall arrives suddenly in mid-September and often lingers on into November. The change from fall to winter is often abrupt. Winters are long, cold, and snowy. In many years, a thaw lasting one to two weeks occurs in February” (Monroe County Soil Survey, 1984:2).

The growing season averages 139 days, beginning around 11 May and ending around 27 September. The total mean annual precipitation is 28.04 inches. The average seasonal snowfall is 39.3 inches with extremes recorded of 83 inches and 14 inches. In winter the average daily temperature is 19.9 degrees F and in the summer the average daily temperature is 68.4 degrees F. Recorded extremes are –48 degrees F and 109 degrees F. The prevailing westerly winds have an average wind speed ranging from a high of 12 mph in April to a low of 7 mph in August (Monroe County Soil Survey, 1984).

#### **2.4.4 Air Quality**

Regional air quality within the study area is good. This is primarily due to climatic characteristics conducive to dispersion and an absence of major industry. Fort McCoy is within an "attainment" area, indicating that the concentrations of air contaminants in the atmosphere do not exceed Federal and state ambient air quality standards. Air quality at Fort McCoy is good. The initial State Clean Air Act, Title V permit was obtained in July 1996 and last renewed in 2003. Fort McCoy continues to complete process improvements to maintain a high air quality standard.

#### **2.4.5 Soils**

Fort McCoy soils are divided into six main categories based on their texture. These categories are peat, sand, loamy sand, sandy loams, silt loams and varied loams (Figure 5). Minor amounts of fine sandy loam and loam are present.

Dawson peat and Newson loamy sand soil series are deep, nearly level, poorly drained soils subject to flooding and ponding. The soils have a seasonal high water table above the surface or within one foot of the surface. A few other soils that have hydric inclusions in their mapping units are CeA (Ceresco), Cfa (Coffeen), CuA (Curran), DdA (Dells), Ka (Kato), Kpa (Kickapoo), MaA (Meehan and Au Gres sands). They support native wetland vegetation. The total acreage for poorly drained soils on Fort McCoy is 5,558 acres.

Over 80% of Fort McCoy soils are classified as sand. The soil series include the Boone, Impact, Meehan, Au Gres and Tarr sands. They are deep, excessively drained soils with very little organic matter. When the vegetation layer is removed, wind erosion occurs in sandy soils. Slopes range from level to 45%. The total acreage for sand on Fort McCoy is 49,837 acres.

The sandy loams are mostly Billett sandy loam and Urne fine sandy loam. Very small amounts (less than 120 acres total) of Ceresco fine sandy loam, Eleva sandy loam, Kickapoo fine sandy loam and Meridian loam are present. They are deep, well drained soils with low organic matter content. Slopes range from level to 45%. The total acreage for sandy loams on Fort McCoy is 776 acres.

The silt loams are mostly Council silt loam and La Farge silt loam. Small amounts (ranging from 10 to 82 acres for each series) of the following soil series are present; Coffeen silt loam, Curran silt loam, Dells silt loam, Downs silt loam, Kato silt loam, Norden silt loam, and Wildale silt loam. The slopes range from 0 to 30%. The total acreage for silt loams on Fort McCoy is 914 acres.

Varied loams are Norden, Urne, and Dorerton soils. They are deep, steep and well-drained soils on ridge tops and back slopes. Organic matter content is moderately low in these soils. Slopes range from 20 to 45% and there is a very severe hazard of erosion. The total acreage for varied loams on Fort McCoy is 2,238 acres.

With the exception of hilly areas, Fort McCoy is located in an area with relatively low inherent erodibility from water movement. The more level areas can tolerate high levels of soil disturbance, allowing for soil disturbing activities such as vehicular traffic to be more concentrated in those areas. Potential wind erosion, T&E species and cultural resources sites require some constraint in using these areas. Very sandy or very wet soils may also limit the accessibility and trafficability of some areas” (Warren et al., 2002).

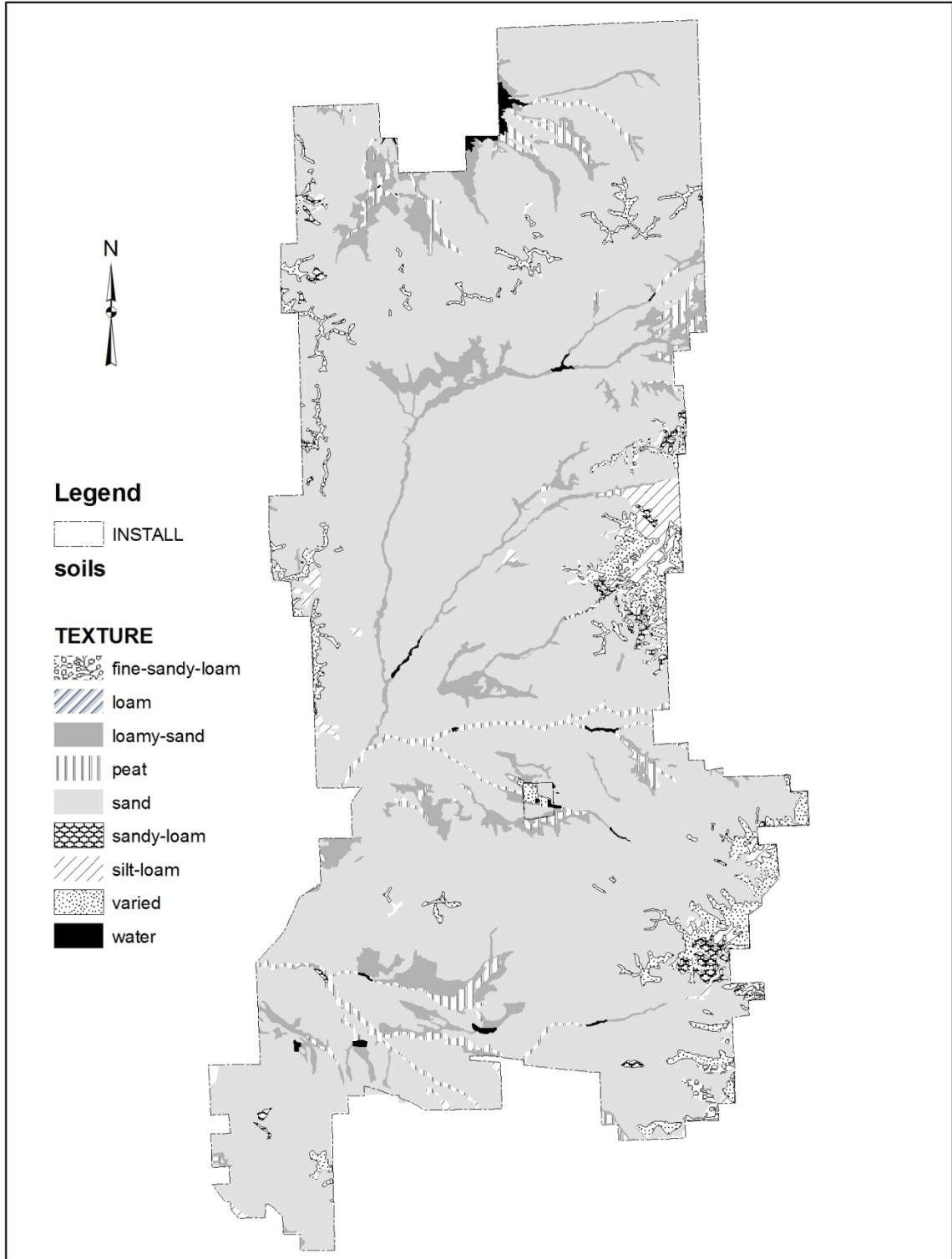


Figure 5. Soil Types on Fort McCoy.  
 (Natural Resources Conservation Service)

## **2.5 Ecosystems**

### **2.5.1 Fort McCoy Ecosystem**

The USFS has classified and mapped the ecosystems in the Upper Great Lakes region of Minnesota, Wisconsin and Michigan (Albert, 1995). This system places most of Fort McCoy in the Driftless Area under the Eau Claire subsection. The drier soils and greater frequency of fires results in more oak dominance in forest, savanna and brush lands than the other Driftless Area subsections. The northwest corner of Fort McCoy is included in the Southeastern Wisconsin Savanna Ecosystem, under the Central Wisconsin Sand Plain subsection (Black River Falls sub-subsection). Glacial Lake Wisconsin occupied much of this subsection, depositing glacial lacustrine sediments. Droughty outwash and sand lake plain supported jack pine-northern pin oak barrens.

The NRB used "A Guide to Forest Communities and Habitat Types of Central and Southern Wisconsin" (Kotar and Burger, 1996) to divide the ecosystem into management units. The system uses forest habitat type classification based on vegetation communities and soil properties.

### **2.5.2 Tension Zone**

Fort McCoy lies at the intersection of two major ecotones, the zone of transition between two ecosystem types. On the east to west continuum, the transition from eastern forests to western prairies influence the vegetation types of Fort McCoy. This mix of forest and prairie results in the savanna ecosystem that dominates on post. On the north to south continuum Fort McCoy lies just south of the band, which has been termed the tension zone? The tension zone is identified in *The Vegetation of Wisconsin* (Curtis, 1959), as a relatively narrow band that separates the northern coniferous forests from the central deciduous forests. Within the tension zone there is gradation between these two plant provinces. Many plants reach their northern or southern limits within this zone. Fort McCoy lies within this zone and the mix of vegetation on post is indicative of both the northern and southern forests.

## **2.6 General Biotic Environment**

### **2.6.1 Water Resources**

Fort McCoy has 10 installation lakes and impoundments, totaling 184 surface acres that provide habitat for warm and cold-water fish species and approximately 71.2 miles of coldwater streams and tributaries (Appendix E). The majority of the streams are Class I trout water, maintaining naturally reproducing brook and brown trout. The Driftless Region of Wisconsin lacks natural lakes derived from glaciation. Fort McCoy lakes and impoundments are created by either damming rivers and streams or through excavating soil to create "man-made" lakes. The impoundments on Fort McCoy coldwater streams provide a variety of uses for recreation, military training, and habitat for fish and wildlife.

#### **2.6.1.1 Watersheds**

The La Crosse River begins in the northeast portion of Fort McCoy. Much of the installation is in the La Crosse River watershed (Figure 6). The northern ¼ of Fort McCoy drains into Robinson (Clear) Creek, which is part of the Black River watershed. Land to the east of post, including a very small portion of Fort McCoy, is the Lemonwier River portion of the Wisconsin River watershed. The La Crosse River is one of the minor Mississippi drainages. The Black River and Wisconsin River are considered major Mississippi drainages. Fort McCoy is the largest landholder in the upper La Crosse River watershed and is instrumental in maintaining good water quality in the La Crosse River.

#### **2.6.1.2 Lakes**

The three Sandy Lakes (Big Sandy, Sandy, and West Sandy) range in size from 10 to 19 acres. They were excavated in 1968 as borrow pits, providing construction sub-base material for the construction of Interstate 90. Their primary use is for military training but they provide excellent recreational angling opportunities. These closed system lakes are spring fed, support two-story fisheries and have mesotrophic characteristics. Generally, lake water is characterized by very soft water, typically neutral to slightly acidic pH, and infertile.

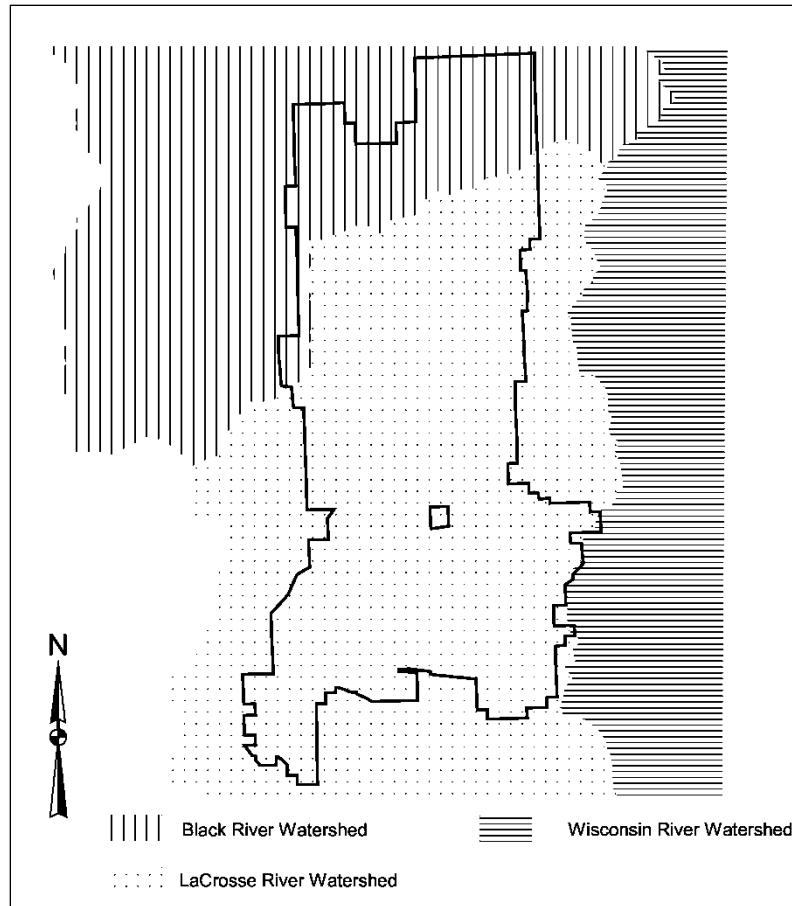


Figure 6. Major watersheds on Fort McCoy.

#### 2.6.1.2.1 Management Considerations

Sandy and Big Sandy Lakes are managed for largemouth bass and bluegill. Rainbow trout stocking has played an important role to supplement angler’s creel where approximately 80 percent of the lake fishermen target rainbow trout. The recreational rainbow trout fishery reduces the angling demand on the naturally reproducing centrarchid (panfish) fishery. Trout stamps are required by anglers fishing for stocked trout. These fish are purchased through the Genoa National Fish Hatchery. The West Sandy panfish bag limit was modified in 2003 to reduce harvest, changing the Fort McCoy fishing regulation to allow 10-panfish of a minimum length of 8-inches kept per licensed angler. The regulation has had a positive effect to the panfish structure and will remain in place to achieve quality.

Military training use at Big Sandy Lake has increased since replacing Alderwood Lake as the site for water training and bridging. The Sandy lakes could be enlarged as an alternate means to developing another sand “borrow” site to provide fill for construction.

The fisheries program will continue with efforts to keep reducing and possibly eliminate Eurasian watermilfoil (EWM) from Sandy Lake. Figure 7 shows the time required for EWM removal has been significantly reduced, with the plants virtually eliminated. Monitoring aquatic vegetation will determine program success and monitor the status of other installation waters to keep this aquatic invasive from spreading.

#### 2.6.1.3 Impoundments

There are primarily seven impoundments available for Fort McCoy recreational anglers, ranging in size from 2 to 93 acres (Appendix E). The oldest impoundment, East Silver, was created in the 1920’s and the most recent, Squaw Lake, was created in 1962. Kraft (2003) dam inventory showed that many impoundment dams were failing or in need of maintenance. Two impoundments, WAC (1991) and Lower



Sparta Pond (1994) were reclaimed back to free flowing streams. Alderwood and Hazel Dell are planned to be removed and have been reduced or partially drained. These lakes were drawn down and with the water control structure removed from Hazel Dell in 2011 and the Alderwood structure is scheduled for removal in 2013 or beyond. Sparta, Swamp and Stillwell have bottom draw outlets; the other impoundments still have the original overflow or top-draw dams and are steadily filling with silt. The Squaw Lake dam is expected to be renovated to improve water releases from the middle of the lake. Squaw Lake construction is anticipated in 2011. Algal blooms and macrophyte growth during the summer can be problematic and result in lower angling and training quality.

Impoundment water quality characteristics and the fish community are monitored to identify trends and condition. Fort McCoy surface water quality is primarily characterized as soft water, typically neutral to slightly acidic pH, and infertile. The waters are low in nutrients, with low hardness and alkalinity. Impoundments associated with Silver and Tarr Creek watersheds are the exception with medium-hard water, medium-high productivity and fertile.

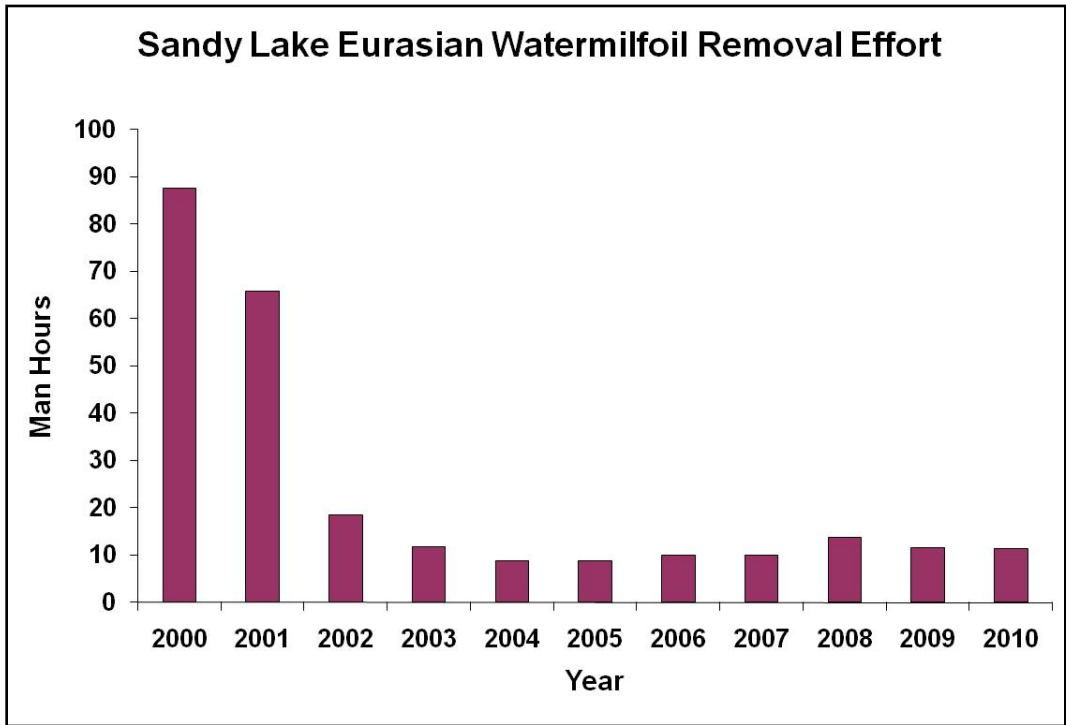


Figure 7. Reduction in time required for Eurasian watermilfoil removal.

**2.6.1.3.1 Management Considerations**

A primary watershed management program goal is to manage sediment within streams and impoundments. Stream impoundments fill from sediment transport at accelerated rates. Aquatic succession from lake to wetland can happen within the course of decades. One impoundment, West Silver Wetlands, was created in 1952 and quickly filled in with sediment. The Silver Creek impoundment is managed as a wetland and provides greatest benefit to waterfowl, reptiles, amphibians, and other wildlife. Hydraulic dredging have been completed from 2002-2006 for Hazel Dell, Sparta, Swamp and East Silver Lakes helping to reclaim lake water storage, water releases and improved fisheries (figure 8).

Warmer water temperatures are a potential negative impact created by impoundments on trout streams. Since 1997, stream temperatures were monitored with thermograph data loggers. Temperature data along with stream biomonitoring using an index of biotic integrity (IBI) have indicated when Fort McCoy impoundments were significantly affecting aquatic integrity. Future management will continue to assess thermal impacts resulting from impoundments with alternatives to improve water quality to receiving waters. Alternatives include: 1) removing the dam structure to manage as a natural stream; 2) install a middle or bottom-draw dam/outlet to reduce the thermal impact to the receiving water; or 3) sediment



Figure 8. Dredging operations on Hazel Dell Lake.

management, pond reclamation, excavating or dredging the impoundment sediments to reduce shallow areas that contribute to higher water temperatures. These options will be assessed on a case-by-case basis to determine the most cost-effective approach that not only enhances the training mission, but also benefits the aquatic ecosystem and recreational angling. When implementing the first two alternatives, it is important to assess and manage sediment and the potential for sediment transport when removing or renovating the dam or water control structure. Sediment trap maintenance will aid in the longevity of these reclamation projects and/or benefit the stream condition. As outlets are modified and sediment removed, water-level will be managed to minimize thermal effects or macrophyte and plant production to maximize reservoir fish production. The NRB shall continue to evaluate Fort McCoy watersheds to determine areas contributing to stream sediment loads and implement Best Management Practices (BMPs). Aquatic macrophytes are inventoried to assess plant densities and avoid the introduction of exotic plant species like curly pond weed (*Potamogeton crispus*) and EWM.

#### 2.6.1.4 Streams

Fort McCoy has approximately 71.2 miles of streams and tributaries (Figure 9). Almost all are recognized by the WDNR as trout streams with approximately 51 miles classified as Class I trout streams, 8 miles as Class II trout streams, and 5 miles as Class III trout streams (Appendix E). The North Impact Area (NIA) and Range 29 close 14.1 miles of trout stream to fishing access because of the risk from active training and unexploded ordnance. Two of the streams, Clear and Silver, have very unique and pristine habitats that could be considered as Outstanding or Exceptional Resource Waters as noted in NR207. Areas around these waters have been designated as Fort McCoy Natural Areas. Two streams, Creek 23-12 (Ash Run North Ditch) and Creek 11-8 (West Fork Ranch Creek) are characterized as non-trout waters.

Streams which have headwaters in the agricultural areas off Fort McCoy are influenced by off-post practices and typically have lower water quality when entering Fort McCoy. Brook trout and brown trout are naturally reproducing while an occasional rainbow trout enter the streams after being stocked in the impoundments. Trout anglers most commonly fish in the larger sections of the La Crosse River, Tarr and Silver Creek however some find the smaller tributaries to be great fun, catching aggressive brook trout.

Aquatic vegetation and invertebrates are important to fish assemblages as well as indicators of water quality. Aquatic vegetation, like the exotic water cress (*Nasturtium*) is indicative of springs, groundwater or high water quality and grows in many of Fort McCoy's streams. Vegetation like water crow's foot (*Ranunculus*) and *Elodea* provides cover for fish and areas of attachment for aquatic insects. Aquatic vegetation provides diversity similar to braided channels within the channel, creating additional niches for young fish and forage. Woody debris provides additional habitat for fish and aquatic insects. Drake (1996) conducted the latest macroinvertebrate study, using insects to show water quality to be very

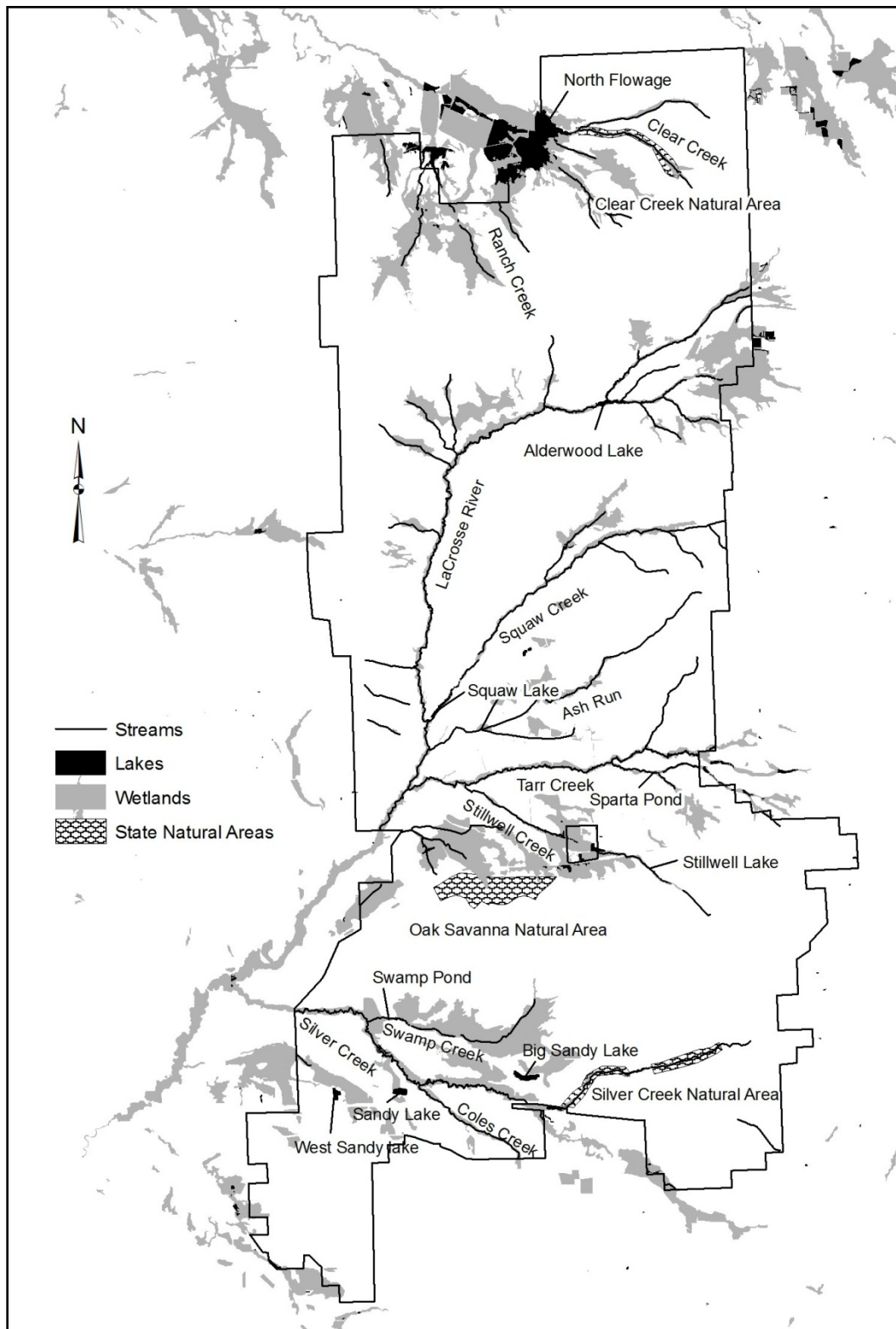


Figure 9. Streams, impoundments, lakes, wetlands and natural areas.

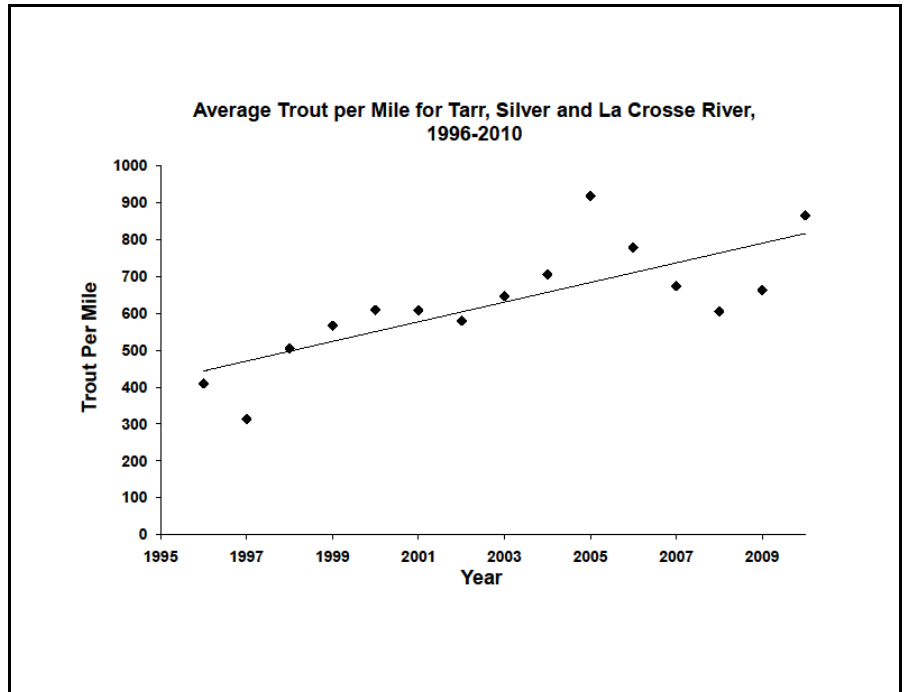
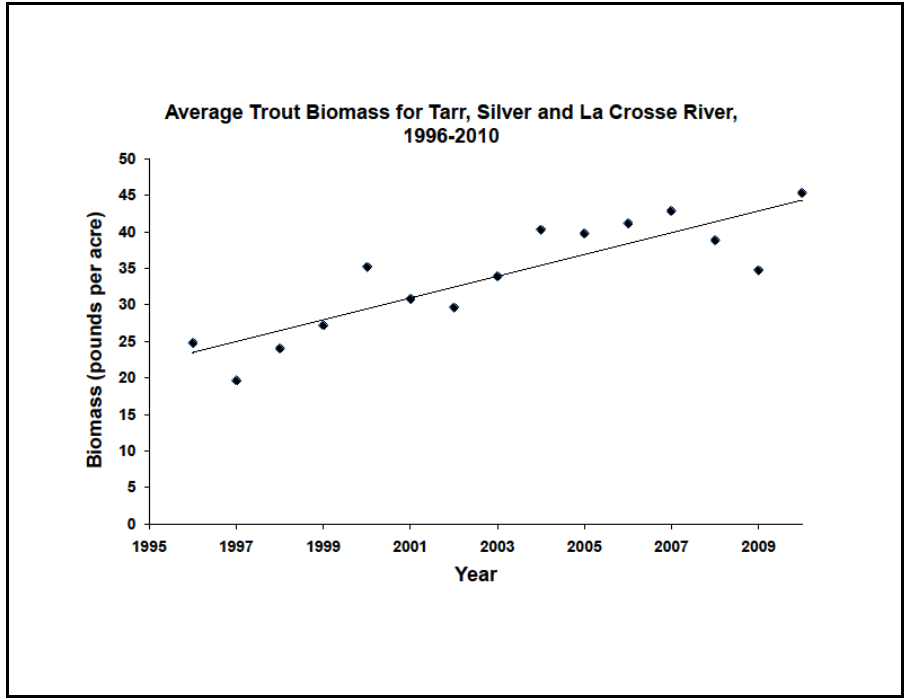


Figure 10. Fort McCoy trout trends, biomass (pounds per acre) in the upper panel and trout density (CPUE - trout per mile), for the La Crosse River, Tarr and Silver Creek. Since 1997, both young and adult brook and brown trout have responded positively to Fort McCoy watershed management, reducing sediment and enhancing stream habitat.

good. Some insects found on Fort McCoy that are indicators of high quality are: Plecopterans, *Taeniopteryx spp.*, *Isoperla spp.*, and *Nemoura spp.*; Ephemeropterans, *Baetis spp.*; and Tricopteran, *Platycentropus*, *Lepidostoma*, and *Glossosom*.

#### **2.6.1.4.1 Management Considerations**

The watershed management program is focused on sediment management within streams and impoundments. Many tools and policies have been developed to reduce the effects from sedimentation and erosion within Fort McCoy watersheds. Many of the unimproved roads have been converted to asphalt, seal coat or concrete surface which reduces costs for maintenance and results in less sediment delivery to watersheds. Riparian habitat is typically well protected. Forest management practices overlook harvestable timber within a variable width buffer zone along stream habitat. Fort McCoy restricts vehicle maneuvering within 25 meters of streams and wetlands (Fort McCoy Reg 350-1). The LRAM is actively restoring vegetation to minimize soil loss. The RTLA has conducted monitoring associated with wetland buffers to determine the level of policy compliance and impacts to the resources. Two separate survey years have shown no significant breaches in policy or impacts from training within the designated buffers. Lanes training requires larger chunks of contiguous training area to perform military exercises. Stream crossings for tracked and wheeled vehicles are established, with unlimited restrictions to foot training within the wetlands and streams. Shallow water crossings will be built in near future, at the Alderwood Dam removal site and possible 1-2 other locations.

Two of the natural areas located within Fort McCoy are along Clear and Silver Creeks. These areas are also protected from intrusive land uses like timber harvest and vehicle maneuver training. The stream bottoms are predominantly shifting sand that can limit the amount of natural reproduction, instream cover, and food available to the fish. Since 1995, Fort McCoy has used prefabricated wood structures (LUNKERS) armored with riprap, and brush bundling in streambank stabilization projects to increase overhead cover. These stream enhancement and erosion control methods have played a very important role in reproductive success and overall trout densities. Streambank restoration as well as sediment trap maintenance interrupt or minimize sediment loads and transport process. Sediment management has become an important tool to increase Fort McCoy trout numbers and stream biomass (Figure 10).

Continued growth and development will increase impervious surface and surface water runoff and have a potential affect to high quality trout waters. Wetlands and recharge areas are critical in times of droughts to replenish the aquifers. Watershed development and avoiding wetland impacts are going to be the greatest challenges in maintaining high quality aquatic resources. Codified (protected by Wisconsin State Statute) streams like Ash Run and associated ditches are susceptible to degradation if Cantonment Area development impinges on the riparian area and does not plan to manage stormwater runoff resulting in higher stream temperatures and sediment delivery. Low Impact Development (LID) concepts are going to be more common with DoD compliance of the Energy Independence and Security Act (EISA). The resultant of this smart growth concept should aid the installation to make continued improvements regarding surface water quality and sediment management. Generally, stormwater should be allowed to percolate and seep into settling areas, ditches or basins and select to have less stormwater piped or channeled directly into Cantonment Area streams. Vertical growth (taller buildings) in lieu of expanding horizontally, thus reducing the amount of impervious surfaces within the Cantonment Area, should also be examined.

#### **2.6.2 Flora**

There are three broad categories of land covertype (communities) at Fort McCoy; wetlands, dry upland communities, and dry-mesic upland communities (figure 11). These communities are based on The Forest Habitat Type Classification of Southern Wisconsin (Kotar, 1996).

##### **2.6.2.1 Wetlands**

Fort McCoy has approximately 4,400 acres of wetlands based on Wisconsin Wetland Inventory (Figure 9). Roads, railroads and other sources of fill material are believed to have caused the water table to rise in some lower areas, creating wetlands and modifying the boundaries of previously existing wetlands. The wetlands along streams were created by stream meandering and are believed to be less influenced by anthropogenic features. Wetlands provide an important function in recharging aquifers and buffering streams by filtering sediment and nutrients.

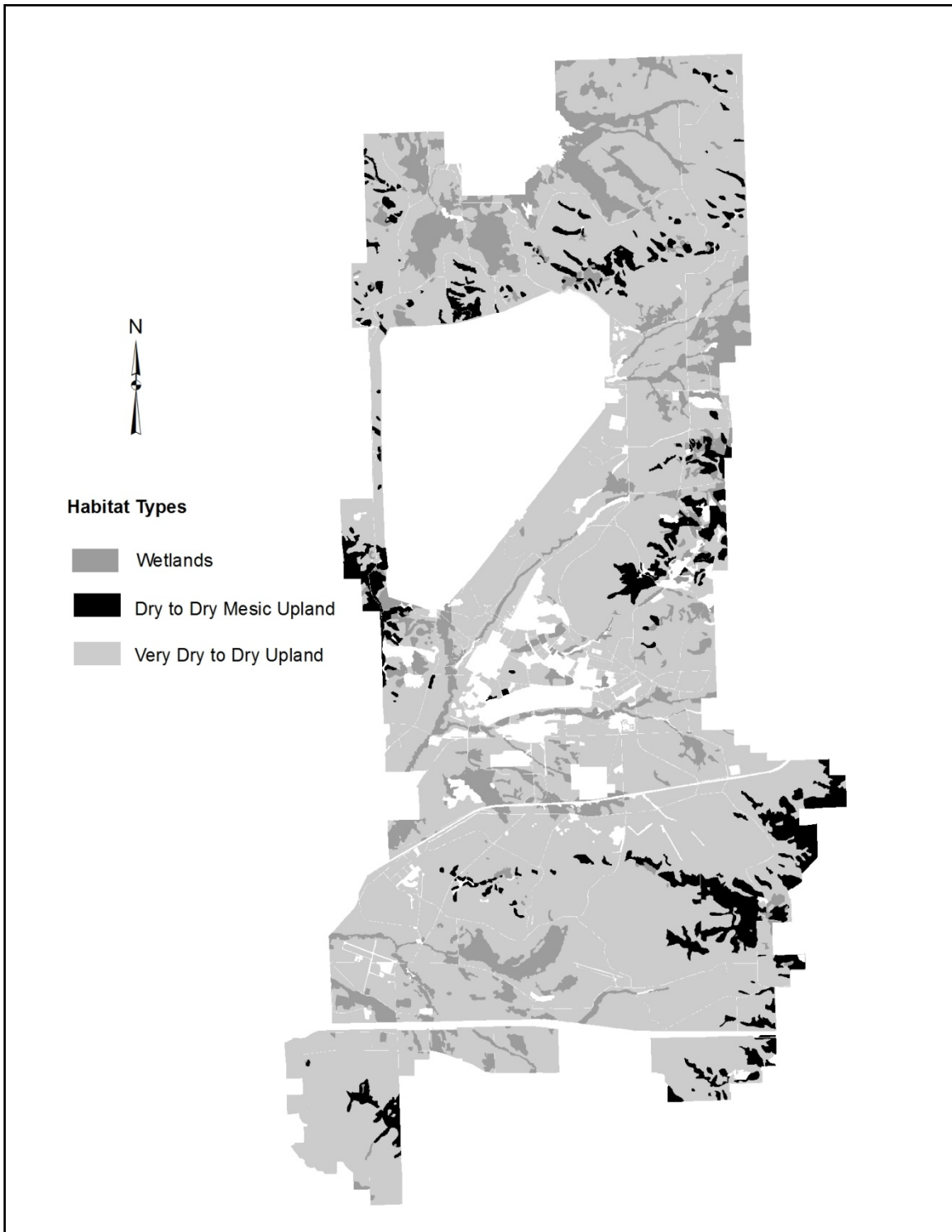


Figure 11. Land Cover Types.

Associated vegetation includes: white pine, red maple, quaking aspen, white oak, poison sumac, speckled alder, star flower, winterberry, dewberry, cinnamon fern, skunk cabbage, bunchberry, bluejoint grass, sedges, sphagnum moss, meadowsweet, cattails, and dogwood.

Animal species associated with these wetlands are: white-tailed deer, mink, otter, white-footed deer mouse, muskrat, beaver, sandhill crane, great blue heron, least bittern, wood ducks, northern harrier, sora rail, marsh wren, swamp sparrow, red-winged blackbird, wood turtle, Blanding's turtle, green frog, northern water snake, and spring peeper.

#### **2.6.2.1.1 Wetland types**

The Forest Habitat Type Classification for Southern Wisconsin indicates the wetlands on Fort McCoy as PVRh (White Pine/Blueberry-Dewberry) habitat type. The vegetation reflects a dry mesic rather than a mesic or wet-mesic environment. This is probably related to the sandy soils above the saturation zone not holding sufficient moisture to support mesic vegetation during dry seasons or drier than average years. White pine is considered the climax successional stage in this community type. Non-forested wetland types documented on Fort McCoy are; pond, stream, marsh, sphagnum bog, coastal-plain bog, sedge meadow, wet meadow, alder thicket, shrub carr, and swamp (Freckmann 1992).

Ephemeral ponds are wetlands that fill with water in the spring and generally dry out later in the year. Some ephemeral ponds may only dry out under drought conditions. Ephemeral ponds are generally small and surrounded by terrestrial habitat. These ponds contain no fish, thus providing safe habitat for amphibians, insects, and crustacean species. The importance of ephemeral ponds to biodiversity and fully functioning ecosystems has only recently been recognized on a national scale. A Blanding's turtle survey and monitoring project documented the importance of Fort McCoy's ephemeral ponds to Blanding's turtles. Blanding's turtles travel long distances across the landscape and move from one ephemeral pond to the next.

#### **2.6.2.1.2 Management Considerations**

In accordance with EO 11990, avoidance of all aspects of long- and short-term impacts to wetlands on Federal lands is a very high priority, as well as initiatives to enhance their natural value. Disturbance associated with troop training activities or land maintenance and new construction activities present a high potential for damaging wetlands. Timber harvests, if conducted at the wrong time of year, can also adversely impact wetlands. Disturbance to wetlands, while necessary to set back succession, may result in the introduction or spread of exotic species which may degrade wildlife habitat quality. Historically, wetlands were kept in a dynamic state through periodic droughts and fires, which help to set back plant succession and remove organic matter deposited within the wetlands over many years. Due to over a century of fire suppression and changes in attitudes and policies about fire, many wetlands are now in, or approaching, a climax stage through the course of natural succession and the spread of exotic/invasive plants.

Wetland loss should be avoided. The NEPA process will identify projects that affect wetlands and require mitigation. In areas where wetland "take" is unavoidable, mitigation will need to be considered and negotiated. Wetland mitigation and banking program will be considered with the WDNR, USACE and EPA to aid in Fort McCoy developments. Formal group discussions should be established with our basin partners for devising plans to best protect wetlands, the public trust, and mission needs. As an alternative to on-site wetland bank or mitigation, Fort McCoy may need to consider purchasing adjacent land to or acquiring land within the region that can be developed into wetlands to protect the training interests in regards to military mission expansion. Wetland mitigation is becoming more apparent with the need to upgrade training facilities and ranges to best prepare troops for future missions. A wetland delineation contract was completed in 2009 to assess large land parcels that are expected to have future developments. Wetland delineations will be completed as required for specific site developments to further reduce wetland loss. Wetland mitigation banking should also become a higher priority to best protect the training interest and off-set wetland loss when it cannot be avoided. Selecting locations where the natural resource conditions are suited or designs that will aid the treatment to convert the landscape to wetland is important. Creating wetland-ephemeral pond habitat that adds critical habitat value to organisms like the Blanding's turtle should also be emphasized. Mitigation will require Fort McCoy to manage the mitigated wetland to ensure that it meets and maintains wetland criteria specifications. Fort McCoy manages one mitigated wetland (1.9-acres) located near Anderson Shale Pit, adjacent to Squaw Creek.

**2.6.2.2 Very Dry to Dry Upland Communities**

This is the predominant community type on Fort McCoy. It is described by the Forest Habitat Type Classification (Kotar) as PVGy (White pine/Blueberry-Huckleberry) community type. The USFS (Albert) describes this community as oak forest, savanna and brushlands. Excessively drained deep sands and sandy loams over sandstone in a rolling to steep landscape allow plants adapted to this xeric condition to thrive. Frequent fires maintain the oak forest and prevent natural succession to white pine, which is considered the climax forest (Figure 12). In areas where fire has been suppressed there is a considerable amount of red maple, black cherry and white pine in the understory.

Savanna plant communities are dependent on fire and disturbance to maintain the typical open structure. With fire suppression, the vegetation in the savanna communities quickly succeeded to a more closed forest condition. Oak grubs existed for decades in the presence of fire, slowly growing deep, established root systems, while the vegetation would be repeatedly burned. These oak grubs took advantage of the fire suppression and grew profusely for several seasons. In presettlement times a few oaks would attain a thick corky bark during periods without fire and then be able to survive later fires. This process established the open structure of the savanna communities. With twenty years of fire suppression the canopy of the former oak barrens closed and caused a change in the ground layer. The typical mix of prairie and woodland plants slowly degraded to a low diversity woodland ground layer. The seed bank will exist for many decades in a degraded ecosystem. Prescribed fire and thinning the oaks can release this remnant seed bank. Savanna communities are also called barrens. For consistency, the term savanna will be used in the INRMP.

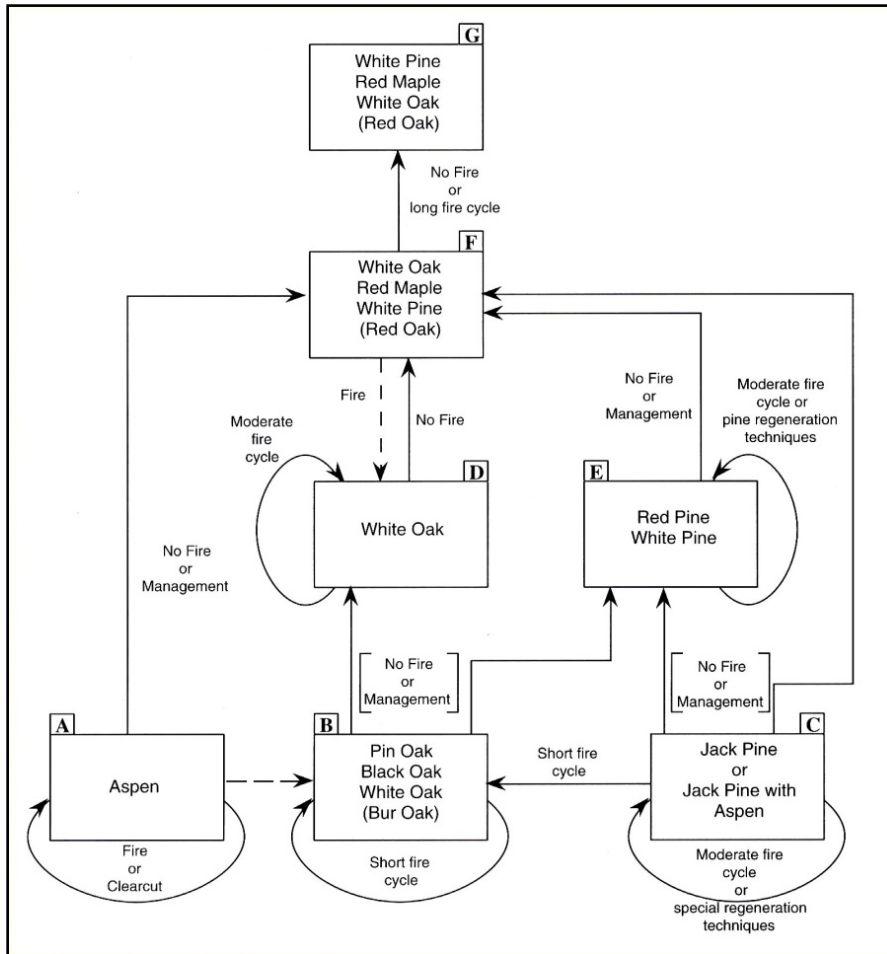


Figure 12. Succession model for dry upland plant communities.  
(Reprinted with permission, Kotar and Burger, 1996)



Fires resulting from military training, disturbance associated with vehicle maneuvers, and the lack of intensive agricultural disturbance have kept areas of Fort McCoy in a quality savanna/barrens complex. The North Impact Area (NIA), Badger Drop Zone, Range 29 and the Fort McCoy Barrens Natural Area are good examples of an oak savanna. Jack pine stands are present and are managed for pulpwood. Red pine plantations have been planted in open areas and under a sparse oak overstory since the Wisconsin Conservation Corps days of the 1930's.

Associated vegetation includes; black oak, white oak, bur oak, northern pin oak, jack pine, white pine, red pine, red maple, black cherry, American hazel, blueberry, huckleberry, big bluestem, little bluestem, wild lupine, hoary puccoon, bird's foot violet, wild rye, downy phlox, prairie dropseed, blazing star and Indian grass.

Associated animals include; white-tailed deer, badger, red and gray fox, coyote, gray wolf, gray and fox squirrel, thirteen-lined ground squirrel, meadow vole, red-tailed hawk, kestrel, wild turkey, killdeer, upland sandpiper, eastern kingbird, eastern bluebird, tree swallow, grasshopper sparrow, savanna sparrow, KBB, western slender glass lizard, phlox moth, red-tailed prairie leafhopper, blue racer, eastern hognose snake, bullsnake and five-lined skink.

#### **2.6.2.2.1 Management Considerations**

The oak savanna/barrens community (Figure 13) is considered one of the rarest plant communities in Wisconsin. The Wisconsin Natural Heritage Inventory lists oak barrens as a G2 rating (imperiled globally because of rarity). In pre-settlement times it is estimated there was between 7 and 10 million acres of Wisconsin savanna; presently the WDNR estimates that only 2,000 acres of high quality barrens remains in the state outside of Fort McCoy. The NRB estimates that Fort McCoy has approximately 13,700 acres of quality barrens with 7,500 acres within the NIA. The KBB, one of McCoy's two Federally-listed T&E species, along with a whole host of Federal and state concern species are savanna dependent. Savannas are excellent areas for military training and maneuvers; the structure tends to allow available vehicle maneuverability, with random pockets of more dense trees or forest edges available for cover and concealment resources. With up to 20,000 acres of low quality oak forest on Fort McCoy, there is great potential for oak savanna restoration activities. Prescribed fires and timber cuts have been implemented to help restore these areas.



Figure 13. Oak savanna.

Invasive plants such as leafy spurge, spotted knapweed, cow vetch, crown vetch and St. John's wort have been mapped within many of the savanna remnants and along the peripheries of low quality oak forests. Exotic invasive plant species have a very strong impact on native plant communities and may

replace the majority of native species if left unchecked. One consideration with restoring low quality oak forest to savanna is the potential to increase such invasive plant species populations. Many of the savanna associated invasives cannot survive in more closed canopy forests, but if the forest canopies are thinned out or removed, it will create suitable environment for these species.

Open grassy areas on steep slopes and ridge tops are known as goat prairies and contain many unique and rare prairie plant and insect species. The extreme topography of goat prairies has prevented most uses or development that would have impacted them. The greatest threat to these areas is the steady encroachment of trees, shrubs and exotic species that shade or out-compete the prairie species. Conversion of low quality oak forest to red pine plantation has occurred frequently in the past. Based on the value of savanna to the military, wildlife and ecosystem management, red pines will not be planted in savanna areas.

The sandy soils have a thin A horizon that contains organic material overlaying thick sand. If the vegetation layer and the A horizon are lost, the sand is susceptible to wind erosion. This has occurred on some of the past and present ranges and other high use areas. Hundreds of dollars per acre are spent to restore sand blowout areas. It is now realized that these areas support uncommon insect species. Depending on military training requirements, some of these sand blowout areas will remain to provide habitat for these species.

Oak wilt (*Ceratocystis fagacearum*) is a fungal disease of oak trees which enters a tree through a wound in the bark and spreads to adjacent trees through root grafts. Activities such as pruning, timber harvesting, shredding, and firewood cutting are prohibited in oak stands during April through July, when Oak wilt can be transmitted to healthy oaks via insect vectors feeding on sap flowing from a break in the bark. Oak wilt can kill red, black and northern pin oak trees within a couple of months of infection. Trees in the white oak family (white, bur) are more resistant to the disease. Fort McCoy has a significantly higher occurrence of oak wilt than surrounding areas because training maneuvers occur during the May-July infection period. Use of tree wound dressing is utilized to help reduce the possible spread of the disease. The ITAM distributes tree wound dressing to military units and maintenance shops for activities that are considered high potential for tree damage during the May through July oak wilt season. The dressing does not treat the disease, it only seals off or covers exposure of diseased tissues to reduce transmission of the fungus by insects to new areas. Additionally, management to limit root graft dispersal of the disease has been implemented on a limited basis via root plowing to severe infected areas from healthy trees. More of this work is likely to occur in the future to help curb impacts to cover and concealment resources.

### **2.6.2.3 Dry to Dry-Mesic Upland Communities**

This community occurs on the north and northeast facing slopes on Fort McCoy. The Forest Habitat Type Classification (Kotar) calls this the ArDe-V (red maple/pointed-leaf tick trefoil, blueberry variant) community type. This type is found on loams and silt loams and represents a transition between the dry and dry-mesic communities. Northern red oak (Figure 14) is the dominant tree species in this community but it is not regenerating. Red maple, basswood and white pine are taking over these sites since they are more shade tolerant than oak (Figure 15).

Fires occur infrequently and are usually not as intense as those occurring in drier communities. Many older oaks have basal fire scars. More prescribed burning may increase the amount of oak seedlings in the understory and keep these sites in oak forest. The snow pack, which lasts longer in the spring because of slope aspect, provides more soil moisture and protects trees from early spring wildfires.

Associated vegetation present are: northern red oak, white oak, black oak, white pine, bigtooth aspen, red maple, basswood, bitternut hickory, dogwood, American hazel, blueberry, Virginia creeper, poison ivy, interrupted fern, tick trefoil, hog peanut, wild geranium and sweet cicely.

Associated fauna present are: white-tailed deer, gray and fox squirrel, flying squirrel, red and gray fox, white-footed deer mouse, red-backed vole, raccoon, porcupine, wild turkey, sharp-shinned hawk, ruffed grouse, barred owl, whip-poor-will, eastern wood peewee, eastern phoebe, black-capped chickadee, wood thrush, red-eyed vireo, scarlet tanager, wood frog, red-backed salamander, and northern red-bellied snake.

#### **2.6.2.3.1 Management Considerations**

The steep slopes associated with this community are less favorable for many military training activities and vehicle access. Because of the rugged terrain, water erosion is a concern. Large gullies from roads and shale pits have formed from unchecked water flow in some areas.



Figure 14. Northern red oak forest.

The natural conversion of oak stands to red maple, basswood and other species is a concern to both forestry and wildlife. Mast-producing oak trees are important to many different wildlife species for food and cover. Northern red oak sawtimber is the most valuable wood on Fort McCoy. Encroaching species are not as valuable to wildlife and produce lower quality lumber.

Oak wilt is a major factor in these community types (see Para. 2.6.2.2.1).

These communities also tend to be located where richer loam and silt soils are found. These soils are much more vulnerable to sheet and rill erosion due to soil structure/textures and the steep slopes they are associated with, than the courser sands that comprise most other areas on post. Maintaining good tree and vegetative cover in these areas is crucial to limit natural erosion and to reduce access of activities that could increase soil erosion potential, such as off road driving.

Exotic invasive plant species such as garlic mustard have become established within this habitat type. The invasives are responsible for reducing native plant diversities and are likely to have a strong negative impact on valuable red oak and other timber species regeneration within these areas. Management strategies need to target these species for control/elimination and ensure management practices take these species into consideration during the planning phases.

#### **2.6.2.4 Fort McCoy Natural Areas**

There are three Fort McCoy Natural Areas (FMNA) established because of their uniqueness, high natural integrity and rare status (Figure 9). Clear Creek and Silver Creek FMNA's are pristine wetlands associated with floodplains along stream headwaters. These riparian communities have rare vegetation and excellent water quality. The Oak Barrens FMNA represents one of the rarest natural plant communities in Wisconsin and is of biological significance in the Midwest. Memorandums of Understanding (MOU) and management plans have been developed between Fort McCoy and the WDNR for these FMNAs.

##### **2.6.2.4.1 Fort McCoy Natural Areas Management Considerations**

Management of FMNAs is guided by MOUs and management plans that have been approved by the WDNR. Vehicle use is restricted in the FMNAs except on established trails or by special request; foot training is allowed at any time. The goal for FMNAs is to maintain and enhance natural community interactions, aquatic integrity and rare populations.

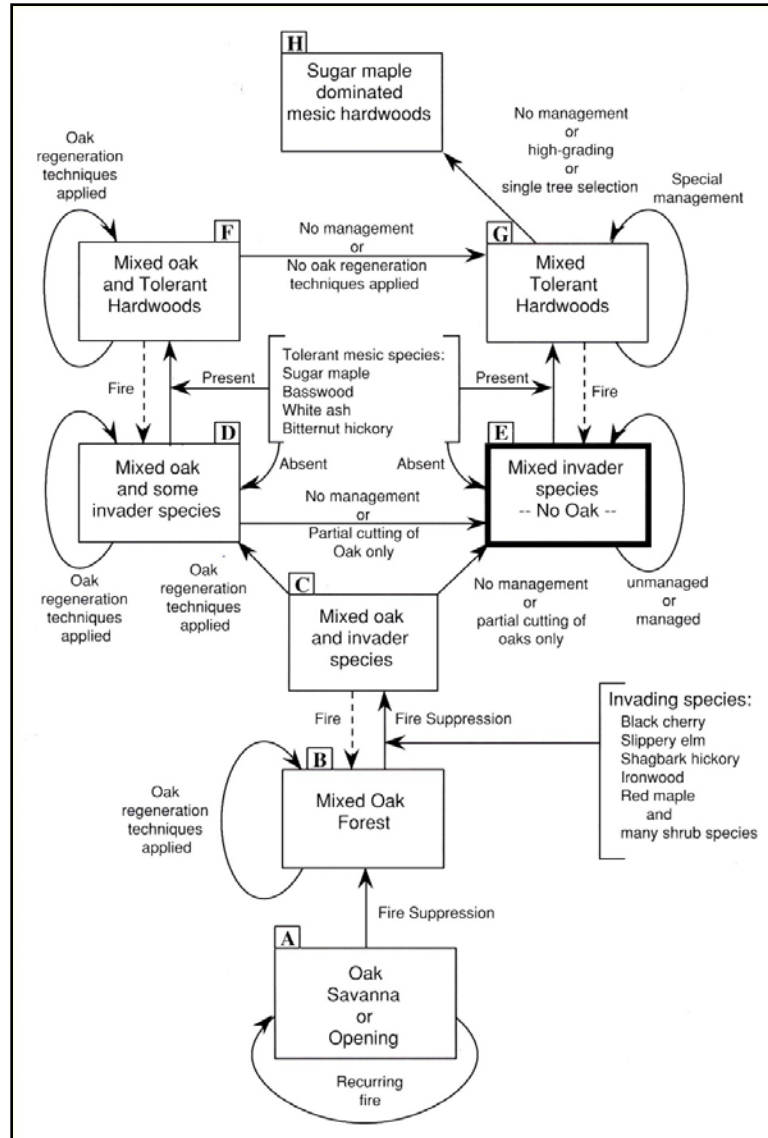


Figure 15. Succession model for dry-mesic upland plant communities.  
(Reprinted with permission, Kotar and Burger, 1996.)

### 2.6.3 Floral Inventories

The earliest recorded instance of plant collecting on Fort McCoy was in 1931 when Emil Krushke collected a specimen of prairie parsley (*T. Polytaenia nuttallii*) for the Milwaukee Public Museum. Surveys were done for specific areas in 1972, 1979, 1988 and 1989. In 1975, a general survey of all areas on Fort McCoy was completed. In 1981 and 1982, a herbarium collection was started, this was added to in 1990-91 by RTLA. The RTLA program has continued to add more plants to the plant list and collection on a nearly annual basis. All of the plants documented (approximately 1000 species) on Fort McCoy are listed in Appendix F, Table 8. More information on flora inventories and monitoring is at Para. 4.2.5.

### 2.6.4 Fauna

As of March 2012, over 230 bird, 53 mammal, 19 reptile, 12 amphibian and 30 fish species have been identified on Fort McCoy (Appendix F, Tables 1, 2, 3 and 4). An initial survey of butterflies and moths was conducted by Judy Maxwell in 1992 (Appendix F, Tables 5 and 6).

### **2.6.5 Threatened and Endangered Species**

As of March 2012, one Federal endangered species, 14 state endangered species, and 21 state threatened species have been documented on the installation. In addition, three species (red-tailed prairie leafhopper, regal fritillary butterfly, and Henslow's sparrow) that have been documented on the installation are now classified as Army Species at Risk (Appendix F, Table 7).

### **3.0 ENVIRONMENTAL MANAGEMENT STRATEGY AND MISSION SUSTIANABILITY**

#### **3.1 Land Uses**

The main use for Fort McCoy lands is to support military training and one of the primary goals of this INRMP is to ensure the operational mission will continue on a sustainable basis. There are areas where training is highly limited (natural areas and wetlands), areas where training is prohibited (family housing), and places where non-military use is restricted (NIA). Most locations on post are open to both training and other uses such as recreation and natural resources management. There are many areas within the boundaries of the post that are dedicated to specific uses (Figures 16a & b). These areas are based on use, or use restrictions. Within each area there are a variety of ecological associations.

##### **3.1.1 Standard Training Areas**

The majority of the land on Fort McCoy is divided into 82 training areas totaling 45,648 acres. These training areas are assigned to troop units as requested for specific training purposes. Maneuvers, bivouac, and dismounted training are allowed in these training areas. Included in the training areas is the large network of improved roads, tank trails and unimproved (woods) trails.

##### **3.1.1.1 Management Considerations**

Military training takes priority in training areas and all other uses are allowed when they will not hinder the training mission. In general, natural resource management activities are designed to enhance the training capabilities of the land. The goal of the NRB is to use ecosystem management principles to manage training areas for unrestricted military training while encouraging biodiversity and preserving the integrity of ecosystems. All NRB activities that might impact training are coordinated with the DPTMS Range Officer and the Scheduling Section prior to work being conducted.

##### **3.1.2 Special Training Areas**

Special training areas are primarily dedicated to training Soldiers on specific tasks. Other uses of the land such as timber production, outdoor recreation and ecosystem management are secondary or nonexistent. These areas include ranges (multi-purpose, small arms, ambush, tank, grenade, machine gun and demolition), firing points (artillery and mortar), assault airstrip, landing zones (LZ), drop zones (DZ), enemy prisoner of war camps, multi-purpose field training sites, rock crusher site, forward entry control points, forward arming and fueling points, Combined Arms Collective Training Facility (CACTF), Logistical Support Areas (LSA), and Forward Operating Bases (FOB). Approximately 2600 acres of Fort McCoy are dedicated to special training areas (some but not all of these areas are shown in figures 16a & b). For more specific information on special training areas, reference Fort McCoy's Range Complex Master Plan (RCMP).

##### **3.1.2.1 Management Considerations**

Care and maintenance of the range areas is under the jurisdiction of the Training Division and the direction of the Range Officer in DPTMS. The DPW provides mowing and pest control support on the ranges. The NRB coordinates any activity that may impact the training areas or ranges (timber harvests, hunting, or data collection) with the Scheduling Section. Some ranges and special use areas are burned each spring to reduce woody vegetation and decrease fuel loads to prevent uncontrolled wildfires during active use. The DZs, firing points, and LZs are maintained as open grasslands and managed, secondarily, for prairie flora and fauna.

The RCMP recommends specific actions to meet the training needs in the near future. Projects that are programmed to occur in the next five years include: 1) Construction of a Known Distance (KD) range adjacent to Range 18 in FY12. The KD range will train and familiarize soldiers on the skills necessary to identify, engage and hit targets in a static array with small arms weapons systems out to 1,000 meters. 2) Modernize Range 101 to an Army standard Automated Modified Record Fire Range in FY12. 3) Upgrade Range 4, Convoy Live Fire Range, in FY18. Unprogrammed Military Construction Army projects expected to occur in the next five years include: 1) Upgrade Range 12 Light Anti-Tank Weapons Range in FY19.

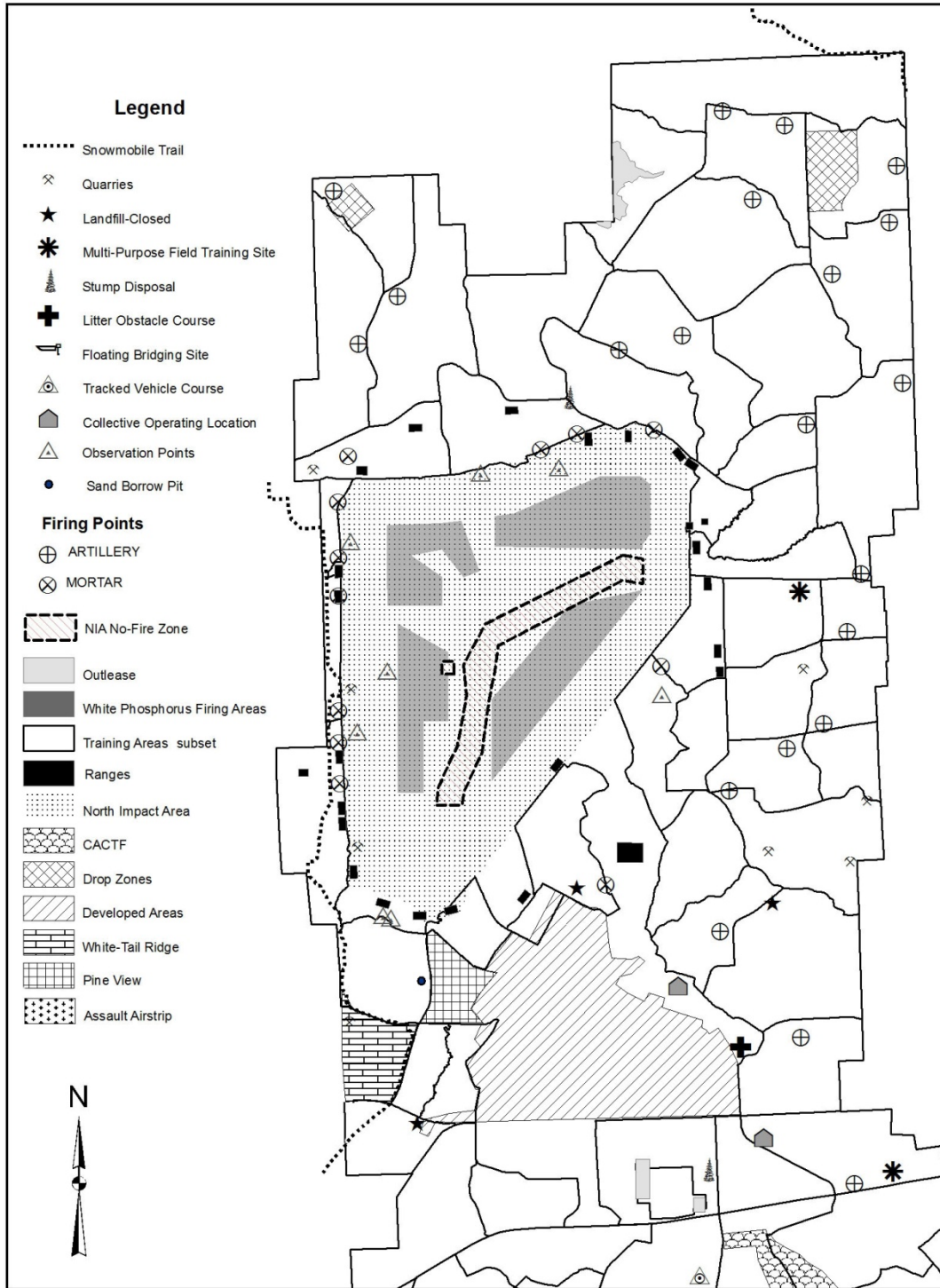


Figure 16a. Land Uses on North Post of Fort McCoy.

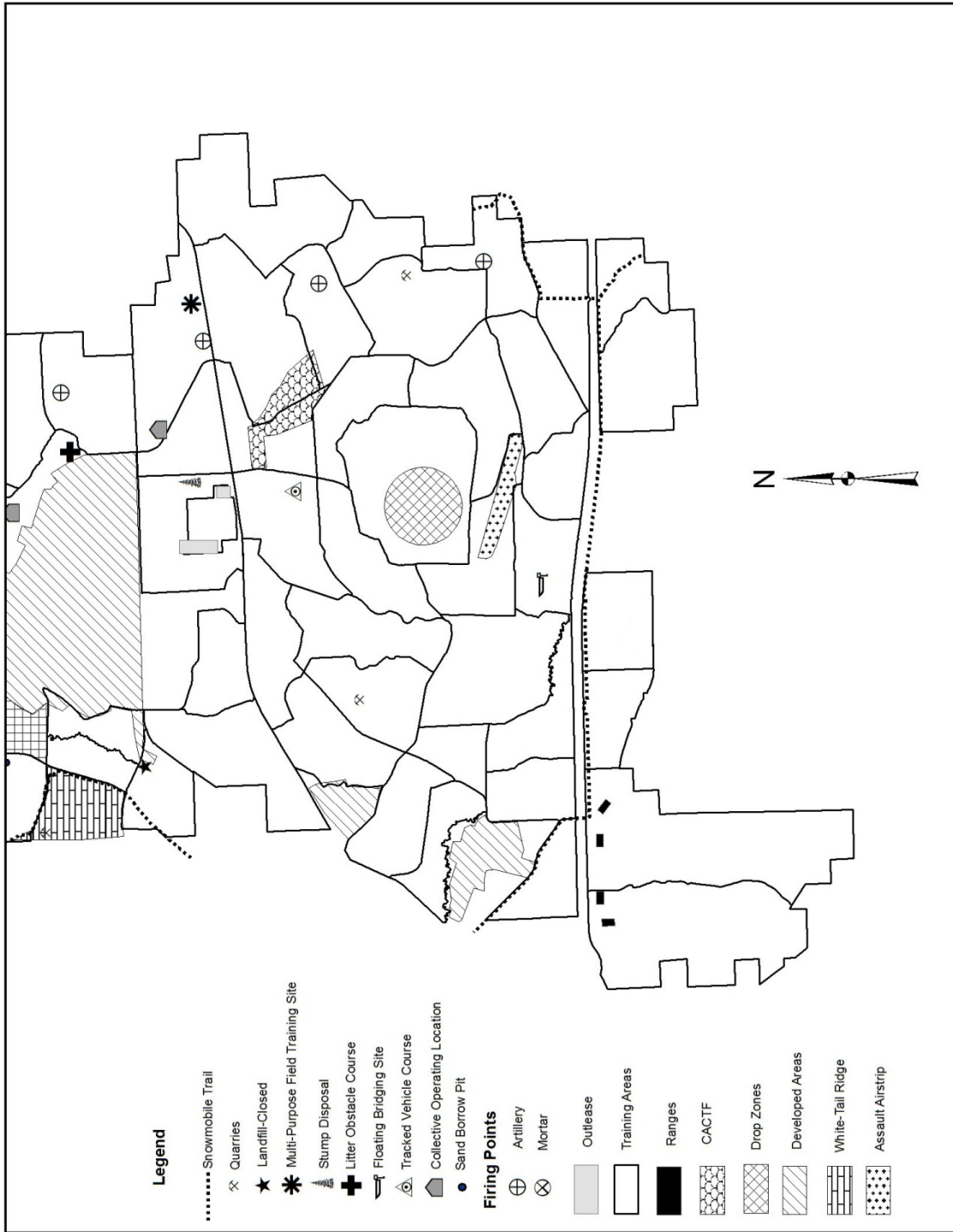


Figure 16b. Land Uses on South Post of Fort McCoy.



This project will provide additional required targets and standard range operations and control facilities. Current range does not have the required targets or standard range operations and control facilities IAW TC 25-8 2) Upgrade Range 29 Digital MPTR in FY20. This project upgrades the current MPTR to a digital capable range. Current range will not support the digital training requirements or units training at Fort McCoy

Unprogrammed Operations and Maintenance Army and Operations and Other Procurement, Army funded projects expected to occur in the next five years include: 1) Construct a Forward Arming and Refueling Point in training area C-19; 2) Relocate taxiway at Young Assault Airstrip; 3) Construct a unmanned aerial system airstrip; 4) Build courtyard walls for urban operations facilities in B-24, Mobile Urban Training Sites, and the Home Station Training Complex; 5) Add instrumentation to the Mobile Urban Training Site – North; 6) Instrument the urban training area facilities in B-24; 7) Establish an urban training area in B-25; 7) Construct an after action review building for Range 36H and Home Station Training Lane 1; 8) Upgrade Range 17A, light demolition range; relocate the vehicle recovery course training area to D-8 from B-24; 9) Construct an Airfield Seizure Village; 10) Upgrade Big Sandy Lake Water Operations Site; 11) Instrument the urban training area facilities in B-25; 12) Develop a Logistics Support Area in training area B-5. The upgrades and modernizations are expected to have minimal impact on Fort McCoy natural resources as compared to new range construction. Constructing the KD range will have a larger impact because it will expand into an undeveloped area.

### **3.1.3 North Impact Area (NIA)**

The NIA is 7773 acres and serves as the target area for artillery and aircraft weapons firing and as a safety fan for the ranges that surround it. The NIA began use around 1944 to support anti-aircraft and artillery usage and by 1959 had expanded to its current size.

The majority of the NIA is treeless and is comprised of low rolling hills. This terrain allows targets to be seen for long distances providing excellent training for gunners and forward observers. The NIA is the only impact area where high explosive ammunition is fired at Fort McCoy. The NIA is strictly off limits because of the danger of unexploded ordnance. The La Crosse River flows through the center of the NIA with a broad expanse of level to rolling ground on either side. Steep ridges surround much of the perimeter and provide some noise abatement. A scarified firebreak and berm serves to prevent wildfires from escaping and identifies the perimeter boundary.

#### **3.1.3.1 Management Considerations**

Concern over the NIA and its possible impacts to the La Crosse River resulted in WDNR, USFWS, DPTMS and DPW forming a team that met periodically in the 1990's to review data collected on water quality and training activities. One outcome of this team was the designation of a 547 acre Restricted Fire Zone around the LaCrosse River. This group no longer meets, however information and data is shared with state and federal agencies on an as needed basis.

White phosphorous (WP) firing is restricted to four areas within the NIA to avoid depositing WP into wetlands. When burning WP lands in a water body or wetland the burning is extinguished and the oxidation process slows. Waterfowl can ingest the particles while searching for food and be poisoned. A small family cemetery is located in the NIA and is designated as a no-fire zone.

While military use is the exclusive use of the NIA, this area is believed to closely resemble the presettlement prairie/savanna landscape (Simmers et al. 1995). Wild lupine thrives from the fire and surface disturbance that is common in the NIA. There is also a significant wetland complex associated with the La Crosse River. Live fire ranges using the impact area as a safety fan may have electronic target systems that can be damaged by uncontrolled fires. Using prescribed burning and firebreaks is important to keep target system damage to a minimum and it is a crucial tool to minimize lost training time. Ranges which have been prescribed burned are less likely to stop training due to safety concerns and limited visibility from smoke and fire. The goal is to maintain the NIA as a viable training resource and to maintain high water quality on the La Crosse River. There are approximately 550 acres of KBB habitat in the NIA. The frequent wildfires are thought to be beneficial to KBB habitat even though large areas may be burned at one time. Annual prescribed burning of the NIA is also implemented to reduce fuel loads and minimize wildfire burns from escaping the area. There is an active bald eagle nest in the southeast corner of the NIA.

The NIA provides a large refuge to deer during gun – deer season. Leafy spurge and spotted knapweed have been discovered growing in the NIA.

In 2008, an Operational Range Assessment Program (ORAP) Phase I Qualitative Assessment was conducted for the Fort McCoy operational range complex. The purpose of the ORAP Phase I Assessment is to evaluate operational range areas using readily available data to determine whether or not a potential existed for a release or a substantial threat of a release of Munitions Constituents of Concern (MCOC) to an off-range area at levels that may pose an unacceptable risk to human health or the environment. The MCOC are defined as those munitions constituents that have the potential to migrate from a source area to an off-range receptor (human or ecological) in sufficient quantities to pose an unacceptable risk to human health or the environment (Department of Defense Instruction (DODI) 4715.14, 2005).

The ORAP Phase I Qualitative Assessment (Malcolm Pirnie, 2008) evaluated the 226 operational ranges at Fort McCoy based on three components: (1) sources of potential MCOC, (2) migration pathways from ranges, and (3) potential off-range human and/or ecological receptors. Ranges with at least one component absent were categorized as unlikely to have MCOC migrate off-range and pose an unacceptable risk to human or ecological receptors: 161 of Fort McCoy’s operational ranges were categorized as “unlikely.” Ranges with the potential for MCOC migrating off-range and affect human or ecological receptors were categorized as “inconclusive.” Sixty-five of Fort McCoy’s operational ranges were categorized as “inconclusive” and recommended for inclusion in this Phase II Assessment.

The project goal for the ORAP Phase II Assessment at Fort McCoy is to determine whether concentrations of MCOC in surface water systems and/or groundwater are migrating from the 65 operational ranges at concentrations that present an unacceptable risk to human health and/or the environment. The Phase II Assessment will analyze media which may include surface water, sediment, benthic macroinvertebrate, and groundwater samples collected at Fort McCoy. During the ORAP Phase II Assessment, MCOC will be identified for each medium in the La Crosse-Bad Axe River Basin based on an evaluation of munitions types and environmental media. Surface water samples will be analyzed for potential MCOC including metals, explosives, and perchlorate, sediment will be analyzed for metals and explosives, and groundwater will be analyzed for metals, explosives, and perchlorate. The final round of sampling took place in June 2011 and included the collection of surface water and sediment from four separate locations on Fort McCoy. Groundwater samples from the wells at Ski Hill and Range 2 were also collected. The final ORAP Phase II report is currently under review. Fort McCoy anticipates receiving the final approved version by December 2012.

### **3.1.4 Developed Areas**

#### **3.1.4.1 Cantonment**

See paragraph 2.2.2 for more information.

#### **3.1.4.2 Housing**

See paragraph 2.2.3 for more information.

#### **3.1.4.3 Transportation**

See paragraph 2.2.4 for more information.

#### **3.1.4.4 Management Considerations**

The infrastructure of developed areas is a factor that must be taken into account when managing the land. Management activities such as deer hunts and timber sales are more visible to the public in developed areas. Several security fences were placed around the Cantonment and family housing areas. The fencing is restricting deer movement and made accessibility to some training areas more difficult for recreational use and training use. Some of the gravel parking lots and their edges are infested with exotic, invasive plants and serve as a seed source to infest new areas when vehicles drive into the training areas after parking in the Cantonment Area. In the next five years, there are new construction projects planned in the Cantonment Area and the airfield. Many of the projects are upgrades or later phases of existing facilities and are sited within the Cantonment Area. See Para. 2.2.6 for more details on future construction.

An increase of paving and parking lots in the Cantonment Area is increasing the amount of storm water runoff. Since 2010, Fort McCoy has been collaborating with EPA and Purdue University to use Purdue's Long Term Hydrological Impact Analysis (LTHIA) to delineate the watersheds. The EPA's Guidance for complying with Section 438 was used to identify preliminary low impact development (LID) practices for the 3 subwatersheds. An additional 16 developing subwatersheds were identified in which LID management practices may provide benefits in reducing runoff and non-point source (NPS) pollution. We look to utilize EPA "Smart Growth" objectives for future developments to negate storm water concerns and perhaps even resolving existing surface water quality threats.

Movement of deer in/around the Fort McCoy/Sparta Airport runway was identified as a safety problem until the airfield was enclosed by a fence in 2009 to exclude deer and provide security.

Roadsides in the training areas provide habitat for the KBB so a system of identifying KBB areas along roads has been implemented. The T&E biologist marks KBB habitat with fence posts and instructs the grounds crew not to mow those areas until late September or October.

The DPW conducts tree removal along roads during winters when snowfall amounts are below normal. Erosion is a main concern in areas of steep slopes or in the vicinity of stream crossings. Coordination between DPW and NRB is vital to minimizing impacts to water resources.

### **3.1.5 Wetlands and Fort McCoy Natural Areas**

See paragraphs 2.6.2.1 and 2.6.2.4 and figure 9 for information on wetlands and FMNAs.

#### **3.1.5.1 Management Considerations**

See paragraphs 2.6.2.1.1 and 2.6.2.4.1 for information on management considerations.

### **3.1.6 Experimental Plots and Study Areas**

Experimental plots have been established on Fort McCoy to provide scientific information needed to conduct ecosystem management. Research partnerships are established with universities and other agencies. Experimental plots, like wetlands and natural areas, can pose some restrictions to training. Unlike wetlands and natural areas, these restrictions normally result in minimal impacts to training and are usually temporary in nature. Plot locations are coordinated with Range Scheduling to ensure impacts on military training are minimized.

Studies done in the past and partners involved include:

- Study of ticks and zoonotic diseases with Michigan State University.
- Erosion control with the Construction and Engineering Research Laboratory.
- Chunkwood road construction with Cold Regions Research and Engineering Laboratory, USFS and Wisconsin National Guard.
- Oak wilt control with University of Minnesota.
- Response of lupine to disturbance with the UWM.
- Mark-recapture of KBB with the University of Wisconsin-Stevens Point.
- Flea beetle predation on leafy spurge with the U. S. Department of Agriculture.
- The KBB population modeling with the Oak Ridge National Laboratory.
- Control of leafy spurge with UWM.
- Grassland bird monitoring with UWM.
- Diplodia shoot blight research in red pine plantations with UWM.
- Developing western slender glass lizard survey techniques with the University of Wisconsin-Stevens Point.
- Characteristics of habitat utilized by phlox moths with Iowa State University.

#### **3.1.6.1 Management Considerations**

The use of experimental plots that exclude military use from that area must be well located to prevent hampering the military mission. Many of the studies do not require exclusion of training, but merely intermittent access to the sites and possible placement of data collection devices. After the study is completed the area is returned to normal use as quickly as possible. These types of studies are important for properly managing the natural resources on Fort McCoy as many of the ecological and natural community

processes are not well understood at this time. “In reality there are large gaps in our knowledge of the ecology and population biology of these species (rare plants)... Fort McCoy is a laboratory well suited for research that addresses both practical problems faced by conservationists (e.g., habitat restoration) and theoretical questions yet unanswered by science” (Leach, 2001:12).

### **3.1.7 Recreation Areas**

Outdoor recreation areas are divided into two classes. Class I areas are primarily managed for intensive use and include the Pine View Recreation Area and Whitetail Ridge Recreation Area. Class II areas are natural environment areas that support dispersed recreational activities in conjunction with other uses to include hunting, fishing, and trapping. Class II generally fall within the training areas with some of the Whitetail Ridge area undeveloped and used as Class II recreation. See Figure 16a & b for locations of Class I recreational areas.

#### **3.1.7.1 Pine View Recreation Area (PVRA)**

The PVRA is the only authorized campground and swimming area on Fort McCoy. It is a complete facility containing 148 paved camping pads, 30 tenting pads, ten lakeside cabins and other types of rentals for overnight stays. Most are equipped with full (electric, water, sewer) or electric hook-up, picnic table and grill. All types and sizes of camping units are accommodated. Located within walking distance of the campground is a five-acre picnic site with two comfort stations, two large shelter houses, grills, playground equipment, swimming beach and ample parking. A marked hiking trail of about 1.5 miles begins at the picnic area and meanders along the La Crosse River. During the turkey and archery seasons, deer and turkeys are registered at the PVRA.

#### **3.1.7.2 Whitetail Ridge Recreation Area (WRRRA)**

The WRRRA has the only marked and groomed cross-country ski trail on Fort McCoy. It also contains a downhill skiing facility with 185-foot vertical drop, four lighted slopes (the longest two are 1300 feet in length), and a T-bar lift. A water storage pond is located within WRRRA to provide water for the snowmaking machine. Other amenities include snow tubing, ski equipment rental, chalet with snack bar, lounge, restrooms, paintball course, and laser tag course.

#### **3.1.7.3 Sportsman’s Lodge**

The Fort McCoy Sportsman’s Lodge opened in fall, 2010 with a small clubhouse, rifle range, pistol range, and a trap and skeet range. Future plans include a larger lodge with a bar, restaurant and meeting rooms, and a 3-D archery range. The lodge is open to the public.

#### **3.1.7.4 Public Private Venture**

Fort McCoy has proposed the development of recreational facilities for service members and their families within the existing PVRA and WRRRA. The Proposed Action is the conversion of an undeveloped portion of the recreation areas to a Commercial Recreation District (CRD). The Proposed Action would be accomplished through a Public Private Venture (PPV) arrangement. Under the PPV arrangement, the Installation would lease land in the proposed CRD to a private contractor to develop and operate certain facilities. The size, extent, and content of each facility would be decided by the developer based on market studies conducted by the developer. If warranted, additional NEPA studies would be conducted at that time. The Preferred Alternative involves converting approximately 70 acres of undeveloped land on Ski Hill Drive to a CRD and leasing it to private vendors to develop and operate various commercial recreation enterprises. The Determination of Availability was signed on 6 August 2010 by the Deputy Assistant Secretary of the Army approving the PPV.

#### **3.1.7.5 Snowmobile Trail**

There are approximately 18 miles of authorized snowmobile trails on Fort McCoy; the northeast corner, along the west boundary, and south of US 16 (see Figures 16a & b). The trail surface is groomed by the Monroe County Snowmobile Alliance (MCSA) as needed. The Fort McCoy trail is a portion of a regional trail operated by MCSA stretching over 75 miles from Tomah to Neillsville.

### **3.1.7.6 Natural Environment Areas (Class II Recreation Areas)**

Natural environment areas make up the majority of Fort McCoy's land and are locations that support dispersed recreational activities to include firewood collecting, hunting, fishing, and trapping. These activities require a permit and may be limited due to training requirements. Other recreational activities such as photography, bird watching, and bicycling are allowed only in PVRA and WRRRA. Specific training areas/sites may be closed due to scheduled training taking place. All personnel not involved with scheduled training must consult with the Scheduling Section and/or the Fort McCoy Game line before entering any natural environment areas covered by the 82 training area delineations.

### **3.1.7.7 Management Considerations**

The NRB manages that portion of Outdoor Recreation that is related to the natural resources. The Community Recreation Division of the DFMWR is responsible for managing and maintaining the recreational activities, facilities and programs. The DPW provides mowing and other grounds maintenance support. The maintenance and use of the snowmobile trail is responsible for spreading invasive plants along its path, so more resources have to be dedicated to invasive species control and containment. The PPV project and the Sportman's Club have the potential to negatively impact training in the adjacent training areas and ranges.

### **3.1.8 Wellhead Protection Area**

The WDNR has required Fort McCoy to establish a Wellhead Protection Area (WHPA) (Figure 4) in accordance with WDNR regulation NR811. The WHPA must encompass an area that has a minimum of a five-year travel time for groundwater supplying Fort McCoy's drinking wells. It is desirable to protect a fifteen-year time of travel if possible. More information on Fort McCoy's wells is located in Para. 2.2.6.1. Fort McCoy created a Wellhead Protection Plan (WPP) to establish responsibilities and procedures for protecting Fort McCoy's water resource from contamination. The WPP lists prohibited activities and minimum setbacks required from water supply wells to various activities. In addition to the drinking wells, there is also a 100 foot buffer around all wells on ranges and within training areas.

#### **3.1.8.1 Management Considerations**

The rapid permeability of the sandy soils and sandstone bedrock on Fort McCoy that allows a quick groundwater recharge rate also increases the possibility of groundwater contamination. The predominant soils, Tarr, Impact and Boone sands have poor filtering capacity for substances that could contaminate the groundwater. Some activities that could pollute ground water are restricted within the WHPA with tighter restrictions within 1200 feet of the wells. These restrictions have direct impacts on training events associated with activities such as refueling operations, maintenance operations, grey water disposal, field latrines, or other activities that have a potential to pollute ground water resources. Management activities such as the use of herbicide for invasive plant species is also impacted by these restrictions, and therefore other control measures such as biologic or mechanical control may have to be used.

### **3.1.9 Outleases and Easements**

Fort McCoy has one agriculture outlease involving two locations totaling 90 acres (Figures 16a & b) for cranberry bogs, drainage and reservoir. One of the lease areas is called the North Flowage and is a popular fishing area. The outlease brings in \$850 per year that pays part of the administrative cost of operating the leases. These parcels are renewed every five years with the last renewal occurring in 2009.

Easements present on Fort McCoy involve utilities corridors (fiber optic cable, natural gas, and electricity), roads, administrative facilities and communications towers. The Omaha District, USACE administers the outleases and easements.

#### **3.1.9.1 Management Considerations**

Each lease has its own agreement that spells out limitations of use by Fort McCoy for training and recreation as well as limitations for the leasee. Fort McCoy's largest body of water, the North Flowage, is flooded as a result of the water storage lease. The lease allows access to the flowage from military land for recreational purposes. The cranberry agriculture outlease area on south post has no provisions allowing

recreational use of the leased land. The water storage lease and cranberry lease have little impact on military training as the majority of these areas are classified as wetlands. Pesticide use must be reported to the installation pest controller each month they are used. The income received through the outlease program is lower than the amount charged by the USACE for administration. Easements for utilities and roads bisect training areas and have some negative impacts on the training mission and wildlife habitat.

### **3.1.10 Shale Quarries and Sand Pits**

Fort McCoy has nine shale quarries and one active sand pit on the installation (Figures 16a & b). Locally excavated shale or purchased gravel was the main road surface on Fort McCoy for many years until recently when black top or “chip seal” became the preferred surfacing material. Shale is now mainly used to improve range roads and tank trails. Sand from the sandpit is used for fill material in construction projects and to spread on roads in the winter. All but two of the shale quarries have been abandoned. One abandoned shale quarry is used to stockpile, then crush cement chunks resulting from demolition projects. Another abandoned quarry was reclaimed in 1985 with dredge material hauled out of Upper Sparta Pond. Part of the dredge material was spread to a six-inch layer and the remainder was left as piles. Cottonwood trees quickly seeded in and stabilized the soil. Dredge spoils from Hazel Dell Lake were used to rehabilitate a former borrow site, this made the abandoned pit a more productive landscape.

#### **3.1.10.1 Management Considerations**

Shale and sand that is excavated close to the site where it is used can be a cost-effective material. The material is free for use on Fort McCoy and hauling costs are relatively low. Shale pits are typically located on ridge tops and are a leading cause of gully erosion on Fort McCoy. The vegetation and topsoil are removed and the area is compacted from excavation. During rain, the water cannot percolate downward and is directed out of the quarry area by opening channels on the quarries’ side. A large amount of water runs out from these openings and creates massive gullies, depositing the soil down-slope where it covers and kills vegetation. Water that does not run off the quarry sites collects and creates small wetlands. These wetlands are important sources of water for wildlife and ephemeral ponds for amphibian breeding. Roads leading to the quarries are usually steep and wash out frequently. Shale material becomes slippery from precipitation and therefore is not the best road material to use from a safety standpoint. It also has a tendency to breakdown over time, creating sediment runoff and the need to continually reapply material. Sand and other borrow pits that are left “open” for several years have a high probability of becoming infested with invasive plants, therefore efforts should be made to limit or properly site these pits to reduce impacts of invasive species.

Sandpits are highly susceptible to wind erosion. Once the topsoil and vegetation are removed it is very difficult to reestablish vegetative cover on the low fertility and droughty, coarse sandy soils. Once abandoned, the sandpit becomes a sand blowout and requires effort to stabilize it. All new sandpits require a reclamation plan to restore the site so it will benefit the training mission. Sand pits with steep, cliff-like edges may attract nesting birds such as bank swallows, cliff swallows, or kingfishers. Disturbing active nests by extracting sand is in violation of the Migratory Bird Treaty Act. All banks should be kept at a gentle slope to avoid fines or temporary closure of the sand pit.

#### **3.1.11 Stump Disposal Areas**

Fort McCoy has two authorized stump disposal areas for trees and stumps that are removed from construction projects or other removal needs such as hazard tree removal. The first stump disposal area was established in 1991 to deal with the increasing amount of debris from construction projects within and near the Cantonment Area. The second site was recently established to handle material from range upgrades on North Post. A temporary stump disposal site may be created when necessary and will go through the NEPA review process before it is used.

##### **3.1.11.1 Management Considerations**

The debris is chipped once a year (more often if it is needed) and the chips are used as landscape mulch, erosion control, or to improve accessibility along sand trails within the training and maneuver area. The public is able to gather chips for personal use if they purchase a firewood permit. In February 2005 a pile of wood chips started on fire through spontaneous combustion. Subsequent wood grinding contracts

limited the size of chip piles to prevent future fires and required enough space between the piles to allow access to firefighting vehicles. The NRB inspects these areas to determine if invasive plant species are present and then writes a control plan if any are found. Wood chips that are infested with invasive plant material have the potential to spread invasive plants to new areas.

### **3.1.12 Mound Prairie Cultural Site**

The Mound Prairie Cultural Site is 27 acres along the installation boundary south of State Highway 16. There are 12 low mounds in the area that were first reported as Native American mounds by Stephen Peet in 1883. Recent investigations have concluded the mounds are of natural origin but are still considered a sacred site by the Ho-Chunk Nation. Most of the area was covered by red pine that was planted in 1966 and 1968. In the mid-1990's the pine was harvested from the mounds without using heavy equipment. In 2010 most of the plantation was salvage harvested after a severe hail storm in July 2009 caused widespread mortality. Smaller portions of the site were planted with black walnut in 1967 and 1968, or are covered by a natural stand of jack pine. This area is not shown on the map at figure 16b to respect the privacy of the Ho-Chunk Nation.

#### **3.1.12.1 Management Considerations**

Any management activities considered for the site must be coordinated with the Ho-Chunk IAW "The Mound Prairie Sacred Area Management Plan". When the storm damage was discovered, NRB consulted with the Ho-Chunk to determine the proper course of action. The trees were harvested off most of the site but a small section along Coles Creek remained unharvested to avoid damaging part of the cultural site. The management plan (appendix G) was developed with Ho-Chunk approval that encompassed the site and surrounding area damaged by the hail storm. The actual sacred site will be managed as a savanna with the outlying area allowed to naturally regenerate back to pine forest with hand planting to augment the existing seedlings. The site is limited to dismantled military training (no vehicles) only.

### **3.1.13 Closed Landfills**

Fort McCoy has ten properly closed landfills within its boundaries. Two of the largest landfills dated back to the 1940's and 1960's. The demolition landfill was in operation for approximately 20 years in the 1990's and 2000's. All three have been closed in conformance with the WDNR rules governing landfill closures.

#### **3.1.13.1 Management Considerations**

Three of the closed landfills are off limits to vehicle traffic and soil or cap disturbance, to prevent damage to their caps. This is accomplished with fences and signs. The landfill adjacent to the LaCrosse River is managed as a sand prairie and may be placed into a prescribed burn schedule to help maintain the plant community. The closed landfill next to Range 29 is at risk of wildfires from the range. The Fire Department is not allowed to use the fire plow to control fires on the landfill cap. Fires are discouraged by keeping the grass mowed and with a series of firebreaks between the range and the landfill.

## **3.2 Management Units**

### **3.2.1 Training Areas**

Fort McCoy has 82 training areas with the capacity for military maneuvers totaling 46,648 acres. Boundaries are typically natural or cultural features that are generally easy to identify, such as, streams, ridgelines, roads or firebreaks. The installation is divided into five main areas; A, B, C, D and M. Those areas are further divided numerically. The average training area size is 580 acres and ranges from 102 to 1,460 acres.

Units training at Fort McCoy have to request specific training areas and then stay within those areas while conducting exercises. This allows the Scheduling Section to disperse the training across Fort McCoy throughout the year and to ensure safety, while minimizing training conflicts. The ITAM Program uses the training area designations to analyze the impacts associated with training loads, to provide the Range Scheduler and Range Officer with the conditions of the various training areas and

suggestions for carrying capacity of each training area, as well as the cost of rehabilitation and repair associated with varying training loads or specific events. The Scheduling Section alerts recreational users of Fort McCoy of the scheduled training areas to prevent conflicts with training, especially during the hunting season. Hunters, trappers, fishermen, and firewood collectors are required to call the GAME line (388-GAME) prior accessing Fort McCoy to get a listing of the closed areas.

The Wildlife Program uses older training area designations for deer data entry. This is to keep the information constant through the years of data collection.

### **3.2.2 Forestry Compartments**

The Forestry Program has divided the installation into 94 forest compartments ranging in size from 144 to 1183 acres, with the average size being 683 acres. The boundaries originally corresponded with training area boundaries when the first inventory was completed in 1967-1968. Over time, the training area boundaries have changed but the compartment boundaries have remained constant. In 1970, various impact areas were consolidated into the present day NIA. The result was 8 compartments removed from management (51, 52, 62, 63, 66, 67, 68, and 69).

Each compartment is further divided into stands. These are areas of similar vegetation or land use with forested stands grouped by species, age, size and stocking density. The minimum size for a stand is typically 10 acres although stands may be delineated to a smaller size if there are special management needs (high value, wildlife or T&E habitat).

### **3.2.3 Special Management Areas**

Areas with cultural or significant natural resources are considered under special management to provide the required degree of protection. Two cemeteries and a Native American Sacred Site (Mound Prairie) have been identified and protected. Known buried cultural resources sites are protected but not identified in maps or on the ground to prevent looting. There are nine KBB core areas protected from vehicle use (see the Fort McCoy Karner Blue Butterfly Endangered Species Management Plan for more details). These areas produce significant numbers of KBBs and serve as a source area to keep the population viable. The Fort McCoy Natural Areas (see figure 9) allow foot training only. The wellhead protection area requires special management to avoid contaminating the Fort McCoy's potable water supply. Specific types of training are restricted in locations with shallow water tables.

### **3.3 Natural Resources Consultation Requirements**

Fort McCoy has completed Biological Assessments for activities that may affect the gray wolf and federally endangered KBB. Section 7 consultation with the USFWS now occurs when Fort McCoy anticipates exceeding the amount of incidental take currently authorized in the USFWS's March 24, 1994 Biological Opinion and subsequent amendments, or new activities will be conducted that have not yet been assessed.

### **3.4 National Environmental Policy Act (NEPA) Review**

The NEPA review coordinates environmental reviews for projects planned on Fort McCoy in accordance with 32 CFR Part 651, Environmental Analysis of Army Actions. The NEPA process includes the systematic examination of possible and probable environmental consequences of implementing a proposed action. The NEPA review is managed by the ED.

#### **3.4.1 NEPA Goals**

The goal of NEPA review is to integrate the NEPA process into Army project planning at the earliest possible time. All construction, repair, remodeling activities, repair and maintenance of all range roads, the South Post family housing area, the airfield, range and training area modifications and upgrades are reviewed for environmental impact. The project proponent completes an internal work review information sheet and submits that along with pertinent project data to the environmental coordinator to initiate the environmental review.

“Informed decision-making using the NEPA process must be an integral part of natural resources management on installations. By following the NEPA process, damages to natural resources on Army lands can be minimized or mitigated”(Williamson, 1997:3).



The NEPA establishes policies and goals for the protection of the environment. Section 102(2) of NEPA contains certain procedural requirements directed toward the attainment of such goals. The NEPA process includes the systematic examination of possible and probable environmental consequences of implementing a proposed action. To be effective, integration of the NEPA process with other Army project planning will occur at the earliest possible time.

### **3.4.2 NEPA Categories**

The following are the five broad categories into which proposed actions on Fort McCoy may fall into for environmental review:

1. Exemption by law. The law must apply to DoD and/or Army and must prohibit, exempt, or make impossible full compliance with NEPA (40 CFR 1500.6).
2. Emergencies. In the event of an emergency, the Army may need to take immediate actions that have environmental impacts, such as those to promote national defense or security or to protect life or property, without the specific documentation and procedural requirements of other sections of this part. In such cases, at the earliest practical time, the Headquarters, Department of Army proponent will notify the Office of Director of Environmental Programs.
3. Categorical Exclusions (CATEX). These actions normally do not require an Environmental Assessment (EA) or an Environmental Impact Statement (EIS). The Army has determined that they do not individually or cumulatively have a significant effect on the human environment.
4. Environmental Assessment (EA). An EA is a public document and is required when the proposed action has the potential for:
  - Cumulative impact on environmental quality when combining effects of other actions or when the proposed action is of lengthy duration.
  - Release of harmful radiation or hazardous/toxic chemicals into the environment.
  - Violation of pollution abatement standards.
  - Some harm to culturally or ecologically sensitive area.
5. Environmental Impact Statement (EIS). An EIS is a public document with a primary purpose of ensuring that NEPA policies and goals are incorporated early into the programs and actions of Federal agencies. An EIS is required to provide a full and fair discussion of significant environmental impacts. Along with other project documentation, the EIS provides a basis for informed decision making. Further, it allows a public review and comment on the proposal.

The following are actions normally requiring an EIS:

- Significant expansion of a military facility, such as a depot, munitions plant, or major training installation.
- Construction of facilities that have a significant effect on wetlands, coastal zones, or other areas of critical environmental concern.
- The disposal of nuclear materials, munitions, explosives, industrial and military chemicals, and other hazardous or toxic substances that have the potential to cause significant environmental impact.
- Major changes in the mission of facilities either affecting areas of critical environmental concern or causing significant environmental impact.
- Land acquisition, leasing or other actions that may lead to significant changes in land use.
- Training exercises conducted outside the boundaries of an existing military reservation where significant environmental damage may occur.

### **3.5 Partnerships and Collaborative Resource Planning**

The NRB actively participates in partnerships and resource planning to enhance awareness and work collectively to manage resources for the following projects or organizations:

- Clear Creek and Stillwell Creek stream monitoring trends with the USGS, WDNR, Monroe Co., NRCS, and EPA
- Monroe County Invasive Plant Species Working Group
- The KBB Recovery Groups

- Trout stream habitat restoration (Trout Stamp & Trout Unlimited)
- Lake Restoration (Lake Tomah, Angelo, and Perch Lake)
- American Fisheries Society (WI Chapter)
- Wildlife Society (WI Chapter)
- Wisconsin Prescribed Fire Council

### **3.6 Public Access and Outreach**

Public access for outdoor recreation activities dates back to 1962 when the Camp McCoy Fish and Wildlife Advisory Council approved small game, gun deer and archer seasons. In 1963, the first cooperative agreement was signed by the Wisconsin Conservation Department, USFWS and Camp McCoy that allowed the Army to manage the wildlife on the installation. The Sikes Act and AR 200-1 state that Army installations that are suitable for recreational use are open to public access for hunting, fishing, and trapping. This access is subject to requirements necessary to ensure safety and military security. More information about recreational access is found in paragraph 4.14.2.

#### **3.6.1 Outreach Objectives**

The NRB conducts natural resources awareness activities within the Fort McCoy community in accordance with DPW and mission priorities. If the mission dictates, awareness activities are also considered for implementation on a case by case basis within the surrounding area. The objectives of these activities are to:

- Showcase the natural resources present on Fort McCoy.
- Highlight the work done to protect and enhance the resources.
- Educate the workforce and trainers on compliance requirements for natural resource laws and regulations.
- Explain program goals and activities.
- Encourage support for management activities and projects.

#### **3.6.2 Military Personnel Awareness**

The SRA program under ITAM takes the lead on educating the military about the environment (Para. 1.5.2.1.1.4.4). The NRB provides KBB information to Range Branch, Facilities and Grounds and LRAM to avoid unnecessary take. This may be either presentations by the T&E biologist or an information packet sent for review and signature.

#### **3.6.3 Public Awareness**

Any request for public awareness activities are requested through the Fort McCoy Public Affairs Office then routed to DPW and ED. The activity can be supported if it is determined to be a benefit for Fort McCoy and the NRB staff is available. Some past activities include the following:

- Presentations at meetings of professional societies.
- Field trips for universities, local schools, nongovernmental environmental organizations and state and local government agencies.
- Annual Arbor Day Ceremony to highlight the importance of trees in everyday life.
- Informational booths at Armed Forces Day.

#### **3.6.4 Volunteer Programs**

Volunteer work is greatly encouraged and appreciated. Each year numerous volunteers participate in a wide variety of projects. These projects help to meet the management goals and provide beneficial experiences for the volunteer participants. Some past volunteer projects included:

- Invasive plant species surveys and control.
- Maintaining artificial nesting structures for several bird species.
- Assistance with spotlight deer surveys.
- Apple tree surveys and brush clearing.
- Rough white lettuce planting and surveys.
- Assist with whitetail deer harvest registration.

- American chestnut introduction and monitoring.
- Forest inventory data collection.
- Providing volunteer opportunities to military and civilian personnel.

### **3.6.5 Environmental Education**

The NRB has been honored in supporting and leading numerous environmental education and outreach programs both on and off the installation. The NRB has been involved with the following programs:

- Badger Challenge Academy.
- Sparta Area Independent Learning School.
- High School science and environmental groups extra-curricular field trips.
- West Salem School District 7<sup>th</sup> Grade Outdoor Education Program.
- Eagle and Boy Scout projects provide a chance for scouts to participate in wildlife projects.
- Teacher environmental workshops.
- Conducting conference field trips.
- Hosted a two day session for area teachers as part of the Science Technology, Engineering, and Math (STEM) grant program.

### **3.6.6 Research Opportunities**

Research projects prove beneficial to the NRB by providing insight into species diversity and management goals and strategies. Where appropriate, NRB will continue to support graduate student research projects and collaboration efforts with federal, state, and local agencies and universities on natural resources issues.

### **3.7 Encroachment Partnering**

Encroachment is the cumulative result of internal and external activities/events that inhibit normal military training, testing, and operations. It is the result of any activity, law, or pressure that affects the ability of military forces to train to doctrinal standards or to perform the mission assigned to the installation. The Army program to address encroachment is called Army Compatible Use Buffers (ACUB). The ACUBs establish buffers around Army installations to limit effects of encroachment and maximize the amount of land inside the installation that can support the mission. Fort McCoy does not have an active ACUB program as of 2012 but efforts are underway to establish one.

A Joint Land Use Study (JLUS) is a way to reduce potential conflicts between military installations and stakeholders while sustaining economic growth and development, protecting public health and safety, and protecting military missions. Planning has started for a JLUS for Fort McCoy and will involve elected officials from the local communities of Sparta, Tomah, Monroe County, Jackson County, and the towns of Adrian, Angelo, Grant, Greenfield, LaFayette, and New Lyme in Monroe County. The Mississippi River Regional Planning Commission is a partner in this process.

### **3.8 State Comprehensive Wildlife Plan**

The Wisconsin Wildlife Action Plan focuses on efforts to conserve species of greatest conservation need. The plan identifies native wildlife species with low or declining populations, the habitats associated with these species, and conservation actions that are needed to ensure these species do not become listed as threatened or endangered.

Sixteen ecological landscapes have been identified in Wisconsin based on their ecological attributes and management opportunities. Fort McCoy is included under the Western Coulee and Ridges Ecological Landscape. The Wisconsin Wildlife Action Plan includes Fort McCoy as part of a larger Conservation Opportunity Area (COA) called the Fort McCoy Barrens and Oak Savanna COA and is of continental significance because of the rare natural communities and species it contains. The INRMP management efforts that tie into the Wisconsin Wildlife Action plan include:

- Oak savanna restoration.
- Sand prairie and oak barrens restoration and maintenance.
- Goat prairie restoration and maintenance.

- Grassland wildlife management.
- Management of floodplain forests and large southern upland forest tracts.
- Restoration and maintenance of red and white oak as a cover type.
- Protection of rare features found only in the Driftless Area.
- Preservation of cliff communities, along with cave and bat hibernacula.
- Restoration and protection of spring-fed cold water streams.
- Big river protection and maintenance. Some of these streams support especially rich or otherwise significant assemblages of fish, reptiles, reptiles and aquatic invertebrates.

### **3.8.1 Additional Documents Citing Fort McCoy's Ecological Significance**

In addition to its listing in the Wisconsin Wildlife Action Plan, Fort McCoy is listed as a Land Legacy Place in Wisconsin by the WDNR. The WDNR gives Fort McCoy five stars out of a possible five stars for its conservation significance, specifically noting the coldwater streams, grasslands, and rich reptile and insect communities.

The Wisconsin Bird Conservation Initiative lists the Fort McCoy-Robinson Creek Barrens as a Wisconsin Important Bird Area citing the area as the largest and best-maintained barrens and savanna in the entire upper Midwest.

### **3.9 Climate Change Vulnerability Assessment**

The Wisconsin Department of Natural Resources, along with the University of Wisconsin are working together in a partnership titled the "Wisconsin Initiative on Climate Change Impacts (WICCI)". This partnership is looking at past data to determine how Wisconsin's climate has changed and to make predictions on future climate conditions. WICCI has released its first comprehensive report, Wisconsin's Changing Climate: Impacts and Adaptation. As stated in the WICCI website: "The report will serve as a resource for business executives, government, natural resource managers, public health officials and other decision makers as they take strategic steps to preserve jobs, invest resources wisely, build resiliency and protect our built and natural environment in the face of a changing climate." The goals of WICCI are to:

- Assess and anticipate climate change impacts upon Wisconsin's natural and built environments.
- Evaluate risks and vulnerabilities within our ecosystems, infrastructure, industries, agriculture, tourism and other human and natural systems.
- Recommend practical adaption strategies and solutions that businesses, farmers, public health officials, municipalities, resource managers and other stakeholders can implement.

NRB will use these reports to help guide adaptive management strategies within the INRMP.

#### **3.9.1 Wisconsin Climate Trends**

The following is a summary of Wisconsin's climate trends from 1950-2006.

- Statewide average temperature increased 1.5<sup>0</sup>F.
- The greatest amount of warming is occurring in winter and spring, especially in northwest Wisconsin.
- Nighttime low temperatures are warming faster than daytime highs, especially in summer.
- There has been a decline in extremely cold winter nights, especially in northwest Wisconsin.
- The date of the last spring freeze is occurring 6-20 days earlier.
- The date of the first fall freeze is occurring 3-18 days later.
- The growing season has increased up to 4 weeks.
- Statewide annual average precipitation has increased 15% although areas of northern Wisconsin became drier.

#### **3.9.2 Wisconsin Climate Projections**

The following is a summary of future climate projections for Wisconsin.

- Average temperatures will increase 4-9<sup>0</sup>F.
- The winter time period will see the most pronounced warming.
- There will be fewer extremely cold winter nights and more hot summer days.
- The likelihood of 3-inch or more rainstorms will increase during the spring and fall.

### **3.9.4 Affected Resources on Fort McCoy**

How will climate change impact the fish and wildlife species found on Fort McCoy. It is projected that the following will occur:

- Tree species, such as, jack pine, red pine, and aspen will retreat northward and will become a much smaller component of the forest landscape.
- There will be a decline in tree species diversity.
- New forest pests and diseases will occur.
- Though annual precipitation will increase, warmer temperatures will result in increase evapo-transpiration resulting in drier soils.
- The likelihood of summer wildfires will increase.
- Some wildlife species will see either range expansions or contractions.
- Migration patterns will change with earlier arrivals and later departures while some species may not migrate at all.
- Plant and insect phenology could change rapidly resulting in insect emergence at times when host plants are not available.
- Cold water fish species, such as brook trout, may disappear from streams due to warm water temperatures.
- Cause increased mortality for KBB larva and adults.

### **3.9.5 Fort McCoy Management Actions**

Fort McCoy is in the initial stages of modifying land management activities in an attempt to minimize these impacts. A few examples of these modifications are:

- With increasing air temperatures and the severity of storms, it will become more critical to maintain KBB habitat in shaded areas that offer refuge areas for the butterfly. Instead of using herbicides to kill the sapling and shrub component, mechanical alteration of the habitat will be utilized allowing for re-growth of these species. Completing this management on a rotational basis will ensure habitat both within open and partially shaded areas.
- Maintaining tree and shrub species along streams will buffer temperature increases. In some instances, this may require the planting of trees within the riparian areas that will offer future shade to the stream.

## 4.0 PROGRAM ELEMENTS

### 4.1 Threatened and Endangered Species Management

Fort McCoy has taken a proactive approach in managing T&E species on the Installation. This has greatly reduced any negative impacts to the military training mission. The focus of T&E management is savanna habitat management to enhance populations of the federally endangered KBB (Figure 17). A list of T&E species present is in Appendix F, Table 7.

The goals for the program are:

- a. Support the continuance of the military training mission while at the same time maintaining compliance with all applicable federal and state laws and regulations, such as the Endangered Species Act of 1973.
- b. Continue to protect/manage state and federal T&E species found on Fort McCoy while allowing the successful completion of the military mission.
- c. Adopt, to the maximum extent possible, the KBB Federal Recovery Goals established for Fort McCoy in order to assist with the conservation of this species.
- d. Educate Soldiers, civilian employees and individuals in the surrounding communities on the importance of managing/conserving T&E species.



Figure 17. Female Karner blue butterfly.

#### 4.1.1 Management Activities

- Have an open line of communication with all persons and agencies interested in or who may impact KBBs and other T&E species.
- Review projects through the NEPA review process to eliminate or minimize negative impacts to KBBs. Coordinate all management and research activities with DPTMS as well as other NRB programs to ensure compatibility.
- Submit reports to the compliance agencies.
- Conduct annual briefings to the segment of the workforce that might impact T&E species.
- Document occurrence records for listed species.

#### 4.1.2 Karner Blue Butterfly Surveys and Management

The KBB was listed as federally endangered in 1992. The Fort McCoy KBB Management Plan is currently being revised and will be finalized in the near future. The main management objective of this plan is to assist in the conservation of the KBB while accomplishing the military mission. The goals of the current plan are to:

- a. Maintain two Large Viable Metapopulations (LP) of KBBs.
- b. Continue to conserve the population of KBBs found within Training Areas A1 and A2.
- c. Maintain connectivity between the North Post LP and the KBB population located on Black River State Forest (BRSF) lands south of Interstate 94.

The major actions required to meet the management objectives and conservation goals are:

- a. Maintain a positive disturbance regime through military training, silviculture, wildlife, and specific KBB habitat management practices.
- b. Control or eradicate invasive plant species that have the ability to displace lupine and nectar species.
- c. Implement a monitoring plan that will: provide population estimates; provide presence and/or absence data; and provide for re-surveying the installation for KBB habitat on a 10 year interval.
- d. Continue to review projects through the NEPA review process to eliminate or minimize negative impacts to KBBs.
- e. Continue to enhance KBB habitats in training area C21 to facilitate the movement of KBBs between Fort McCoy and BRSF lands.
- f. Continue to provide KBB awareness information to Soldiers and those civilian employees whose activities may impact KBBs or their habitat.

#### **4.1.2.1 Management Activities**

- Utilize distance sampling using straight-line transects to estimate KBB populations annually. Surveys are conducted at 22 sites annually during both the spring and summer flights. The survey protocol states that each site will be surveyed on a seven-day interval. This is not always possible due to inclement weather conditions and conflicts with military training.
- Monitor KBB habitat at selected sites to determine changes in nectar availability and canopy cover. Vegetation data is collected at ten KBB survey sites twice annually. The goal of KBB habitat monitoring is to detect changes in vegetation that is believed to be important to KBBs. Data collected will be used to assist in determining the cause of KBB population trends, either long term declines or increases. The protocol for collecting this data was first used on Fort McCoy in 2006, not enough time to see any trends. A secondary use of data is to assist in determining when to conduct management activities within a site.
- Re-map KBB habitat every 10 years. Wild lupine is the sole host plant for larvae of the KBB. The first survey to identify the location and density of all wild lupine patches on Fort McCoy was conducted in 1991 through 1994. A re-inventory of wild lupine was initiated in 2001 and completed in 2006. A third survey will be completed between 2012 and 2014. All incidental take calculations are completed using acres of lupine disturbed.
- Conduct presence/absence surveys within all KBB habitat patches to determine percentage of habitat being used by the butterfly. The KBB presence/absence surveys were conducted from 1991-1994, from 1996-2002, and again from 2006-2008. In all three instances, survey results indicated that over 90% of lupine patches on Fort McCoy are used by KBBs. Presence of KBBs is confirmed by observing adult KBBs, larvae, or eggs. In general, the 1995 Wisconsin Habitat Conservation Plan protocol for conducting presence/absence surveys is followed. The areas most likely to contain KBBs within and/or around each lupine patch are searched three times before determining that KBBs are absent.
- Complete habitat management activities as specified within the KBB Management Plan. This generally includes the control of undesirable vegetation through mowing, shredding, prescribed fire, removal by chainsaw and brush cutters, and herbicide application.
- Complete mitigation actions (re-planting of wild lupine and nectar species) required due to permanent loss of habitat resulting from construction projects. Lupine seed and selected seed from nectar species will be harvested annually to be used to complete this action.

#### **4.1.3 Gray Wolf Surveys and Management**

The first resident gray wolf was documented on Fort McCoy in 1999. Since that time wolves have occupied a territory that encompassed most of North Post and adjacent private land. During the winter of 2009/2010, a pair of wolves established a territory on South Post. Fort McCoy has a valid Gray Wolf Management Plan. The objective of the management plan is to assist in the conservation of the gray wolf while accomplishing the military mission. This will be accomplished by protecting known den and rendezvous sites, maintaining habitat, and maintaining an adequate prey base for wolf survival.

The conservation goal is to maintain habitat suitable to support a minimum of one wolf pack on the installation. Actions required to meet the management objectives and conservation goal are:

- a. Continue with a Wolf Awareness Training Program to educate soldiers, civilian employees, recreational users of Fort McCoy, and surrounding landowners.
- b. Protect known wolf den and rendezvous sites.
- c. Maintain an adequate prey base.

#### **4.1.3.1 Management Activities**

- Conduct track surveys during winter months to estimate populations.
- Conduct howling surveys during summer months to determine if pups are present within the pack(s).
- Utilize remote cameras to assist in determining wolf numbers on the installation.
- Maintain over-winter white-tailed deer populations at 20-25 deer per square mile through hunting seasons.

- Limit disturbances to known den and rendezvous sites by maintaining a 100 meter buffer around them.
- Continue the ban on coyote hunting during the gun-deer season to prevent accidental shooting of gray wolves.
- Continue with ban on coyote hunting with dogs on North Post.
- Continue to limit coyote trappers to using #2 offset coil spring traps or smaller to increase the likelihood that wolves can pull out of traps if captured.
- Provide all survey results to the WDNR for inclusion in statewide data summaries.
- Fort McCoy will coordinate future wolf harvest activities with the WDNR. It is likely that not all harvest methods currently approved in Wisconsin will be allowed on Fort McCoy. For instance, the use of hounds to hunt wolves will not be allowed on the installation. Since Fort McCoy wolf pack territories extend off the installation, Fort McCoy intends to be conservative when setting harvest levels since it is possible wolves from these packs could be killed off the installation.
- Fort McCoy will authorize USDA-Animal and Plant Health Inspection Service (APHIS)-Wildlife Services to trap and euthanize up to one mile within the installation borders any wolves that depredate on livestock or pets near residential areas adjacent to the installation, as the military mission allows.
- Continue to work with the WDNR and with USDA-APHIS-Wildlife Services in an attempt to capture and place telemetry collars on additional wolves. The WDNR aircraft used for monitoring wolves will be allowed access to Fort McCoy airspace when the military training mission allows.

#### 4.1.4 Blanding's and Wood Turtle Surveys and Management

Both the Blanding's turtle and wood turtle are state threatened species while the Blanding's turtle is also considered a federal species of concern. The primary intent of this project is to gather baseline information on the distribution and habitat utilization of Blanding's and wood turtles on Fort McCoy. Information gathered during the project will be used when drafting a Biological Assessment if Blanding's turtles are federally listed. In addition, the information is used to assess impacts of construction and maintenance projects, military training activities, and fish habitat improvement projects on the turtles. Specific objectives of the surveys and telemetry monitoring are to: 1) identify hibernating areas; 2) identify nesting areas; 3) identify habitat utilization preferences; 4) obtain home range estimates; and, 5) provide an opportunity for students to assist with data collection and analysis as part of their outdoor education curriculum (Figure 18).



Figure 18. Student with Blanding's turtle.

##### 4.1.4.1 Management Activities

- Continue telemetry monitoring project. Transmitters are attached to eight to ten turtles annually. These turtles are located numerous times throughout the year in order to obtain home range estimates, identify hibernating areas, identify nesting areas, and to identify habitat utilization preferences. Information gathered is used to assess impacts of construction and maintenance projects, military training activities, and fish habitat improvement projects on the turtles.
- Continue surveys to determine distribution of Blanding's and wood turtles on Fort McCoy. Observations of both species have been maintained since the late 1970's, however, surveys specifically targeting these species were not conducted on Fort McCoy from 1982 through 1999. Surveys are now conducted annually as resources allow. Surveys are conducted by walking marsh and stream edges searching for turtles that have recently emerged from hibernation or that are basking in open areas.



- Continue to allow students to participate in the project as part of their outdoor education curriculum.

#### **4.1.5 Red-tailed Prairie Leafhopper Survey and Management**

The red-tailed leafhopper is an Army species at risk, a federal species of concern and a Wisconsin state endangered species. Initial surveys for this species were conducted in 1997 when they were found in 12 locations on the installation. Additional surveys were completed in 2008, 2009, and 2010 documenting the leafhopper in 47 locations. Many of the leafhoppers were located in prairie remnants found on steep slopes. These areas are referred to as goat prairies. Since 1997, many of these goat prairies have been expanded by removing trees and brush.

##### **4.1.5.1 Management Activities**

- Conduct surveys in sites known to contain the red-tailed prairie leafhopper and in other suitable habitat areas.
- Conduct management activities of goat prairies dependent upon survey results.

#### **4.1.6 Phlox Moth Survey and Management**

The phlox moth is a federal species of concern and a Wisconsin state endangered species. This species was first documented on Fort McCoy in 1993. When resources allow, surveys for this species are conducted annually. To date, this species has been documented in 105 separate habitat patches.

##### **4.1.6.1 Management Activities**

- Conduct surveys in known habitat areas.
- Map the habitat of phlox moths on the Installation and update as resources allow.

#### **4.1.7 Bullsnake Surveys and Management**

Bullsnares are a state of Wisconsin species of concern. Occurrence records for this species have been documented since the mid-1980s. A telemetry monitoring project was initiated in 2005. The goals of this monitoring project are to determine the distribution on the installation; identify habitat utilization preferences; obtain home range estimates; identify hibernation/denning sites; and to gather information on growth rates. Information gathered is also being used to assess and minimize impacts of construction and maintenance projects, military training activities, and natural resource management activities on bullsnares and their habitat.

##### **4.1.7.1 Management Activities**

- Conduct surveys in early April to identify denning sites and to capture new individuals.
- Place passive information transponders under the skin of bullsnares to identify individual snakes if recaptured.
- Surgically implant telemetry transmitters in selected snakes and continue to monitor these snakes as resources allow.
- Continue to educate Soldiers, civilian employees and other interested individuals concerning this species.

#### **4.1.8 Regal Fritillary Surveys and Management**

The regal fritillary is an Army species at risk, a state endangered species, as well as a federal species of concern. This species was first documented on Fort McCoy in 2010.

##### **4.1.8.1 Management Activities**

- Conduct surveys to determine current distribution of this species on the installation.
- Dependent upon survey results, develop management guidelines specific to this species.

#### **4.1.9 Bald Eagle Surveys and Management**

The bald eagle was removed from federal listing in 2007 but is still a federally protected species. There are currently two active eagle nests on the installation. Surveys will continue for a minimum of five years post delisting pending availability of resources.

##### **4.1.9.1 Management Activities**

- Periodic visits will be made to previous nest locations to determine eagle presence within these territories.
- Periodic checks of nest sites will be made to determine nesting success.

#### **4.1.10 Osprey Surveys and Management**

Ospreys were removed from the state threatened species list in 2009. Osprey nests are monitored annually to determine nest success. Ospreys are currently nesting on man-made platforms as well as natural nests. Nest monitoring will continue dependent upon availability of resources.

##### **4.1.10.1 Management Activities**

- Periodic visits will be made to previous nest locations to determine osprey presence within these territories.
- Periodic checks of nest sites will be made to determine nesting success.
- Install new nest platforms as need requires and resources allow.

#### **4.1.11 Rough White Lettuce Surveys and Management**

In the early 1980's, rough white lettuce, a state endangered species, was documented in one location on Fort McCoy. Subsequent surveys conducted in the early 1990's were unsuccessful in locating this plant. In 1998, a new population was discovered in an area that was prescribed burned in 1997 and 1998. Seeds from these plants were collected and planted in additional locations on the installation. In 2002, a second population was discovered in an area that had recently been prescribed burned and a third population was found adjacent to the second. Subsequent surveys have not found any new populations and the existing populations are monitored periodically to determine their status.

##### **4.1.11.1 Management Activities**

- Periodically prescribe burn rough white lettuce areas to stimulate growth.
- Conduct surveys as resources allow for documenting the location and number of rough white lettuce plants.
- Collect and plant seeds to increase the population.

#### **4.1.12 Cerulean Warbler Surveys and Management**

The cerulean warbler is a state threatened species and a federal species of concern. A singing male was first documented on the installation in 2009. Additional surveys conducted on Fort McCoy in 2010 documented two singing males.

##### **4.1.12.1 Management Activities**

- Conduct surveys annually in areas where cerulean warblers were previously found.
- As resources allow, expand surveys to other areas of suitable habitat in an attempt to document additional warblers on the installation.
- Attempt to verify nesting activity (i.e. female warblers).

#### **4.1.13 Henslow's Sparrow Surveys and Management**

The Henslow's sparrow is an Army Species at Risk, a state threatened species, and a federal species of concern. Observations of this species on Fort McCoy occurred during the 1990s. The last known observations occurred during 2001. In 2007 and 2008 Henslow's sparrow surveys were conducted on the installation. No observations were recorded. Fort McCoy lies on the northern edge of the Henslow's sparrow range. Little preferred habitat, large areas of tall dense grasses, occur on the installation.

#### **4.1.13.1 Management Activities**

- Conduct surveys periodically as funding allows.

#### **4.2 Law Enforcement of Natural Resources Laws and Regulations**

Enforcement of natural and cultural resources laws are a vital aspect of management. Rules and regulations are developed (see para. 4.2.1 and 4.14.3) to protect rare or unique species, protect sensitive areas and keep sportsmanship an active part of hunting, trapping and fishing.

##### **4.2.1 History and Authority**

The Patrol Operations Branch under the Fort McCoy Police Department of the Directorate of Emergency Services provides a game warden as needed during the hunting, fishing and trapping seasons and enforces all laws on Fort McCoy. They provide road and range patrols, military police investigations, crime prevention, and physical security.

Since Fort McCoy starting allowing hunting and fishing on post in the late 1950's, game warden responsibilities have gone through many changes. In the early 1960's, additional military police were brought in from other bases and federal agents were on base to process violators. In 1973, the first conservation warden was hired. At the present, conservation warden duties are assigned to one of the civilian officers. More officers are assigned warden duties during the gun-deer season.

The NRB is the proponent organization for hunting, fishing, trapping and firewood regulations and initiates the yearly review, update and approval of all natural resource regulations. The regulations are coordinated with the Fort McCoy Process Improvement Board (PIB) and staffed for Command approval far enough in advance of the specific season for the process to be completed in time.

The Installation Commander has the authority and responsibility to enforce natural resource laws under 16 USC § 670a (b) (3) (A), 10 U.S.C. § 2671(c), and AR 200-3, paragraph 1-24 (b).

##### **4.2.2 Jurisdiction**

Fort McCoy has areas of concurrent and exclusive federal jurisdiction. Enforcement can be performed by state and federal officers in areas of concurrent jurisdiction. Department of the Army police enforce laws in areas of federal exclusive jurisdiction. Fort McCoy uses the Federal Magistrate Court to adjudicate violators who are issued natural resource violations.

##### **4.2.3 Enforcement Activities**

Natural resources enforcement on Fort McCoy occurs year-round, with particular emphasis on the various hunting and fishing seasons. With the adoption of early trout season and spring turkey hunts, the hunting and fishing season is essentially year-round. The gun-deer season has a greater influx of sportsman and the PIB responds by increasing the number of game wardens available.

##### **4.2.4 Training**

The Sikes Act mandates that DoD installations employ adequate numbers of professionally trained natural resources personnel, including law enforcement personnel, to implement the INRMP. The Act authorizes DoD to enforce all federal environmental laws. The DODI 4715.03 (14 Feb 2011) (page 19) states, "DoD components shall ensure that sufficient numbers of professionally trained ... natural resources law enforcement personnel are available..."

#### **4.3 Wetlands Management**

The NRB manages wetlands to maintain or improve the wetland quality. Wetlands are important features for watershed management as they filter storm and flood water and recharge groundwater aquifers. Wetlands and associated floodplains provide important buffering capacity for streams to ultimately maintain fishery and water quality to negate any potential impacts as a result of military maneuvers and watershed developments. The Environmental Compliance Branch plays a role in wetland management whenever wetlands are impacted, requiring regulatory compliance specific to wetland losses. There are over 4,000 acres of wetlands on Fort McCoy. A description of Fort McCoy wetlands is detailed in para. 2.6.2.1. The NRB will actively manage between 100-300 acres annually.

Timber harvesting activities in wetlands are done during winter months or when areas are dry to ensure harvesting equipment does not cause damage or excessive rutting. Swamp hardwoods and aspen in the wetlands will be harvested based on recommendations from the wildlife biologist to increase ruffed grouse habitat. White pine will be thinned to increase the diameter of remaining trees. Precautions such as higher residual basal areas and leaving dominant trees will be taken into account to ensure crop trees are windfirm since root systems tend to be shallow on these sites. The use of vehicles and heavy equipment for timber harvesting in wetlands is restricted to frozen ground conditions. Beyond this exception for timber harvests, and for travel on established roads/trails, there is a 25-meter buffer zone of no vehicle travel around wetlands and waterways.

Federal facilities are to maintain “no net loss of wetlands.” Construction and building expansion on Fort McCoy has significantly increased without direct impact to wetland habitat. Wetland banking and mitigation concepts are being pursued with the expectation there may be wetland impacts that are unavoidable with future growth. In 2002, the first wetland mitigation project was initiated that was required for completing the eastern maneuver road project. The mitigation involved creating a 1.4-acre wetland to buffer Squaw Creek from stormwater runoff originating at Anderson Shale Pit and associated roadways. The wetland has been re-shaped and lined with soil clay amendments. In addition, a solar powered well was installed to assure proper plant hydration throughout the growing season. Non-native plant species are controlled to enhance the native wetland plants. Additional monitoring and prescribed burning are also conducted there to ensure quality and compliance. Wetland mitigation requires annual monitoring and reporting to the USACE.

In 2008, a wetland delineation contract was implemented to help DPW and DPTMS avoid construction and watershed development conflicts with wetlands. The contractor surveyed Fort McCoy lands to show wetland area boundaries by investigating three factors; hydric soils, hydrology, and hydrophytic plants. Master planning will use this information to plan future facility and infrastructure projects. The NEPA process is also used to avoid negative wetland impacts.

In 2009, the Wisconsin Wetland Association (WWA) established a new outreach program that highlights some of the best wetlands in Wisconsin. Fort McCoy was a participant of the WWA *Wetland Gems* program which recognized two wetlands on Fort McCoy that were characterized as a lowland hardwood and coniferous swamp area. The program goal is to increase public awareness and appreciation of the state’s wetlands. This recognition demonstrates the ability of Fort McCoy to train Soldiers and maintain stewardship of high quality natural resource habitat.

#### **4.3.1 Management Activities**

- Control beaver populations through trapping to prevent degrading trout habitat, flooding roads or drowning large areas of timber.
- Maintain diverse wetland communities through prescribed burning, open water creation, and the control of woody vegetation.
- Survey, monitor, and control invasive plant species such as reed canary grass, purple loosestrife, glossy buckthorn, and other species.
- Manage and maintain natural integrity of rare bog communities.
- Survey and evaluate potholes that were made in the early 1980s for the presence of invasive plants.
- Identify and treat any pristine wetland sites that have small populations of reed canary grass.
- Use the NEPA review process to avoid or minimize impacts to wetlands, including ephemeral ponds, from construction and maintenance projects.
- As funding allows, continue to delineate wetlands on the installation and update that information in the GIS database.
- If needed, establish a wetland bank or wetland partnership. One option is to purchase lands to allow wetland banking off the installation.
- If needed, develop an opportunity to purchase wetland credits for smaller wetland impacts.
- Map ephemeral ponds when observed.
- Survey and evaluate wetlands to develop management strategies to control nuisance wildlife and maintain healthy wetland communities.

#### **4.4 Fisheries Program – Watershed Management**

The Fort McCoy fisheries program manages for healthy and viable aquatic resources on a watershed scale. Having high quality aquatic resources is important for the military mission and supports the public trust. See chapter 2.6.1 for more water resource information. Other paragraphs in this INRMP address initiatives to promote water quality; these include 2.6.1, 3.1.8, 4.3, 4.11, and 4.22.1. Program goals are:

- a. Promote the successful completion of military training missions by maintaining high quality aquatic resources.
- b. Maintain and improve aquatic ecosystem integrity.
- c. Provide recreational opportunities. Fort McCoy supports EO 12962 on recreational fisheries by providing access to the general public.

##### **4.4.1 Management Activities**

- Develop and manage contracts for watershed and water quality management. Prepare the annual “State of Fort McCoy Waters Report”.
- Develop annual work plans and management plans. Update 5-year plan and establish terms for the Cooperative Agreement. Provide comments and data to the Monroe County Land and Water Plan, and WDNR Basin Plan (*State of the Bad-Axe LaCrosse River Basin*).
- Establish and maintain partnerships and Inter Agency Agreements. Work towards improving status of 303d impaired waters. Continue partnership support of the Stillwell and Clear Creek projects.
- Enhance recreational angling and obtain disease free fish from the FWS for stocking the lakes.
- Coordinate military training opportunities with troop units for water related mission essential tasks.
- Use the NEPA review process to minimize impacts to aquatic resources while benefiting training sustainability.
- Develop monitoring strategies to support Section 438 Energy Independence & Security Act.
- Integrate stormwater management into DPTMS, DPW, and DFMWR construction projects to include wetland mitigation benefits.
- As resources allow, apply sediment management strategies to maintain surface water quality (dredge lakes, stream sediment basins, fix erosion, use best management practices, or apply low impact developments).
- Promote fisheries by educating the public and military about the fisheries program and mission initiatives.
- Utilize a collaborative effort in obtaining grant funding and support to aggressively manage sediment loads in the upper La Crosse River watershed (Tarr and Silver Creek).
- Manage and maintain fishing regulations to support recreational angling quality.

##### **4.4.2 Watershed Management - Lake Resources**

Lake resources provide a realistic training platform for water purification training, water supplies for construction, and adjacent land space for bivouac sites. Specific to military training and safety, Big Sandy Lake has been upgraded to fully support bridging and rafting exercises affording the opportunity to remove the Alderwood Lake dam to return this former training lake to a free flowing stream. The lakes and reservoirs are also managed for fishery quality to provide Soldiers, families, and the public recreational angling opportunities.

Watershed management for lake resources also focuses on: 1) assessment, treatment and eradication of exotic species in Fort McCoy’s aquatic habitat, and 2) evaluating aquatic vegetation and the fish community to maintain high quality training and recreational facilities. Eurasian watermilfoil (EWM), a macrophyte, is the primary exotic species targeted for control. Educational signs have been installed at boat ramps. The EWM is spreading rapidly through Minnesota and Wisconsin waters. Lake Associations, local, state and federal agencies have been working to control the spread of this species. Nuisance plants like curly pondweed and EWM dominate lake littoral zones, overtake native macrophytes, reduce fish habitat, and impact recreational activities. These activities are a requirement of the cooperative agreement with the USFWS and WDNR that supports controlling EWM.

#### 4.4.2.1 Management Activities

- Assess lake morphology and sediment inputs.
- Survey, control, and/or eradicate EWM and curly pondweed in Fort McCoy waters.
- Monitor fish populations using approved Wisconsin or American Fishery Society methods.
- Provide public education materials on EWM at the boat landings.
- Establish and sustain a high quality bass fishery at the North Flowage, and validate the bass population using fish age structures and tag techniques
- Maintain lake predator-prey population balance to improve and sustain a quality panfish population at the North Flowage and other lakes.
- Determine fish populations, determine harvest goals, remove excess or undesirable fish, and when appropriate support local restoration projects. Assure fish are certified disease-free prior to restocking.
- Analyze and monitor water quality characteristics to determine conditions and trophic trends for management recommendations.
- Utilize water level management as a productive means for lake and stream water quality, aquatic macrophyte, and algal management.
- Modify water control structures and as resources allow, repair or renovate.
- Determine lake requirements for dissolved oxygen then manage, modify, and/or maintain dissolved oxygen levels using aeration and water circulation devices.
- Improve lake habitat: fix AquaCrib fasteners, add woody debris, and tree drops, etc.
- Conduct angler and creel surveys: interviews and questionnaires are used to enhance management strategies.
- Use anglers and regulations to sustain fishery balance.
- Stock disease free forage fish (minnow species) in designated waters.
- Stock disease free channel catfish in West Sandy.
- Stock disease free walleye in Stillwell Lake.
- Stock disease free rainbow trout in Stillwell, Sparta, Squaw, Swamp, Big Sandy, and Sandy Lake.
- As required, assess fish and aquatic biota for munitions, metal, and pesticide contaminants.
- Control furbearer population through trapping to minimize impacts to shorelines, dams/dikes, fish populations, habitat, roads, or forest resources.

#### 4.4.3 Watershed Management – Stream Resources

Fort McCoy water resources were significantly impacted by military training activities prior to 1980's. Fort McCoy land practices not only affected local water quality but had an effect on water quality and fisheries downstream. Management practices like TARP and LRAM along with changes in military training minimized damages to land especially near waterways which helped to minimize water quality and wetland impacts. Fort McCoy baseline stream water quality characteristics were established during a study from 1993 to 1996. The study showed that the water quality to be good when leaving the installation (Noble 1996). Characteristics like fecal coliform, suspended solids, and turbidities were typically higher when entering the installation as compared to leaving the installation, especially during rain events. Noble (1998) reported that Coles Valley and Mound Prairie had significantly higher turbidity and total suspended solid levels than other Fort McCoy streams. These higher levels are likely attributed to off-post land uses. Fecal coliform was significantly higher at Mound Prairie than any other site sampled.

The US Army Corps of Engineers Waterways Experiment Station (WES) conducted an extensive study in the North Impact Area (NIA) looking at munitions and metals (Simmers et. al. 1995). The WES study provided Fort McCoy with baseline concentrations of munitions and metals found in aquatic sediment and waters. Biomonitoring assessments were also used to show that the aquatic biota was not affected by constituents found within water and aquatic sediments.

Since 1996, Fort McCoy has used the Wisconsin methodology for stream assessments related to stream habitat and the aquatic community (Hilsenhoff 1983, Lyons 1996, and Simonson et al. 1993). Biomonitoring processes use the aquatic organisms, like aquatic invertebrates or the "fish community" to establish an Index of Biotic Integrity (IBI) or water quality rating. Biomonitoring can be effective in identifying locations impairing stream water quality and affecting the biotic index. The health of aquatic

ecosystems as determined by IBI helps classify or rate the quality of each fishery that was derived from the number and type of fish collected from the stream. Fort McCoy biomonitoring results along with water quality characteristics are used for developing management plans, basin plans, and classifying trout waters. The WDNR includes this information in the Clean Water Act (CWA) 305b EPA report. The IBI data supports the water quality-monitoring program, serves as baseline information for some streams, and provides fishery information prior to habitat improvement, construction, unknown phenomena or natural events (Figure 19).

Fort McCoy collaborated with USGS to install stream gages on three streams (Stillwell, Silver Creek and the La Crosse River). Silver Creek and La Crosse River serve as reference sites. Water characteristics for each site are determined for water flow, sediment loads, temperature, and oxygen. Increased precipitation in the area coincided with the establishment of the stream gages. Local aquifers and streams have been impacted by a multi-decade drought, but precipitation amounts have increased similar to having flood events comparable to a 100 and 500-year events. These high flow and flood events have impacts on stream bank and substrate erosion as well as increasing channel size impacting habitat. Our goal is to monitor stream water released from upstream water reservoirs (lakes) and monitor conditions as to establish new action steps if necessary to improve water quality and quantity to sustain a coldwater trout fishery. As a result of increased rain events, stream flows have increased significantly. Meteorologists report that 2010 was one of the warmest and wettest years on record. Fort McCoy has two streams that qualify as EPA 303d impaired waters, Stillwell Creek and Squaw Creek. This designation requires the use of monitoring results to formulate the Total Maximum Daily Loads (TMDLs) of pollution (i.e. sediment and water temperature). The TMDL aids in the process for determining potential alternatives for stream rehabilitation and an implementation plan when feasible.

Both Stillwell and Squaw Creek were listed as a "303d impaired waters" in 2002 as a result of Fort McCoy's water and biomonitoring programs. Squaw Creek impairments result from warmer lake surface water that is released from the water control device, a pipe used to discharge water from the Squaw Lake at Pine View Campground. These warmer surface waters when discharged into Squaw Creek regularly impact aquatic life dependent on coldwater, especially brook trout and mottled sculpin. In 2011, the dam at Squaw Creek was renovated with a design to release waters from a depth of 8' below the lake's surface. This will release colder water into Squaw Creek to improve the water quality. Stillwell Creek impairments are somewhat different and appear to be related to sediment and water releases from a cranberry operation that is isolated within the installation. Water management from the agricultural operation artificially creates poor stream habitat and water quality conditions. The primary impacts are from their water use practice having wide flow regimes, where we see them hold water, releasing too little water or conversely when they need to release large quantities, they release water quickly. Releasing large quantities of water may be to benefit coldwater species within the stream. For Stillwell, the program goal is to assess watershed trends; determine water quality and quantity; and determine action steps or solutions to sustain a trout fishery downstream from an agriculture operation. Minimum and maximum stream flow, sediment, and water quality characteristics are monitored and used to establish management strategies. These management strategies must be suitable for the agricultural operation as well as to support a trout fishery downstream. If unsuccessful, the lease terms may need to be modified to address water quality problems. The WDNR and EPA evaluate stream conditions and the ability to sustain the trout fishery, both are requirements used to classify Wisconsin's streams status as trout water.

A program goal is to refine the water monitoring project for the La Crosse River and Silver Creek as water leaves the installation. It is valuable to monitor spring-summer rain events and use quarterly monitoring to determine land use and training effects on Fort McCoy surface waters. This demonstrates to the public that Fort McCoy water quality is within compliance of the CWA and to use as an indicator for identifying and repairing land uses that may impact surface waters. Continuous monitors are also used in select locations to determine thermal and dissolved oxygen effects from environmental (seasonal) and water development projects. Biomonitoring projects will continue as an important and reliable requirement to support the military mission, demonstrate fishery trends for recreational quality and as indicators of water quality. The results of water monitoring show that the military training mission can be accomplished without negatively impacting the aquatic resource.

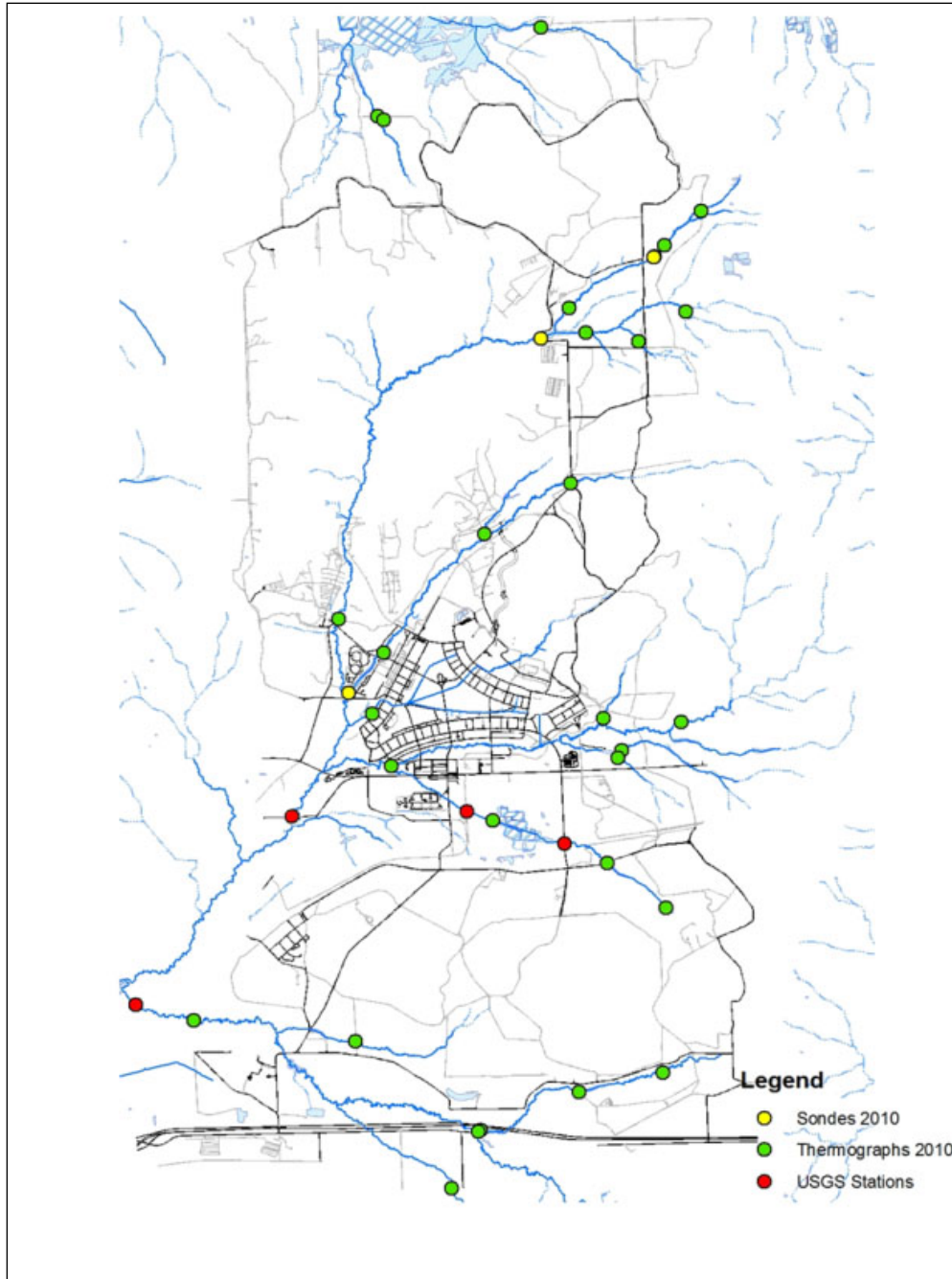


Figure 19. Remote water sampling devices that continuously collect water characteristics are displayed with colored dots for stream sites tested in 2010. Water quality characteristics correlates significantly to the fish and invertebrate community. The YSI Sondes (yellow dots) were used below lakes to collect temperature, oxygen, pH and turbidity for anticipated dam removal or renovation projects. Thermographs (green dots) were used to monitor summer temperatures for fish index of biotic integrity sampling stations. The USGS gage stations (red dots) continuously monitor flows and temperature. Water sample collections are triggered remotely with select samples provided to a certified laboratory for sediment and nutrients assessments.



#### **4.4.3.1 Management Activities**

- Update GIS stream data layers for land use planning opportunities.
- Coordinate with on- and off-post organizations to minimize watershed sediment loading.
- Identify dams for removal or reclamation.
- Secure funding to either remove or reclaim dams.
- Determine lake and stream water quality trends.
- Monitor Ammunition Supply Point for white phosphorus usage within the NIA.
- As resources allow, coordinate and use sediment removal devices to best manage sediment loading in the upper La Crosse River Basin.
- Require Best Management Practices (BMP) in all aspects of construction, forestry and range projects following guidance in Wisconsin Construction Site Handbook (WDNR 1993) and Forestry BMPs for Water Quality in Wisconsin (WDNR 1995). Fix watershed erosion and sedimentation using BMPs on disturbed sites, to include borrow sites, boundary firebreaks and road crossings.
- Implement biomonitoring assessments annually.
- Complete streambank restoration and habitat improvement projects as resources allow (Figure 20).
- Establish management strategies to enhance waters with impaired integrity. Monitor treatments like BMPs and streambank restoration to demonstrate cost-effectiveness and to achieve continuous process improvements.
- Integrate survey results with WDNR datasets to update the Fish Distribution Study, Master Fish File, and stream classifications updates referenced in Wisconsin Trout Streams (WDNR 1980).
- Work with DPW and DPTMS to improve culvert style, size, and installation.
- Work with local partners to improve stream conditions in the La Crosse and Black River Basins.
- Conduct angler and creel surveys to determine economic impact and angler satisfaction.
- Control furbearer population through trapping to minimize impacts to shorelines, fish populations, habitat, roads or forest resources.
- Remove beaver dams affecting trout waters.

#### **4.4.4 Watershed Management Sampling Methods**

The NRB utilizes a suite of sampling methods to monitor lake and stream fish communities. These methods are approved by the American Fisheries Society and consistent with state and federal sampling and monitoring protocols. Stream electrofishing units (backpack, towed-barge), boom shocker (lakes), nets, visual, creel-angler interviews, or hook-and-line surveys are used to assess fish populations and to arrive at management inferences. Lake and stream fish communities are also used as indicators of aquatic biotic integrity to establish a water quality rating. Water quality samples are typically collected by remote or continuous monitoring devices (Sondes, thermographs, and USGS gage stations). Water samples are also collected by contractors sending water samples to certified laboratories or by using portable devices for flow, turbidity, temperature, oxygen, pH, salinity, and conductivity.

#### **4.5 Wildlife Management**

The Wildlife Program is tasked with maintaining and improving the wildlife resource on Fort McCoy. Management techniques such as hunting/trapping programs, prescribed burning, habitat management, and invasive plant control are important tools in maintaining the biological diversity and integrity of Fort McCoy's wildlife resources. Program goals are:

- Manage for species diversity.
- Maintain healthy, viable wildlife populations.
- Improve, maintain and restore habitat quality.

#### **4.5.1 White-tailed Deer Management**

Deer population management is essential to the military mission. The overwinter population goal is 20-25 deer per square mile of deer range. Populations in excess of goals can result in degraded military training lands due to vegetation changes; loss of habitat quality and biological diversity; impacts to endangered, threatened, and species of concern; agricultural depredation; public relations problems;

increase in motor vehicle accidents; spread of zoonotic disease (i.e., Lyme, Anaplasmosis, Babesia, and Ehrlichia); and potential wildlife health problems such as chronic wasting disease. Populations below the overwinter goal will be out of compliance with the gray wolf management plan. Fort McCoy was established as a separate deer management unit in Wisconsin in 1985. Population management is achieved through regulated hunting programs that also provide recreational opportunities and generate funds for the Wildlife Program.



Figure 20. Streambank restoration and habitat improvement project.  
Top photo is project in 1995; bottom photo is project in 2010.

#### 4.5.1.1 Management Activities

- Conduct annual archery and gun hunting seasons (see para.4.5.2).
- Collect and analyze deer population data.
- Maintain a deer population database.
- Conduct Cantonment Area dusk and spotlight surveys from September through November annually to monitor urban deer population trends.
- Conduct doe/fawn surveys throughout the installation annually from July through September to determine population recruitment.
- Conduct habitat management projects that benefit deer populations (see para.4.5.3).
- Support chronic wasting disease testing requests from the WDNR.

#### 4.5.2 Hunting and Trapping Seasons

Some wildlife species (game species) are managed to prevent their populations from exceeding the carrying capacity of the habitat or conflicting with human activities or interests. Zoonotic disease problems

such as rabies (some furbearers) and Lyme disease (deer) can result from populations that are too high. Population management is primarily directed at white-tailed deer and furbearing species such as beaver, fox, raccoon, otter, and muskrat. Although beaver create valuable wetlands, they can also cause damage to roads and culverts, flood upland habitat, and degrade coldwater trout streams. Black bear reports have increased since 2005 and are indicative of a growing local bear population. Population management strategies, including hunting, will need to be developed to avert potential problems in the future. Hunting and trapping seasons are conducted annually to maintain wildlife populations at levels that reflect management goals. All hunting and trapping seasons are held in conjunction with Wisconsin State seasons except the disabled and muzzle loader seasons. Hunting seasons include: archery, spring and fall turkey, small game, gun-deer, muzzle-loader (deer), and a deer hunt for people with disabilities. Special archery seasons are held within the Cantonment Area as part of an urban deer management program.

#### **4.5.2.1 Management Activities**

- Prepare a Fort McCoy Hunting, Fishing, Trapping Regulation 420-29.
- Establish permit quotas for the permit sales program for gun-deer, muzzle-loader, disabled hunt, Cantonment archery, and fall and spring turkey seasons.
- Send a letter of intent to WDNR each year as per the Cooperative Plan with the WDNR and the USFWS; and Chapter 10 of the WDNR Administrative Code (NR10.01 (3) (e) 7).
- Collect harvest and biological data and maintain databases.
- Coordinate with DFMWR on archery deer and turkey registration.
- Register deer during the 9-day gun-deer, muzzle-loader, and disabled season.
- Coordinate trapping activities in areas with large furbearer populations when needed.
- Issue a limited number of trapping permits each year.
- Coordinate annually with the WDNR on matters pertaining to hunting and trapping seasons.
- Coordinate and support military preventive medicine or veterinary units and/or researchers involved with zoonotic disease projects.
- Conduct hunter surveys at deer/turkey registration stations or through email.
- Establish strategies and procedures, including hunting option and trapping, to manage bear populations.

#### **4.5.3 Habitat Management**

The goal is to improve, maintain and restore habitat quality to support ecologically diverse and resilient training lands that can withstand various training activities. Coordination is done with ITAM and DPTMS to ensure habitat management strategies coincide with current and future training land requirements. A wide range of vegetative communities are found within Fort McCoy, including dry sand prairies, oak savanna-barren associations, upland forests, wetlands, and riparian corridors. These diverse communities provide important habitats for many game and nongame wildlife species, including species of special concern. Prescribed burning (Figure 21) plays a large part in habitat improvement. Other program areas involve coordination with forestry on upland habitat projects and ITAM on restoration projects involving native plant species. Native seed often takes multiple years to become firmly established and to dominate a planted site, therefore nurse crops such as annual rye or oats, etc. should be planted with the native plant species in order to ensure there is sufficient vegetative cover to limit encroachment of invasive plant species.

##### **4.5.3.1 Actions**

- Conduct spring and fall prescribed burns. Improve habitats for grassland birds.
- Coordinate aspen management with the Forestry Program.
- Identify areas of degraded oak savanna and use timber sales, prescribed fire, mechanical clearing and troop projects to restore the savanna/barrens communities.
- Keep large, flat areas open through prescribed burning to complement training activities.
- Continue to work and communicate with other government agencies and private organizations to manage savanna communities.

- Manage apple trees by pruning trees and removing competing species.
- Improve browse habitat by selectively cutting and shredding woody plant species such as aspen, oaks, staghorn sumac, and other shrub or tree species to provide food and cover for game and nongame species. When feasible, work with the Forestry Program and military trainers to keep logging slash on site to provide winter browse.
- Use volunteers when available to accomplish annual cleaning and maintenance of artificial nest boxes and other structures for wood ducks, ospreys, kestrels, eastern bluebirds, and bats.
- Collect native plant seed on Fort McCoy to use in the LRAM program for revegetation or use Wisconsin highway native seed mixtures (70, 70A, 75, or 80) where appropriate. Use Wisconsin highway mix # 3 in areas that need quick stabilization. Maxwell's (1996) field investigation showed that the highway mix does not invade into the surrounding native vegetation, instead the native vegetation is slowly establishing into areas seeded with highway mix.
- Plant American chestnut seed and monitor germination and growth.
- Develop habitat specific seed mixtures where needed for rehabilitation/restoration.



Figure 21. Prescribed burning

#### 4.5.4 Grassland (Prairie) Management

Grasslands are an important component of Fort McCoy providing large open areas to meet military training requirements. They also are a declining habitat type nationwide which support a wealth of wildlife species. Fort McCoy currently has 3,475 acres of grassland that is actively managed through prescribed burns, invasive plant control, and LRAM rehabilitation. The WDNR report “Managing Habitat for Grassland Birds; A Guide for Wisconsin” lists Fort McCoy as a top 10 priority grassland management areas in the state (Sample and Mossman, 1997). Fort McCoy is the only large-scale management area south of the Tension Zone, increasing the importance for birds and other species that are near the northern edge of their range. Research has provided baseline data on the distribution and productivity of grassland birds on Fort McCoy which is being used to develop and implement management strategies to avoid potential conflicts if grassland birds are federally listed in the future.

##### 4.5.4.1 Management Activities

- Maintain the current grassland resources and increase the size of specified sites, if feasible, by using prescribed burns, exotic plant control, mowing, native plant restoration, timber harvests, and brush removal.
- The NIA, Warrens DZ, Cranberry DZ, Range 29, Badger DZ, and the oak savanna FMNA will serve as “core” grassland bird population areas and will be managed spatially to maintain a balance of grassland successional stages.
- Maintain specified open areas within the Cantonment Area as unmowed grassland sites.
- Breeding and visiting bird species will be monitored to evaluate management practices and training impacts, and to identify areas of population sinks.
- Identify lowland areas of potential grassland for management.
- Support research projects that provide further understanding of grassland communities.

#### 4.5.5 Game Species Surveys

Deer population and trends are calculated through harvest data and road surveys. Cantonment deer surveys are conducted from September through November to monitor urban deer populations. Harvest data are used in the Sex-Age-Kill formula developed by the WDNR. This information is used to set harvest quotas. Harvest figures are also collected during the spring and fall turkey seasons to monitor turkey populations.

Surveys include ruffed grouse drumming surveys, turkey gobble surveys, woodcock surveys, brood surveys for grouse and turkey.

#### **4.6 Forestry**

The purpose of the forestry program is to provide a scientific basis for managing the forest resources. The major forest types present are scrub oak (low quality oak), jack pine, oak, red pine and white pine. Lesser amounts of aspen, red maple, and paper birch are present. Program goals are:

- a. To support Fort McCoy's military training and mobilization requirements.
- b. To manage the forest resource according to ecosystem management principles while providing a sustained yield of forest products.
- c. To manage for forest health. Specific pests that are monitored or actively managed against include jack pine budworm, oak wilt, gypsy moth, white pine tip weevil, annosus root rot, and pine bark beetle.
- d. To provide for other multiple uses of the forest resources like outdoor recreation, wildlife habitat, soil erosion protection, watershed protection, clean air and noise abatement.

##### **4.6.1 Forest Inventory**

Army Regulation 200-1, section 4-3, para. d.7 requires responsible stewardship of forested lands. Army Regulatory Guidance for Reimbursable Agriculture/Grazing and Forestry programs (DAIM-ED-N, 17 Aug 1999) requires that volume inventories of forest stands be made and kept current (not older than ten years). Fort McCoy has 51,000 acres of land in the inventory system so a reinventory of 5,100 acres each year will keep the inventory current and provide accurate information for determining management goals. Areas which received a treatment such as a timber sale, planting, or TSI, or have had a land use change will be updated first. The data and inventory maps are entered into a GIS mapping system and database. The annual allowable harvest is recalculated every five years based on forest inventory updates.

The forest acreage by major cover type is: scrub oak (low quality oak)-19,200 acres, jack pine-8,300 acres, northern red oak-3,500 acres, red pine-2,800 acres, aspen-2,100 acres, white pine-1,400 acres, swamp hardwoods-1,400 acres. Minor cover types occupy 400 acres and include bottomland hardwoods, central hardwoods, northern hardwoods, spruce, and tamarack. The remainder of the acreage, 12,000 acres, includes nonforested areas such as grasslands, developed areas, brush, right of ways, roads, and other areas.

##### **4.6.1.1 Management Activities**

- Re-inventory 4,000 to 5,500 acres annually.
- Recalculate annual allowable harvest for the major commercial tree species.

##### **4.6.2 Timber Harvest**

Timber harvests are completed for a variety of reasons but are usually in one of four categories: 1) Training improvement harvest to reduce tree density or create openings to benefit military training; 2) Intermediate harvest to remove some of the trees in the forest to give the remaining trees more growing space; 3) Salvage harvest to remove dead and dying trees or to remove trees for a land-use change; 4) Regeneration harvest to remove trees in order to regenerate the forest. Timber harvests may occur in any forested area of the installation except where they are not allowed such as the NIA, riparian areas, and cultural resources sites eligible for inclusion in the National Register of Historic Sites.

Fort McCoy has two processes for harvesting timber, it may be administered by the Omaha District, USACE, or it may be completed by the installation using the Small Lot Timber Sale (SLTS) Regulation FMR 200-5. Sales completed through the SLTS program are limited to an appraised value of \$5,000 per sale and a total income of \$30,000 per year and funds are deposited into the forestry account IAW DFAS-IN Manual 37-100-XX. The USACE sales consist of the larger valued sales.

Proposed timber sales are submitted for review in January and bids are usually opened the following November. Proposed sales are reviewed utilizing the installations NEPA process to accept, reject, or modify individual sales on the list. Once an area is approved, the forestry staff will establish boundaries, estimate the volume, determine the harvest regulations, create a map and bid sheet for the USACE to use in soliciting bids.

A timber sale may allow biomass harvesting in the form of removing timber slash or unmerchantable trees in accordance with “Wisconsin’s Forestland Woody Biomass Harvesting Guidelines”. Fort McCoy might deviate from the guidelines, especially guideline 4.B: “Do not harvest fine wood material on dry nutrient-poor sites” where it is necessary to clear the land for a land use change (range construction, etc.), remove slash to avoid short-term negative impacts to the training mission, or reduce fuel loads near sensitive areas (installation boundary and ranges, etc.).

#### **4.6.2.1 Regeneration Harvest**

Harvesting methods such as clearcutting, strip clearcutting, seed tree, shelterwood and group selection are used to secure the necessary light, moisture and seedbed requirements for each tree species to regenerate. Aspen are always regenerated using clearcuts. The roots send up a thick growth of sprouts when the soil is exposed to sunlight. Jack pine seeds require mineral soil to effectively germinate and the seedlings need full sunlight. Jack pine is best regenerated by clearcutting, strip clearcutting and seed tree harvests. Northern red oak may sprout from stumps or regenerate by acorns; the seedlings need moderate to full sunlight to survive. Shelterwood and group selection are the harvest systems most often used to regenerate oak. Post-sale treatments, seedbed scarification, and herbicides may be used to enhance the regeneration conditions. If natural regeneration is inadequate five years after harvest, then artificial reforestation is considered.

#### **4.6.2.2 Intermediate Harvest**

The intermediate harvest removes trees that are poor quality, suppressed, declining in health, or are an undesirable species. The remaining trees have more growing space and will respond by increasing their diameter growth. Red pine harvests will be limited to thinnings, salvage cuts or removals for land use changes. Northern red oak, scrub oak, red pine and white pine are thinned periodically. Red pine is thinned every eight to ten years with the removals limited to 1/3 or less of the volume. This prevents wind damage that may occur if too many trees are removed and the remaining trees are exposed to the wind.

#### **4.6.2.3 Salvage Harvest**

Salvage harvests remove dead or dying timber quickly before the timber decays to the point that it cannot be used by industry. Harvesting prior to land use changes such as new construction or creating fuel breaks can also be categorized as a salvage harvest. The land use change takes the area out of timber management so the timber value is salvaged by the Army. Reasons that salvage harvests have been completed on Fort McCoy include wind damage, bark beetle infestation, hail damage, flood damage, pine pocket mortality, range construction, building construction, fuel breaks, and impact area expansion. Timber harvested for enhancing training or reducing fuels for wildland fires may be followed by shredding or prescribed burning.

#### **4.6.2.4 Management Activities**

- Timely removal of timber in areas designated for a land use change.
- Harvest timber to secure natural regeneration of tree species, restore oak savanna, or enhance training missions. Approximately 600 acres a year will be harvested. The rotation ages and annual allowable harvest for each tree species are: jack pine, 45 years, 160 acres; red pine, 120 years, 28 acres; red oak, 90 years, 28 acres; swamp hardwood, 50 years, 23 acres; aspen, 40 years, 30 acres.
- Manage red pine plantations for pulpwood and sawtimber production.
- Manage jack pine stands for pulpwood on a 45-year rotation.
- Clear-cut aspen to regenerate aspen stands and provide a variety of age classes within a close spatial arrangement.
- Use timber sales and firewood permits to remove dead trees that pose a safety hazard to training.

#### **4.6.3 Forest Health**

Ecosystem management recognizes that endemic levels of insects and disease play a vital role in maintaining a healthy forest. Epidemic outbreaks of pests are prevented through the use of silvicultural practices and monitoring. Specific pests that are monitored or actively managed against include; jack pine budworm, oak wilt, annosum root rot, gypsy moth, white pine tip weevil, and pine bark beetle. Wildland

fire management is an important component of forest health management, more information can be found in para. 4.16.

In May 2007, Fort McCoy completed a gypsy moth management plan (Kerkman, 2007) to give military leaders and natural resource managers the information necessary to make decisions and take actions to prepare for a gypsy moth outbreak. High priority treatment areas are identified in the plan to protect areas that are heavily used by military training. Areas considered most vulnerable are bivouac areas and the wooded edges along multipurpose field training sites, firing points, mortar points, platoon/squad ranges, and drop zones. In 2009, Monroe County was added to the gypsy moth quarantine area. This requires timber harvesters to provide documentation they are certified to conduct inspections and certify that the wood products are gypsy moth free. The quarantine affected firewood cutters by prohibiting firewood movement out of the quarantine areas.

#### **4.6.3.1 Forest Health Surveys**

##### **4.6.3.1.1 Oak Wilt Survey**

Since 1990, Fort McCoy has been actively surveying and controlling oak wilt. The occurrence of oak wilt is unnaturally high at Fort McCoy because the highest levels of military training coincide with the oak wilt infection period. During early to mid-July when the oak wilt symptoms are most visible (leaves turning brown and falling off), the forestry staff conducts either a windshield survey or helicopter survey of the oak forests to identify new oak wilt centers or to determine if established centers are still active. This information is added to a GIS database.

##### **4.6.3.1.2 Gypsy Moth Trapping**

The Wisconsin Department of Trade, Agriculture and Consumer Protection (WDATCP) completes surveys on Fort McCoy using 100 gypsy moth traps (Figure 22) each year as part of the USFS program "Slow the Spread". The traps are baited with female gypsy moth pheromones and placed on a grid of about one per square mile. This is done to survey the moth population to determine if more aggressive control measures are needed. In 1996, four gypsy moths were captured and the number has been steadily increasing each year. The trapping numbers went down to a low of 6 in 2005 but then increased to 538 in 2010. Before 2009, the trapping program was completed with forestry staff using WDATCP supplied traps, starting in 2009 the trapping on Fort McCoy was taken over by the Monroe County gypsy moth trapper funded by WDATCP. Fort McCoy will request trapping results from within the installation to keep track of the overall trend on Fort McCoy.

##### **4.6.3.2 Management Activities**

- Assist the Fire Department with wildfire protection, to include prescribed burning.
- Coordinate oak wilt control treatments with ITAM.
- Monitor oak wilt centers that have been treated with a vibratory root plow to check the spread of oak wilt between healthy and diseased trees. Identify new oak wilt centers. Educate Soldiers, civilian employees and visitors about oak wilt.
- Coordinate gypsy moth trapping with the Wisconsin Department of Agriculture, Trade and Consumer Protection (WDATCP).
- Coordinate gypsy moth control with the WDATCP, WDNR and USFS. This may involve aerial spraying of pheromone flakes, biological agents such as Gypcheck or Bt, or pesticides.
- Use timber sales to thin overstocked oak forests to increase the health and vigor of the residual trees as a means to prepare them for gypsy moth defoliation.
- Survey for forest damage with a helicopter overflight once each year if support is available.
- Prevent annosus root rot from becoming established on Fort McCoy by treating cut red pine stumps with a fungicide approved for annosus when the trees are harvested in air temperatures above freezing (32° F).



Figure 22. Gypsy moth trap.

#### 4.6.4 Timber Stand Improvement

Timber stand improvement (TSI) uses mechanical or chemical means to increase growth on higher value tree species. Northern red oak, red pine, and white pine are the trees species most commonly targeted for improvement with TSI. Trees removed are usually cut down so they are resting on the ground. This prevents large numbers of dead trees standing within the training areas and presenting a falling hazard to Soldiers training in the area. Types of TSI activities that are suitable on the installation include:

- a. Weeding-removing undesirable tree species from direct competition with the desirable trees. Trees removed may be within a set radius or overtopping the “leave” tree. This is typically done in younger stands to increase the proportion of the target species within the forest.
- b. Crop tree release-removing trees from direct competition with high quality or “crop” trees. The removed trees may be the same species as the crop trees but of poorer form. This is typically done in young to mid-aged stands where tree form and quality are evident.

##### 4.6.4.1 Management Activities

- Manage the high value oak stands for quality sawlogs.
- Maintain stands of northern red oak.
- Release white or red pine from competition.

#### 4.6.5 Reforestation

Fort McCoy places an emphasis on natural reforestation by using timber sales to create proper seedbed and light conditions for the targeted tree species. Northern red oak and jack pine seedlings are shade intolerant and are typically regenerated using seed tree, shelterwood, or clear cuts. Vegetation control may be needed before or soon after the timber sale to remove competing plants.

Artificial regeneration may be accomplished by hand planting or machine planting, depending on the size of the area, advance regeneration present, and access restrictions. Large areas of red pine have been planted in the past but are seldom planted at this time; open areas are more valuable as grassland or barrens habitat than pine plantations. Hand planting is often accomplished by school groups or Boy Scout organizations as part of classroom learning or to complete community service requirements.

##### 4.6.5.1 Management Activities

- Perform seedbed preparation for jack pine regeneration using the severe duty shredder or rollerchopper on about 20 acres per year as the budget allows.



- Mature oak is harvested using the shelterwood method in conjunction with understory removal by herbicides or fire. In areas where oak regeneration has failed, oak seedlings may be hand planted to restore the oak component.
- Hand or machine plant red or white pine to serve as visual screens or noise buffers near the installation boundary, highway corridors, or range areas.
- Hand plant a variety of tree species along stream corridors to provide stream-side shade to buffer stream temperatures.
- Hand plant pine in the vicinity of Mound Prairie Area to augment the existing natural regeneration.

#### **4.7 Vegetative Management**

This section discusses the vegetation management activities completed by ITAM and the DPW grounds contractor. Other types of vegetation management are addressed in different sections of this INRMP: management of forests and trees is addressed in section 4.6; and management of invasive species is addressed in section 4.9. The ITAM section has the responsibility for management of vegetation other than trees and invasive plants in the training areas and DPW manages vegetation within improved grounds areas to include ranges, Cantonment, airfield, roads, and railroads.

##### **4.7.1 Vegetative Inventories**

###### **4.7.1.1 Range and Training Land Assessment (RTL) Inventory**

A major goal of the Army's ITAM program is to achieve optimum sustainable use of training lands. The RTL component of ITAM supports this goal by providing scientifically valid land condition data that is used to determine how training may impact long term sustainability of training lands. The RTL program was authorized Army-wide in 1987, and was established on Fort McCoy in 1991. From 1991 -1994, all core plots were surveyed on an annual basis to develop baseline data and to determine trends in soil erosion and training disturbance. Base line data was also used to establish knowledge of plant and animal communities throughout the Installation. During this period, data collection followed an Army wide protocol (Tazik et al., 1992). Data collection and reporting was uniform for all Installations, but lacked specific details necessary for yearly management needs. In 1995, DA authorized Installations to deviate from the initial methodology in order to tailor programs more suitable to individual Installation training scenarios and needs. The new protocols were dubbed LCTA II methodology. The LCTA II methodologies for Fort McCoy were formed from 1995 through 2000. Collecting baseline data using the new techniques took place from 1995-1997. Short-term monitoring for LCTA II protocol took place in 1997 and 2000. There were no LCTA data collected in 1998 due to lack of funding. Two special projects were conducted in 2000 and 2001; a study on the impacts of wind-storm damage and forest regeneration and a study of oak savanna restoration for the INRMP. From the end of 2002 until the spring of 2005 the RTL program on Fort McCoy was not staffed. This was due to budgetary shortfalls within ITAM, as well as reorganization of Fort McCoy's Directorate of Plans, Training, Mobilization, and Security. During this hiatus, in 2004, the LCTA program was officially renamed as the Range and Training Land Assessment (RTL) program to better reflect its role in range and training land management and training support. The program focused on installation specific training and land requirements and provided a uniform RTL Plan outline to be completed by all installations. In 2008 a revised RTL Plan was finalized. That plan is the current protocol used on Fort McCoy with methodologies modified as needed based on lessons learned in the field and through analysis of data or to support new training requirements.

The current RTL plan can be divided into three main categories: Long Term monitoring (vegetation assessments), Short Term monitoring (mapping of disturbance features in high use areas for example) which assesses current condition of high use areas, and validation assessments which determine the effectiveness of LRAM management. Long term monitoring assessments conducted once every 3 – 5 years are designed to collect trend information on plant community shifts and changes on ground cover attributes (for example amount of bare soil versus litter and vegetation cover). Short term monitoring is an abbreviated version of long term monitoring protocol where important parameters are assessed using a more qualitative approach. In 2011, the Fort McCoy ITAM program worked with Colorado State

University – Center of environmental Management on Military Lands (CSU-CEMML) to establish a Habitat Training Map. The methodology allowed for classification of installation vegetation communities via the National Vegetation Classification System (NVCS) which was further interpreted to identify how each vegetation type could be correlated to its ability to support various types of training. This exercise was done in an effort to produce a map that displays habitat suitability in regards to training and maneuver types. The maps can be used facilitate planning and coordination of training exercises on the Installation and to measure gross changes in overall habitat types. By being able to measure the net gain/ loss of certain training habitat types, the ITAM program will be able to contribute valuable information in regards to long term planning throughout the Installation. Long term monitoring techniques can then be utilized to validate land condition and map designations if needed. Other long term monitoring assessments have been conducted in Firing Points, drop zones (Badger Drop Zone), and special management sites (C-12 Hazel Dell). Short term monitoring (annual assessments) are also conducted in Firing Points as well as throughout the Installation (Training Disturbance Mapping and Reconnaissance Assessment). Training Disturbance Mapping Assessment tracks medium to high levels of soil disturbance in an effort to track different levels of training pressures across the Installation. Long term monitoring techniques can be used in high use areas as defined by the mapping exercise to define the plant community and ground cover attributes. This is done in an effort to develop management recommendations as needed. Assessments of LRAM management areas comprise the remaining RTLA survey efforts. LRAM utilizes a series of techniques to control woody encroachment within open maneuver areas and to rehabilitate moderate to severely degraded areas for example. The RTLA program supports the LRAM program by assessing the effectiveness of the different techniques used to reach the management goal. The assessments used to validate LRAM management can vary in technique depending on the specific management goal.

#### **4.7.1.2 Special Vegetation Inventories**

Special vegetation surveys are done to document natural processes or management actions. In 2000, a survey was completed to document vegetation changes resulting from a severe windstorm that damaged over 3,000 acres of forest. Another survey was conducted in 2001 and updated in 2007 to check the results of the oak savanna restoration project north of Hazel Dell Lake. Additional surveys may occur at Hazel Dell if the data indicate it is needed. The Badger Drop Zone (BDZ) was surveyed in 2001 and again in 2008-2009 to document the vegetation trends following extensive engineering dig operations that took place in 2000.

#### **4.7.1.3 Urban Forest Survey**

An initial survey was conducted in 1991 with subsequent updates in 1995, 1999 and 2008-2009. Survey information collected before 2008 was lost during directorate reorganization. The 2008-2009 survey covered the Cantonment Area, family housing, and the Pine View Recreation Area and included GIS files showing the tree/shrub location and attributes. The survey should be maintained annually by updating plantings and removals.

#### **4.7.1.4 Forest Inventory Analysis Plots**

The USFS established about 20 permanent forest inventory plots on Fort McCoy as part of the USFS Forest Inventory and Analysis (FIA) Program. Plot locations are visited on a five year rotation with 20% of the plots surveyed in a given year. The research mission is to inventory and evaluate past trends, current status, and potential supply, use, condition and productivity of the renewable natural resources of forest lands. The FIA Program combines the information with related data on insects, diseases and other types of forest damages and stressors to assess the health, condition and potential future risks to forests. Information on the plot locations is not given out to land owners to avoid intentional disturbance or preservation.

#### **4.7.2 ITAM Vegetation Management**

The LRAM program under ITAM completes actions to sustain the extensive training lands that are not part of an improved range. Most of these actions are directed toward controlling the woody vegetation encroaching into open spaces, creating open areas by removing existing small trees and brush, maintaining maneuver trails, repairing maneuver damage, and planting vegetation to control erosion.

#### 4.7.2.1 LRAM Vegetation Control

The LRAM controls woody vegetation encroachment and removes existing small trees and brush using a severe-duty shredder to cut and chip the plants. This can be done at anytime of the year unless oak trees or wild lupine are present. Shredding is avoided from April through July when oaks are present to avoid injuring oaks and spreading oak wilt disease. Shredding is normally not completed from May through August to avoid adult KBB flight periods. Follow-up treatments with more shredding, prescribed burning, or herbicide application may be necessary if the vegetation sprouts back. LRAM applies herbicides using a wet-blade that cuts the sprouts while applying herbicide.

#### 4.7.2.2 LRAM Vegetation Planting

Planting is done with seed mixtures free from invasive plant species and is done mainly along trails, cross country maneuver sites, and DPTMS training area reconfiguration projects to prevent erosion. Seed germination and seedling survival is increased when planted with a cover crop such as rye.

#### 4.7.3 Grounds Vegetation Management

The grounds contract requires grass mowing and trimming IAW the performance work statement for the DPW Service Contract. Mowing is done between 1 April and 31 October in designated locations when the grass exceeds the maximum length for those locations. See table 2 for the allowable maximum length for each area. Area A includes the high visibility areas in the Cantonment Area (“J” Street, building 50, and Wisconsin Military Academy) and consists of 97 acres. Area B includes the majority of the Cantonment Area, PVRA, range staging areas and firing lines, family housing, and the administrative portion of the airfield and consists of 750 acres. Area C includes roadsides, parade fields, Ammo Supply Point, ranges, the airfield and consists of 917 acres. Area D includes lake edges, FOBs, assault airstrip, closed landfills, and consists of 447 acres. Area E includes drainage ditches and consists of 196 acres.

Herbicides are used to control vegetation along fence lines, within parking lots, and within the Fort McCoy railroad Right-Of-Way (ROW).

Grass Cutting Area	Maximum length	Cut to # of inches
A	When grass exceeds 4”	3
B	When grass exceeds 6”	3
C (Includes Roadsides)	When grass exceeds 9”	3
D (Includes Lakesides)	When grass exceeds 12”	3
E	Cut one time during August.	3

Table 2. Grass mowing requirements.

#### 4.8 Migratory Bird Management

The Migratory Bird Treaty Act (MBTA) prohibits the taking, killing, or possessing of migratory birds unless permitted by regulations promulgated by the Secretary of the Interior. Conserving migratory birds is a key component to managing for biological diversity and ecosystem management. Conserving migratory birds starts with conserving, protecting, and managing the species habitats. This can be accomplished through consideration of migratory birds and their habitats when assessing the impacts of projects through the NEPA Review Process. In addition, surveys for these species will be accomplished as resources allow. Research projects targeting migratory birds will be encouraged to increase our knowledge of these species and their habitat utilization on the installation.

##### 4.8.1 Management Activities

- Monitor borrow pits, and prohibit the removal of material if nesting activity is evident.
- Maintain proper sloping in sand borrow pits to discourage nesting.
- Avoid large scale habitat manipulation such as prescribed burning during nesting seasons.
- Support research requests that provide greater insight on species habitat needs and population trends.

- Manage habitats through a variety of methods to include timber sales, prescribed burning, mechanical shredding, and invasive species control.
- Maintain artificial nesting structures for bluebirds and provide technical guidance to volunteer nest box monitors.

#### **4.9 Invasive Plant Control**

Invasive plants degrade land conditions and vegetative cover vital for realistic training and can directly limit training activities; pose human health and safety concerns; act as one of the leading causes of habitat destruction and biodiversity loss (T&E species); require the diversion of funding from other natural resource or operation priorities; and threaten the economic value of surrounding agricultural and private lands. Fort McCoy currently works to control 32 invasive species. An Invasive Weed Management Plan is being finalized which goes into further detail of early detection, prevention, control, and monitoring. Survey and treatment contracts and on-going partnerships are used to control invasive plants. These projects will provide continued implementation of management efforts that will ensure protection, preservation, and stability of training lands and native flora and fauna.

##### **4.9.1 Management Activities**

- Survey for new populations of invasive plants during the time of year each target species is most visible.
- Survey treated areas and plan follow-up control work if necessary.
- Continue the use of biological control agents for leafy spurge and spotted knapweed control.
- Coordinate with other programs and directorates to minimize spread and impacts associated with invasive plants.
- Identify alternative ways to control/treat invasive plants, such as coordination with DPW to grade old vegetated parking lots or mow populations of invasive plants prior to seed set.
- Collect field data associated with mapping and treatments of invasive plants.
- Submit monthly reports of herbicide amounts used, acres treated, and species treated.
- Maintain a database of all treatments and coordinate for GIS layers to be created or updated to graphically display treatment areas and data.
- Provide maps, consultation, and comments to NEPA review and project coordinators in reference to invasive populations.
- Maintain herbicide equipment and identify needed resources.
- Work in partnership with federal, state, and local agencies to control invasive plants; provide biological control agents to these partners to aid in control off the installation.
- Conduct prescribed burns for integrated management strategies.
- Investigate new biocontrol options.
- Survey for potential new invasive species.

##### **4.9.2 Invasive Plant Species Monitoring**

Work with invasive plant species started in 1988. Since that time, population distribution of leafy spurge, spotted knapweed, glossy buckthorn, garlic mustard, and purple loosestrife have been mapped. New populations are continually mapped and entered in GIS. Treatments are monitored annually and entered in a database.

#### **4.10 Pest Management**

Pest Management Operations on Fort McCoy are conducted by DPW and guided by the IPMP (2009) as required in AR 200-1. The goals of Fort McCoy's pest management operations are to:

- a. Reduce pesticide use through Integrated Pest Management (IPM).
- b. Operate in a safe and legal manner.
- c. Manage pests.

#### **4.10.1 Management Activities**

- Report pesticide use each month as required by AR 200-1.
- Report annual pesticide use to AEC.
- The NRB coordinates with the pest control staff to use their facilities for storage and mixing.
- Follow the procedures listed in FM Reg 420-30 (Wellhead Protection Plan) that places restrictions on mixing and storing pesticides to reduce the chances of contaminating potable water supplies.
- The DPW Pest Management coordinates with NRB on reported injured, sick, or dead fauna.
- Identify issues relating to natural resources in the draft IPMP.

#### **4.11 Land Management (Soil Erosion)**

The Fisheries program (see section 4.4) helps identify and resolve erosion problems. The LRAM program completes erosion control when the training mission is determined to be the cause or where needed to improve sites for training requirements. The RTLA Program assists in identifying training impacts via disturbance monitoring during each training season, maneuver trail surveys, and monitoring of high use areas such as firing points. The DPW is responsible for control work when the erosion is natural or resulting from improved roads, shale quarries or sand pits. If erosion poses an immediate threat to safety or surface water quality, it is given a higher priority in the work order process and control may occur quickly. More information about LRAM erosion control work can be found in the five year ITAM plan.

#### **4.11.1 Management Activities**

- Identify and prioritize erosion resulting from abandoned shale quarries and submit work orders for DPW.
- Annually inspect active shale quarries and sand pits to determine erosion control measures required. Emphasize project phasing to minimize the area of soil disturbance. Recommend project site solutions, offering best management practices (BMPs) to minimize soil loss.
- Ensure BMPs for erosion control are implemented in contracts that involve construction, timber harvests, or other operations disturbing vegetation that contribute to soil erosion.

#### **4.12 Agriculture/Grazing Outleases**

For more information on agricultural outleases see para. 3.1.9.

#### **4.12.1 Management Activities**

- Update agricultural outlease agreements to include measures allowing recreational angling in accordance with initial lease agreement (Stillwell Creek watershed).
- Establish uniform flow regimes within Stillwell Creek.

#### **4.13 Geographic Information Systems (GIS) Management**

At the close of each fiscal year, major accomplishments, events and activities are summarized and archived by the GIS lab for use in reports within and outside Fort McCoy. Some of the activities archived include: prescribed burns, wildfires, timber sales and invasive plant control. The GIS is used to document many of the surveys and management activities conducted within the NRB. The majority of this data is available for use by all managers within the NRB, and selected data is available for use by individuals within other organizations on Fort McCoy. Examples of data layers created and maintained include: prescribed burn areas; wildfire areas; watershed areas; wetlands; timber sales; areas treated for invasive plant control; endangered species habitats; and occurrence records for listed and rare species. These data layers are routinely used to assess impacts of proposed projects on installation natural resources as well as in reports summarizing surveys and management actions completed.

#### **4.14 Outdoor Recreation**

See section 3.1.7 for a description of outdoor recreation (OR) areas. The contracted grounds crew maintains the turf and trees in high-use areas such as Pine View Recreation Area (PVRA) and Whitetail Ridge Recreation Area (WRRRA). Management of fish and wildlife species and their habitats provides for hunting, fishing, trapping and wildlife viewing. Forest management uses the multiple-use concept to

provide for OR considerations. The pest controller is responsible for controlling those undesirable animal and plant species and their habitats that are not compatible with OR programs. The NRB goals for OR are to:

- a. Protect and maintain the natural resources upon which OR depend.
- b. Assist with specific OR program and project expansions.

#### **4.14.1 Military Mission Considerations**

To avoid conflicts with the military mission, PVRA and WRRRA are located on 660 acres that do not allow tactical military training (Figures 16a &b). Training areas open to hunting and fishing are announced using the GAME line (608) 388-4263. Permit holders are not allowed in training areas while they are used for military training. Civilian vehicles are prohibited in most training areas after dark to allow black-out drive training.

#### **4.14.2 Public Access**

The public is allowed access on Fort McCoy to pursue recreational opportunities. The PVRA and WRRRA are unrestricted to the public. Access to the training areas is limited to permit holders, the general public is not allowed in those areas to watch wildlife, or gather berries, mushrooms, or other items unless approved by the Public Affairs Office (PAO). Permit holders must be aware of the closed areas to avoid losing their privileges. Access to the Cantonment Area is restricted to gates guarded by Fort McCoy police. Vehicles have to be registered (visitors will get a temporary pass) and identification is checked.

#### **4.14.3 Hunting, Fishing, and Trapping Programs**

Hunting, fishing and trapping are allowed by the public through the purchase of permits. There are no preferences given to military in purchasing permits, with all applicants having an equal chance. The number of permits sold for gun-deer, muzzle-loader, Cantonment archery, turkey hunting and trapping are regulated by a quota. The first applications to arrive through the mail are the first awarded permits until the maximum number of permits issued is reached. The seasons and general regulations generally follow the State of Wisconsin regulations, the exceptions are disabled and muzzle-loader hunts. Regulations that are unique to Fort McCoy have been added. Violating the regulations can result in revocation of all hunting, fishing, trapping and firewood collection privileges for one year to life, depending on the severity of the violation.

##### **4.14.3.1 Permit Sales**

Hunting, fishing, trapping and firewood permits are through the NRB. All permittees require appropriate State of Wisconsin state licenses in addition to Fort McCoy permits before they are allowed to hunt, fish, or trap on Fort McCoy. Money generated is used to purchase fish for stocking, habitat improvement projects and fund up to 10% of permit sales administration. In 2009 a 3-year contract was developed in collaboration with the WDNR to sell Fort McCoy hunting, fishing and trapping permits through their Automated License Issuance System (ALIS). The WDNR sends the revenue (minus vendor and transaction fees) to Fort McCoy. This process eliminated the need for individuals to submit an application or purchase a permit directly from the Permit Sales Office during normal business hours. Individuals interested in a non-quota permit (Archery, small game, or fishing) can purchase their permit directly from an authorized ALIS agent throughout Wisconsin or online at anytime. Individuals interested in a quota hunt permit are still required to apply through the Permit Sales Office. Those selected are then entered into the WDNR database and are instructed to purchase their permit from an ALIS agent or online. Firewood permits must be purchased at the NRB Permit Sales Office. Permit information is summarized in table 3.

##### **4.14.3.2 Management Activities**

- Conduct permit sales process reviews annually for possible increases in efficiencies.
- Issue all permits by required dates.
- Provide customer service for questions concerning hunting, fishing, trapping, or firewood regulations.

<u>PERMIT</u>	<u>FEE</u>	<u>DATES</u>
Small Game	\$13	Concurrent with state season
Waterfowl	Included under small game permit	“ “
Fall Turkey	\$13	“ “
Archery	\$17	“ “
Cantonment Archery (urban hunt)	\$13	“ “
Archery Bonus Tag	\$12	“ “
Gun-deer	\$21	“ “
Gun-deer Bonus Tag	\$12	“ “
Muzzle-Loader	\$13	First weekend in November
Disabled Hunt (Deer)	\$10	First weekend in October
Spring Turkey	\$13	Six - five day seasons in April and May
Trapping	\$20	Concurrent with state season
Fishing	\$13	1 April to 31 March of each year
Fishing	\$8 (over 65, disabled, 4 day resident/nonresident or children under 16)	
Firewood	\$10/day, \$50/month	Cantonment all year, training areas are open from 1 Sept to 30 April yearly.

Table 3. Permit sales information.

#### **4.14.4 Other Natural Resources Oriented Outdoor Recreation**

Camping is allowed only at PVRA. Picnicking is available at the PVRA and the lakes where shelters have been erected for that use (Sandy, Big Sandy, West Sandy, Swamp, Stillwell, and Alderwood). Swimming is only allowed at the PVRA beach in the marked swimming and wading area where lifeguards are on duty. Pleasure boating is allowed on all the lakes except Hazel Dell, Stillwell, Swamp and Sparta Pond. Boating is limited to canoes or rowboat since gasoline motors are not allowed on Fort McCoy lakes. Hiking trails are located in PVRA and WRRRA. Downhill skiing, cross-country skiing and downhill tubing are available at the WRRRA. Dispersed recreational opportunities are only available in the PVRA and WRRRA locations, they are not allowed in the range and training areas. These activities include; photography, berry picking, mushroom collecting, bird watching, bicycling and recreational driving. Limiting intensive recreational uses to specific areas (PVRA and WRRRA) eliminates potential conflicts with military training activities.

#### **4.14.5 Safety and Security**

The PVRA is fenced off from the rest of Fort McCoy to prevent users from wandering into training areas and the Cantonment Area. The Cantonment Area also has a fence separating it from the training areas and public access. Access to the Cantonment Area is limited to gates manned by the Fort McCoy Police who check identification of individuals wanting entry. Hunters are required to display an activity card in the windshield of their vehicle with the hunter's names, activity, and emergency phone number. This allows the warden to quickly identify vehicles authorized to be in the training areas. There are six emergency phones identified on the hunting maps for use if needed.

#### **4.15 Bird/Animal Aircraft Strike Hazard (BASH) Program**

Fort McCoy airfield operations are in the process of developing a plan to address BASH. A chain-link fence constructed around the perimeter of the airfield in 2009 has significantly reduced chances of aircraft collisions with deer and other large mammals.

#### **4.16 Wildland Fire Management**

Fire Protection and Prevention (FPP) is responsible for all fire suppression and prescribed burning that occurs on Fort McCoy. The NRB serves as technical advisors and proponents for ecosystem

management burns. The NRB also assists by providing personnel and equipment to help with fuel reduction burns and occasional wildfire suppression activities. The NRB maps the extent of wildfires and appraises any damage caused to commercial timber or wildlife habitat. The damage appraisal is then forwarded to ITAM, Range Control, and FPP. The IWFMP was approved in July 2009 and addresses fire management issues in greater depth than the INRMP. Forest stands are protected from wildfires by scarifying firebreaks around areas that are likely to burn (NIA and certain ranges) to prevent the fire from spreading. The NRB personnel assist the FPP with prescribed burning of the NIA for fuel reduction. Prescribed burning of selected forest stands, prairie and savanna areas, and areas of high fuel accumulations are accomplished for silvicultural reasons and to prevent wildfires.

FPP uses a fireplow attached to a tracked tractor to suppress a large portion of wildfires each year. While this is an effective technique, it has the potential to increase soil erosion, spread invasive plants and hinder overland vehicle movement. Either FPP or LRAM should revegetate the plowline after the fire is completely extinguished.

#### **4.16.1 Wildfire Partnerships**

Fort McCoy partnered with the Black River State Forest and TNC of Wisconsin in TNC's Fire Learning Network (FLN) initiative. The FLN was part of a nationwide collaboration between TNC, the USFS and the US Dept. of Interior that promotes restoration of fire-adapted ecosystems across the US through fire use education, fire management training, and support for on-the-ground fire restoration efforts. This project was funded through the National Fire Plan whose 10-year comprehensive strategy is to; improve fire suppression and prevention, reduce hazardous fuels, restore fire adapted ecosystems and promote community assistance.

#### **4.16.2 Priority Actions**

Through a series of workshops and meetings the FLN has provided a means to allow large landowners a chance to collaborate toward landscape-scale ecosystem management. Each partner has identified priority actions that will fit into the National Fire Plan. Fort McCoy's priority actions are:

- Reduce wildfire potential in areas adjacent to NIA.
- Reduce wildfire potential and enhance habitat in the northeast corner of Fort McCoy.
- Develop habitat and reduce wildfire potential through mutually beneficial actions along the installation boundary with the Black River State Forest.
- Reduce wildfire potential in the northwest corner of Fort McCoy by working with Monroe Co. and private landowners.
- Reduce wildfire potential along eastern edge of Fort McCoy by working with WDNR (La Crosse Valley State Park) and private landowners.
- Conduct red card certification class (S-130, S-190, I-100 and pack test) for all burning crew members.
- Conduct crew boss academy training.
- Send select employees to fire behavior classes (S-290 and S-390).

#### **4.16.3 Reducing Wildfire Potential**

Fort McCoy is a fire adapted ecosystem and hosts an assortment of military training activities that can easily ignite a wildfire (artillery, pyrotechnics, tracer rounds, smoke grenades, etc.). This creates the possibility that Fort McCoy could cause a catastrophic wildfire at some time. The town of Millston is 2.5 miles north of Fort McCoy and is considered a community at risk of wildfire damage. There are also many houses that have been built near the boundary in recent years. Containing wildfires on the installation and at a manageable size is a priority. Some of the actions to reduce the risk of catastrophic wildfires include; breaking up continuous stands of pine that could sustain a running crown fire, keeping trails open and accessible for fire suppression vehicles, maintaining scarified firebreaks where environmentally appropriate, maintaining the installation boundary firebreak as an access lane and fuel break, grinding debris from range and training land maintenance activities with a tub grinder, and grinding timber sale slash in place with the severe duty shredder. Some new training requirements have created increase need for fire management. Firing of the Multiple Launch Rocket System (MLRS) has potential to create wildfires and



steps are now taken annually to identify firing areas and conduct prescribed burns or mowing to reduce fuels a short period of time before the unit comes to Fort McCoy to train.

#### **4.16.4 Management Activities**

- Conduct prescribed burns to remove pine regeneration and heavy fuel load build-up.
- Grind timber sale slash in-place with the severe duty shredder in priority areas.
- Grind trees and stump debris from maintenance and construction projects using a tub grinder.
- Annually assist fire dept with burning the NIA, ranges of potential risk, and MLRS or other special use sites with wildfire potential.
- Coordinate access on adjacent private lands for fire suppression activities.
- Conduct timber harvests to remove continuous pine cover.
- Establish bur oak, a fire resistant species, in areas of high fire incidence.
- Maintain scarified firebreaks around the NIA and select ranges.
- Maintain a vegetated firebreak around the installation boundary with emergency vehicle access where possible.

#### **4.16.5 Wildland Fire Training**

The Integrated Army Wildland Fire Policy created the requirement for the IWFMP and incorporates the National Wildfire Coordinating Group (NWCG) organizational standards into installation wildland fire organizations. This requires all military, civilian, contractor and emergency services personnel involved in wildland fire management to possess certifications appropriate for their expected level of involvement. The minimum requirement is the red card certification (S-130, S-190, I-100 and pack test) and all FPP and NRB personnel involved with wildfire or prescribed burning were required to meet these qualifications by 2007. Higher levels of training, such as crew boss and fire boss require more classes for certification. The Chief, FPP will determine which individuals will be trained at those levels.

##### **4.16.5.1 Management Activities**

- Have all personnel involved with burning trained to the red card specifications.
- Have an adequate number of personnel trained to higher levels as directed by Chief, FPP.

#### **4.16.6 Prescribed Burns**

Prescribed burns are accomplished on Fort McCoy for five main reasons; reducing fuel loads, ecosystem management, enhancing training lands, controlling exotic species and as a training opportunity for military units with firefighting related mission essential tasks. The two main fire seasons are spring and fall. Occasional brush pile burns are done in summer or winter. There are two main types of prescribed burns: 1) Annual burns - these burns are associated with weapons ranges for the purpose of avoiding wildfires by reducing fuels. 2) Other - these burns are completed for any of the five reasons listed above and may be burned one time or repeatedly. Locations of these burn types are shown in figure 23.

##### **4.16.6.1 Planning Process**

At least one month before the burn season, a list of potential burn areas is created by NRB and reviewed by FPP, ITAM, NEPA and Range Control. Priority areas are identified and detailed plans for each burn are prepared and reviewed. A copy of the plan is sent to Chief, FPP for his approval and files. Burns required for fuel reduction projects are given the highest priority and usually burned first.

On the day prior to burning, the Range Control Scheduling Section is contacted to ensure no military training is occurring and FPP is contacted to see if they can support a burn mission. On the burn day, the burn proponent notifies the following activities: Fort McCoy Public Affairs Office; Fort McCoy Range Control; Fort McCoy Police Desk; WDNR Fire Dispatch in Black River Falls; Monroe County Sheriff; neighbors who are close to the burn; the railroad company if the railroad right-of-way is burned; the area power company if burning under power lines; Fort McCoy rail line if burning by Fort McCoy tracks; DPW roads and grounds in case they are doing projects adjacent to sites; and the Fort McCoy Ammunition Supply Point if within their vicinity. When the required equipment and personnel are on site,

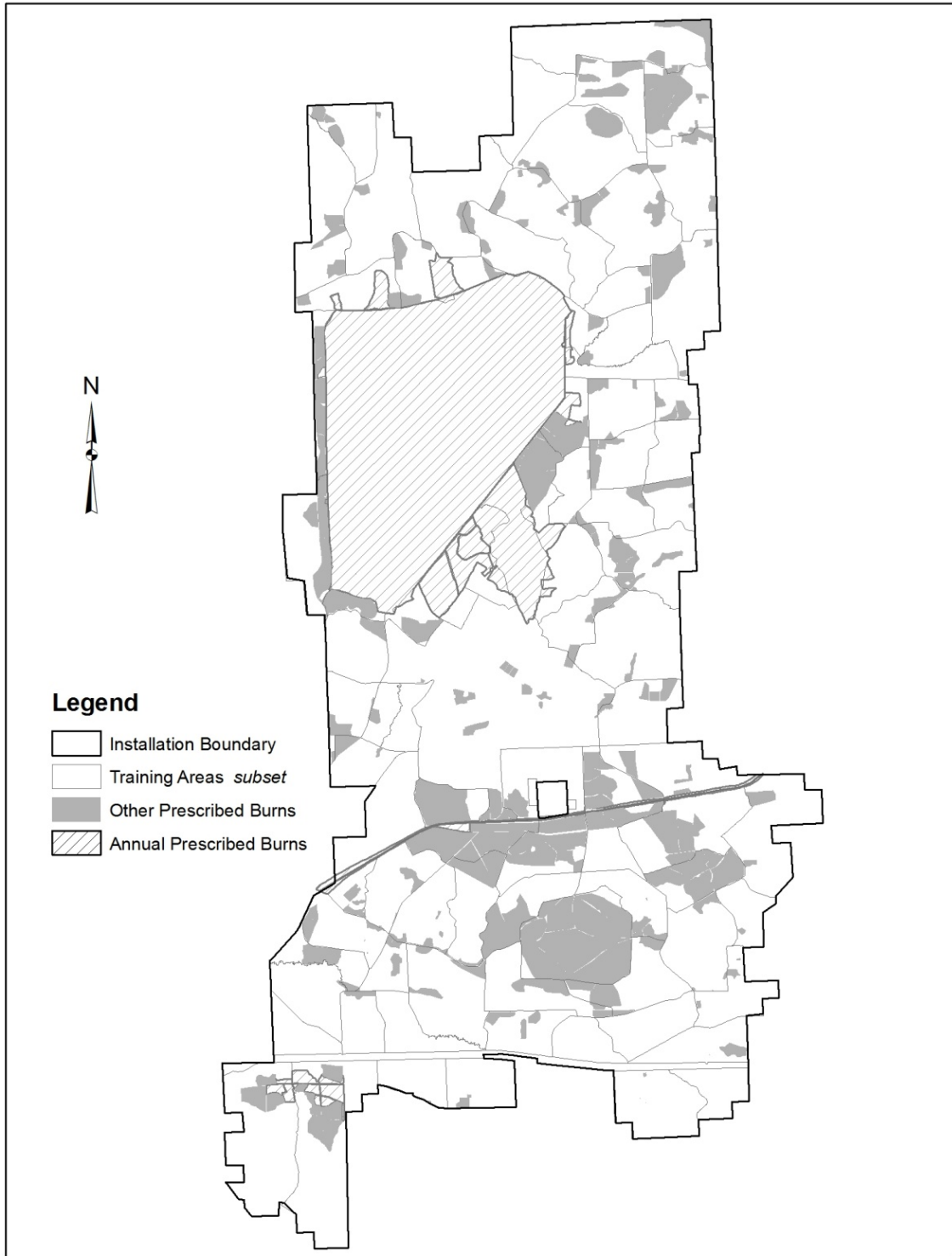


Figure 23. Prescribed burn locations.

the weather is verified to see if it is within the written prescription, the crew is briefed on the fire plan, and a small test burn is conducted. When the burn boss is satisfied that a burn can be safely accomplished, the burn is carried out as planned with all ignition being completed by 1400 hours. The FPP usually checks the burn site the night of burn to ensure no re-ignition occurs.

#### **4.16.6.2 Site Specific Burn Plans**

Each burn requires a specific plan and map developed so the interested parties can review and comment on the plan. Each burn has the potential to cause adverse effects to natural and cultural resources in the burn site, in the vicinity of the burn, and downwind from the burn. The adverse effects are listed on the burn plan along with planned actions to avoid or mitigate the effects. On the burn day the plan is briefed to all the burning participants and each one is given a map. A sample plan and map is located in Appendix F. Each plan must include the following components:

- Burn objectives
- Notification list
- Area description
- Burn objectives/justification
- Concerns from each NRB program manager
- Acceptable weather and fuel moisture parameters
- Smoke management plan
- Crew organization
- Equipment required
- Expected duration of the burn
- Managing the burn (preparation, firing, contingencies, mop-up, etc.)
- Post burn assessment

Upon completion of the burn and post burn assessments are complete, the plan with field notes, along with the map is archived by the wildlife office. A GIS shapefile of the actual burn area is created for archiving by the GIS laboratory. This may be done either by digitizing off an aerial photo or using global positioning systems (GPS).

#### **4.16.6.1 Management Activities**

- Annually plan and burn approximately 1,000 acres of prescribed burns outside of the NIA.
- Plan prescribed burns using the Fort McCoy prescribed burn form and route for approval.
- Place notification on Game-line during spring turkey and fall hunts about possibility of burns.
- Prepare and route burn plans electronically for approval and storage.

#### **4.17 NRB Training**

As the operational budget allows, typical training conferences and classes attended by the NRB staff on an annual basis may include the following:

- Attend annual National Military Fish and Wildlife Association Meeting.
- Attend annual Fisheries Society National Meeting.
- Attend annual WDNR Wildlife Management Meeting.
- Attend annual meeting of The Wisconsin Wildlife Society.
- Prescribed fire training.
- DoD/Army Forester training sessions.
- National and Wisconsin Society of American Foresters Meetings.
- Herbicide recertification.
- Any additional pertinent training offered.
- US Army Training Support System Conference

#### **4.18 Coastal/Marine Management**

Not applicable.

#### **4.19 Floodplains Management**

Reference wetland paragraph 4.4.3.

#### **4.20 Other Leases**

Fort McCoy leases 67,815 acres from the Black River State Forest, 1,015 acres from Jackson County, 1,147 acres from Monroe County, and 602 acres from Habelman's Cranberry Co. for use by Soldiers training on Fort McCoy. Training on all the areas except Habelman's is limited to low impact uses such as dismounted military training and some bivouac. The agreement for Habelman's requires Fort McCoy to fix impacts after use.

##### **4.20.1 Management Activities**

- Investigate ways to increase training use of leased lands.

#### **4.21 Fort McCoy Natural Areas Management (FMNA)**

FMNAs are valuable for scientific research, teaching of conservation and natural history, the preservation of biological diversity, and for providing benchmarks for determining the impact of use on managed lands. As such, the FMNAs are limited to dismounted, non mechanized military training. More information on FMNAs is located in para. 2.6.2.4. MOUs and management plans have been developed between Fort McCoy and the WDNR for these FMNAs.

##### **4.21.1 Management Activities**

- Follow practices as outlined in the approved FMNA Management Plans.
- Conduct yearly inspections of FMNAs as outlined MOU with the WDNR.
- Monitor beaver activity/populations in FMNAs. Remove beaver and dams as needed.
- Ensure signage is posted per MOU and management plan.
- Maintain plant community integrity and conduct management as necessary.
- Conduct invasive species control and surveys.
- Use biological control for leafy spurge populations in the Fort McCoy barrens.
- Provide education and outreach programs using these sites, if requested.
- Conduct grassland bird habitat studies in relation to the impacts of invasive species in the Fort McCoy barrens.
- Conduct prescribed burns in these sites.
- Conduct assessment of rough white lettuce seed plantings.
- Submit yearly report to WDNR on status of FMNAs and management conducted.

#### **4.22 Military Land Use Areas Management**

The DPTMS, Range and Training Division has the primary responsibility of maintaining improved ranges or training areas, maneuver trails, including firing points, mortar points, landing and drop zones DPW has a role in maintaining ranges, roads, tank trails and training sites that are considered real property assets.

##### **4.22.1 North Impact Area (NIA)**

See para 3.1.3 for background information on the NIA.

###### **4.22.1.1 Management Activities**

- Reduce erosion and stream sedimentation through BMPs within the La Crosse River watershed outside of the NIA and encourage private landowners to participate.
- Enhance and maintain the integrity of the fishery. Use the fish community as an indicator of aquatic integrity.
- Demonstrate that the NIA is managed in a responsible manner. Management includes sampling water quality, and meeting with outside agencies to discuss issues on an as needed basis.
- Maintain the NIA and upper La Crosse River corridor in a plant community (oak savanna/barrens/prairie complex) that is tolerant of the land use activities.

- Allow the La Crosse River to maintain natural sinuosity and monitor the effects.
- Use prescribed burning to reduce the chance of wildfires escaping from the NIA.
- Develop plan for the control of spotted knapweed and leafy spurge in the NIA. Control options will include chemical and biological agents. Some areas along the perimeter of the NIA can be chemically treated and arrangements can be made with an Explosive Ordnance Disposal unit and Range Control to access limited areas within the NIA.

#### **4.22.2 Drop Zones (DZ), Air Assault Strip and Landing Zones (LZ)**

The three DZs; Badger, Cranberry, and Warrens, are open grasslands that are managed primarily as open expanses for training and secondarily for prairie flora and fauna. Although mowing has been used at Cranberry and Warrens, it should be avoided unless required for a specific mission because it can damage grassland bird nests. The Young Assault Airstrip is surrounded by a grassy area that is periodically mowed by DPW. The LZs are planned in the vicinity of firing points to allow helicopter access.

##### **4.22.2.1 Management Activities**

- Control invasive plant species.
- Use prescribed burning to keep the DZs open.
- Use timber sales to clear trees from the airstrip runway approaches.

#### **4.22.3 Improved Ranges**

Care and maintenance of the range areas is under the jurisdiction of Range and Training Division in DPTMS. The DPW provides mowing, pest control support, and maintenance of buildings, parking lots, roads, etc. The ITAM and NRB coordinate any activity that may impact the range (timber harvests, hunting, or data collection) with the DPTMS Scheduling Section. Prescribed burns are conducted around certain ranges each spring to reduce woody vegetation and decrease fuel loads to prevent uncontrolled wildfires during active use. The large open area (700 acres) of Range 29 has become an important area for grassland birds. Cease-fires are initiated whenever mega-fauna are identified on ranges to help reduce impacts to wildlife species.

##### **4.22.3.1 Management Activities**

- Annually burn Ranges 6, 18, 26, and 29 in the spring to reduce wildfire potential.
- Annually burn downrange of Range 101 and 31A in early spring to reduce wildfire potential from night shooting of tracer rounds.
- Provide technical guidance for fire break maintenance around selected ranges (26, 100, 101 and 102) to reduce wildfire danger.

#### **4.23 Developed Areas Management**

##### **4.23.1 Cantonment and Housing Area Management**

The DPW operates the grounds maintenance program and is responsible for the grounds work in developed areas, along right-of-ways, and other areas. In 1982, Fort McCoy started withdrawing land from the mowing program until approximately 212 acres were put into the “No-Mow” program. These included areas that were a distance from buildings and mowing could not be justified. In addition to saving money by not mowing the land, other benefits were; increase of native vegetation, improved nongame wildlife habitat and additional stormwater retention.

The goals of the grounds maintenance program are:

- a. Support present and future mission requirements.
- b. Protect real estate investments from depreciation and damage.
- c. Protect the natural beauty of the landscape.

Housing occupants maintain their yards. Grounds personnel prune deadwood from the large trees in the area to prevent damage and injury to property and persons. The DFMWR personnel maintain a fenced garden plot for the occupants. Pest control is provided by DPW Pest Control or as a self-help program for smaller problems.

#### **4.23.1.1 Management Activities**

- Coordinate mowing and pest control requirements to achieve natural resource objectives.
- Provide technical oversight relating to urban forest management.
- Use special/urban hunts to manage deer populations.
- Minimize negative effects from stormwater run-off by using BMPs in construction designs and projects.
- Provide technical review of NEPA documents from DPW projects.
- Provide technical oversight related to water development projects.
- Control invasive plant species.
- Update urban forest inventory annually.

#### **4.23.2 Airport Management**

The NRB involvement is limited to managing the nearby forest to keep tree growth from impacting the facilities and managing animal populations to avoid interfering with aircraft. The DPW is responsible for mowing, urban tree care and removing individual trees that impact Federal Aviation Administration (FAA) rules for runway safety. The airfield was enclosed by a fence in 2009 to provide increased security and exclude deer from the runways.

#### **4.23.2.1 Management Activities**

- Control invasive species.
- Use timber sales to help keep runway flight paths in compliance with FAA rules for runway safety.

#### **4.23.3 Roads and Railroads**

Herbicides are used along the railroad bed to keep vegetation in check while roadsides are mowed. Roadsides in the training areas provide habitat for the KBB so a system of identifying KBB areas along roads has been implemented. The T&E biologist marks KBB habitat with fence posts and instructs the grounds crew not to mow those areas until September or October. The road maintenance crew assists with tree removal along roads during winters when snowfall amounts are below normal. Erosion is a main concern in areas of steep slopes or in the vicinity of stream crossings. Coordination between the road maintenance crew and NRB is vital to minimizing impacts to water resources.

#### **4.23.3.1 Management Activities**

- Maintain markers identifying KBB habitat restricted-mow areas along the roads.
- Prescribed burn along the railroad ROW to reduce fuel loads and maintain healthy prairie species to reduce railroad likelihood as corridor for long range spread of non-native and invasive plants.
- Use the work order process to alert the DPW contractor when culverts are obstructed.
- Coordinate with mowing crews to reduce spread of invasive plants, especially wild parsnip.
- Recommend and coordinate methods to minimize effects from stormwater runoff.
- Recommend BMPs to minimize sediment loading.

#### **4.24 Cultural Resources Management (CRM)**

Cultural Resources Management assists the Installation Commander in making decisions regarding the cultural resources under his control in compliance with public laws, in support of the military mission, and consistent with sound principles of cultural resources management. The successful balance of mission requirements and cultural resources compliance responsibilities requires long-term planning and coordination, and effective management to prevent conflicts between the mission and managed resources. More information concerning the CRM program is found in the Integrated Cultural Resources Management Plan (ICRMP).

Program goals are:

a. Accomplish necessary compliance actions for the management of cultural resources that may be affected by installation actions. This goal is the focus of the ICRMP that ties into the INRMP and the Installation Master Plan.

b. To locate and evaluate the significance of archaeological sites located on Fort McCoy and to

identify and protect all those that meet the criteria for inclusion on the National Register.

c. To contribute to the knowledge about the prehistory and history of West-Central Wisconsin through the analysis and synthesis of data collected in procedures designed to achieve compliance with Federal and state historic preservation laws.

d. To give priority to the evaluation of sites located in areas that are heavily used for training maneuvers, both to identify and devise protective strategies for National Register quality sites located in areas of high maneuver impact and to reduce the number of recorded sites that must be avoided by training activities.

e. To enforce Federal laws that prohibit willful vandalism and casual collection of antiquities from sites located on Fort McCoy through a program of selective surveillance and published notices.

#### **4.24.1 Cultural and Historic Resources**

Fort McCoy hosts archaeological sites and other historic properties dating from the Paleo-Indian period through the modern military era (ca. 12,000 B.C. through present day). Numerous Native American archaeological sites are present in areas that are in close proximity to streams and wetlands. These sites are typically a palimpsest of small short term occupations resulting from resource procurement excursions and are marked by features, projectile points, lithic debitage from late in the reduction sequence and, for Woodland sites or later, pottery. This activity on the stream terraces appears to intensify during the Middle Archaic period (approximately 4500 years ago) and continues through late pre-contact and even early post-contact Native American periods. EuroAmerican use of land overlooking waterways tends to focus on mill activity and, to a lesser extent, recreational lake clubs. These sites are usually identified through a combination of historic records and surficial remnants of buildings and structures, such as cabin foundations or mill dams. This activity begins in the late 19<sup>th</sup> Century and lasts until the land was purchased by the US Government for the Army installation now known as Fort McCoy.

Away from water sources, the archaeological sites at Fort McCoy tend to be primarily post-contact farmsteads and military-related sites, with the occasional pre-contact Native American lithic reduction workshop also present in areas where workable raw materials are located.

Ongoing archaeological survey, Native American consultation, and other historical studies will undoubtedly alter the number of identified cultural and historic properties throughout this INRMP's life. At the time of this writing, approximately 65% of the installation's available lands have been inventoried for historic properties. Lands that are unavailable for surveys include the NIA, live fire ranges, and most of the Cantonment Area. In the inventoried area, over 400 archaeological sites have been identified.

Two buildings and two sets of stone gates have been determined to be eligible for the National Register of Historic Places (NRHP). Like most of the constructed properties on the installation, these properties are associated with the Army's use of the land.

The Ho-Chunk nation identified two sacred sites and one property of traditional, religious, and cultural significance located on Fort McCoy. With proper coordination, the Ho-Chunk Nation will be allowed access for ceremonial and religious purposes.

More information and a summary of Fort McCoy's mission and its effects on cultural and historic resources are located in the Fort McCoy Integrated Cultural Resources Management Plan.

#### **4.25 RTLA Bird and Small Mammal Surveys**

Bird surveys under LCTA were conducted during 1991, 1992, and 1994 field seasons. Surveys conducted during this period were to follow an Army-wide protocol (USACERL Tech Report N-92/03, Feb 1992). Current suggestions for avian surveys point to the need to conduct annual bird surveys using the Ralph et al (1995) point count methodology, which is the standard acceptable methodology for the Upper Midwest. Previous data collected by LCTA and by the wildlife program on presence/absence is useful background information, but in order to understand trends in bird populations at Fort McCoy annual surveys using a standard protocol will need to be conducted.

Small mammal surveys were also dictated as a part of the initial LCTA protocol. Small mammal surveys were to take place every 5 years. The initial small mammal survey was conducted June through July of 1991. To date no further small mammal survey using the original LCTA protocol has been accomplished due to changes in program guidance and focus. Other presence/absence surveys have

however been conducted by the wildlife program on post. More information on LCTA monitoring is discussed under Section 4.7.1.

Guidance from the Sustainable Range Program as of 2004 had indicated avian and wildlife survey efforts, especially if there is a well established Natural Resources Branch in place on the Installation, are generally not a RTLA program responsibility. Therefore, the current RTLA program does not participate in avian and wildlife assessments as part of the normal monitoring program.

#### **4.26 Soil Resources Inventory and Monitoring**

Soils inventories on Fort McCoy are based on the NRCS Soil Survey Geographic (SSURGO) Soils database from 2004. Field validation of these mapping units has not been conducted on a comprehensive level. One important aspect to consider is identification of hydric soils or soils with hydric components. Field verifications should be conducted as needed such as when a proposed construction site overlaps possible hydric soils.

The LCTA Program also contracted Center for Environmental Management of Military Lands (CEMML) to produce an erodibility index of Fort McCoy's soil resources. The report, *Soil Erosion Survey of Fort McCoy, Wisconsin* (Warren et al., 2002), provides some general conclusions and suggestions for soil conservation on post. The report concluded, generally, that up to 90 % of the land area of Fort McCoy has soils with a high tolerance for soil disturbance, as long as vegetation loss is minimized. The RTLA program will utilize information derived from this report as well as field data collected to keep updated tabs on soil and disturbance related impacts.

Currently, the RTLA program monitors erosion, soil disturbance, and exposed soils at vegetative survey plots as part of the long-term monitoring every five years. RTLA short-term monitoring, conducted annually, makes qualitative assessments of disturbed soils and potential erosion problem areas. Information obtained during surface water quality monitoring conducted during rainfall events will help identify watersheds impacted from erosion and sedimentation. Observations and soil erosion reports from other Fort McCoy personnel will also aid in correcting Installation erosion areas. Problem areas will be addressed with appropriate Directorates to achieve water quality improvements.

#### **4.27 Data Storage, Retrieval and Analysis**

Each NRB program stores data in their individual filing cabinets and computer files. Computer files are stored in a central server that is backed up daily. At the close of each fiscal year (FY), major accomplishments, events and activities are summarized and archived by the GIS lab for use in reports within and outside Fort McCoy. Some of the activities archived include: prescribed burns, wildfires, timber sales and invasive plant control.



## **5.0 IMPLEMENTATION OF THE PLAN**

### **5.1 Project Development**

This section describes how the NRB develops new projects and administers existing projects to complete implementation of the INRMP. There are two general types of projects; one-time and recurring. One-time projects are closed-out after project completion while recurring projects are typically planned for successive years. An example of one-time projects is lake dredging while an example of a recurring project is KBB population surveys that are completed twice each year. All projects are subject to the NEPA review process as defined in 32 CFR Part 651.9.

#### **5.1.1 Determine Project Need**

All projects begin when there is an identified need. The need may result from; a change in the military mission, new law or regulation, research and education, new technology, professional judgment, customer request, or any other changes or new information that might surface. Recurring projects should be assessed annually to determine if the project is still required.

#### **5.1.2 Project Details**

The project proponent or program manager in charge of the project researches the details and cost before presenting it for initial approval by the Chief, NRB. The project proponent or program manager will need to provide the following information before a project will be reviewed:

- a.) How much will the project cost?
- b.) What is the estimated schedule for completion?
- c.) When will the project start and end?
- d.) Is it a one-time or recurring project?
- e.) What are the benefits of the project?
- f.) How will it benefit and support the military mission?
- g.) How will the project be completed (project design that is most cost-effective or beneficial)?
- h.) Who will complete the project?
- i.) Has this been attempted by other installations or agencies?
- j.) What equipment and supplies are required?
- k.) Will additional funding sources be needed?
- l.) Future requirements or potential impacts on military mission.
- m.) What are the ramifications if we don't do the project?

#### **5.1.3 Project Approvals**

After the project has been researched and a summary of the project is completed, the project is submitted to the Chief, NRB for review and approval. After review, the Chief, NRB will route the project to the Chief, ED for a final approval. After the project is approved, a NEPA review will be initiated. Small projects may be completed by installation staff or by the existing DPW contractor if the project is covered by the contract. If the project requires a new contract or a change to the existing contract then a "Request for Services Contract Approval" form is completed for approval. Funding for the project is requested through the appropriate source described in section 5.4.

#### **5.1.4 Project Completion**

Any activity that occurs within the training areas must be coordinated with Range Scheduling to prevent any impacts to the military training mission. Projects that involve excavating or digging need coordination with Digger's Hotline. The project proponent visits the site frequently to inspect progress and make sure the project specifications are followed. A completed project is inspected to determine if the project goals were satisfied. If everything is satisfactorily completed, NRB records are updated.

### **5.2 Achieving No Net Loss**

The most effective way to achieve "no net loss" of training capability at Fort McCoy is to be proactive in managing the natural resources. Anticipating a potential training constraint (or encroachment) and completing actions to minimize the impact on training prevents a "roadblock" from negatively

impacting the military training mission. Some constraints are required by federal statute and cannot be avoided. Constraints may be internal or external. Internal constraints come from within the installation boundaries and result from actions done by the Army or Fort McCoy that inhibit some or all training missions. These constraints may be imposed through laws and regulations from other Federal agencies and include; cultural resources, threatened and endangered species, wetlands, surface water, steep topography, wellhead protection areas, family housing, development, and landfills. External constraints result from actions that occur off the installation such as housing developments and roads. Paragraph 2.3.4 discusses the effects of natural resources management on the mission and Appendix D shows the areas where restrictions on mission or training may occur.

## **5.2.1 Internal Constraints**

### **5.2.1.1 Cultural Resources**

The presence of certain types of cultural resources may place constraints on the type of undertaking conducted, including training and other activities that result from the military mission. Constraints usually reflect the nature of the resource as well as that of the undertaking. The most prevalent type of protected cultural resource are archaeological sites that are eligible for inclusion in the National Register of Historic Places (NRHP). Native American sacred sites and properties of traditional, religious, and cultural significance are also protected and training is restricted to foot traffic only. Other undertakings may be restricted to actions that will not adversely affect the resource. Likewise, NRHP-eligible buildings and structures may also restrict undertakings to those that will not adversely affect the resource.

### **5.2.1.2 Cemeteries**

There are two cemeteries and two individual gravesites located on Fort McCoy. These areas are protected from all disturbances.

### **5.2.1.3 Threatened and Endangered Species**

The KBB and gray wolf management plans were written with input from DPTMS in order to minimize impacts to the training mission at the planning stage. Actions conducted on Fort McCoy that will disturb vegetation and soil, to include many military training activities, are reviewed prior to completion in order to lessen impacts to resources. If endangered species habitats will be impacted, suggestions are made to either avoid or minimize these impacts. Building construction within KBB Management Areas is avoided whenever possible since these sites generally have the highest KBB populations and are the most important areas for Fort McCoy to reach its conservation goals. If impacts to KBB habitat are unavoidable, the biologist determines if the incidental take can be approved at the installation level or if approval from the FWS is needed. Endangered species habitat that is disturbed from a construction project normally must be mitigated. That is, the habitat lost must be replaced in an alternate location. Fort McCoy will be looking into completing some of these mitigation requirements off of the installation to reduce future impacts to military training.

To help ensure the long-term survival of KBBs on Fort McCoy, core population areas were identified in 1996, and signed in the field to designate their boundaries. Use restrictions in these areas included vehicle traffic, bivouacking, and digging; foot traffic was allowed. When KBBs were first documented on Fort McCoy and the initial management plan was completed in 1995, the amount of disturbance occurring on the landscape from military training activities was not known. The main purpose of the core areas was to ensure there would be KBB habitat areas on the landscape that would not be disturbed from military training activities. These areas would serve to re-populate surrounding areas if widespread disturbance occurred. Since 1995, no widespread disturbances have occurred on the landscape and it is now believed that it is unlikely that any will occur in the future. Due to this fact, core areas designations will be removed in 2012.

### **5.2.1.4 Surface Water and Wetlands**

Wetland habitat accounts for less than one tenth of the installation land acreage, covering approximately 4,400 acres. Floodplains and riparian habitat are typically well protected from vehicular travel. Fort McCoy restricts vehicle maneuvering within 25 meters of streams and wetlands (Fort McCoy

Reg 350-1). Restrictions are in place around bodies of surface water to minimize sources of pollution; however there are exceptions to the regulation given appropriate coordination or activity review to permit water related training like water removal, water purification, or float-type vehicle missions. Larger chunks of contiguous training land are needed to perform realistic military exercise. The DPTMS is in the planning process to establish stream crossings for tracked and wheeled vehicles. Foot training within the wetlands and streams are unrestricted.

The NEPA process identifies projects that may impact wetlands. Training and engineer personnel who apply good planning techniques can identify project alternatives to help avoid or minimize wetland losses. In areas where wetland losses or “take” is unavoidable, mitigation may need to be considered and negotiated. Wetland mitigation and banking programs will be considered with the WDNR, USACE and EPA to aid in Fort McCoy developments. Formal group discussions should be established with our basin partners for devising plans to best protect wetlands, the public trust, and mission needs. As an alternative to on-site wetland bank or mitigation, off-site wetland project should be considered to protect the military mission.

The 7,000-acre NIA is bisected by the La Crosse River and several smaller tributaries and wetland complexes. Efforts have been successful to minimize weapons fire into wetlands and waterways by moving targets outside a “no-fire” La Crosse River buffer area to reduce errant rounds impacting the stream. See the map of indirect fire restrictions in Appendix D. Ammunition containing white phosphorus is used in target areas designated to limit exposure to water and waterfowl. Monitoring efforts demonstrate that these practices as well as training activities are not having significant impacts to the aquatic resources.

The NRB helps to mitigate sediment impacts on water quality associated from training lands development and military operations by applying habitat restoration techniques in lakes and streams. Monitoring programs are in place to aid in identifying areas impacting aquatic resources and surface water quality to avoid environmental compliance concerns. Environmental non-compliance to the CWA or a notice of violation could possibly delay or impede the military mission. Proactive management is not only a benefit to the military’s natural resource, but a benefit to neighboring landowners within these major water basins.

#### **5.2.1.5 Fort McCoy Natural Areas (FMNA)**

The FMNAs offer limited access for troop training. Only dismounted field training exercises can take place within FMNA boundaries and digging/excavation is not allowed.

#### **5.2.1.6 Steep Topography**

Fort McCoy has 8,600 acres of land with slopes greater than 20%. These sloped areas are less conducive to mounted vehicle maneuvers and for sites such as tactical operations centers or assembly areas. The NRB can reduce the amount of T&E constraints on level ground by creating more KBB habitat on the steep hillsides. Thinning trees near the top of ridges can increase the quality of training by providing good lookout areas on high ground.

#### **5.2.1.7 Wellhead Protection Area (WHPA)**

Fort McCoy Regulation 420-30 prohibits activities from taking place within the WHPA that have the potential to contaminate Fort McCoy’s drinking water. Military training activities that are affected include; vehicle/equipment maintenance, motor fuel dispensing facilities/operations, petroleum product storage tanks, target/backstop areas, impact areas, firing of large munitions and burning powder charges.

#### **5.2.1.8 Landfills**

Out of ten closed landfills on Fort McCoy, four of them are off limits to vehicle traffic and soil or cap disturbance; three are located in the training areas and one in the NIA buffer zone. The first landfill, approximately one acre in size and located in Training Area C-2, was used as a demolition landfill for approximately 15 years from the early 1990’s until 2005. It contains primarily wood scraps from building demolition and is surrounded by a fence to prevent access. Landfill 5, the second landfill located in the training area, is approximately 30 acres in size and is located in Training Area M-3. Landfill 5 was in use from 1965 to 1989 and was used for a variety of wastes from animal carcasses to demolition material. Landfill 5 has a fence on the south and west sides to prevent access. The third landfill, landfill 2, is six

acres in size and is located in Training Area D-11. Landfill 2 was used to dump coal ash, construction waste and other non-recyclable material from 1942 to 1950.

The landfill located in the NIA buffer zone was used from WWII until 1965 for disposing empty pesticide containers. It was excavated and capped in 1993 and the cap must be maintained. The pesticide landfill has an earthen berm around the perimeter and the road leading to it is gated at the NIA boundary to prevent access.

A sediment disposal site covering three acres in training area B-24 has heavy metal contaminated soils from dredging Hazel Dell lake. Vehicle use and digging is prohibited in this site.

### **5.2.2 External Constraints**

The area around Fort McCoy has historically been rural with low population densities. Within the past 20 years, more development has taken place in the area adjacent to the installation boundary and most external constraints result from this increased development. See Appendix D for more details on the constraints.

The Army program to address external encroachment is called Army Compatible Use Buffers (ACUB). The ACUBs establish buffers around Army installations to limit effects of encroachment and maximize the amount of land inside the installation that can support the mission. Fort McCoy does not have an active ACUB program as of 2012 but efforts are underway to establish one.

A Joint Land Use Study (JLUS) is a way to reduce potential conflicts between military installations and stakeholders while sustaining economic growth and development, protecting public health and safety, and protecting military missions. Planning has started for a JLUS for Fort McCoy and will involve the local communities of Sparta, Tomah, Monroe County and Jackson County. The Mississippi River Regional Planning Commission will be a partner in this process.

### **5.3 Use of Cooperative Agreements (CAs)**

A Cooperative Agreement (CA) is an acquisition tool that is less formal than a contract but gives the government more control than a grant. It is considered an effective way to implement INRMPs and requires substantial government involvement. The CAs have been used by the NRB in the past. There are no CAs in place at this time, but there are on-going discussions concerning how to enter into agreement CA with the WDNR. Department of Defense Instruction (DODI) 4517.03 references section 670c-1 of the Sikes Act to give priority for the procurement of INRMP implementation and enforcement services to Federal and State agencies with responsibility for fish and wildlife management. The DODI also states that DoD installations may enter into CAs with States, local governments, nongovernmental organizations, and individuals to provide for natural resources maintenance and improvement or conservation research on or off DoD installations. The DoD installations are allowed to enter into interagency agreements with other Federal agencies for INRMP implementation and enforcement services.

### **5.4 Funding**

This section describes the different types of fund sources available through DPW. The INRMP projects may be funded through a variety of funding mechanisms each with unique rules on what is allowed. The ITAM program is funded through DPTMS channels and is described in the draft ITAM plan.

#### **5.4.1 Budget Requirements Worksheet**

The majority of INRMP funding is acquired primarily through the Resource Management Office (RMO) on Budget Requirements Worksheet. The Budget Requirements Worksheets are submitted for funding in three broad categories: 1) Recurring Requirements, 2) Non-Recurring Requirements, and 3) Other Recurring and Non-Recurring Requirements.

##### **5.4.1.1 Recurring Requirements**

Recurring requirements are those that occur on a routine and predictable cycle. They include costs for civilian labor, contractor support, travel, training, equipment, and supplies. Recurring costs are associated with regularly or periodically occurring requirements and the requirement frequency may be annually, every three years, every five years or other.

#### **5.4.1.2 Non-Recurring Requirements**

Non-recurring requirements are needed to address environmental activities not performed on a recurring basis. These are one-time requirements to address new regulations, a change in mission, correct currently out of compliance situations, or prevent a situation that is currently in compliance but may soon be out of compliance due to upcoming deadlines or changes in regulations. They also include those requirements necessary for preparing, updating, and revising plans.

#### **5.4.1.3 Other Recurring and Non-Recurring Requirements**

These are requirements and activities that are not required or do not specifically have established deadlines by legally-mandated requirements or have conditions or deadlines contained in national laws but are needed to address overall environmental goals and objectives and to sustain environmental stewardship.

#### **5.4.2 Reimbursable Funds**

The wildlife and forestry programs bring in funds to the government through the sale of timber, firewood, fishing permits, hunting permits, and trapping permits. Agriculture outleases are another source of revenue. Funds brought in through these sources are returned to the installations by reimbursing costs charged to the individual accounts.

##### **5.4.2.1 Forestry Reimbursable Account**

Revenue generated through timber sales and firewood permits is deposited in the Army Reimbursable Forestry Program (ARFP). Each year the forestry program is required to estimate the amount of funds they will deposit into the account and request the amount needed to fund forestry activities on the installation. The Omaha District COE administers the timber sale program on Fort McCoy and they also estimate the amount of deposit and reimbursement they require for the FY. All this information is entered into the Reimbursable Program Tracking System (RPTS). The RPTS is a web-based program that facilitates efficient data entry and analysis. The ARFP is self sustaining so the estimates from all the participating installations is used to calculate the total amount of estimated income and the total funding requirement of the program. Each installation is authorized no more than the amount of income they estimate, funding amount may be adjusted up or down through the year as income is deposited. If an installation makes more income than the combined expenses of the administering COE and their program, then 40% of the net proceeds (the amount not utilized by the installation and COE for operating expenses) are sent to a state entitlement fund created to compensate states for tax revenue lost on timber sales. These revenues are intended to be used for roads and schools in the counties affected. The remaining 60% of the net proceeds are deposited into the DoD Forest Reserve Account.

Forestry reimbursable funds can only be used for expenses related to the production of lumber or timber products. This includes protection from fire, insects, and disease. Forestry reimbursable funds are used to fund the forestry technician, forestry supplies, and forestry service contracts.

##### **5.4.2.2 Forest Reserve Account (FRA)**

Net revenues obtained by the ARFP that are not deposited into the state entitlement fund are made available for natural resources projects. The projects are not limited to commercial timber production and may include wildlife or other conservation projects that are related to forest management. Recent FRA projects on Fort McCoy funded invasive species surveys and suppression efforts in timber sale areas. The FRA projects are requested annually through RPTS and are prioritized with all installation submissions.

##### **5.4.2.3 Fish and Wildlife Reimbursable Funds**

Revenue obtained through the sale of Fort McCoy hunting, fishing and trapping permits is deposited into the 21X5095 account and is available to support wildlife and fisheries projects and annual stocking of fish into several impoundments. Recent projects supported by 21X funds include enhancement of winter deer browse, grassland management, wildlife surveys, hunting seasons, aquatic habitat enhancement and sediment removal. Up to 10% of the revenue can be used to support permit sales administration.

### 5.4.3 Un-Resourced Requirements

Installation Budget Requirements Worksheet funding shortfalls are immediately put on an Un-resourced Requirements List (URR). This list is forwarded to RMO to request additional funds to complete projects. The URR funds may come in at any time of the year but typically are released near the end of the FY.

### 5.5 NRB Staffing

The following staffing is identified to implement this INRMP:

Environmental Division Chief	1
Natural Resources Branch Chief	1
Forester	1
Forestry Technician	1
Wildlife Biologist	1
Biological Technician	1
Fisheries Biologist	1
T&E Species Biologist	1

The staffing list does not include personnel within DFMWR, Office of the Staff Judge Advocate, and DPTMS who have roles in implementation of this INRMP. The list does not include any contract staff involved with the service contracts administered by NRB. Per DODI 4517.03, “the management and conservation of natural resources within DoD control, including planning, implementation, oversight, and enforcement functions are inherently governmental functions that shall not be contracted.” The scopes-of-work for services contracted for INRMP implementation clearly address contractor and Government functions relating to natural resources.

#### 5.5.1 Volunteers

The NRB has used two volunteer programs to allow interested individuals to work under the direction of NRB government staff. The USFWS and the Army Family and Morale, Welfare and Recreation Command have volunteer programs. Volunteers are typically individuals from the local area who are high school or college-aged and are interested in pursuing a career in natural resources management. Other volunteers have been adults who enjoy the outdoors and are looking for ways to become involved during their spare time. Some projects using volunteer services have been forestry, fisheries and wildlife. Volunteers are required to complete forms that give them insurance coverage while performing volunteer services.

### 5.6 Monitoring Progress

Progress toward completing INRMP goals is measured in three ways:

- a. Tracking funding of the Installation Budget Requirements Worksheet projects and the obligation rate of the funds.
- b. The implementation schedule (Appendix B). This schedule shows the planned actions and their scheduled completion dates that will help complete INRMP goals. Each program will check off their accomplishments for the completed fiscal year on the implementation schedule.
- c. Assessing whether NRB programs have successfully managed natural resources on the installation without impacts to the military mission.

#### 5.6.1 INRMP Implementation Assessment

In addition to the three subjects measured in para 5.6, INRMP implementation is further analyzed by reviewing the following seven topics:

- a. INRMP Project Implementation
  - (1) Are INRMP projects, including follow-up inventorying and monitoring work, properly identified, developed, and submitted for funding?
  - (2) Has project funding been received, obligated, and expended?
  - (3) Have projects been completed and do they meet expected objectives?

- b. Listed Species and Critical Habitat
  - (1) Are conservation efforts effective?
  - (2) Does the INRMP provide conservation benefits necessary to preclude critical habitat designation?
  - (3) Are species at risk identified and are steps being undertaken to preclude listing?
- c. Partnerships Effectiveness
  - (1) Has the INRMP review team (USFWS and WDNR) been effective in ensuring the INRMP's implementation?
  - (2) Are other partnerships needed to meet the INRMP goals?
  - (3) Have other partnerships been effectively used to meet INRMP goals?
- d. Fish and Wildlife Management and Public Use
  - (1) Are public recreational opportunities such as hunting, fishing and wildlife viewing available to base residents and employees?
  - (2) Are public recreational opportunities such as hunting, fishing and wildlife viewing available to the public?
- e. Team Adequacy
  - (1) Is the installation's natural resources team adequately resourced to fully implement the INRMP?
  - (2) Is the installation's natural resources team adequately trained to fully implement the INRMP?
  - (3) Does the installation encourage retaining existing natural resources personnel to maintain corporate knowledge and manage resources with the most qualified professionals to support the military mission?
- f. Ecosystem Integrity
  - (1) To what extent are the installation's native ecological systems currently intact?
  - (2) In what ways are an installation's various habitats susceptible to change or damage from different stressors?
  - (3) What stressors affect each habitat type?
- g. INRMP Impact on the Installation Mission. To what degree (i.e., high, medium, or low) is the INRMP and its associated actions supporting the installation's ability to sustain the current and potential future military mission?

## 6.0 ENVIRONMENTAL ASSESSEMENT

### 6.1 Introduction

This Environmental Assessment (EA) is prepared in accordance with NEPA, its implementing regulations published by the Council on Environmental Quality (40 CFR 1500-1508), AR 200-1, Environmental Protection and Enhancement and 32 CFR 651, and Environmental Analysis of Army Actions. Under NEPA and its implementing regulations, federal agencies are required to consider the environmental impacts of major proposed actions in the form of an EA or Environmental Impact Statement (EIS). This NEPA analysis is in the form of an EA, which analyzes the potential consequences of implementing the INRMP for Fort McCoy.

### 6.2 Purpose and Need for the Proposed Action

a. Purpose: The purpose of the proposed action is to implement the INRMP at Fort McCoy. The INRMP is the installation's plan for managing natural resources to support and be consistent with the military mission while protecting and enhancing those resources for multiple use, sustainable yield and biological integrity. The management of natural resources is a series of processes over an extended period of time. This updated INRMP begins in 2012 and extends until a review for operation and effect (conducted no less than every five years) determines the need for a major revision.

b. Need: The Sikes Act (16 USC 670) requires military installations to develop and implement an INRMP in cooperation with the US Fish and Wildlife Service (USFWS) and the state fish and wildlife agency, in this case, the Wisconsin Department of Natural Resources (WDNR). Army Regulation 200-1 requires installations to integrate natural resources stewardship and compliance responsibilities with operational requirements to help achieve sustainable ranges, training areas, and other land assets and develop, initiate and maintain programs for the conservation, utilization, and rehabilitation of natural resources on Army lands.

### 6.3 Description of the Proposed Action

The proposed action for this EA is to implement the Fort McCoy INRMP. Under the Sikes Act the elements of the INRMP must be consistent with the use of the military installation to ensure the preparedness of the Armed Forces. The elements of the plan are to provide for: 1) fish and wildlife management, land management, forest management and fish and wildlife-oriented recreation; 2) fish and wildlife habitat enhancement or modifications; 3) wetland protection, enhancement, and restoration, where necessary for support of fish or wildlife; 4) integration of, and consistency among, the various activities conducted under the plan; 5) the establishment of specific natural resource management objectives and time frames for proposed actions; 6) the sustained use by the public of natural resources to the extent such use is not inconsistent with the needs of fish and wildlife resources management; 7) public access to the military installation that is necessary or appropriate for the use described in number 6, above, subject to requirements necessary to ensure safety and military security; 8) for the enforcement of natural resource laws and regulations; and 9) no net loss in the capability of the installation land to support the military mission of the installation.

### 6.4 Alternatives Considered

The No Action Alternative and the Preferred Alternative are the only two alternatives considered for the proposed action.

a. The preferred alternative is to implement the revised INRMP at Fort McCoy: This alternative is required by statute (16 U.S.C. 670). It is also required by Army Regulation 200-1.

b. No Action: This alternative is not feasible. Fort McCoy would be in violation of 16 U.S.C. 670 and AR 200-1.

### 6.5 Affected Environment

The affected environment for Fort McCoy in general is covered in Section 2 of the INRMP itself and it is also thoroughly discussed in the "Programmatic Environmental Assessment for the Real Property Master Plan, Fort McCoy, Wisconsin, September 2008 prepared by CH2MHILL".



## **6.6 Environmental Consequences**

This is a focused Environmental Assessment. The following valued environmental components (VECs) have been categorically excluded from this EA because no significant adverse effects are anticipated: Land Use; Air Space; Geology and Soils; Vegetation and Forestry; Invasive Species; Wildlife and Fisheries; Threatened and Endangered Species; Groundwater; Surface Water & Wetlands; Air Quality; Noise; Hazardous Materials & Hazardous Waste; Fire Management; Public Access and Recreation; Socioeconomics and Environmental Justice; Human Health and Safety; Cultural Resources; Visual Resources; Traffic and Transportation; and Infrastructure. The INRMP, by design, provides beneficial impacts to the natural resources of Fort McCoy and to the environment in general. These beneficial impacts are discussed in the INRMP. The Sikes Act requires the INRMP to provide for the integration of, and consistency among, the various activities conducted under the INRMP. The Fort McCoy INRMP has been prepared and reviewed by qualified, experienced natural resources professionals at Fort McCoy. No known adverse impacts were included in the plan. This Environmental Assessment, along with the INRMP itself, will go out for public review. Any significant comments will be addressed in the final documents.

## **6.7 Cumulative Effects**

There will be no adverse cumulative effects as a result of this plan.

## **6.8 Conclusions Regarding Significance of Impacts**

There are no significant adverse impacts expected from the implementation of the INRMP. The implementing regulation at 40 CFR Parts 1500-1508 (1508.27) of the NEPA requires consideration of whether a project would have significant effect on the quality of the human environment. Significance includes consideration of both the context and intensity.

### **6.8.1 Context**

Per 40 CFR Parts 1500-1508 (1508.27) of the NEPA: “*Context*: This means that the significance of an action must be analyzed in several contexts such as society as a whole (human, national), the affected region, the affected interests, and the locality. Significance varies with the setting of the proposed action. For instance, in the case of a site-specific action, significance would usually depend upon the effects in the locale rather than in the world as a whole. Both short- and long-term effects are relevant.” The implementation of the INRMP would not create a significant adverse impact on society as a whole or on the affected region.

### **6.8.2 Intensity**

Per 40 CFR Parts 1500-1508 (1508.27) of the NEPA: “*Intensity*: This refers to the severity of the impact. Responsible officials must bear in mind that more than one agency may make decisions about partial aspects of a major action. The following should be considered in evaluating intensity:”

- 1) “Impacts that may be both beneficial and adverse. A significant effect may exist even if the Federal agency believes that on balance the effect will be beneficial.” The beneficial effects of implementing the INRMP are discussed throughout the INRMP with most of the discussion in Sections 2 and 4. This INRMP is intended to have beneficial effects on the natural resources of Fort McCoy and any known management procedures that could cause adverse effects have been removed.
- 2) “The degree to which the proposed action affects health and safety.” There are no known adverse impacts on health and safety.
- 3) “Unique characteristic of the geographical area such as proximity to historic or cultural resources, park lands, prime farm lands, wetlands, wild and scenic rivers, or ecologically critical areas.” The implementation of the INRMP will have no adverse effect on cultural resource sites located on the installation. There are no park lands, prime farm lands, wild and scenic rivers or ecologically critical areas on the installation. There will be no adverse effect on wetlands on the installation.
- 4) “The degree to which the effects on the quality of the human environment are likely to be highly controversial.” This plan is not expected to be highly controversial.

- 5) *“The degree to which possible effects on the human environment are highly uncertain or involve unique or unknown risks.”* The possible effects on the human environment are not highly uncertain and do not involve unique or unknown risks.
- 6) *“The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.”* The implementation of the INRMP will not establish a precedent for future actions with significant effects or represent a decision in principle about a future consideration.
- 7) *“Whether the action is related to other actions with individually insignificant but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts.”* The implementation of the INRMP is not related to other actions that together will have significant adverse cumulative impacts. The intent of the implementation of the INRMP is to produce beneficial cumulative effects.
- 8) *“The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources.”* The implementation of the INRMP will not have any significant impact on districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places and will not cause loss or destruction of significant scientific, cultural or historical resources.
- 9) *“The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.”* Separate Environmental Assessments were prepared for the Gray Wolf Management Plan and for the Karner Blue Butterfly Management Plan. The KBB is a federally endangered species found on the installation while the gray wolf was recently removed from the federal list of endangered species.

## **6.9 List of Preparers and Agencies and Persons Consulted**

### **6.9.1 Preparers**

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## Bibliography

- Albert, D. A. 1995. Regional Landscape Ecosystems of Michigan, Minnesota, and Wisconsin: A Working Map and Classification. North Central Forest Experiment Station, Forest Service-U.S. Department of Agriculture. General Technical Report NC-178.
- Caldwell, Karyn. 2003. U.S. Army Fort McCoy Integrated Cultural Resources Management Plan. Colorado State University @ Fort McCoy Archaeology Laboratory, 110 East Headquarters Road, Fort McCoy, Wisconsin 54656-5226.
- Curtis, J.T. 1959. The Vegetation of Wisconsin. The University of Wisconsin Press, Madison, Wisconsin.
- Directorate of Public Works .2008.Real Property Master Plan, Fort McCoy, Wisconsin. 2008. FCH2MHILL.
- Directorate of Public Works. 2010. Fort McCoy Regulation 420-30. Wellhead Protection Plan. Environmental Division. Fort McCoy, Wisconsin.
- Drake, T.C. 1997. Rapid Bioassessment and Macroinvertebrate Survey of 11 Streams on the Fort McCoy Military Reservation, Sparta, Wisconsin. M.S. Thesis. College of Natural Resources. University Of Wisconsin-Stevens Point.
- Earth Tech Corporation. 1996. Fort McCoy Installation Compatibility Use Zone Study (ICUZ). Project Number HA 00107 4P.
- Freckman, R. W. 1992. Final Report-Fort McCoy Wetland Survey. Unpublished.
- Friedl, Brent A. 2011. Integrated Training Area Management ITAM Plan FY12-17. Parsons Inc., Fort McCoy, Wisconsin.
- Haney, A., and S. Apfelbaum. 1993. Oak Barrens in Central Wisconsin. College of Natural Resources, University of Wisconsin-Stevens Point.
- Herrick, S.K., J.A. Kovach, E.A. Padley, C.R. Wagner, and D.E. Zastrow. 2009 Wisconsin's Forestland Woody Biomass Harvesting Guidelines. PUB-FR-435-2009 WI DNR Division of Forestry and Wisconsin Council on Forestry: Madison, WI. 51 pp.
- Kerkman, James R. 2007. Fort McCoy Gypsy Moth Management Plan. Directorate of Plans, Training, Mobilization, and Security. Range and Training Division, Biological and Cultural Resources Team. Fort McCoy, Wisconsin.
- Keystone Center, The. 1996. The Keystone National Policy Dialogue on Ecosystem Management-Final Report. Colorado.
- Kotar, J., and T. L. Burger. 1996. A Guide to Forest Communities and Habitat Types of Central and Southern Wisconsin. The Department of Forestry, University of Wisconsin-Madison.
- Kraft, Chris. 2003 Dam Inspection Report, 2003. Griffin Services, Inc., Directorate of Support Services, Engineering Department, Fort McCoy, Wisconsin.
- Leach, Mark K. 2001. The Rare Plants of Fort McCoy Military Reservation, Monroe Co., Wisconsin. *Integrated Natural Resources Management Plan 2012*

- The Michigan Botanist 40:3-15.
- Leslie, M., G.K. Meffe, J.L. Hardesty, and D.L. Adams. 1996. Conserving Biodiversity on Military Lands: A Handbook for Natural Resources Managers. The Nature Conservancy, Arlington, VA.
- Lyons, J., L. Wang, and T.D. Simonson. 1996. Development and Validation of an Index of Biotic Integrity for Coldwater Streams in Wisconsin. N. Amer. J. Fish Mgmt. 16:241-256.
- Martin, Lawrence. 1965. Physical Geography of Wisconsin. The University of Wisconsin Press, Madison, Wisconsin.
- Maxwell, J. 1996. Memo to the Biological Services Team. Succession of Plant Community on Tarp Areas-Observations. Unpublished.
- Noble, Jr., J.D. 1997. La Crosse River Aquatic Monitoring Summary Report, 1993-1996. Fort McCoy in-house report.
- Noble, Jr., J.D. 1998. Silver Creek Water Quality Summary Report for Monroe County Department of Land Conservation. Fort McCoy in-house report.
- Nuzzo, V. 1986. Extent and Status of Midwest Oak Savanna: Presettlement and 1985. Natural Areas Journal. 6:6-36.
- Pest Control Management Plan. 1995. Fort McCoy, Wisconsin.
- Public Forest Resource Group. 1994. Final Report of The Ad Hoc Committee-Collaborative Planning Opportunities for State Forests, National Forest System and County Forests Association. Wisconsin Department of Natural Resources, USDA Forest Service, Wisconsin County Forests Association.
- Running, Garry L., Sabin, Ty J., and Ripley, Jemuel L. 1998. Geomorphological Survey of Fort McCoy, Wisconsin. Department of the Interior, U.S. Geological Survey, Middleton, Wisconsin.
- Sample, David W., Mossman, Michael J. 1997. Managing Habitat for Grassland Birds, A Guide for Wisconsin. Bureau of Integrated Science Services, Department of Natural Resources, P.O. Box 7921, Madison, Wisconsin 53707.
- Simmers, J.W., Price, R.A., Myers, K., Karn, R., Kress, R.D., Tatem, H.E., Jensen, K.C., Wilhelm, G.S., and Cherry, D.S., 1995. Impact Area Contaminant Inventory: Fort McCoy, Misc. Paper EL-97. U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS.
- Soil Conservation Service. 1984. Soil Survey of Monroe County, Wisconsin. United States Department of Agriculture.
- Tazik, David J., Warren, Steven D., Diersing, Victor E., Shaw, Robert B., Brozka, Robert J., Bagley, Calvin F., Whitworth, William R., 1992. U.S. Army Land Condition-Trend Analysis (LCTA) Plot Inventory Field Methods. US Army Corps of Engineers, Construction Engineering Research Laboratory (USACERL) Technical Report N-93/03. USACERL, Champaign, IL.
- US Army Corps of Engineers, Huntsville Division. 1996. Range and Training Land Program, Range Development Plan, Fort McCoy, Wisconsin. Nakata Planning Group, LLC.
- U.S. Army Corps of Engineers, Omaha District. 1994. Wellhead Protection Area Study, Fort McCoy, Monroe County, Wisconsin. RUST Environment and Infrastructure.

- Warren, Steven D., Ruzycki, Thomas S., Senseman, Gary M. 2002. Soil Erosion Survey of Fort McCoy, Wisconsin. Center for Environmental Management of Military Lands, Colorado State University, Fort Collins, Colorado.
- Williamson, J. D. 1997. Guidelines to Prepare Integrated Natural Resources Management Plans for Army Installations and Activities. U.S. Army Environmental Center, Aberdeen Proving Ground, MD.
- Wilder, Timothy T. 2006. Fort McCoy Karner Blue Butterfly Endangered Species Management Plan. Directorate of Plans, Training, Mobilization, and Security. Range and Training Division, Biological and Cultural Resources Team. Fort McCoy, Wisconsin.
- Wisconsin's Changing Climate: Impacts and Adaptation. 2011. Wisconsin Initiative on Climate Change Impacts Nelson Institute for Environmental Studies, University of Wisconsin-Madison and the Wisconsin Department of Natural Resources, Madison, Wisconsin.
- Wisconsin Department of Natural Resources. 1980. Wisconsin Trout Streams. Publication 6-3600 (80).
- Wisconsin Department of Natural Resources. 1992. Strategic Plan for Managing the Mississippi River into the Next Century.
- Wisconsin Department of Natural Resources. 1993. Wisconsin Construction Site Best Management Handbook. Publication WR-222 93-REV.
- Wisconsin Department of Natural Resources. 1994. Bad Axe-La Crosse Water Quality Management Plan. Publication number WR329-94-REV
- Wisconsin Department of Natural Resources. 1995. Wisconsin's Forestry Best Management Practices for Water Quality. Publication number FR093.
- Wisconsin Department of Natural Resources. 1995. Wisconsin Lakes. Publication number PUB-FM-800-95REV.

## APPENDIX A

## LIST OF ABBREVIATIONS

ACUB	Army Compatible Use Buffers
AEC	Army Environmental Center
AIRFA	American Indian Religious Freedom Act
ALIS	Automated License Issuance System
APHIS	Animal and Plant Health Inspection Services
AR	Army Regulations
ARMID	Army Reserve Installation Management Division
ARFP	Army Reimbursable Forestry Program
ATTACC	Army Training and Testing Area Carrying Capacity
BDZ	Badger Drop Zone
BMP	Best Management Practices
BRSF	Black River State Forest
CACTF	Combined Arms Collective Training Facility
CATEX	Categorical Exclusion
CEMML	Center for Ecological Management of Military Lands
CFR	Code of Federal Regulations
COA	Conservation Opportunity Area
CPRS	Commander's Performance Review System
CR	Community Recreation
CRD	Commercial Recreation District
CRM	Cultural Resources Management
CSU	Colorado State University
CWA	Clean Water Act
DA	Department of the Army
DES	Directorate of Emergency Services
DFMWR	Directorate of Family and Moral, Welfare and Recreation
DoD	Department of Defense
DODI	Department of Defense Instruction
DPTMS	Directorate of Plans, Training, Mobilization and Security
DOL	Directorate of Logistics
DZ	Drop Zones
EA	Environmental Assessment
EAW	Environmental Awareness
EIS	Environmental Impact Statement
EISA	Energy Independence and Security Act
EO	Executive Order
EPA	Environmental Protection Agency
EPR	Environmental Program Requirements
ESA	Endangered Species Act
EWM	Eurasian Watermilfoil
FAA	Federal Aviation Administration
FPP	Fire Prevention and Protection
FLN	Fire Learning Network
FMNA	Fort McCoy Natural Area

FOB	Forward Operating Base
FPP	Fire Protection and Prevention
FRA	Forestry Reserve Account
FY	Fiscal Year
GIS	Geographic Information Systems
IBI	Index of Biotic Integrity
ID	Identify
ICRMP	Integrated Cultural Resources Management Plan
IFB	Invitation for Bid
IMMA	Installation Material Maintenance Activity
IMCOM	Installation Management Command
INRMP	Integrated Natural Resources Management Plan
IPM	Integrated Pest Management
IPMP	Integrated Pest Management Plan
ITAM	Integrated Training Area Management
IWA	In Accordance With
IWFMP	Integrated Wildland Fire Management Plan
JLUS	Joint Land Use Study
JTC	Joliet Training Center
KBB	Karner Blue Butterfly
KD	Known Distance
LCM	Land Condition Module
LCTA	Land Condition Trend Analysis
LID	Low Impact Development
LP	Large Viable Metapopulation
LRAM	Land Rehabilitation and Maintenance
LSA	Logistical Support Area
LTHIA	Long Term Hydrological Impact Analysis
MBTA	Migratory Bird Treaty Act
MCSA	Monroe County Snowmobile Alliance
MCOC	Munitions Constituents of Concern
MOU	Memorandum of Understanding
MOUT	Military Operations on Urbanized Terrain
MPFTS	Multi-Purpose Field Training Site
MSU	Michigan State University
NAGPRA	Native American Grave Protection and Repatriation Act
NCO	Non-Commissioned Officer
NEPA	National Environmental Policy Act
NGO	Nongovernment Organization
NHPA	National Historic Preservation Act
NIA	North Impact Area
NPS	National Park Service
NPV	Nucleopolyhedrosis Virus
NRB	Natural Resources Branch
NRCS	Natural Resources Conservation Service
NRHP	National Registered Historic Property
NWCG	National Wildfire Coordinating Group



OR	Outdoor Recreation
ORAP	Operational Range Assessment Program
ORISE	Oak Ridge Institute for Science and Education
PAO	Public Affairs Office
PIB	Process Improvement Board
PLS	Planning Level Survey
PMP	Pest Management Plan
PPV	Public Private Venture
PVRA	Pine View Recreation Area
RCMP	Range Complex Master Plan
RFMSS	Range Facility Management Support System
RMO	Resource Management Office
ROW	Right of Way
ROWPU	Reverse Osmosis Water Purification Unit
RPTS	Reimbursable Program Tracking Software
RR	Rail road
RTLA	Range and Training Land Assessment
SHPO	State Historic Preservation Officer
SLTS	Small Lot Timber Sales
SRA	Sustainable Range Awareness
SSURGO	Soil Survey Geographic Database
TA	Training Area
TARP	Training Area Recovery Plan
T&E	Threatened and Endangered
TMDL	Total Maximum Daily Load
TNC	The Nature Conservancy
TRI	Training Requirements Integration
TSI	Timber Stand Improvement
URR	Un-Resourced Requirements
USACHPPM	US Army Center for Health Promotion and Preventive Medicine
USACE	US Army Corps of Engineers
USARC	United States Army Reserve Command
USDA	United States Department of Agriculture
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Service
UW	University of Wisconsin
UWL	University of Wisconsin-La Crosse
UWM	University of Wisconsin-Madison
UXO	Unexploded Ordnance
WCD	Wisconsin Conservation Department
WDATCP	Department of Agriculture, Trade and Consumer Protection
WDNR	Wisconsin Department of Natural Resources
WES	Waterways Experimental Station
WHPA	Wellhead Protection Area
WP	White Phosphorous
WPP	Wellhead Protection Plan
WPDES	Wisconsin Pollutant Discharge Elimination System
WRRRA	Whitetail Ridge Recreation Area

WWII  
WWA  
WWTP

World War Two  
Wisconsin Wetland Association  
Wastewater Treatment Plant

## APPENDIX B

Implementation Schedule			2011		
<i>Shaded areas considered must-fund</i>		Paragraph reference	Planned	Completed	Results
1	Special Vegetation Survey	4.7.1.2			As needed
2	Forest Inventory	4.6.1.1	X		
3	Re-Map KBB Habitat	4.1.2.1	X		
4	KBB Habitat Monitoring	4.1.2.1	X		
5	Oak Wilt Survey	4.6.3.2	X		
6	Urban Forest Survey Update	4.7.1.3, 4.23.1.1	X		
7	FIA Plots	4.7.1.4	X		FMC not fund
8	Grassland Bird Survey	4.5.4.1			
9	Game Animal Surveys	4.5.1.1	X		
10	Spotlight Survey	4.5.1.1	X		
11	Doe:Fawn Survey	4.5.1.1	X		
12	Grouse Drumming Survey	4.5.5	X		
13	Turkey Gobble Survey	4.5.5	X		
14	Woodcock Survey	4.5.5	X		
15	Brood Surveys	4.5.5	X		
16	Hunter Survey	4.5.2.1	X		
17	Fisheries Surveys	4.4.2.1	X		
18	IBI	4.4.4	X		
19	Stream Shocking	4.4.4	X		
20	Netting	4.4.4	X		
21	Lake Shocking	4.4.4	X		
22	Creel Census-Lakes	4.4.2.1, 4.4.4	X		
23	Creel Census-Stream	4.4.3.1, 4.4.4	X		
24	Hook & Line	4.4.4	X		
25	Assess Fish For Contaminants	4.4.2.1	X		As needed
26	Water Quality	4.4.2.1, 4.4.4	X		
27	Investigate Impaired Waters	4.4.3.1	X		
28	Update Trout Water Classification	4.4.3.1	X		
29	Determine Water Quality Trends	4.4.3.1	X		
30	Threatened and Endangered Surveys	4.1			
31	KBB Straight-Line Transects	4.1.2.1	X		
32	KBB Presence/Absence	4.1.2.1			
33	Monitor KBB Habitat	4.1.2.1	X		
34	Remap KBB Habitat	4.1.2.1	X		
35	Bald Eagle Surveys	4.1.9.1	X		
36	Phlox Moth Surveys	4.1.6.1	X		
37	T&E Turtle Surveys	4.1.4.1	X		
38	Turtle Telemetry	4.1.4.1	X		
39	Osprey Surveys	4.1.10.1	X		
40	Red-Tailed Prairie Leafhopper	4.1.5.1	X		
41	Bull Snake Telemetry And Survey	4.1.7.1	X		
42	Rough White Lettuce Survey	4.1.11.1, 4.21.1	X		
43	Regal Fritillary Survey	4.1.8.1	X		
44	Cerulean Warbler Surveys	4.1.12.1	X		
45	Gypsy Moth Trapping	4.6.3.2	X		FMC not fund
46	Gypsy Moth Control	4.6.3.2			FMC not fund, as needed
47	Timber Sales	4.6.2, 4.8.1	X		
48	Land Use Change	4.6.2.4	X		
49	Enhance Training Mission	4.6.2.4	X		
50	Restore Oak Savanna	4.6.2.4	X		
51	Natural Regeneration	4.6.2.4	X		
52	Aspen Regeneration	4.5.3.1, 4.6.2.4	X		
53	Intermediate Harvest	4.6.2.2	X		
54	Lower Fire Danger	4.16.4	X		
55	Airfield Flight Path Clearing	4.23.2.1			As needed
56	Salvage Harvest	4.6.2.3			As needed
57	Insect and Disease Protection	4.6.3.2	X		
58	Artificial reforestation	4.6.5.1	X		
59	Reforest Mound Prairie Area	4.6.5.1			
60	Manage Red Pine Plantations	4.6.2.4, 4.6.4.1	X		
61	Manage Jack Pine	4.6.2.4	X		
62	Manage Good Oak	4.6.4.1, 4.6.5.1	X		
63	Maintain Good Oak	4.6.4.1	X		
64	Timber Stand Improvement	4.6.4.1			
65	Oak Wilt Education	4.6.3.2	X		
66	Monitor Oak Wilt Pockets	4.6.3.2	X		
67	Aerial Forest Damage Survey	4.6.3.2	X		
68	Annosus Root Rot Control	4.6.3.2	X		
69	Seedbed Prep for Jack Pine Regeneration	4.6.5.1	X		
70	Recalc Annual Allowable Harvest	4.6.1.1			

Implementation Schedule		2011			
<i>Shaded areas considered must-fund</i>		Paragraph reference	Planned	Completed	Results
71	Attend Forestry Training	4.17	X		
72	Archery Hunt	4.5.1.1	X		
73	Gun Deer Hunt	4.5.1.1	X		
74	Cantonment Deer Hunt	4.5.2.1, 4.23.1.1	X		
75	Collect & Analyze Data	4.5.1.1, 4.5.2.1	X		
76	Maintain Harvest/Biological Database	4.5.1.1	X		
77	Deer Habitat Improvement Projects	4.5.1.1	X		
78	Coordinate Permit Sales Regs	4.5.2.1	X		
79	Establish Quotas For Hunting Seasons	4.5.2.1	X		
80	WI DNR Letter of Intent	4.5.2.1	X		
81	MWR Register Turkey & Archery Deer	4.5.2.1	X		
82	Register Deer Gun Deer Season	4.5.2.1	X		
83	ID Areas with Large Furbearer Pops.	4.5.2.1	X		
84	Consult WDNR on Hunting Issues	4.5.2.1	X		
85	Support Preventive Medicine	4.5.2.1	X		
86	Spring Habitat Burns	4.5.3.1	X		
87	Fall Habitat Burns	4.5.3.1	X		
88	Collect Native Seed	4.5.3.1			As needed
89	Plant Native Seed	4.5.3.1			As needed
90	Develop Seed Mixtures	4.5.3.1			
91	Maintain Existing Apple Trees	4.5.3.1	X		
92	Improve Browse Habitat	4.5.3.1	X		
93	Maintain Nesting Structures	4.5.3.1	X		
94	Osprey	4.5.3.1			As needed
95	Bluebird	4.5.3.1, 4.8.1	X		
96	Wood Duck	4.5.3.1	X		
97	Bat	4.5.3.1	X		
98	Grassland Bird Studies	4.21.1			
99	Improve Grassland Bird Habitat	4.5.3.1	X		
100	Plant American Chestnut Trees	4.5.3.1			As needed
101	Review Permit Sales Process	4.14.3.2	X		
102	Issue Trapping Permits	4.14.3.2	X		
103	Issue Hunting Permits	4.5.2.1, 4.14.3.2	X		
104	Issue Fishing Permits	4.4.2.1, 4.14.3.2	X		
105	Issue Firewood Permits	4.6.2.4, 4.14.3.2	X		
106	Permit Sales Customer Service	4.14.3.2	X		
107	Restore & Manage Savanna/Barrens	4.5.3.1	X		
108	Increase Grassland Area	4.5.4.1	X		
109	Prescribed Burns	4.5.4.1	X		
110	Mowing	4.5.4.1			As needed
111	Native Plant Restoration	4.5.4.1			As needed
112	Timber Harvests	4.5.4.1	X		
113	Brush Removal	4.5.4.1			
114	Manage Grassland Core Areas	4.5.4.1	X		
115	NIA	4.5.4.1	X		
116	Warrens DZ	4.5.4.1			As needed
117	Cranberry DZ	4.5.4.1			As needed
118	Range 29	4.5.4.1	X		
119	Badger DZ	4.5.4.1	X		
120	Oak Savanna FMNA	4.5.4.1	X		
121	Training Areas B-26, B-27	4.5.4.1			As needed
122	Maintain Cantonment Unmowed Areas	4.5.4.1	X		
123	Exotic Plant Species	4.9.1	X		
124	All Invasive Species Surveys	4.3.1, 4.9.1, 4.21.1	X		
125	Leafy Spurge Treatment	4.9.1, 4.21.1, 4.22.1.1	X		
126	Spotted Knapweed Treatment	4.9.1, 4.22.1.1	X		
127	Garlic Mustard Treatment	4.9.1	X		
128	Buckthorn Treatment	4.3.1, 4.9.1	X		
129	Purple Loosestrife Treatment	4.3.1, 4.9.1	X		
130	Eurasian Watermil/Curly Pondweed	4.4.2.1	X		
131	Survey	4.4.2.1	X		
132	Treatment	4.4.2.1	X		
133	Wild Honeysuckle Treatment	4.9.1	X		
134	Canada Thistle Treatment	4.9.1	X		
135	Crown Vetch Treatment	4.9.1	X		
136	Autumn Olive Treatment	4.9.1	X		
137	Siberian Pea Shrub Treatment	4.9.1	X		
138	Black Locust Treatment	4.9.1	X		
139	Reed Canary Grass Treatment	4.3.1	X		
140	Wild Parsnip Treatment	4.9.1, 4.23.3.1	X		
141	Other Invasive Plant Treatment	4.3.1, 4.9.1, 4.22.2.1, 4.23.1.1,	X		

Implementation Schedule			2011		
<i>Shaded areas considered must-fund</i>		Paragraph reference	Planned	Completed	Results
142	Fort McCoy Education/Coordination	4.9.1, 4.23.3.1			
143	Investigate New Control Measures	4.9.1			
144	Manage Invasive Database	4.9.1	X		
145	Monthly Herbicide Reports	4.9.1, 4.10.1	X		
146	Avoid Herbicides in Wellhead Area	4.10.1	X		
147	Coordinate to Share Pest Facility	4.10.1	X		
148	Coordinate with DOL for Sick Fauna	4.10.1	X		
149	Maintain Herbicide Equipment	4.9.1	X		
150	Herbicide Certification/Recertification	4.17	X		
151	Complete Invasive Species Plan	4.9	X		
152	investigate New Biocontrol	4.9.1			
153	Manage FMNA	4.21	X		
154	Inspect FMNA Annually	4.21	X		
155	Remove Beaver Dams	4.3.1, 4.4.2.1, 4.4.3.1, 4.21	X		
156	Maintain FMNA Signs	4.21			As needed
157	Annual FMNA Report to WDNR	4.21.1	X		
158	FMNA Education and Outreach	4.21.1			
159	Manage FMNA as needed	4.21.1	X		
160	Wetlands Management	4.3	X		
161	Control Beaver Populations	4.3.1, 4.4.2.1, 4.4.3.1	X		
162	Prescribe Burn Wetlands	4.16.6.1			
163	Control Woody Vegetation in Wetlands	4.3.1	X		
164	Manage Bog Communities	4.3.1			
165	Survey Manmade Potholes	4.3.1			As needed
166	Review/Update GIS wetlands/streams	4.3.1, 4.4.3.1			
167	Wetland Banking or Partnership	4.3.1, 5.2.1.4			
168	Wetland Mitigation	5.2.1.4	X		
169	Wetland Delineation Contracts	4.3.1			As needed
170	Map Ephemeral Ponds	4.3.1			As needed
171	Evaluate Wetlands	4.3.1	X		
172	Fisheries Program Administration	4.4	X		
173	Contract Oversight	4.4.1	X		
174	Develop/Maintain Fisheries Plans	4.4.1	X		
175	Maintain Partnerships	4.4.1, 4.4.3.1	X		
176	Support Clear & Stilwell Creek project	4.4.1	X		
177	Obtain Disease-Free Fish	4.4.1	X		
178	Coordinate With Military Training	4.4.1	X		
179	Sediment Working Group	4.4.2.1	X		
180	Support Energy Ind. & Security Act	4.4.1	X		
181	Stormwater Mgmt/Construct Proj.	4.4.1, 4.23.3.1	X		
182	Fishing Regulations	4.4.1, 4.4.2.1	X		
183	Streambank Restore and Habitat Improve	4.4.3.1, 4.6.5.1	X		
184	Assess Lake Morphology	4.4.2.1	X		
185	Lake Habitat	4.4.2.1	X		
186	Fish Stocking	4.4.2.1	X		
187	Stock Trout	4.4.2.1	X		
188	Stock Walleye	4.4.2.1	X		
189	Stock catfish	4.4.2.1	X		
190	Stock Minnows	4.4.2.1	X		
191	Water Level Management	4.4.2.1	X		
192	LaCrosse River Sedimentation Control	4.4.1, 4.4.3.1, 4.22.1.1	X		
193	Monitor ASP for White Phos Use	4.4.3.1	X		
194	BMP Monitoring and Use	4.4.3.1, 4.22.1.1, 4.23.1.1, 4.23.3.1	X		
195	Culvert Management	4.4.3.1, 4.23.3.1	X		
196	Tag LM Bass in North Flowage	4.4.2.1	X		
197	Develop North Flowage High Quality Fishery	4.4.2.1	X		
198	Education Materials at Boat Landings	4.4.2.1	X		
199	Predator/Prey Balance in Lakes	4.4.2.1	X		
200	Install Fish Cover in Lakes	4.4.2.1	X		
201	Aqua Crib Fasteners	4.4.2.1			
202	Woody Debris	4.4.2.1	X		
203	Tree Drops	4.4.2.1	X		
204	Provide Stock Fish to Area Lakes	4.4.2.1	X		
205	ID Dams for Removal or Reclamation	4.4.2.1, 4.4.3.1	X		
206	Biomonitoring Assessments	4.4.3.1	X		
207	Monitor/Maintain Oxygen Levels	4.4.2.1	X		
208	Funding for Dam Removal Reclaim	4.4.3.1	X		
209	ID Fix to Sedimentation	4.4.1, 4.4.3.1	X		

Implementation Schedule		2011			
<i>Shaded areas considered must-fund</i>		Paragraph reference	Planned	Completed	Results
210	Open Communication with T&E Interests	4.1.1	X		
211	Review NEPA Forms for T&E Concerns	4.1.1	X		
212	Reduce Project Impacts to T&E	4.1.1	X		
213	Monitor Bald Eagle Nesting Success	4.1.9.1	X		
214	Monitor Osprey Nesting Success	4.1.10.1	X		
215	Install Osprey Nest Platforms	4.1.10.1			As needed
216	Restore and Manage Goat Prairies	4.1.5.1	X		
217	KBB Management Plan	4.1.2	X		
218	Maintain KBB No-Mow Roadside Marks	4.23.3.1	X		
219	Complete Major Revision of KBB Plan	4.1.2	X		
220	Submit T&E Compliance Reports	4.1.1	X		
221	Conduct Annual Briefings To Workforce	4.1.1	X		
222	Document Occurance Records	4.1.1	X		
223	KBB Public Outreach and Education	4.1, 4.1.2	X		
224	Habitat Management Activities	4.1.2.1	X		
225	Complete Mitigation Actions	4.1.2.1	X		
226	KBB Core Area Re-evaluation	5.2.1.3	X		
227	Involve Area Students with Projects	4.1.4.1	X		
228	Wolf Track Surveys-Winter	4.1.3.1	X		
229	Wolf Howling Surveys	4.1.3.1	X		
230	Telemetry Monitoring of Collared Wolf	4.1.3.1	X		
231	Remote Camera Survey	4.1.3.1	X		
232	Maintain 100 Meter Buffer	4.1.3.1	X		
233	Coyote Hunting Ban for Gun-Deer Season	4.1.3.1	X		
234	North Post Ban on Coyote Hunt w/Dogs	4.1.3.1	X		
235	Coyote Trap Size Limit	4.1.3.1	X		
236	Reports to WDNR	4.1.3.1	X		
237	Outreach and Education	4.1.7.1, 4.4.2.1	X		
238	Develop Regal Fritillary Mgmt Guidelines	4.1.8.1			
239	Rough White Lettuce Seed Collect & Plant	4.1.11.1			As needed
240	Rx Burn RW Lettuce Areas	4.1.11.1			As needed
241	Major Gray Wolf Plan revision	4.1.3	X		
242	Harvest and Plant Lupine Seeds	4.1.2.1	X		
243	Map and Update Phlox Moth Habitat	4.1.6.1			
244	Migratory Bird Management	4.8	X		
245	Monitor Borrow Pits for Bird Use	4.8.1	X		
246	Discourage Nesting in Borrow Pits	4.8.1	X		
247	Reduce Wildfire Potential	4.16.1	X		
248	Prescribe Burn	4.6.3.2, 4.16.4	X		
249	Shred Timber Sale Slash	4.16.4	X		
250	Grind Wood Debris w/Tub Grinder	4.16.4	X		
251	Timber Sales to Break Pine Cover	4.16.4	X		
252	Coord Fire Dept Access to Private Lands	4.16.4			
253	Red Card Certification	4.16.5.1			As needed
254	Burn Boss Training	4.16.5.1	X		
255	Burn 1,000 Acres Annually (Not NIA)	4.1.11.1, 4.3.1, 4.5.3.1, 4.5.4.1, 4.6.3.2	X		
256	Assist Burning the NIA	4.16.4, 4.22.1.1	X		
257	Establish bur oak	4.16.4			
258	Complete Burn Plans for All Burns	4.16.6.1	X		
259	Game Line to Notify Hunters about Burns	4.16.6.1	X		
260	Route Burn Plans Electronically for Approval	4.16.6.1	X		
261	NIA Monitoring and Management	4.22.1.1	X		
262	Update GIS Database	4.3.1, 4.4.3.1, 4.9.1, 4.13	X		
263	Coordinate Mow and Pest Control	4.23.1.1	X		
264	Tech Oversight on Water Related Proj	4.23.1.1	X		
265	Technical Oversight to Urban Forestry	4.23.1.1	X		
266	Establish Uniform Flows in Stillwell	4.12.1	X		
267	Update Ag Lease to Include Angling	4.12.1	X		
268	Investigate Ways to Use Lease Lands	4.20.1	X		
269	Comment on Pest Management Plan	4.10.1	X		
270	Arbor Day Ceremony	3.6.3	X		
271	Public Informational Booths/Open house	3.6.3	X		
272	NEPA Review for Projects	3.4, 4.3.1, 4.4.1, 4.9.1, 4.23.1.1	X		
273	Attend Training	4.17	X		
274	Fish and Wildlife National Meeting	4.17	X		
275	Fisheries Society Meeting	4.17	X		
276	WDNR Wildlife Management	4.17			As needed
277	Wisconsin Wildlife Society Meeting	4.17			As needed
278	Fund Travel Costs	5.4.1.1	X		
279	Buy Equipment and Supplies	5.4.1.1	X		
280	Support Research Projects	4.1.1, 4.5.4.1, 4.8.1	X		

Implementation Schedule		2012			
<i>Shaded areas considered must-fund</i>		Paragraph reference	Planned	Completed	Results
1	Special Vegetation Survey	4.7.1.2			As needed
2	Forest Inventory	4.6.1.1	X		
3	Re-Map KBB Habitat	4.1.2.1	X		
4	KBB Habitat Monitoring	4.1.2.1	X		
5	Oak Wilt Survey	4.6.3.2	X		
6	Urban Forest Survey Update	4.7.1.3, 4.23.1.1	X		
7	FIA Plots	4.7.1.4	X		FMC not fund
8	Grassland Bird Survey	4.5.4.1	X		
9	Game Animal Surveys	4.5.1.1			
10	Spotlight Survey	4.5.1.1	X		
11	Doe:Fawn Survey	4.5.1.1	X		
12	Grouse Drumming Survey	4.5.5	X		
13	Turkey Gobble Survey	4.5.5	X		
14	Woodcock Survey	4.5.5	X		
15	Brood Surveys	4.5.5	X		
16	Hunter Survey	4.5.2.1	X		
17	Fisheries Surveys	4.4.2.1	X		
18	IBI	4.4.4	X		
19	Stream Shocking	4.4.4	X		
20	Netting	4.4.4	X		
21	Lake Shocking	4.4.4	X		
22	Creel Census-Lakes	4.4.2.1, 4.4.4	X		
23	Creel Census-Stream	4.4.3.1, 4.4.4	X		
24	Hook & Line	4.4.4	X		
25	Assess Fish For Contaminants	4.4.2.1	X		As needed
26	Water Quality	4.4.2.1, 4.4.4	X		
27	Investigate Impaired Waters	4.4.3.1	X		
28	Update Trout Water Classification	4.4.3.1	X		
29	Determine Water Quality Trends	4.4.3.1	X		
30	Threatened and Endangered Surveys	4.1			
31	KBB Straight-Line Transects	4.1.2.1	X		
32	KBB Presence/Absence	4.1.2.1			
33	Monitor KBB Habitat	4.1.2.1	X		
34	Remap KBB Habitat	4.1.2.1	X		
35	Bald Eagle Surveys	4.1.9.1	X		
36	Phlox Moth Surveys	4.1.6.1	X		
37	T&E Turtle Surveys	4.1.4.1	X		
38	Turtle Telemetry	4.1.4.1	X		
39	Osprey Surveys	4.1.10.1	X		
40	Red-Tailed Prairie Leafhopper	4.1.5.1	X		
41	Bull Snake Telemetry And Survey	4.1.7.1	X		
42	Rough White Lettuce Survey	4.1.11.1, 4.21.1	X		
43	Regal Fritillary Survey	4.1.8.1	X		
44	Cerulean Warbler Surveys	4.1.12.1	X		
45	Gypsy Moth Trapping	4.6.3.2	X		FMC not fund
46	Gypsy Moth Control	4.6.3.2			FMC not fund, as needed
47	Timber Sales	4.6.2, 4.8.1	X		
48	Land Use Change	4.6.2.4	X		
49	Enhance Training Mission	4.6.2.4	X		
50	Restore Oak Savanna	4.6.2.4	X		
51	Natural Regeneration	4.6.2.4	X		
52	Aspen Regeneration	4.5.3.1, 4.6.2.4	X		
53	Intermediate Harvest	4.6.2.2	X		
54	Lower Fire Danger	4.16.4	X		
55	Airfield Flight Path Clearing	4.23.2.1			As needed
56	Salvage Harvest	4.6.2.3			As needed
57	Insect and Disease Protection	4.6.3.2	X		
58	Artificial reforestation	4.6.5.1	X		
59	Reforest Mound Prairie Area	4.6.5.1	X		
60	Manage Red Pine Plantations	4.6.2.4, 4.6.4.1	X		
61	Manage Jack Pine	4.6.2.4	X		
62	Manage Good Oak	4.6.4.1, 4.6.5.1	X		
63	Maintain Good Oak	4.6.4.1	X		
64	Timber Stand Improvement	4.6.4.1			
65	Oak Wilt Education	4.6.3.2	X		
66	Monitor Oak Wilt Pockets	4.6.3.2	X		
67	Aerial Forest Damage Survey	4.6.3.2	X		
68	Annosus Root Rot Control	4.6.3.2	X		
69	Seedbed Prep for Jack Pine Regeneration	4.6.5.1	X		
70	Recalc Annual Allowable Harvest	4.6.1.1			



Implementation Schedule		2012			
<i>Shaded areas considered must-fund</i>		Paragraph reference	Planned	Completed	Results
71	Attend Forestry Training	4.17	X		
72	Archery Hunt	4.5.1.1	X		
73	Gun Deer Hunt	4.5.1.1	X		
74	Cantonment Deer Hunt	4.5.2.1, 4.23.1.1	X		
75	Collect & Analyze Data	4.5.1.1, 4.5.2.1	X		
76	Maintain Harvest/Biological Database	4.5.1.1	X		
77	Deer Habitat Improvement Projects	4.5.1.1	X		
78	Coordinate Permit Sales Regs	4.5.2.1	X		
79	Establish Quotas For Hunting Seasons	4.5.2.1	X		
80	WI DNR Letter of Intent	4.5.2.1	X		
81	MWR Register Turkey & Archery Deer	4.5.2.1	X		
82	Register Deer Gun Deer Season	4.5.2.1	X		
83	ID Areas with Large Furbearer Pops.	4.5.2.1	X		
84	Consult WDNR on Hunting Issues	4.5.2.1	X		
85	Support Preventive Medicine	4.5.2.1	X		
86	Spring Habitat Burns	4.5.3.1	X		
87	Fall Habitat Burns	4.5.3.1	X		
88	Collect Native Seed	4.5.3.1			As needed
89	Plant Native Seed	4.5.3.1			As needed
90	Develop Seed Mixtures	4.5.3.1			
91	Maintain Existing Apple Trees	4.5.3.1	X		
92	Improve Browse Habitat	4.5.3.1	X		
93	Maintain Nesting Structures	4.5.3.1			
94	Osprey	4.5.3.1			As needed
95	Bluebird	4.5.3.1, 4.8.1	X		
96	Wood Duck	4.5.3.1	X		
97	Bat	4.5.3.1	X		
98	Grassland Bird Studies	4.21.1	X		
99	Improve Grassland Bird Habitat	4.5.3.1	X		
100	Plant American Chestnut Trees	4.5.3.1			As needed
101	Review Permit Sales Process	4.14.3.2	X		
102	Issue Trapping Permits	4.14.3.2	X		
103	Issue Hunting Permits	4.5.2.1, 4.14.3.2	X		
104	Issue Fishing Permits	4.4.2.1, 4.14.3.2	X		
105	Issue Firewood Permits	4.6.2.4, 4.14.3.2	X		
106	Permit Sales Customer Service	4.14.3.2	X		
107	Restore & Manage Savanna/Barrens	4.5.3.1	X		
108	Increase Grassland Area	4.5.4.1	X		
109	Prescribed Burns	4.5.4.1	X		
110	Mowing	4.5.4.1			As needed
111	Native Plant Restoration	4.5.4.1			As needed
112	Timber Harvests	4.5.4.1	X		
113	Brush Removal	4.5.4.1			
114	Manage Grassland Core Areas	4.5.4.1	X		
115	NIA	4.5.4.1			
116	Warrens DZ	4.5.4.1			
117	Cranberry DZ	4.5.4.1			
118	Range 29	4.5.4.1	X		
119	Badger DZ	4.5.4.1	X		
120	Oak Savanna FMNA	4.5.4.1			
121	Training Areas B-26, B-27	4.5.4.1			As needed
122	Maintain Cantonment Unmowed Areas	4.5.4.1			
123	Exotic Plant Species	4.9.1	X		
124	All Invasive Species Surveys	4.3.1, 4.9.1, 4.21.1	X		
125	Leafy Spurge Treatment	4.9.1, 4.21.1, 4.22.1.1	X		
126	Spotted Knapweed Treatment	4.9.1, 4.22.1.1	X		
127	Garlic Mustard Treatment	4.9.1	X		
128	Buckthorn Treatment	4.3.1, 4.9.1	X		
129	Purple Loosestrife Treatment	4.3.1, 4.9.1	X		
130	Eurasian Watermilfoil/Curly Pondweed	4.4.2.1	X		
131	Survey	4.4.2.1	X		
132	Treatment	4.4.2.1	X		
133	Wild Honeysuckle Treatment	4.9.1	X		
134	Canada Thistle Treatment	4.9.1	X		
135	Crown Vetch Treatment	4.9.1	X		
136	Autumn Olive Treatment	4.9.1	X		
137	Siberian Pea Shrub Treatment	4.9.1	X		
138	Black Locust Treatment	4.9.1	X		
139	Reed Canary Grass Treatment	4.3.1	X		
140	Wild Parsnip Treatment	4.9.1, 4.23.3.1	X		
141	Other Invasive Plant Treatment	4.3.1, 4.9.1, 4.22.2.1, 4.23.1.1,	X		

Implementation Schedule		2012			
<i>Shaded areas considered must-fund</i>		Paragraph reference	Planned	Completed	Results
142	Fort McCoy Education/Coordination	4.9.1, 4.23.3.1	X		
143	Investigate New Control Measures	4.9.1	X		
144	Manage Invasive Database	4.9.1	X		
145	Monthly Herbicide Reports	4.9.1, 4.10.1	X		
146	Avoid Herbicides in Wellhead Area	4.10.1	X		
147	Coordinate to Share Pest Facility	4.10.1	X		
148	Coordinate with DOL for Sick Fauna	4.10.1	X		
149	Maintain Herbicide Equipment	4.9.1	X		
150	Herbicide Certification/Recertification	4.17	X		
151	Complete Invasive Species Plan	4.9	X		
152	investigate New Biocontrol	4.9.1			
153	Manage FMNA	4.21	X		
154	Inspect FMNA Anually	4.21	X		
155	Remove Beaver Dams	4.3.1, 4.4.2.1, 4.4.3.1, 4.21	X		
156	Maintain FMNA Signs	4.21	X		As needed
157	Annual FMNA Report to WDNR	4.21.1	X		
158	FMNA Education and Outreach	4.21.1	X		
159	Manage FMNA as needed	4.21.1	X		
160	Wetlands Management	4.3	X		
161	Control Beaver Populations	4.3.1, 4.4.2.1, 4.4.3.1	X		
162	Prescribe Burn Wetlands	4.16.6.1	X		
163	Control Woody Vegetation in Wetlands	4.3.1	X		
164	Manage Bog Communities	4.3.1			
165	Survey Manmade Potholes	4.3.1			As needed
166	Review/Update GIS wetlands/streams	4.3.1, 4.4.3.1			
167	Wetland Banking or Partnership	4.3.1, 5.2.1.4			
168	Wetland Mitigation	5.2.1.4	X		
169	Wetland Delineation Contracts	4.3.1			As needed
170	Map Ephemeral Ponds	4.3.1			As needed
171	Evaluate Wetlands	4.3.1	X		
172	Fisheries Program Administration	4.4	X		
173	Contract Oversight	4.4.1	X		
174	Develop/Maintain Fisheries Plans	4.4.1	X		
175	Maintain Partnerships	4.4.1, 4.4.3.1	X		
176	Support Clear & Stilwell Creek project	4.4.1	X		
177	Obtain Disease-Free Fish	4.4.1	X		
178	Coordinate With Military Training	4.4.1	X		
179	Sediment Working Group	4.4.2.1	X		
180	Support Energy Ind. & Security Act	4.4.1	X		
181	Stormwater Mgmt/Construct Proj.	4.4.1, 4.23.3.1	X		
182	Fishing Regulations	4.4.1, 4.4.2.1	X		
183	Streambank Restore and Habitat Improve	4.4.3.1, 4.6.5.1	X		
184	Assess Lake Morphology	4.4.2.1	X		
185	Lake Habitat	4.4.2.1	X		
186	Fish Stocking	4.4.2.1	X		
187	Stock Trout	4.4.2.1	X		
188	Stock Walleye	4.4.2.1	X		
189	Stock catfish	4.4.2.1	X		
190	Stock Minnows	4.4.2.1	X		
191	Water Level Management	4.4.2.1	X		
192	LaCrosse River Sedimentation Control	4.4.1, 4.4.3.1, 4.22.1.1	X		
193	Monitor ASP for White Phos Use	4.4.3.1	X		
194	BMP Monitoring and Use	4.4.3.1, 4.22.1.1, 4.23.1.1, 4.23.3.1	X		
195	Culvert Management	4.4.3.1, 4.23.3.1	X		
196	Tag LM Bass in North Flowage	4.4.2.1	X		
197	Develop North Flowage into Trophy LMB	4.4.2.1	X		
198	Education Materials at Boat Landings	4.4.2.1	X		
199	Predator/Prey Balance in Lakes	4.4.2.1	X		
200	Install Fish Cover in Lakes	4.4.2.1	X		
201	Aqua Crib Fasteners	4.4.2.1			
202	Woody Debris	4.4.2.1	X		
203	Tree Drops	4.4.2.1	X		
204	Provide Stock Fish to Area Lakes	4.4.2.1	X		
205	ID Dams for Removal or Reclamation	4.4.2.1, 4.4.3.1	X		
206	Biomonitoring Assessments	4.4.3.1	X		
207	Monitor/Maintain Oxygen Levels	4.4.2.1	X		
208	Funding for Dam Removal Reclaim	4.4.3.1	X		
209	ID Fix to Sedimention	4.4.1, 4.4.3.1	X		

Implementation Schedule		2012			
<i>Shaded areas considered must-fund</i>		Paragraph reference	Planned	Completed	Results
210	Open Communication with T&E Interests	4.1.1	X		
211	Review NEPA Forms for T&E Concerns	4.1.1	X		
212	Reduce Project Impacts to T&E	4.1.1	X		
213	Monitor Bald Eagle Nesting Success	4.1.9.1	X		
214	Monitor Osprey Nesting Success	4.1.10.1	X		
215	Install Osprey Nest Platforms	4.1.10.1			As needed
216	Restore and Manage Goat Prairies	4.1.5.1	X		
217	KBB Management Plan	4.1.2	X		
218	Maintain KBB No-Mow Roadside Marks	4.23.3.1	X		
219	Complete Major Revision of KBB Plan	4.1.2			
220	Submit T&E Compliance Reports	4.1.1	X		
221	Conduct Annual Briefings To Workforce	4.1.1	X		
222	Document Occurance Records	4.1.1	X		
223	KBB Public Outreach and Education	4.1, 4.1.2	X		
224	Habitat Management Activities	4.1.2.1	X		
225	Complete Mitigation Actions	4.1.2.1	X		
226	KBB Core Area Re-evaluation	5.2.1.3			
227	Involve Area Students with Projects	4.1.4.1	X		
228	Wolf Track Surveys-Winter	4.1.3.1	X		
229	Wolf Howling Surveys	4.1.3.1	X		
230	Telemetry Monitoring of Collared Wolf	4.1.3.1	X		
231	Remote Camera Survey	4.1.3.1	X		
232	Maintain 100 Meter Buffer	4.1.3.1	X		
233	Coyote Hunting Ban for Gun-Deer Season	4.1.3.1	X		
234	North Post Ban on Coyote Hunt w/Dogs	4.1.3.1	X		
235	Coyote Trap Size Limit	4.1.3.1	X		
236	Reports to WDNR	4.1.3.1	X		
237	Outreach and Education	4.1.7.1, 4.4.2.1	X		
238	Develop Regal Fritillary Mgmt Guidelines	4.1.8.1	X		
239	Rough White Lettuce Seed Collect & Plant	4.1.11.1			As needed
240	Rx Burn RW Lettuce Areas	4.1.11.1			As needed
241	Major Gray Wolf Plan revision	4.1.3			
242	Harvest and Plant Lupine Seeds	4.1.2.1	X		
243	Map and Update Phlox Moth Habitat	4.1.6.1			
244	Migratory Bird Management	4.8	X		
245	Monitor Borrow Pits for Bird Use	4.8.1	X		
246	Discourage Nesting in Borrow Pits	4.8.1	X		
247	Reduce Wildfire Potential	4.16.1			
248	Prescribe Burn	4.6.3.2, 4.16.4	X		
249	Shred Timber Sale Slash	4.16.4	X		
250	Grind Wood Debris w/Tub Grinder	4.16.4			
251	Timber Sales to Break Pine Cover	4.16.4	X		
252	Coord Fire Dept Access to Private Lands	4.16.4			
253	Red Card Certification	4.16.5.1			As needed
254	Burn Boss Training	4.16.5.1	X		
255	Burn 1,000 Acres Annually (Not NIA)	4.1.11.1, 4.3.1, 4.5.3.1, 4.5.4.1	X		
256	Assist Burning the NIA	4.16.4, 4.22.1.1	X		
257	Establish bur oak	4.16.4	X		
258	Complete Burn Plans for All Burns	4.16.6.1	X		
259	Game Line to Notify Hunters about Burns	4.16.6.1	X		
260	Route Burn Plans Electronic for Approval	4.16.6.1	X		
261	NIA Monitoring and Management	4.22.1.1	X		
262	Update GIS Database	4.3.1, 4.4.3.1, 4.9.1, 4.13	X		
263	Coordinate Mow and Pest Control	4.23.1.1	X		
264	Tech Oversight on Water Related Proj	4.23.1.1	X		
265	Technical Oversight to Urban Forestry	4.23.1.1	X		
266	Establish Uniform Flows in Stillwell	4.12.1	X		
267	Update Ag Lease to Include Angling	4.12.1	X		
268	Investigate Ways to Use Lease Lands	4.20.1	X		
269	Comment on Pest Management Plan	4.10.1	X		
270	Arbor Day Ceremony	3.6.3	X		
271	Public Informational Booths/Open house	3.6.3	X		
272	NEPA Review for Projects	3.4, 4.3.1, 4.4.1, 4.9.1, 4.23.1.1	X		
273	Attend Training	4.17	X		
274	Fish and Wildlife National Meeting	4.17	X		
275	Fisheries Society Meeting	4.17	X		
276	WDNR Wildlife Management	4.17			As needed
277	Wisconsin Wildlife Society Meeting	4.17			As needed
278	Fund Travel Costs	5.4.1.1	X		
279	Buy Equipment and Supplies	5.4.1.1	X		
280	Support Research Projects	4.1.1, 4.5.4.1, 4.8.1	X		

Implementation Schedule		2013			
<i>Shaded areas considered must-fund</i>		Paragraph reference	Planned	Completed	Results
1	Special Vegetation Survey	4.7.1.2			As needed
2	Forest Inventory	4.6.1.1	X		
3	Re-Map KBB Habitat	4.1.2.1	X		
4	KBB Habitat Monitoring	4.1.2.1			
5	Oak Wilt Survey	4.6.3.2	X		
6	Urban Forest Survey Update	4.7.1.3, 4.23.1.1	X		
7	FIA Plots	4.7.1.4	X		FMC not fund
8	Grassland Bird Survey	4.5.4.1			
9	Game Animal Surveys	4.5.1.1	X		
10	Spotlight Survey	4.5.1.1	X		
11	Doe:Fawn Survey	4.5.1.1	X		
12	Grouse Drumming Survey	4.5.5	X		
13	Turkey Gobble Survey	4.5.5	X		
14	Woodcock Survey	4.5.5	X		
15	Brood Surveys	4.5.5	X		
16	Hunter Survey	4.5.2.1	X		
17	Fisheries Surveys	4.4.2.1	X		
18	IBI	4.4.4	X		
19	Stream Shocking	4.4.4	X		
20	Netting	4.4.4	X		
21	Lake Shocking	4.4.4	X		
22	Creel Census-Lakes	4.4.2.1, 4.4.4	X		
23	Creel Census-Stream	4.4.3.1, 4.4.4	X		
24	Hook & Line	4.4.4	X		
25	Assess Fish For Contaminants	4.4.2.1	X		As needed
26	Water Quality	4.4.2.1, 4.4.4	X		
27	Investigate Impaired Waters	4.4.3.1	X		
28	Update Trout Water Classification	4.4.3.1	X		
29	Determine Water Quality Trends	4.4.3.1	X		
30	Threatened and Endangered Surveys	4.1			
31	KBB Straight-Line Transects	4.1.2.1			
32	KBB Presence/Absence	4.1.2.1			
33	Monitor KBB Habitat	4.1.2.1			
34	Remap KBB Habitat	4.1.2.1	X		
35	Bald Eagle Surveys	4.1.9.1	X		
36	Phlox Moth Surveys	4.1.6.1	X		
37	T&E Turtle Surveys	4.1.4.1	X		
38	Turtle Telemetry	4.1.4.1	X		
39	Osprey Surveys	4.1.10.1	X		
40	Red-Tailed Prairie Leafhopper	4.1.5.1	X		
41	Bull Snake Telemetry And Survey	4.1.7.1	X		
42	Rough White Lettuce Survey	4.1.11.1, 4.21.1	X		
43	Regal Fritillary Survey	4.1.8.1	X		
44	Cerulean Warbler Surveys	4.1.12.1	X		
45	Gypsy Moth Trapping	4.6.3.2	X		FMC not fund
46	Gypsy Moth Control	4.6.3.2			FMC not fund, as needed
47	Timber Sales	4.6.2, 4.8.1	X		
48	Land Use Change	4.6.2.4	X		
49	Enhance Training Mission	4.6.2.4	X		
50	Restore Oak Savanna	4.6.2.4	X		
51	Natural Regeneration	4.6.2.4	X		
52	Aspen Regeneration	4.5.3.1, 4.6.2.4	X		
53	Intermediate Harvest	4.6.2.2	X		
54	Lower Fire Danger	4.16.4	X		
55	Airfield Flight Path Clearing	4.23.2.1			As needed
56	Salvage Harvest	4.6.2.3			As needed
57	Insect and Disease Protection	4.6.3.2	X		
58	Artificial reforestation	4.6.5.1	X		
59	Reforest Mound Prairie Area	4.6.5.1			
60	Manage Red Pine Plantations	4.6.2.4, 4.6.4.1	X		
61	Manage Jack Pine	4.6.2.4	X		
62	Manage Good Oak	4.6.4.1, 4.6.5.1	X		
63	Maintain Good Oak	4.6.4.1	X		
64	Timber Stand Improvement	4.6.4.1	X		
65	Oak Wilt Education	4.6.3.2	X		
66	Monitor Oak Wilt Pockets	4.6.3.2	X		
67	Aerial Forest Damage Survey	4.6.3.2	X		
68	Annosus Root Rot Control	4.6.3.2	X		
69	Seedbed Prep for Jack Pine Regeneration	4.6.5.1	X		
70	Recalc Annual Allowable Harvest	4.6.1.1	X		

Implementation Schedule		2013			
<i>Shaded areas considered must-fund</i>		Paragraph reference	Planned	Completed	Results
71	Attend Forestry Training	4.17	X		
72	Archery Hunt	4.5.1.1	X		
73	Gun Deer Hunt	4.5.1.1	X		
74	Cantonment Deer Hunt	4.5.2.1, 4.23.1.1	X		
75	Collect & Analyze Data	4.5.1.1, 4.5.2.1	X		
76	Maintain Harvest/Biological Database	4.5.1.1	X		
77	Deer Habitat Improvement Projects	4.5.1.1	X		
78	Coordinate Permit Sales Regs	4.5.2.1	X		
79	Establish Quotas For Hunting Seasons	4.5.2.1	X		
80	WI DNR Letter of Intent	4.5.2.1	X		
81	MWR Register Turkey & Archery Deer	4.5.2.1	X		
82	Register Deer Gun Deer Season	4.5.2.1	X		
83	ID Areas with Large Furbearer Pops.	4.5.2.1	X		
84	Consult WDNR on Hunting Issues	4.5.2.1	X		
85	Support Preventive Medicine	4.5.2.1	X		
86	Spring Habitat Burns	4.5.3.1	X		
87	Fall Habitat Burns	4.5.3.1	X		
88	Collect Native Seed	4.5.3.1			As needed
89	Plant Native Seed	4.5.3.1			As needed
90	Develop Seed Mixtures	4.5.3.1			
91	Maintain Existing Apple Trees	4.5.3.1	X		
92	Improve Browse Habitat	4.5.3.1	X		
93	Maintain Nesting Structures	4.5.3.1	X		
94	Osprey	4.5.3.1			As needed
95	Bluebird	4.5.3.1, 4.8.1	X		
96	Wood Duck	4.5.3.1	X		
97	Bat	4.5.3.1	X		
98	Grassland Bird Studies	4.21.1	X		
99	Improve Grassland Bird Habitat	4.5.3.1	X		
100	Plant American Chestnut Trees	4.5.3.1			As needed
101	Review Permit Sales Process	4.14.3.2	X		
102	Issue Trapping Permits	4.14.3.2	X		
103	Issue Hunting Permits	4.5.2.1, 4.14.3.2	X		
104	Issue Fishing Permits	4.4.2.1, 4.14.3.2	X		
105	Issue Firewood Permits	4.6.2.4, 4.14.3.2	X		
106	Permit Sales Customer Service	4.14.3.2	X		
107	Restore & Manage Savanna/Barrens	4.5.3.1	X		
108	Increase Grassland Area	4.5.4.1	X		
109	Prescribed Burns	4.5.4.1	X		
110	Mowing	4.5.4.1			As needed
111	Native Plant Restoration	4.5.4.1			As needed
112	Timber Harvests	4.5.4.1	X		
113	Brush Removal	4.5.4.1	X		
114	Manage Grassland Core Areas	4.5.4.1			
115	NIA	4.5.4.1			
116	Warrens DZ	4.5.4.1			As needed
117	Cranberry DZ	4.5.4.1			As needed
118	Range 29	4.5.4.1	X		
119	Badger DZ	4.5.4.1	X		
120	Oak Savanna FMNA	4.5.4.1			
121	Training Areas B-26, B-27	4.5.4.1			As needed
122	Maintain Cantonment Unmowed Areas	4.5.4.1			
123	Exotic Plant Species	4.9.1	X		
124	All Invasive Species Surveys	4.3.1, 4.9.1, 4.21.1	X		
125	Leafy Spurge Treatment	4.9.1, 4.21.1, 4.22.1.1	X		
126	Spotted Knapweed Treatment	4.9.1, 4.22.1.1	X		
127	Garlic Mustard Treatment	4.9.1	X		
128	Buckthorn Treatment	4.3.1, 4.9.1	X		
129	Purple Loosestrife Treatment	4.3.1, 4.9.1	X		
130	Eurasian Watermilf/Curly Pondweed	4.4.2.1	X		
131	Survey	4.4.2.1	X		
132	Treatment	4.4.2.1	X		
133	Wild Honeysuckle Treatment	4.9.1	X		
134	Canada Thistle Treatment	4.9.1	X		
135	Crown Vetch Treatment	4.9.1	X		
136	Autumn Olive Treatment	4.9.1	X		
137	Siberian Pea Shrub Treatment	4.9.1	X		
138	Black Locust Treatment	4.9.1	X		
139	Reed Canary Grass Treatment	4.3.1	X		
140	Wild Parsnip Treatment	4.9.1, 4.23.3.1	X		
141	Other Invasive Plant Treatment	4.3.1, 4.9.1, 4.22.2.1, 4.23.1.1,	X		

Implementation Schedule			2013		
<i>Shaded areas considered must-fund</i>		Paragraph reference	Planned	Completed	Results
142	Fort McCoy Education/Coordination	4.9.1, 4.23.3.1	X		
143	Investigate New Control Measures	4.9.1	X		
144	Manage Invasive Database	4.9.1	X		
145	Monthly Herbicide Reports	4.9.1, 4.10.1	X		
146	Avoid Herbicides in Wellhead Area	4.10.1	X		
147	Coordinate to Share Pest Facility	4.10.1	X		
148	Coordinate with DOL for Sick Fauna	4.10.1	X		
149	Maintain Herbicide Equipment	4.9.1	X		
150	Herbicide Certification/Recertification	4.17	X		
151	Complete Invasive Species Plan	4.9			
152	investigate New Biocontrol	4.9.1	X		
153	Manage FMNA	4.21	X		
154	Inspect FMNA Anually	4.21	X		
155	Remove Beaver Dams	4.3.1, 4.4.2.1, 4.4.3.1, 4.21	X		
156	Maintain FMNA Signs	4.21	X		
157	Annual FMNA Report to WDNR	4.21.1	X		
158	FMNA Education and Outreach	4.21.1	X		
159	Manage FMNA as needed	4.21.1	X		
160	Wetlands Management	4.3	X		
161	Control Beaver Populations	4.3.1, 4.4.2.1, 4.4.3.1	X		
162	Prescribe Burn Wetlands	4.16.6.1			
163	Control Woody Vegetation in Wetlands	4.3.1	X		
164	Manage Bog Communities	4.3.1			
165	Survey Manmade Potholes	4.3.1			As needed
166	Review/Update GIS wetlands/streams	4.3.1, 4.4.3.1			
167	Wetland Banking or Partnership	4.3.1, 5.2.1.4			
168	Wetland Mitigation	5.2.1.4	X		
169	Wetland Delineation Contracts	4.3.1			As needed
170	Map Ephemeral Ponds	4.3.1			As needed
171	Evaluate Wetlands	4.3.1	X		
172	Fisheries Program Administration	4.4	X		
173	Contract Oversight	4.4.1	X		
174	Develop/Maintain Fisheries Plans	4.4.1	X		
175	Maintain Partnerships	4.4.1, 4.4.3.1	X		
176	Support Clear & Stilwell Creek proj	4.4.1	X		
177	Obtain Disease-Free Fish	4.4.1	X		
178	Coordinate With Military Training	4.4.1	X		
179	Sediment Working Group	4.4.2.1	X		
180	Support Energy Ind. & Security Act	4.4.1	X		
181	Stormwater Mgmt/Construct Proj.	4.4.1, 4.23.3.1	X		
182	Fishing Regulations	4.4.1, 4.4.2.1	X		
183	Streambank Restore and Habitat Improve	4.4.3.1, 4.6.5.1	X		
184	Assess Lake Morphology	4.4.2.1	X		
185	Lake Habitat	4.4.2.1	X		
186	Fish Stocking	4.4.2.1	X		
187	Stock Trout	4.4.2.1	X		
188	Stock Walleye	4.4.2.1	X		
189	Stock catfish	4.4.2.1	X		
190	Stock Minnows	4.4.2.1	X		
191	Water Level Management	4.4.2.1	X		
192	LaCrosse River Sedimentation Control	4.4.1, 4.4.3.1, 4.22.1.1	X		
193	Monitor ASP for White Phos Use	4.4.3.1	X		
194	BMP Monitoring and Use	4.4.3.1, 4.22.1.1, 4.23.1.1, 4.23.3.1	X		
195	Culvert Management	4.4.3.1, 4.23.3.1	X		
196	Tag LM Bass in North Flowage	4.4.2.1	X		
197	Develop North Flowage into Trophy LMB	4.4.2.1	X		
198	Education Materials at Boat Landings	4.4.2.1	X		
199	Predator/Prey Balance in Lakes	4.4.2.1	X		
200	Install Fish Cover in Lakes	4.4.2.1	X		
201	Aqua Crib Fasteners	4.4.2.1	X		
202	Woody Debris	4.4.2.1	X		
203	Tree Drops	4.4.2.1	X		
204	Provide Stock Fish to Area Lakes	4.4.2.1	X		
205	ID Dams for Removal or Reclamation	4.4.2.1, 4.4.3.1	X		
206	Biomonitoring Assessments	4.4.3.1	X		
207	Monitor/Maintain Oxygen Levels	4.4.2.1	X		
208	Funding for Dam Removal Reclaim	4.4.3.1	X		
209	ID Fix to Sedimentation	4.4.1, 4.4.3.1	X		

Implementation Schedule		2013			
<i>Shaded areas considered must-fund</i>		Paragraph reference	Planned	Completed	Results
210	Open Communication with T&E Interests	4.1.1	X		
211	Review NEPA Forms for T&E Concerns	4.1.1	X		
212	Reduce Project Impacts to T&E	4.1.1	X		
213	Monitor Bald Eagle Nesting Success	4.1.9.1	X		
214	Monitor Osprey Nesting Success	4.1.10.1	X		
215	Install Osprey Nest Platforms	4.1.10.1			As needed
216	Restore and Manage Goat Prairies	4.1.5.1	X		
217	KBB Management Plan	4.1.2	X		
218	Maintain KBB No-Mow Roadside Marks	4.23.3.1	X		
219	Complete Major Revision of KBB Plan	4.1.2			
220	Submit T&E Compliance Reports	4.1.1	X		
221	Conduct Annual Briefings To Workforce	4.1.1	X		
222	Document Occurance Records	4.1.1	X		
223	KBB Public Outreach and Education	4.1, 4.1.2	X		
224	Habitat Management Activities	4.1.2.1	X		
225	Complete Mitigation Actions	4.1.2.1	X		
226	KBB Core Area Re-evaluation	5.2.1.3			
227	Involve Area Students with Projects	4.1.4.1	X		
228	Wolf Track Surveys-Winter	4.1.3.1	X		
229	Wolf Howling Surveys	4.1.3.1	X		
230	Telemetry Monitoring of Collared Wolf	4.1.3.1	X		
231	Remote Camera Survey	4.1.3.1	X		
232	Maintain 100 Meter Buffer	4.1.3.1	X		
233	Coyote Hunting Ban for Gun-Deer Season	4.1.3.1	X		
234	North Post Ban on Coyote Hunt w/Dogs	4.1.3.1	X		
235	Coyote Trap Size Limit	4.1.3.1	X		
236	Reports to WDNR	4.1.3.1	X		
237	Outreach and Education	4.1.7.1, 4.4.2.1	X		
238	Develop Regal Fritillary Mgmt Guidelines	4.1.8.1			
239	Rough White Lettuce Seed Collect & Plant	4.1.11.1			As needed
240	Rx Burn RW Lettuce Areas	4.1.11.1			As needed
241	Major Gray Wolf Plan revision	4.1.3			
242	Harvest and Plant Lupine Seeds	4.1.2.1	X		
243	Map and Update Phlox Moth Habitat	4.1.6.1			
244	Migratory Bird Management	4.8			
245	Monitor Borrow Pits for Bird Use	4.8.1			
246	Discourage Nesting in Borrow Pits	4.8.1			
247	Reduce Wildfire Potential	4.16.1	X		
248	Prescribe Burn	4.6.3.2, 4.16.4	X		
249	Shred Timber Sale Slash	4.16.4	X		
250	Grind Wood Debris w/Tub Grinder	4.16.4			
251	Timber Sales to Break Pine Cover	4.16.4	X		
252	Coord Fire Dept Access to Private Lands	4.16.4			
253	Red Card Certification	4.16.5.1			
254	Burn Boss Training	4.16.5.1			As needed
255	Burn 1,000 Acres Annually (Not NIA)	4.1.11.1, 4.3.1, 4.5.3.1, 4.5.4.1,	X		
256	Assist Burning the NIA	4.16.4, 4.22.1.1	X		
257	Establish bur oak	4.16.4	X		
258	Complete Burn Plans for All Burns	4.16.6.1	X		
259	Game Line to Notify Hunters about Burns	4.16.6.1	X		
260	Route Burn Plans Electronically for Approval	4.16.6.1	X		
261	NIA Monitoring and Management	4.22.1.1	X		
262	Update GIS Database	4.3.1, 4.4.3.1, 4.9.1, 4.13	X		
263	Coordinate Mow and Pest Control	4.23.1.1			
264	Tech Oversight on Water Related Proj	4.23.1.1	X		
265	Technical Oversight to Urban Forestry	4.23.1.1			
266	Establish Uniform Flows in Stillwell	4.12.1	X		
267	Update Ag Lease to Include Angling	4.12.1	X		
268	Investigate Ways to Use Lease Lands	4.20.1	X		
269	Comment on Pest Management Plan	4.10.1			
270	Arbor Day Ceremony	3.6.3	X		
271	Public Informational Booths/Open house	3.6.3	X		
272	NEPA Review for Projects	3.4, 4.3.1, 4.4.1, 4.9.1, 4.23.1.1	X		
273	Attend Training	4.17	X		
274	Fish and Wildlife National Meeting	4.17	X		
275	Fisheries Society Meeting	4.17	X		
276	WDNR Wildlife Management	4.17			As needed
277	Wisconsin Wildlife Society Meeting	4.17	X		As needed
278	Fund Travel Costs	5.4.1.1	X		
279	Buy Equipment and Supplies	5.4.1.1	X		
280	Support Research Projects	4.1.1, 4.5.4.1, 4.8.1	X		

Implementation Schedule		2014			
<i>Shaded areas considered must-fund</i>		Paragraph reference	Planned	Completed	Results
1	Special Vegetation Survey	4.7.1.2			As needed
2	Forest Inventory	4.6.1.1	X		
3	Re-Map KBB Habitat	4.1.2.1	X		
4	KBB Habitat Monitoring	4.1.2.1			
5	Oak Wilt Survey	4.6.3.2	X		
6	Urban Forest Survey Update	4.7.1.3, 4.23.1.1	X		
7	FIA Plots	4.7.1.4	X		FMC not fund
8	Grassland Bird Survey	4.5.4.1			
9	Game Animal Surveys	4.5.1.1	X		
10	Spotlight Survey	4.5.1.1	X		
11	Doe:Fawn Survey	4.5.1.1	X		
12	Grouse Drumming Survey	4.5.5	X		
13	Turkey Gobble Survey	4.5.5	X		
14	Woodcock Survey	4.5.5	X		
15	Brood Surveys	4.5.5	X		
16	Hunter Survey	4.5.2.1	X		
17	Fisheries Surveys	4.4.2.1	X		
18	IBI	4.4.4	X		
19	Stream Shocking	4.4.4	X		
20	Netting	4.4.4	X		
21	Lake Shocking	4.4.4	X		
22	Creel Census-Lakes	4.4.2.1, 4.4.4	X		
23	Creel Census-Stream	4.4.3.1, 4.4.4	X		
24	Hook & Line	4.4.4	X		
25	Assess Fish For Contaminants	4.4.2.1	X		As needed
26	Water Quality	4.4.2.1, 4.4.4	X		
27	Investigate Impaired Waters	4.4.3.1	X		
28	Update Trout Water Classification	4.4.3.1	X		
29	Determine Water Quality Trends	4.4.3.1	X		
30	Threatened and Endangered Surveys	4.1			
31	KBB Straight-Line Transects	4.1.2.1			
32	KBB Presence/Absence	4.1.2.1	X		
33	Monitor KBB Habitat	4.1.2.1			
34	Remap KBB Habitat	4.1.2.1	X		
35	Bald Eagle Surveys	4.1.9.1	X		
36	Phlox Moth Surveys	4.1.6.1	X		
37	T&E Turtle Surveys	4.1.4.1	X		
38	Turtle Telemetry	4.1.4.1	X		
39	Osprey Surveys	4.1.10.1	X		
40	Red-Tailed Prairie Leafhopper	4.1.5.1	X		
41	Bull Snake Telemetry And Survey	4.1.7.1	X		
42	Rough White Lettuce Survey	4.1.11.1, 4.21.1	X		
43	Regal Fritillary Survey	4.1.8.1	X		
44	Cerulean Warbler Surveys	4.1.12.1	X		
45	Gypsy Moth Trapping	4.6.3.2	X		FMC not fund
46	Gypsy Moth Control	4.6.3.2			FMC not fund, as needed
47	Timber Sales	4.6.2, 4.8.1	X		
48	Land Use Change	4.6.2.4	X		
49	Enhance Training Mission	4.6.2.4	X		
50	Restore Oak Savanna	4.6.2.4	X		
51	Natural Regeneration	4.6.2.4	X		
52	Aspen Regeneration	4.5.3.1, 4.6.2.4	X		
53	Intermediate Harvest	4.6.2.2	X		
54	Lower Fire Danger	4.16.4	X		
55	Airfield Flight Path Clearing	4.23.2.1			As needed
56	Salvage Harvest	4.6.2.3			As needed
57	Insect and Disease Protection	4.6.3.2	X		
58	Artificial reforestation	4.6.5.1	X		
59	Reforest Mound Prairie Area	4.6.5.1			
60	Manage Red Pine Plantations	4.6.2.4, 4.6.4.1	X		
61	Manage Jack Pine	4.6.2.4	X		
62	Manage Good Oak	4.6.4.1, 4.6.5.1	X		
63	Maintain Good Oak	4.6.4.1	X		
64	Timber Stand Improvement	4.6.4.1	X		
65	Oak Wilt Education	4.6.3.2	X		
66	Monitor Oak Wilt Pockets	4.6.3.2	X		
67	Aerial Forest Damage Survey	4.6.3.2	X		
68	Annosus Root Rot Control	4.6.3.2	X		
69	Seedbed Prep for Jack Pine Regeneration	4.6.5.1	X		
70	Recalc Annual Allowable Harvest	4.6.1.1			



Implementation Schedule		2014			
<i>Shaded areas considered must-fund</i>		Paragraph reference	Planned	Completed	Results
71	Attend Forestry Training	4.17	X		
72	Archery Hunt	4.5.1.1	X		
73	Gun Deer Hunt	4.5.1.1	X		
74	Cantonment Deer Hunt	4.5.2.1, 4.23.1.1	X		
75	Collect & Analyze Data	4.5.1.1, 4.5.2.1	X		
76	Maintain Harvest/Biological Database	4.5.1.1	X		
77	Deer Habitat Improvement Projects	4.5.1.1	X		
78	Coordinate Permit Sales Regs	4.5.2.1	X		
79	Establish Quotas For Hunting Seasons	4.5.2.1	X		
80	WI DNR Letter of Intent	4.5.2.1	X		
81	MWR Register Turkey & Archery Deer	4.5.2.1	X		
82	Register Deer Gun Deer Season	4.5.2.1	X		
83	ID Areas with Large Furbearer Pops.	4.5.2.1	X		As needed
84	Consult WDNR on Hunting Issues	4.5.2.1	X		
85	Support Preventive Medicine	4.5.2.1	X		
86	Spring Habitat Burns	4.5.3.1	X		
87	Fall Habitat Burns	4.5.3.1	X		
88	Collect Native Seed	4.5.3.1			As needed
89	Plant Native Seed	4.5.3.1			As needed
90	Develop Seed Mixtures	4.5.3.1			
91	Maintain Existing Apple Trees	4.5.3.1			
92	Improve Browse Habitat	4.5.3.1	X		
93	Maintain Nesting Structures	4.5.3.1	X		
94	Osprey	4.5.3.1			As needed
95	Bluebird	4.5.3.1, 4.8.1	X		
96	Wood Duck	4.5.3.1	X		
97	Bat	4.5.3.1	X		
98	Grassland Bird Studies	4.21.1			
99	Improve Grassland Bird Habitat	4.5.3.1	X		
100	Plant American Chestnut Trees	4.5.3.1			As needed
101	Review Permit Sales Process	4.14.3.2	X		
102	Issue Trapping Permits	4.14.3.2	X		
103	Issue Hunting Permits	4.5.2.1, 4.14.3.2	X		
104	Issue Fishing Permits	4.4.2.1, 4.14.3.2	X		
105	Issue Firewood Permits	4.6.2.4, 4.14.3.2	X		
106	Permit Sales Customer Service	4.14.3.2	X		
107	Restore & Manage Savanna/Barrens	4.5.3.1	X		
108	Increase Grassland Area	4.5.4.1	X		
109	Prescribed Burns	4.5.4.1	X		
110	Mowing	4.5.4.1			As needed
111	Native Plant Restoration	4.5.4.1			As needed
112	Timber Harvests	4.5.4.1	X		
113	Brush Removal	4.5.4.1	X		
114	Manage Grassland Core Areas	4.5.4.1			
115	NIA	4.5.4.1			
116	Warrens DZ	4.5.4.1			As needed
117	Cranberry DZ	4.5.4.1			As needed
118	Range 29	4.5.4.1	X		
119	Badger DZ	4.5.4.1	X		
120	Oak Savanna FMNA	4.5.4.1	X		
121	Training Areas B-26, B-27	4.5.4.1			As needed
122	Maintain Cantonment Unmowed Areas	4.5.4.1			
123	Exotic Plant Species	4.9.1	X		
124	All Invasive Species Surveys	4.3.1, 4.9.1, 4.21.1	X		
125	Leafy Spurge Treatment	4.9.1, 4.21.1, 4.22.1.1	X		
126	Spotted Knapweed Treatment	4.9.1, 4.22.1.1	X		
127	Garlic Mustard Treatment	4.9.1	X		
128	Buckthorn Treatment	4.3.1, 4.9.1	X		
129	Purple Loosestrife Treatment	4.3.1, 4.9.1	X		
130	Eurasian Watermilfoil/Curly Pondweed	4.4.2.1	X		
131	Survey	4.4.2.1	X		
132	Treatment	4.4.2.1	X		
133	Wild Honeysuckle Treatment	4.9.1	X		
134	Canada Thistle Treatment	4.9.1	X		
135	Crown Vetch Treatment	4.9.1	X		
136	Autumn Olive Treatment	4.9.1	X		
137	Siberian Pea Shrub Treatment	4.9.1	X		
138	Black Locust Treatment	4.9.1	X		
139	Reed Canary Grass Treatment	4.3.1	X		
140	Wild Parsnip Treatment	4.9.1, 4.23.3.1	X		
141	Other Invasive Plant Treatment	4.3.1, 4.9.1, 4.22.2.1, 4.23.1.1,	X		

Implementation Schedule			2014		
<i>Shaded areas considered must-fund</i>		Paragraph reference	Planned	Completed	Results
142	Fort McCoy Education/Coordination	4.9.1, 4.23.3.1	X		
143	Investigate New Control Measures	4.9.1	X		
144	Manage Invasive Database	4.9.1	X		
145	Monthly Herbicide Reports	4.9.1, 4.10.1	X		
146	Avoid Herbicides in Wellhead Area	4.10.1	X		
147	Coordinate to Share Pest Facility	4.10.1	X		
148	Coordinate with DOL for Sick Fauna	4.10.1	X		
149	Maintain Herbicide Equipment	4.9.1	X		
150	Herbicide Certification/Recertification	4.17	X		
151	Complete Invasive Species Plan	4.9	X		
152	investigate New Biocontrol	4.9.1	X		
153	Manage FMNA	4.21	X		
154	Inspect FMNA Anually	4.21	X		
155	Remove Beaver Dams	4.3.1, 4.4.2.1, 4.4.3.1, 4.21	X		
156	Maintain FMNA Signs	4.21			As needed
157	Annual FMNA Report to WDNR	4.21.1	X		
158	FMNA Education and Outreach	4.21.1	X		
159	Manage FMNA as needed	4.21.1	X		
160	Wetlands Management	4.3	X		
161	Control Beaver Populations	4.3.1, 4.4.2.1, 4.4.3.1	X		
162	Prescribe Burn Wetlands	4.16.6.1			
163	Control Woody Vegetation in Wetlands	4.3.1	X		
164	Manage Bog Communities	4.3.1	X		
165	Survey Manmade Potholes	4.3.1			As needed
166	Review/Update GIS wetlands/streams	4.3.1, 4.4.3.1			
167	Wetland Banking or Partnership	4.3.1, 5.2.1.4			
168	Wetland Mitigation	5.2.1.4			
169	Wetland Delineation Contracts	4.3.1			As needed
170	Map Ephemeral Ponds	4.3.1			As needed
171	Evaluate Wetlands	4.3.1	X		
172	Fisheries Program Administration	4.4	X		
173	Contract Oversight	4.4.1	X		
174	Develop/Maintain Fisheries Plans	4.4.1	X		
175	Maintain Partnerships	4.4.1, 4.4.3.1	X		
176	Support Clear & Stilwell Creek project	4.4.1	X		
177	Obtain Disease-Free Fish	4.4.1	X		
178	Coordinate With Military Training	4.4.1	X		
179	Sediment Working Group	4.4.2.1	X		
180	Support Energy Ind. & Security Act	4.4.1	X		
181	Stormwater Mgmt/Construct Proj.	4.4.1, 4.23.3.1	X		
182	Fishing Regulations	4.4.1, 4.4.2.1	X		
183	Streambank Restore and Habitat Improve	4.4.3.1, 4.6.5.1	X		
184	Assess Lake Morphology	4.4.2.1	X		
185	Lake Habitat	4.4.2.1	X		
186	Fish Stocking	4.4.2.1	X		
187	Stock Trout	4.4.2.1	X		
188	Stock Walleye	4.4.2.1	X		
189	Stock catfish	4.4.2.1	X		
190	Stock Minnows	4.4.2.1	X		
191	Water Level Management	4.4.2.1	X		
192	LaCrosse River Sedimentation Control	4.4.1, 4.4.3.1, 4.22.1.1	X		
193	Monitor ASP for White Phos Use	4.4.3.1	X		
194	BMP Monitoring and Use	4.4.3.1, 4.22.1.1, 4.23.1.1	X		
195	Culvert Management	4.4.3.1, 4.23.3.1	X		
196	Tag LM Bass in North Flowage	4.4.2.1	X		
197	Develop North Flowage into Trophy LMB	4.4.2.1	X		
198	Education Materials at Boat Landings	4.4.2.1	X		
199	Predator/Prey Balance in Lakes	4.4.2.1	X		
200	Install Fish Cover in Lakes	4.4.2.1	X		
201	Aqua Crib Fasteners	4.4.2.1			
202	Woody Debris	4.4.2.1	X		
203	Tree Drops	4.4.2.1	X		
204	Provide Stock Fish to Area Lakes	4.4.2.1	X		
205	ID Dams for Removal or Reclamation	4.4.2.1, 4.4.3.1	X		
206	Biomonitoring Assessments	4.4.3.1	X		
207	Monitor/Maintain Oxygen Levels	4.4.2.1	X		
208	Funding for Dam Removal Reclaim	4.4.3.1	X		
209	ID Fix to Sedimentation	4.4.1, 4.4.3.1	X		

Implementation Schedule		2014			
<i>Shaded areas considered must-fund</i>		Paragraph reference	Planned	Completed	Results
210	Open Communication with T&E Interests	4.1.1	X		
211	Review NEPA Forms for T&E Concerns	4.1.1	X		
212	Reduce Project Impacts to T&E	4.1.1	X		
213	Monitor Bald Eagle Nesting Success	4.1.9.1	X		
214	Monitor Osprey Nesting Success	4.1.10.1	X		
215	Install Osprey Nest Platforms	4.1.10.1			As needed
216	Restore and Manage Goat Prairies	4.1.5.1	X		
217	KBB Management Plan	4.1.2	X		
218	Maintain KBB No-Mow Roadside Marks	4.23.3.1	X		
219	Complete Major Revision of KBB Plan	4.1.2			
220	Submit T&E Compliance Reports	4.1.1	X		
221	Conduct Annual Briefings To Workforce	4.1.1	X		
222	Document Occurance Records	4.1.1	X		
223	KBB Public Outreach and Education	4.1, 4.1.2	X		
224	Habitat Management Activities	4.1.2.1	X		
225	Complete Mitigation Actions	4.1.2.1	X		
226	KBB Core Area Re-evaluation	5.2.1.3			
227	Involve Area Students with Projects	4.1.4.1	X		
228	Wolf Track Surveys-Winter	4.1.3.1	X		
229	Wolf Howling Surveys	4.1.3.1	X		
230	Telemetry Monitoring of Collared Wolf	4.1.3.1	X		
231	Remote Camera Survey	4.1.3.1	X		
232	Maintain 100 Meter Buffer	4.1.3.1	X		
233	Coyote Hunting Ban for Gun-Deer Season	4.1.3.1	X		
234	North Post Ban on Coyote Hunt w/Dogs	4.1.3.1	X		
235	Coyote Trap Size Limit	4.1.3.1	X		
236	Reports to WDNR	4.1.3.1	X		
237	Outreach and Education	4.1.7.1, 4.4.2.1	X		
238	Develop Regal Fritillary Mgmt Guidelines	4.1.8.1			
239	Rough White Lettuce Seed Collect & Plant	4.1.11.1			As needed
240	Rx Burn RW Lettuce Areas	4.1.11.1			As needed
241	Major Gray Wolf Plan revision	4.1.3			
242	Harvest and Plant Lupine Seeds	4.1.2.1	X		
243	Map and Update Phlox Moth Habitat	4.1.6.1			
244	Migratory Bird Management	4.8	X		
245	Monitor Borrow Pits for Bird Use	4.8.1	X		
246	Discourage Nesting in Borrow Pits	4.8.1	X		
247	Reduce Wildfire Potential	4.16.1			
248	Prescribe Burn	4.6.3.2, 4.16.4	X		
249	Shred Timber Sale Slash	4.16.4	X		
250	Grind Wood Debris w/Tub Grinder	4.16.4			
251	Timber Sales to Break Pine Cover	4.16.4	X		
252	Coord Fire Dept Access to Private Lands	4.16.4	X		
253	Red Card Certification	4.16.5.1			
254	Burn Boss Training	4.16.5.1			As needed
255	Burn 1,000 Acres Annually (Not NIA)	4.1.11.1, 4.3.1, 4.5.3.1, 4.5.4.1, 4.6.3.2	X		
256	Assist Burning the NIA	4.16.4, 4.22.1.1	X		
257	Establish bur oak	4.16.4			
258	Complete Burn Plans for All Burns	4.16.6.1	X		
259	Game Line to Notify Hunters about Burns	4.16.6.1	X		
260	Route Burn Plans Electronically for Approval	4.16.6.1	X		
261	NIA Monitoring and Management	4.22.1.1	X		
262	Update GIS Database	4.3.1, 4.4.3.1, 4.9.1, 4.13	X		
263	Coordinate Mow and Pest Control	4.23.1.1	X		
264	Tech Oversight on Water Related Proj	4.23.1.1	X		
265	Technical Oversight to Urban Forestry	4.23.1.1	X		
266	Establish Uniform Flows in Stillwell	4.12.1	X		
267	Update Ag Lease to Include Angling	4.12.1	X		
268	Investigate Ways to Use Lease Lands	4.20.1	X		
269	Comment on Pest Management Plan	4.10.1	X		
270	Arbor Day Ceremony	3.6.3	X		
271	Public Informational Booths/Open house	3.6.3	X		
272	NEPA Review for Projects	3.4, 4.3.1, 4.4.1, 4.9.1, 4.23.1.1	X		
273	Attend Training	4.17	X		
274	Fish and Wildlife National Meeting	4.17	X		
275	Fisheries Society Meeting	4.17	X		
276	WDNR Wildlife Management	4.17			As needed
277	Wisconsin Wildlife Society Meeting	4.17			As needed
278	Fund Travel Costs	5.4.1.1	X		
279	Buy Equipment and Supplies	5.4.1.1	X		
280	Support Research Projects	4.1.1, 4.5.4.1, 4.8.1	X		

Implementation Schedule		2015			
<i>Shaded areas considered must-fund</i>		Paragraph reference	Planned	Completed	Results
1	Special Vegetation Survey	4.7.1.2			As needed
2	Forest Inventory	4.6.1.1	X		
3	Re-Map KBB Habitat	4.1.2.1	X		
4	KBB Habitat Monitoring	4.1.2.1			
5	Oak Wilt Survey	4.6.3.2	X		
6	Urban Forest Survey Update	4.7.1.3, 4.23.1.1	X		
7	FIA Plots	4.7.1.4	X		FMC not fund
8	Grassland Bird Survey	4.5.4.1			
9	Game Animal Surveys	4.5.1.1	X		
10	Spotlight Survey	4.5.1.1	X		
11	Doe:Fawn Survey	4.5.1.1	X		
12	Grouse Drumming Survey	4.5.5	X		
13	Turkey Gobble Survey	4.5.5	X		
14	Woodcock Survey	4.5.5	X		
15	Brood Surveys	4.5.5	X		
16	Hunter Survey	4.5.2.1	X		
17	Fisheries Surveys	4.4.2.1	X		
18	IBI	4.4.4	X		
19	Stream Shocking	4.4.4	X		
20	Netting	4.4.4	X		
21	Lake Shocking	4.4.4	X		
22	Creel Census-Lakes	4.4.2.1, 4.4.4	X		
23	Creel Census-Stream	4.4.3.1, 4.4.4	X		
24	Hook & Line	4.4.4	X		
25	Assess Fish For Contaminants	4.4.2.1	X		As needed
26	Water Quality	4.4.2.1, 4.4.4	X		
27	Investigate Impaired Waters	4.4.3.1	X		
28	Update Trout Water Classification	4.4.3.1	X		
29	Determine Water Quality Trends	4.4.3.1	X		
30	Threatened and Endangered Surveys	4.1			
31	KBB Straight-Line Transects	4.1.2.1			
32	KBB Presence/Absence	4.1.2.1	X		
33	Monitor KBB Habitat	4.1.2.1			
34	Remap KBB Habitat	4.1.2.1	X		
35	Bald Eagle Surveys	4.1.9.1	X		
36	Phlox Moth Surveys	4.1.6.1	X		
37	T&E Turtle Surveys	4.1.4.1	X		
38	Turtle Telemetry	4.1.4.1	X		
39	Osprey Surveys	4.1.10.1	X		
40	Red-Tailed Prairie Leafhopper	4.1.5.1	X		
41	Bull Snake Telemetry And Survey	4.1.7.1	X		
42	Rough White Lettuce Survey	4.1.11.1, 4.21.1	X		
43	Regal Fritillary Survey	4.1.8.1	X		
44	Cerulean Warbler Surveys	4.1.12.1	X		
45	Gypsy Moth Trapping	4.6.3.2	X		FMC not fund
46	Gypsy Moth Control	4.6.3.2			FMC not fund, as needed
47	Timber Sales	4.6.2, 4.8.1	X		
48	Land Use Change	4.6.2.4	X		
49	Enhance Training Mission	4.6.2.4	X		
50	Restore Oak Savanna	4.6.2.4	X		
51	Natural Regeneration	4.6.2.4	X		
52	Aspen Regeneration	4.5.3.1, 4.6.2.4	X		
53	Intermediate Harvest	4.6.2.2	X		
54	Lower Fire Danger	4.16.4	X		
55	Airfield Flight Path Clearing	4.23.2.1			As needed
56	Salvage Harvest	4.6.2.3			As needed
57	Insect and Disease Protection	4.6.3.2	X		
58	Artificial reforestation	4.6.5.1	X		
59	Reforest Mound Prairie Area	4.6.5.1			
60	Manage Red Pine Plantations	4.6.2.4, 4.6.4.1	X		
61	Manage Jack Pine	4.6.2.4	X		
62	Manage Good Oak	4.6.4.1, 4.6.5.1	X		
63	Maintain Good Oak	4.6.4.1	X		
64	Timber Stand Improvement	4.6.4.1	X		
65	Oak Wilt Education	4.6.3.2	X		
66	Monitor Oak Wilt Pockets	4.6.3.2	X		
67	Aerial Forest Damage Survey	4.6.3.2	X		
68	Annosus Root Rot Control	4.6.3.2	X		
69	Seedbed Prep for Jack Pine Regeneration	4.6.5.1	X		
70	Recalc Annual Allowable Harvest	4.6.1.1			

Implementation Schedule		2015			
<i>Shaded areas considered must-fund</i>		Paragraph reference	Planned	Completed	Results
71	Attend Forestry Training	4.17	X		
72	Archery Hunt	4.5.1.1	X		
73	Gun Deer Hunt	4.5.1.1	X		
74	Cantonment Deer Hunt	4.5.2.1, 4.23.1.1	X		
75	Collect & Analyze Data	4.5.1.1, 4.5.2.1	X		
76	Maintain Harvest/Biological Database	4.5.1.1	X		
77	Deer Habitat Improvement Projects	4.5.1.1	X		
78	Coordinate Permit Sales Regs	4.5.2.1	X		
79	Establish Quotas For Hunting Seasons	4.5.2.1	X		
80	WI DNR Letter of Intent	4.5.2.1	X		
81	MWR Register Turkey & Archery Deer	4.5.2.1	X		
82	Register Deer Gun Deer Season	4.5.2.1	X		
83	ID Areas with Large Furbearer Pops.	4.5.2.1	X		
84	Consult WDNR on Hunting Issues	4.5.2.1	X		
85	Support Preventive Medicine	4.5.2.1	X		
86	Spring Habitat Burns	4.5.3.1	X		
87	Fall Habitat Burns	4.5.3.1	X		
88	Collect Native Seed	4.5.3.1			
89	Plant Native Seed	4.5.3.1			As needed
90	Develop Seed Mixtures	4.5.3.1			As needed
91	Maintain Existing Apple Trees	4.5.3.1			
92	Improve Browse Habitat	4.5.3.1	X		
93	Maintain Nesting Structures	4.5.3.1	X		
94	Osprey	4.5.3.1			As needed
95	Bluebird	4.5.3.1, 4.8.1	X		
96	Wood Duck	4.5.3.1	X		
97	Bat	4.5.3.1	X		
98	Grassland Bird Studies	4.21.1			
99	Improve Grassland Bird Habitat	4.5.3.1	X		
100	Plant American Chestnut Trees	4.5.3.1			As needed
101	Review Permit Sales Process	4.14.3.2	X		
102	Issue Trapping Permits	4.14.3.2	X		
103	Issue Hunting Permits	4.5.2.1, 4.14.3.2	X		
104	Issue Fishing Permits	4.4.2.1, 4.14.3.2	X		
105	Issue Firewood Permits	4.6.2.4, 4.14.3.2	X		
106	Permit Sales Customer Service	4.14.3.2	X		
107	Restore & Manage Savanna/Barrens	4.5.3.1	X		
108	Increase Grassland Area	4.5.4.1	X		
109	Prescribed Burns	4.5.4.1	X		
110	Mowing	4.5.4.1			As needed
111	Native Plant Restoration	4.5.4.1			As needed
112	Timber Harvests	4.5.4.1	X		
113	Brush Removal	4.5.4.1			
114	Manage Grassland Core Areas	4.5.4.1			
115	NIA	4.5.4.1	X		
116	Warrens DZ	4.5.4.1			As needed
117	Cranberry DZ	4.5.4.1			As needed
118	Range 29	4.5.4.1	X		
119	Badger DZ	4.5.4.1	X		
120	Oak Savanna FMNA	4.5.4.1	X		
121	Training Areas B-26, B-27	4.5.4.1			As needed
122	Maintain Cantonment Unmowed Areas	4.5.4.1			
123	Exotic Plant Species	4.9.1	X		
124	All Invasive Species Surveys	4.3.1, 4.9.1, 4.21.1	X		
125	Leafy Spurge Treatment	4.9.1, 4.21.1, 4.22.1.1	X		
126	Spotted Knapweed Treatment	4.9.1, 4.22.1.1	X		
127	Garlic Mustard Treatment	4.9.1	X		
128	Buckthorn Treatment	4.3.1, 4.9.1	X		
129	Purple Loosestrife Treatment	4.3.1, 4.9.1	X		
130	Eurasian Watermilf/Curly Pondweed	4.4.2.1	X		
131	Survey	4.4.2.1	X		
132	Treatment	4.4.2.1	X		
133	Wild Honeysuckle Treatment	4.9.1	X		
134	Canada Thistle Treatment	4.9.1	X		
135	Crown Vetch Treatment	4.9.1	X		
136	Autumn Olive Treatment	4.9.1	X		
137	Siberian Pea Shrub Treatment	4.9.1	X		
138	Black Locust Treatment	4.9.1	X		
139	Reed Canary Grass Treatment	4.3.1	X		
140	Wild Parsnip Treatment	4.9.1, 4.23.3.1	X		
141	Other Invasive Plant Treatment	4.3.1, 4.9.1, 4.22.2.1, 4.23.1.1,	X		

Implementation Schedule			2015		
<i>Shaded areas considered must-fund</i>		Paragraph reference	Planned	Completed	Results
142	Fort McCoy Education/Coordination	4.9.1, 4.23.3.1	X		
143	Investigate New Control Measures	4.9.1	X		
144	Manage Invasive Database	4.9.1	X		
145	Monthly Herbicide Reports	4.9.1, 4.10.1	X		
146	Avoid Herbicides in Wellhead Area	4.10.1	X		
147	Coordinate to Share Pest Facility	4.10.1	X		
148	Coordinate with DOL for Sick Fauna	4.10.1	X		
149	Maintain Herbicide Equipment	4.9.1	X		
150	Herbicide Certification/Recertification	4.17	X		
151	Complete Invasive Species Plan	4.9			
152	investigate New Biocontrol	4.9.1	X		
153	Manage FMNA	4.21	X		
154	Inspect FMNA Anually	4.21	X		
155	Remove Beaver Dams	4.3.1, 4.4.2.1, 4.4.3.1, 4.21	X		
156	Maintain FMNA Signs	4.21			As needed
157	Annual FMNA Report to WDNR	4.21.1	X		
158	FMNA Education and Outreach	4.21.1	X		
159	Manage FMNA as needed	4.21.1	X		
160	Wetlands Management	4.3	X		
161	Control Beaver Populations	4.3.1, 4.4.2.1, 4.4.3.1	X		
162	Prescribe Burn Wetlands	4.16.6.1	X		
163	Control Woody Vegetation in Wetlands	4.3.1	X		
164	Manage Bog Communities	4.3.1	X		
165	Survey Manmade Potholes	4.3.1			As needed
166	Review/Update GIS wetlands/streams	4.3.1, 4.4.3.1			
167	Wetland Banking or Partnership	4.3.1, 5.2.1.4			
168	Wetland Mitigation	5.2.1.4			
169	Wetland Delineation Contracts	4.3.1			As needed
170	Map Ephemeral Ponds	4.3.1			As needed
171	Evaluate Wetlands	4.3.1	X		
172	Fisheries Program Administration	4.4	X		
173	Contract Oversight	4.4.1	X		
174	Develop/Maintain Fisheries Plans	4.4.1	X		
175	Maintain Partnerships	4.4.1, 4.4.3.1	X		
176	Support Clear & Stilwell Creek project	4.4.1	X		
177	Obtain Disease-Free Fish	4.4.1	X		
178	Coordinate With Military Training	4.4.1	X		
179	Sediment Working Group	4.4.2.1	X		
180	Support Energy Ind. & Security Act	4.4.1	X		
181	Stormwater Mgmt/Construct Proj.	4.4.1, 4.23.3.1	X		
182	Fishing Regulations	4.4.1, 4.4.2.1	X		
183	Streambank Restore and Habitat Improve	4.4.3.1, 4.6.5.1	X		
184	Assess Lake Morphology	4.4.2.1	X		
185	Lake Habitat	4.4.2.1	X		
186	Fish Stocking	4.4.2.1	X		
187	Stock Trout	4.4.2.1	X		
188	Stock Walleye	4.4.2.1	X		
189	Stock catfish	4.4.2.1	X		
190	Stock Minnows	4.4.2.1	X		
191	Water Level Management	4.4.2.1	X		
192	LaCrosse River Sedimentation Control	4.4.1, 4.4.3.1, 4.22.1.1	X		
193	Monitor ASP for White Phos Use	4.4.3.1	X		
194	BMP Monitoring and Use	4.4.3.1, 4.22.1.1, 4.23.1.1	X		
195	Culvert Management	4.4.3.1, 4.23.3.1	X		
196	Tag LM Bass in North Flowage	4.4.2.1	X		
197	Develop North Flowage into Trophy LMB	4.4.2.1	X		
198	Education Materials at Boat Landings	4.4.2.1	X		
199	Predator/Prey Balance in Lakes	4.4.2.1	X		
200	Install Fish Cover in Lakes	4.4.2.1	X		
201	Aqua Crib Fasteners	4.4.2.1			
202	Woody Debris	4.4.2.1	X		
203	Tree Drops	4.4.2.1	X		
204	Provide Stock Fish to Area Lakes	4.4.2.1	X		
205	ID Dams for Removal or Reclamation	4.4.2.1, 4.4.3.1	X		
206	Biomonitoring Assessments	4.4.3.1	X		
207	Monitor/Maintain Oxygen Levels	4.4.2.1	X		
208	Funding for Dam Removal Reclaim	4.4.3.1	X		
209	ID Fix to Sedimention	4.4.1, 4.4.3.1	X		

Implementation Schedule		2015			
<i>Shaded areas considered must-fund</i>		Paragraph reference	Planned	Completed	Results
210	Open Communication with T&E Interests	4.1.1	X		
211	Review NEPA Forms for T&E Concerns	4.1.1	X		
212	Reduce Project Impacts to T&E	4.1.1	X		
213	Monitor Bald Eagle Nesting Success	4.1.9.1	X		
214	Monitor Osprey Nesting Success	4.1.10.1	X		
215	Install Osprey Nest Platforms	4.1.10.1			As needed
216	Restore and Manage Goat Prairies	4.1.5.1	X		
217	KBB Management Plan	4.1.2	X		
218	Maintain KBB No-Mow Roadside Marks	4.23.3.1	X		
219	Complete Major Revision of KBB Plan	4.1.2			
220	Submit T&E Compliance Reports	4.1.1	X		
221	Conduct Annual Briefings To Workforce	4.1.1	X		
222	Document Occurance Records	4.1.1	X		
223	KBB Public Outreach and Education	4.1, 4.1.2	X		
224	Habitat Management Activities	4.1.2.1	X		
225	Complete Mitigation Actions	4.1.2.1	X		
226	KBB Core Area Re-evaluation	5.2.1.3			
227	Involve Area Students with Projects	4.1.4.1	X		
228	Wolf Track Surveys-Winter	4.1.3.1	X		
229	Wolf Howling Surveys	4.1.3.1	X		
230	Telemetry Monitoring of Collared Wolf	4.1.3.1	X		
231	Remote Camera Survey	4.1.3.1	X		
232	Maintain 100 Meter Buffer	4.1.3.1	X		
233	Coyote Hunting Ban for Gun-Deer Season	4.1.3.1	X		
234	North Post Ban on Coyote Hunt w/Dogs	4.1.3.1	X		
235	Coyote Trap Size Limit	4.1.3.1	X		
236	Reports to WDNR	4.1.3.1	X		
237	Outreach and Education	4.1.7.1, 4.4.2.1	X		
238	Develop Regal Fritillary Mgmt Guidelines	4.1.8.1			
239	Rough White Lettuce Seed Collect & Plant	4.1.11.1			As needed
240	Rx Burn RW Lettuce Areas	4.1.11.1			As needed
241	Major Gray Wolf Plan revision	4.1.3	X		
242	Harvest and Plant Lupine Seeds	4.1.2.1	X		
243	Map and Update Phlox Moth Habitat	4.1.6.1	X		
244	Migratory Bird Management	4.8			
245	Monitor Borrow Pits for Bird Use	4.8.1	X		
246	Discourage Nesting in Borrow Pits	4.8.1	X		
247	Reduce Wildfire Potential	4.16.1			
248	Prescribe Burn	4.6.3.2, 4.16.4	X		
249	Shred Timber Sale Slash	4.16.4	X		
250	Grind Wood Debris w/Tub Grinder	4.16.4			
251	Timber Sales to Break Pine Cover	4.16.4	X		
252	Coord Fire Dept Access to Private Lands	4.16.4	X		
253	Red Card Certification	4.16.5.1			
254	Burn Boss Training	4.16.5.1			As needed
255	Burn 1,000 Acres Annually (Not NIA)	4.1.11.1, 4.3.1, 4.5.3.1, 4.5.4.1	X		
256	Assist Burning the NIA	4.16.4, 4.22.1.1	X		
257	Establish bur oak	4.16.4			
258	Complete Burn Plans for All Burns	4.16.6.1	X		
259	Game Line to Notify Hunters about Burns	4.16.6.1	X		
260	Route Burn Plans Electronically for Approval	4.16.6.1	X		
261	NIA Monitoring and Management	4.22.1.1	X		
262	Update GIS Database	4.3.1, 4.4.3.1, 4.9.1, 4.13			
263	Coordinate Mow and Pest Control	4.23.1.1	X		
264	Tech Oversight on Water Related Proj	4.23.1.1	X		
265	Technical Oversight to Urban Forestry	4.23.1.1	X		
266	Establish Uniform Flows in Stillwell	4.12.1	X		
267	Update Ag Lease to Include Angling	4.12.1	X		
268	Investigate Ways to Use Lease Lands	4.20.1	X		
269	Comment on Pest Management Plan	4.10.1	X		
270	Arbor Day Ceremony	3.6.3	X		
271	Public Informational Booths/Open house	3.6.3	X		
272	NEPA Review for Projects	3.4, 4.3.1, 4.4.1, 4.9.1, 4.23.1.1	X		
273	Attend Training	4.17	X		
274	Fish and Wildlife National Meeting	4.17	X		
275	Fisheries Society Meeting	4.17	X		
276	WDNR Wildlife Management	4.17			As needed
277	Wisconsin Wildlife Society Meeting	4.17			As needed
278	Fund Travel Costs	5.4.1.1	X		
279	Buy Equipment and Supplies	5.4.1.1	X		
280	Support Research Projects	4.1.1, 4.5.4.1, 4.8.1	X		

## APPENDIX C



COOPERATIVE PLAN  
DEVELOPMENT OF FISH AND WILDLIFE RESOURCES  
FORT MCCOY MILITARY INSTALLATION  
WISCONSIN

1. In accordance with the authority contained in 10 USC Section 2671; 16 USC Sections 670 et seq. (Sikes Act); Public Law 86-797 as amended; and Public Law 105-85, Sections 2901-2914 (Sikes Act Improvement Act of 1997), the Department of Defense, the Department of Interior, and the State of Wisconsin, through their duly designated representatives whose signatures appear below, approve the following Cooperative Plan for the conservation, development, coordination, and management of fish and wildlife resources on the Fort McCoy Military Installation.

WHEREAS, the U.S. Army, Fort McCoy Military Installation, hereinafter referred to as Fort McCoy; the U.S. Fish and Wildlife Service, acting for the Department of Interior, hereinafter referred to as the Service; and the Wisconsin Department of Natural Resources (WI DNR), hereinafter referred to as the State; have a mutual desire and interest that the fish and wildlife populations and habitats on the said military installation be properly managed, conserved, and utilized for both consumptive and nonconsumptive purposes; and

WHEREAS, it is necessary for Fort McCoy, the Service, and the State to agree upon certain matters relative to fish and wildlife management activities which are consistent with the military mission;

NOW AND IN CONSIDERATION of the mutual promises of one party to the other, it is AGREED:

2. Purpose and Objectives:

a. The purpose of this Plan is to establish a cooperative effort for the protection, development, coordination, and management of natural communities, fish and wildlife resources on the Fort McCoy Military Installation.

b. The objectives of this Plan are to:

(1) Protect and conserve the watersheds, the soil, the beneficial forests and timber growth, the vegetative cover, as vital elements of a responsible fish and wildlife management program consistent with the military mission;

(2) Utilize and care for fish and wildlife resources in such a manner that best serves the present and future needs of the United States and its people;

(3) Provide public access in compliance with natural resource management policies and goals of the United States, except where the Commander of Fort McCoy determines that such access would result in the bonafide impairment of the military mission, security, or safety;

(4) Maintain compliance with all applicable Federal, State, and local natural resource conservation laws and regulations;

(5) Ensure that off-road vehicle (ORV) use is restricted to maintained roads or ORVs are used only for military mission, safety, fire response, and natural resources management purposes;

(6) Ensure that range rehabilitation for wildlife management purposes shall be accomplished in consonance with, and does not conflict with, military mission objectives;

(7) Provide proper management techniques for the protection of endangered, threatened (E&T), species of special concern, and their habitat, and for the expansion of E&T species populations where appropriate and compatible with the military mission.

(8) Establish and enhance community relations among the parties hereto and the general public.

3. To achieve the objectives of this Plan, the three participating agencies agree as follows:

a. Mutually:

(1) Public participation will be allowed in the harvest of fish and wildlife, commensurate with military objectives, providing such game species are in sufficient abundance to provide for harvest and sustainable population balance through management practices agreed upon by all concerned parties. All persons granted access shall stand at par with each other, and selections shall be made on an impartial basis. Such access shall be within manageable quotas subject to safety requirements, military security, and the military training mission.

(2) All persons engaged in fish and wildlife activities such as hunting, trapping, or fishing on Fort McCoy shall obtain the appropriate Fort McCoy permit. Permit fees shall be uniform and reasonable, and shall be established and collected under applicable laws and regulations.

(3) All persons engaging in hunting, fishing, or trapping on Fort McCoy must purchase the required state and federal licenses, tags, and stamps.

(4) All hunting, fishing, and trapping on Fort McCoy will be in accordance with federal and state fish and game laws.

(5) Whenever feasible, develop partnerships to accomplish specific program objectives and goals in the areas of: fish removal, the control or eradication of exotic, invasive plants; the conservation of grassland bird species; habitat management projects; natural areas; and native plant communities.

b. Fort McCoy Military Installation:

(1) Will maintain an Integrated Natural Resources Management Plan (INRMP), which includes fish and wildlife management as an integral component, and implement the provisions of the Plan. The INRMP will be made available to the State and Service for review and comment.

(2) Will keep the cooperating agencies to this Plan fully informed as to the status of the progress of the fish and wildlife management activities being carried out on Fort McCoy through written reports, meetings, and personal communications.

(3) Will provide for adequate enforcement of Installation, State, and Federal fish and wildlife laws and regulations.

(4) Will staff the Fish and Wildlife Management Program with professionally qualified personnel who have the education and experience requirements.

(5) Will manage for a healthy, viable aquatic resource. The Fisheries Program will:

(a) Monitor surface water quality characteristics, use biological indicators to follow surface water trends, and evaluate thermal effects of impoundments on the coldwater resources.

(b) Support watershed protection efforts by utilizing Best Management Practices to reduce sedimentation; implement stream bank erosion control and habitat improvement; maintain sediment basins; restore lakes and impoundments; and control exotic species.

(c) Follow the Recreational Fisheries Executive Order 12962 to promote angling opportunities to include people with disabilities, monitor fish population dynamics, conduct angler and creel surveys, improve habitat and provide public information and education.

(6) Will support State efforts with adjacent landowners to improve and promote watershed protection

(7) Will develop management plans for Federal or for selected State endangered or threatened species occurring on Fort McCoy that will become an addendum to this Agreement and/or the INRMP.

(8) Fort McCoy agrees to the following regarding State listed endangered or threatened species contingent on the availability of funds:

(a) Fort McCoy's INRMP will serve as the conservation plan for all State listed species.

(b) Surveys will be conducted for State listed species when current survey data are insufficient.

(c) Species that are classified as Federal endangered or threatened species as well as being State listed will be given priority for surveys.

(d) Occurrence records will be kept when State listed species are observed.

(e) Specific monitoring to document incidental take of individual State listed species will not be conducted. Incidental take will be documented when observed (i.e., dead specimen found/reported).

(f) Survey results and occurrence records will be forwarded to the Wisconsin Bureau of Endangered Resources (WBER) and the WI DNR Area Wildlife Supervisor in a timely manner. This will include any incidental take reports.

(g) When management activities are conducted for State listed species, a summary of this management, to include impacts to State listed species when known, will be forwarded to the WBER and the WI DNR Area Wildlife Supervisor in a timely manner.

(h) When State listed species are known to occur within areas scheduled for construction, they will be considered under the National Environmental Policy Act review process.

c. The Service and/or the State:

(1) Will furnish necessary technical assistance for the establishment and development of long or short range management plans as agreed upon by all parties hereto and technical advice as may be necessary for the implementation and accomplishment of these plans.

(2) Will provide assistance with conservation law enforcement when necessary.

(3) Shall provide technical advice and assistance to Fort McCoy on fish and wildlife management when requested and as available resources allow.

(4) Will provide, as necessary, educational brochures and handouts to promote public awareness of natural resource initiatives as indicated in the Service and State's natural resource objectives and goals.

(5) As the parties agree, will cost-share stream bank restoration with Trout Stamp monies to improve trout habitat on Fort McCoy streams.

(6) The State will provide Fort McCoy with registration materials for deer hunting seasons.

(7) The State will cost share as partners with Fort McCoy, in accordance with any separate agreement between the State and Fort McCoy, for wild turkey management activities if the project is deemed as high priority by the State and if sufficient funds are available.

(8) The Service and State will support a mechanism to accept reimbursable funding to provide natural resources management and research projects on Fort McCoy.

4. Fish and Wildlife Supported Recreation on Fort McCoy:

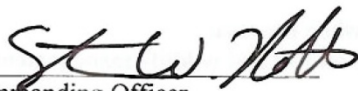
a. Hunting, fishing, and trapping are valuable recreational uses of the resources on Fort McCoy and will be conducted in accordance with State and Federal laws and in accordance with additional regulations established as needed for the protection of any given species.

b. Licenses, permits, and fees for hunting, fishing, and trapping will be required in accordance with applicable State and Federal laws and military regulations. In addition to the applicable State licenses and permits, the appropriate Fort McCoy permit will be required of all persons hunting, fishing, or trapping on Fort McCoy. Persons hunting, fishing, or trapping without appropriate McCoy permits and State licenses will be processed through the Federal Magistrate Court. All revenues generated from the sale of Fort McCoy hunting, fishing, or trapping permits will be expended solely for the implementation of fish and wildlife management activities identified in the INRMP. Expenditures will be authorized solely for the conservation and management of Fort McCoy's fish and wildlife resources and for no other purposes. Permit fees will be deposited directly into the Installation's Fish and Wildlife Receiving Account (21R5095).

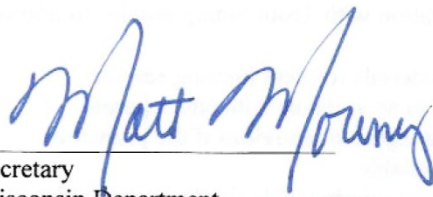
c. This Cooperative Plan recognizes the primary mission of the Fort McCoy Military Installation to be its military function. The public will be allowed to participate in fish and wildlife supported recreation on

Fort McCoy equally with military personnel except where such public participation must be necessarily limited because of military objectives and safety as determined by the Commanding Officer of Fort McCoy.

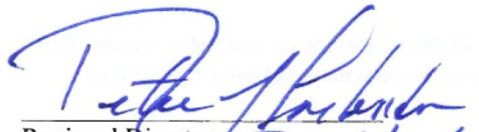
5. Authorization. This Cooperative Plan will be in full force and in effect upon its adoption. Adoption will be indicated by signatures below of duly authorized representatives of the three agencies first above named and will remain in full force and effect as long as permitted by the cited authorities under which it is entered. This Plan may be amended or revised by agreement between all three parties hereto. Any proposed amendment of this Plan may originate with any of the participating agencies. This Plan shall be reviewed and updated if needed by the parties every five years.

  
\_\_\_\_\_  
Commanding Officer  
Fort McCoy, Wisconsin

July 20, 2012  
Date

  
for Secretary  
Wisconsin Department  
of Natural Resources

8/13/12  
Date

  
for Regional Director  
U.S. Fish and  
Wildlife Service  
*Project Leader  
Green Bay ESFO*

27 August 2012  
Date

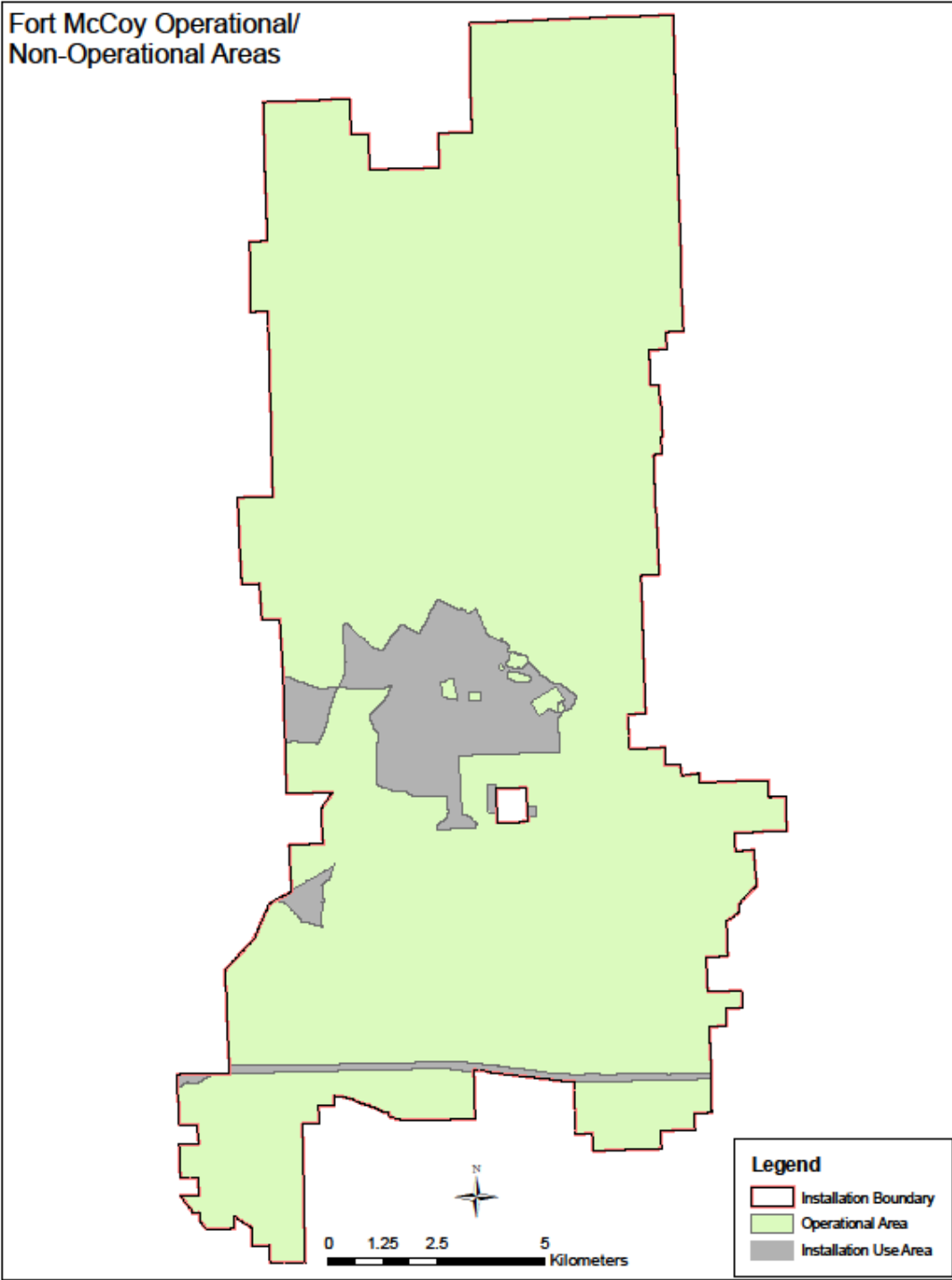
## APPENDIX D

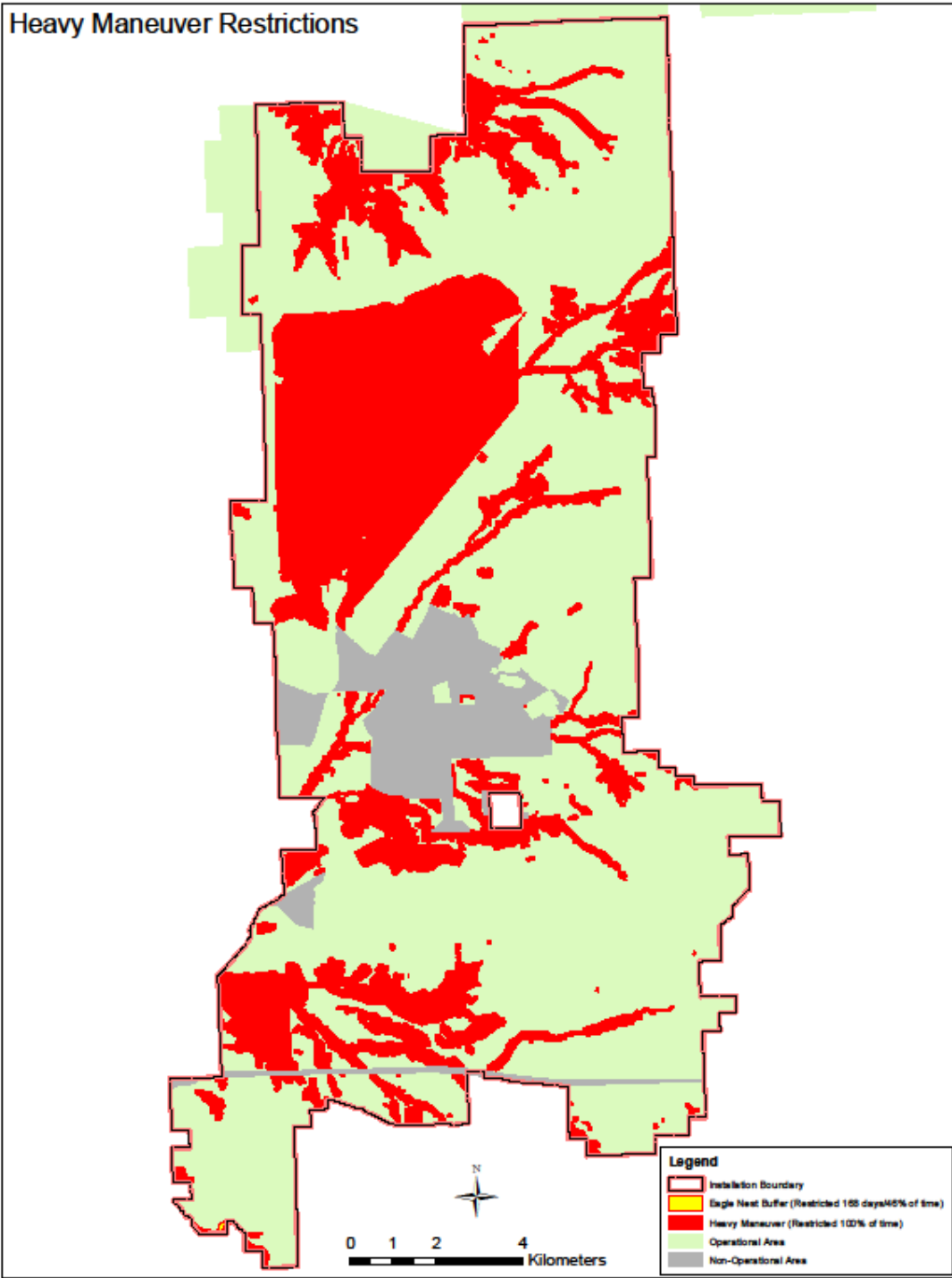
### **3.2 Summarized Impacts and Constraints**

1. Overall Fort McCoy encompasses 59,660.5 acres of land. 4,533.0 acres of land are considered nonoperational area. These lands are zoned for most of the consolidated infrastructure, support, and developed administrative, billeting, warehousing, and support buildings, recreation facilities, as well as a family housing area, an ammunition supply point, and the interstate corridor which runs through the south end of Fort McCoy. The remaining 55,127.5 acres of land are considered available for operational training requirements, to include the north impact area (NIA - 7,773.2 acres) and the Fort McCoy airfield.

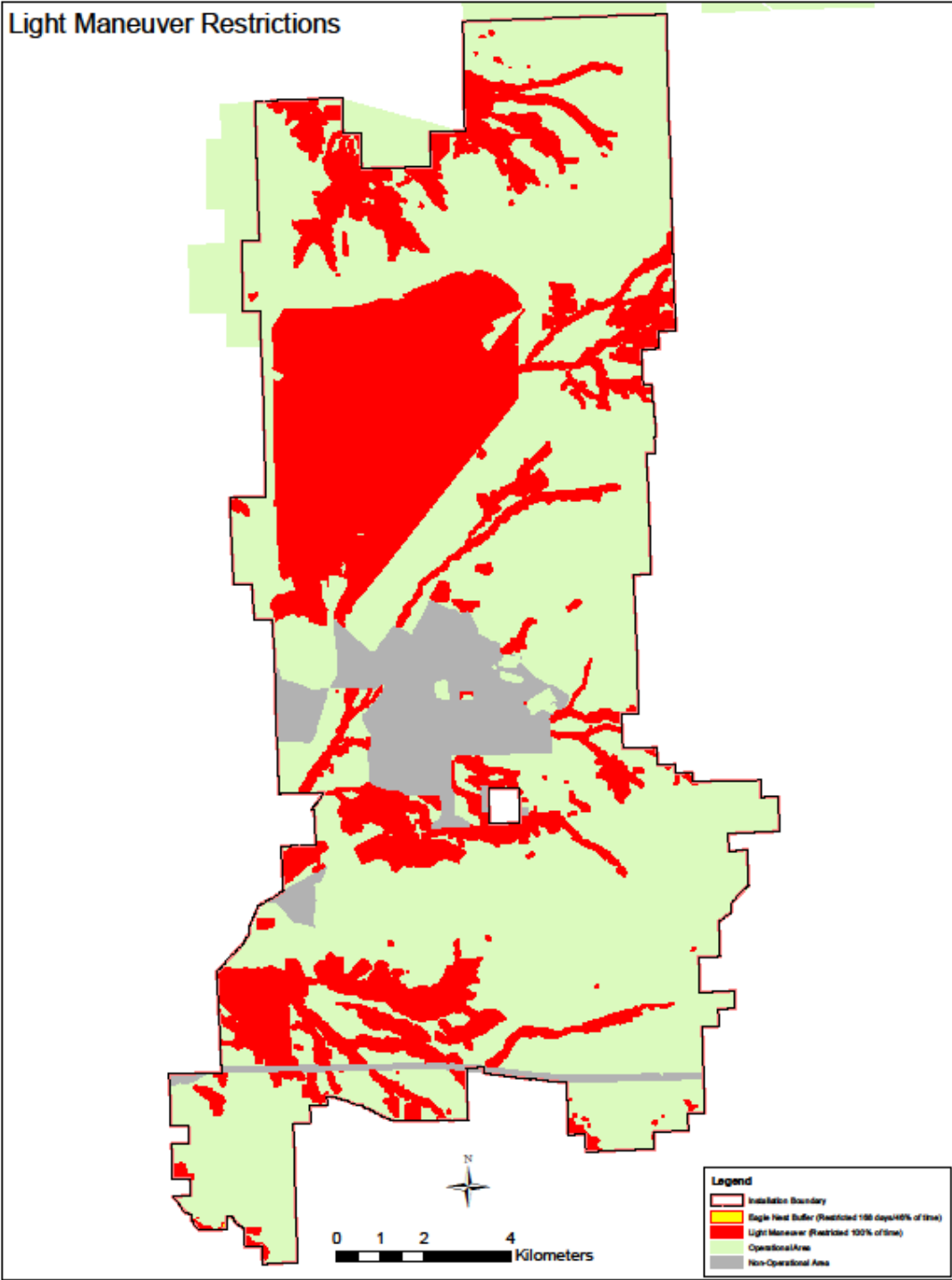
2. Within Fort McCoy there are various restrictions impacting training in a variety of ways. Some restrictions are dictated by federal and state regulations, such as restrictions associated with jurisdictional wetlands; some restrictions are based on human health and safety, such as areas suspected of buried UXO; some restrictions are based on best management practices to limit impacts of specific types of training/training events, such as a 25 meter buffer restriction around wetlands and waterways applied to all heavy and light vehicle maneuvers; or limiting refueling operations in areas where ground water is near the soil surface; etc. Each encroachment factor is discussed individually here and depicted in the associated enclosures.

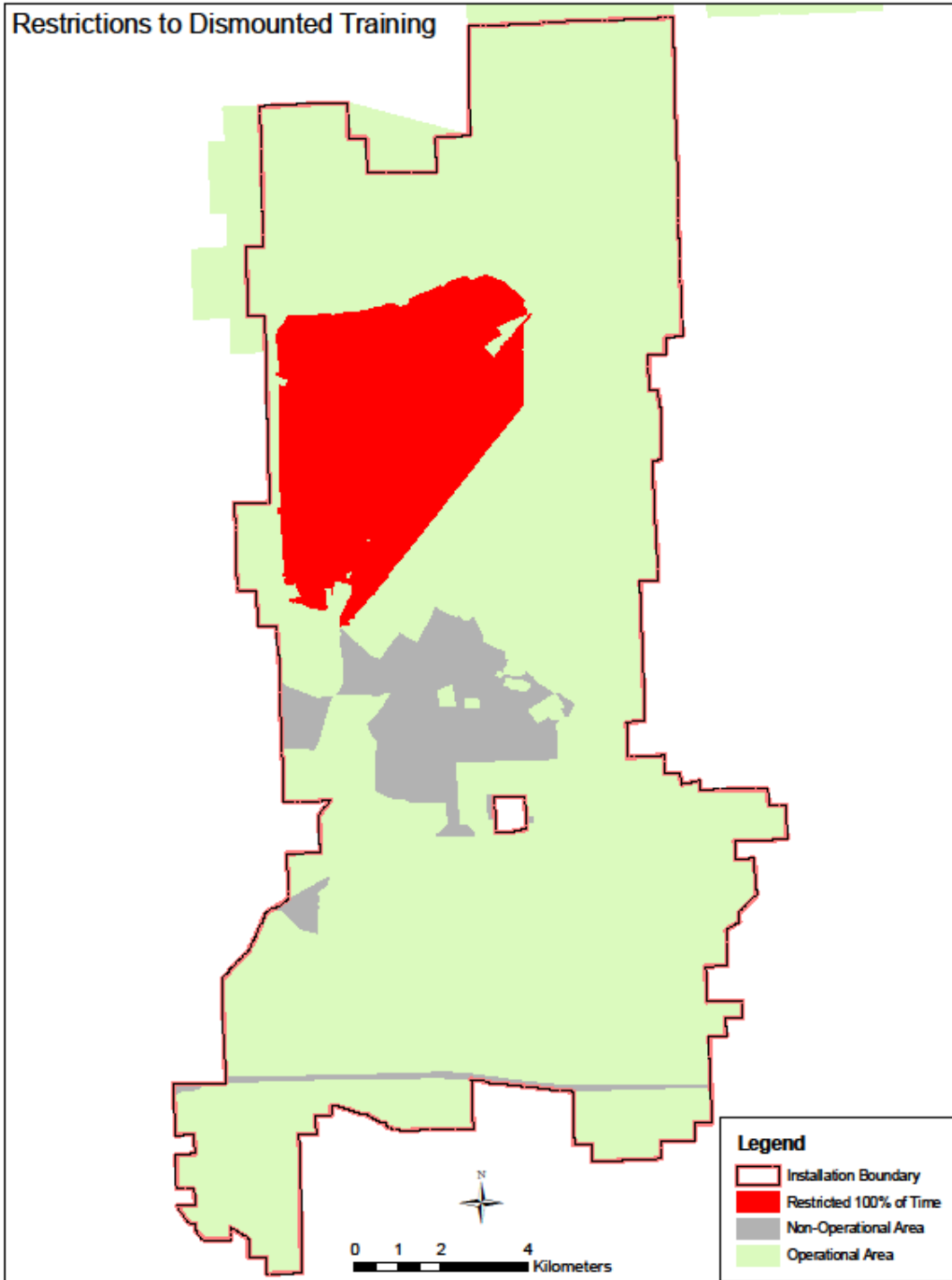
3. Fort McCoy has additional acres available for maneuver training via one lease and three permits (See Map 6.2B Off Post Training Areas). The permitted lands include: 1447.8 acres of Monroe County land, 1015.6 acres of Jackson County land, and 67,815.2 acres of Black River State Forest. Though available these lands are severely restrictive to training. Any maneuver beyond dismounted training is restricted to established roads and designated trails, and availability of these is severely restricted to very narrow windows of time, therefore these lands have not been depicted within the Encroachment Condition Module Maps. The leased property available to Fort McCoy is a 602.6 acre parcel from a private owner, Habelman. This property is relatively free of restrictions, per the lease agreement, however encroachments such as wetlands, still apply. These "Off Post Training Lands" will not be further discussed in this chapter, the encroachments details listed below and encroachment maps are limited to the Fort McCoy Installation Property only.

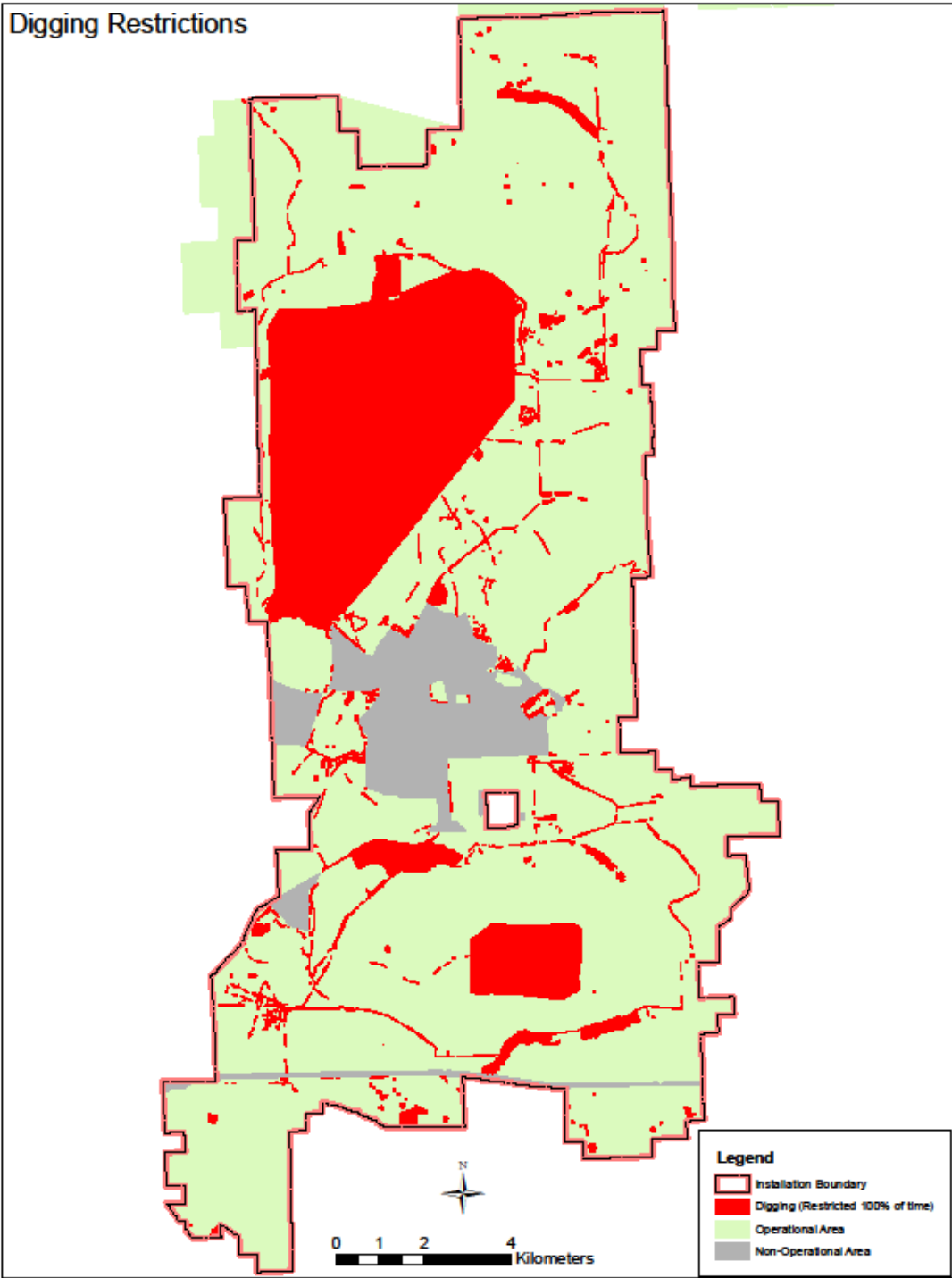


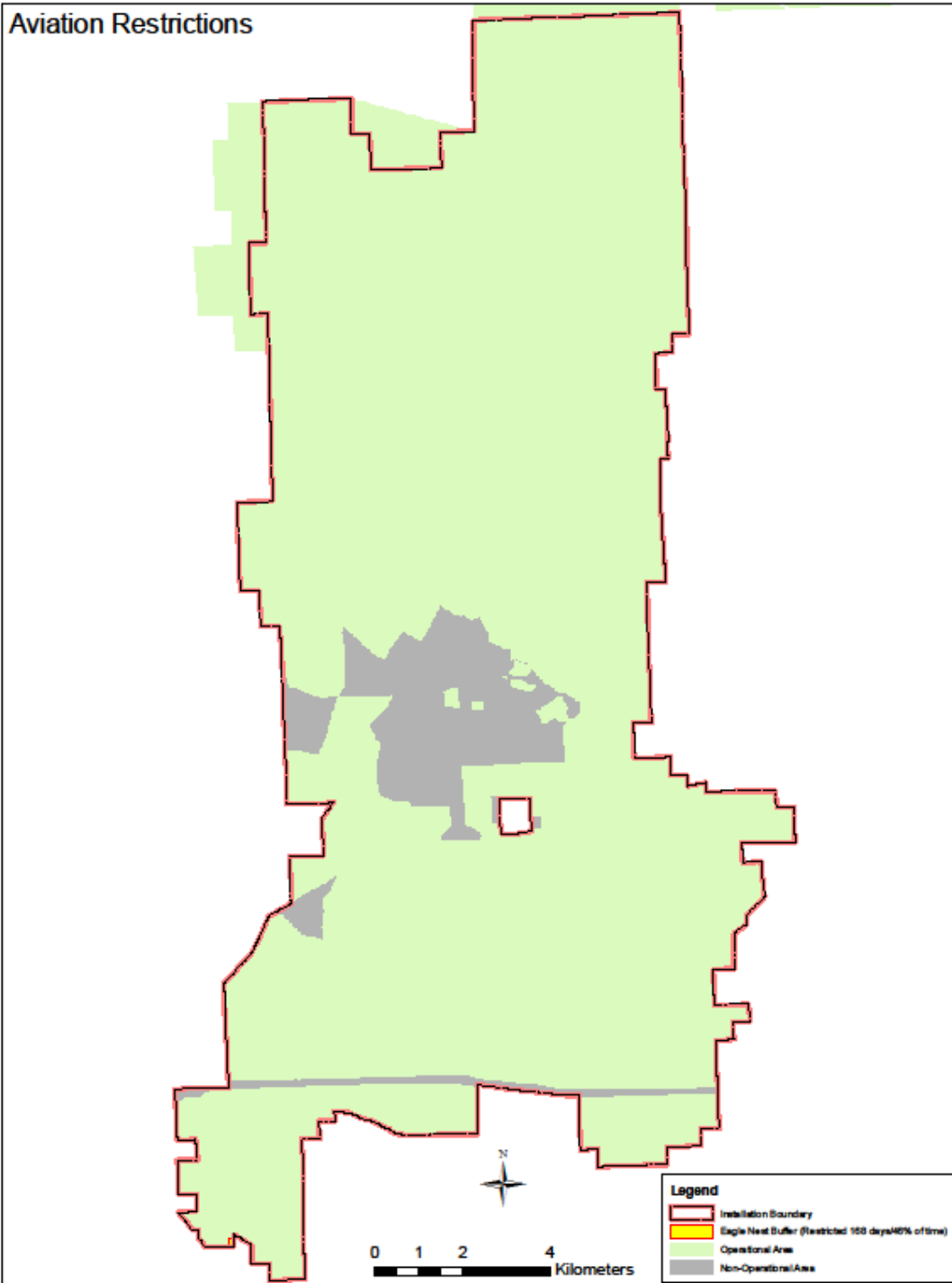


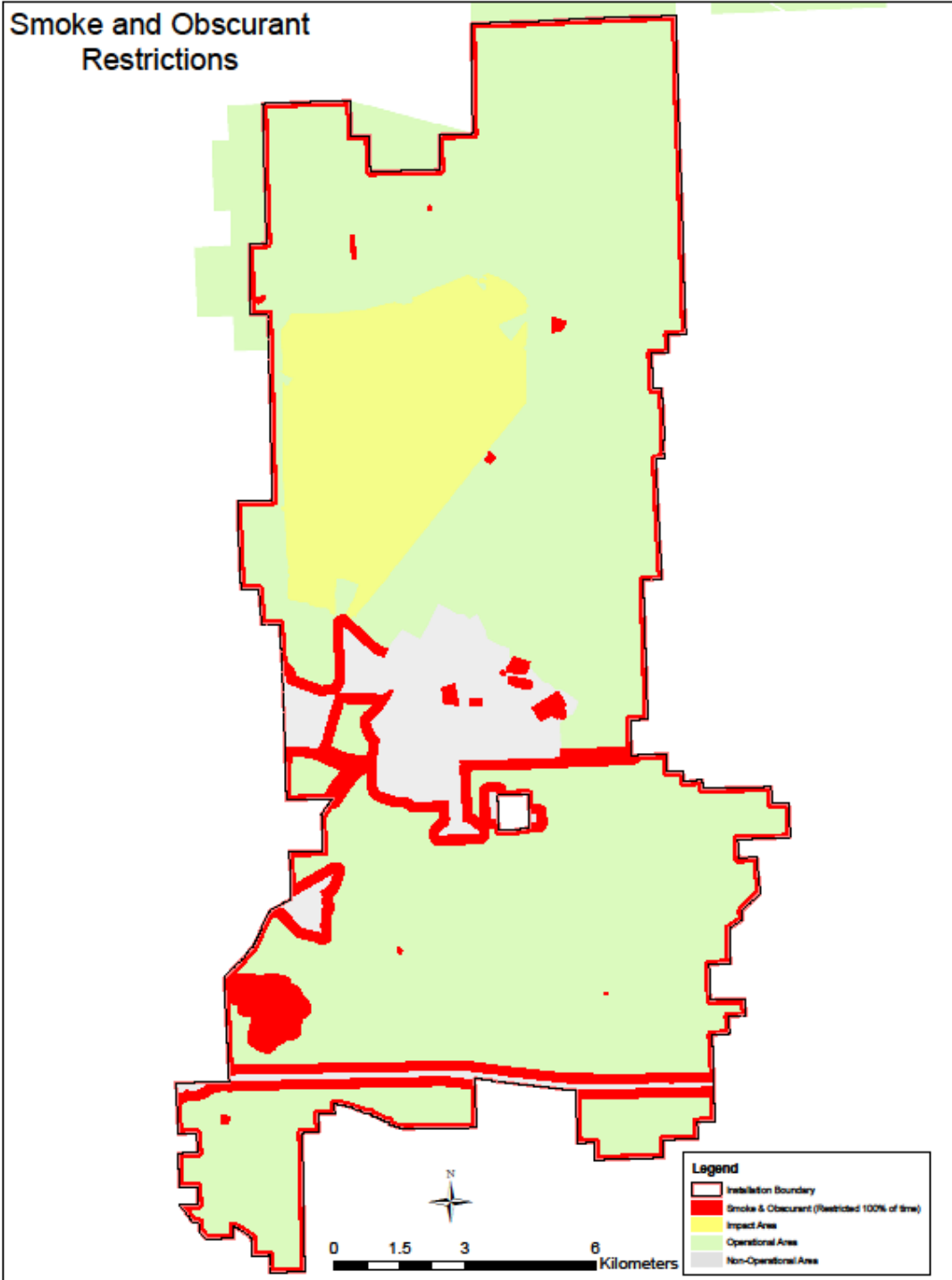


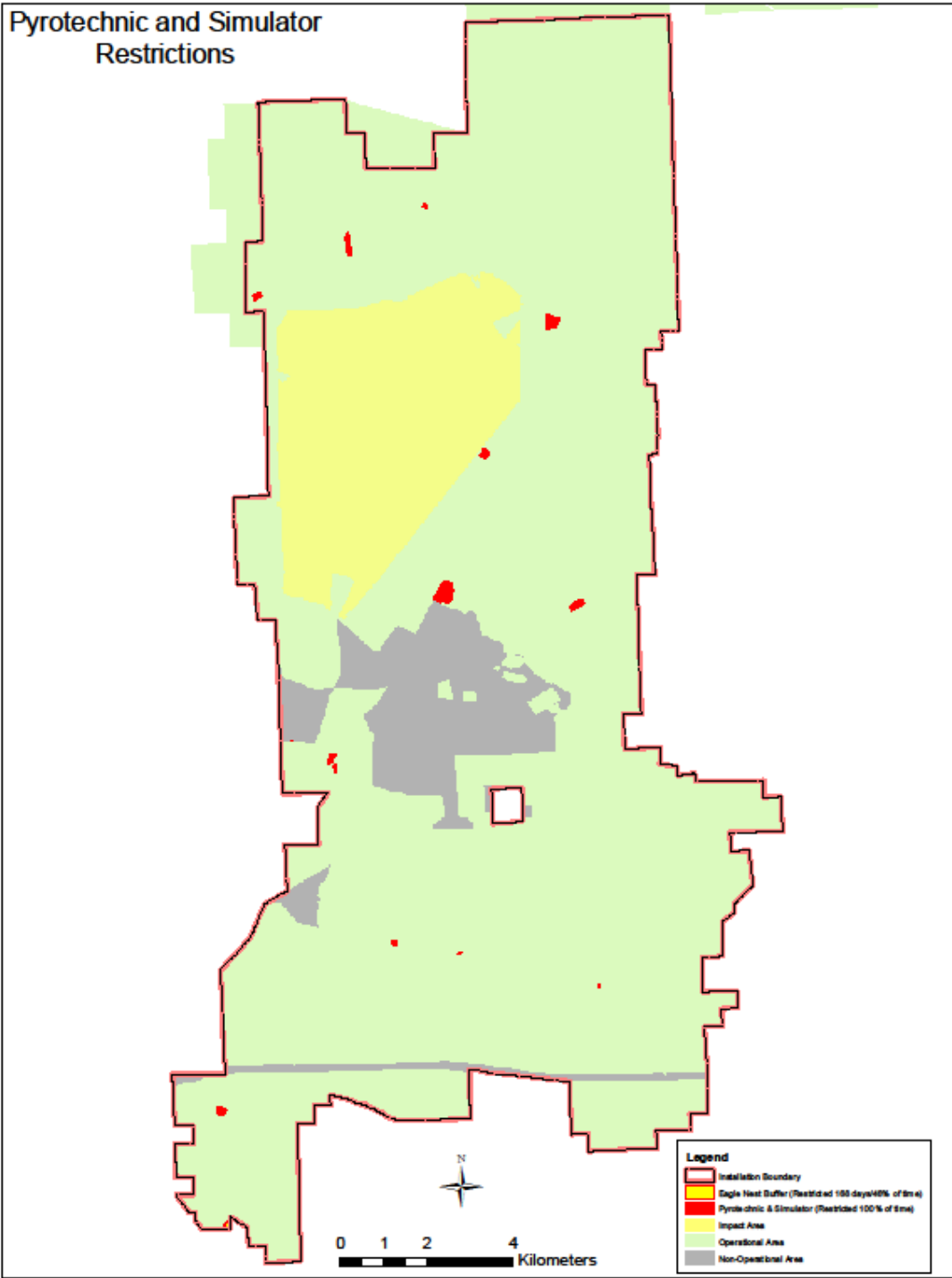


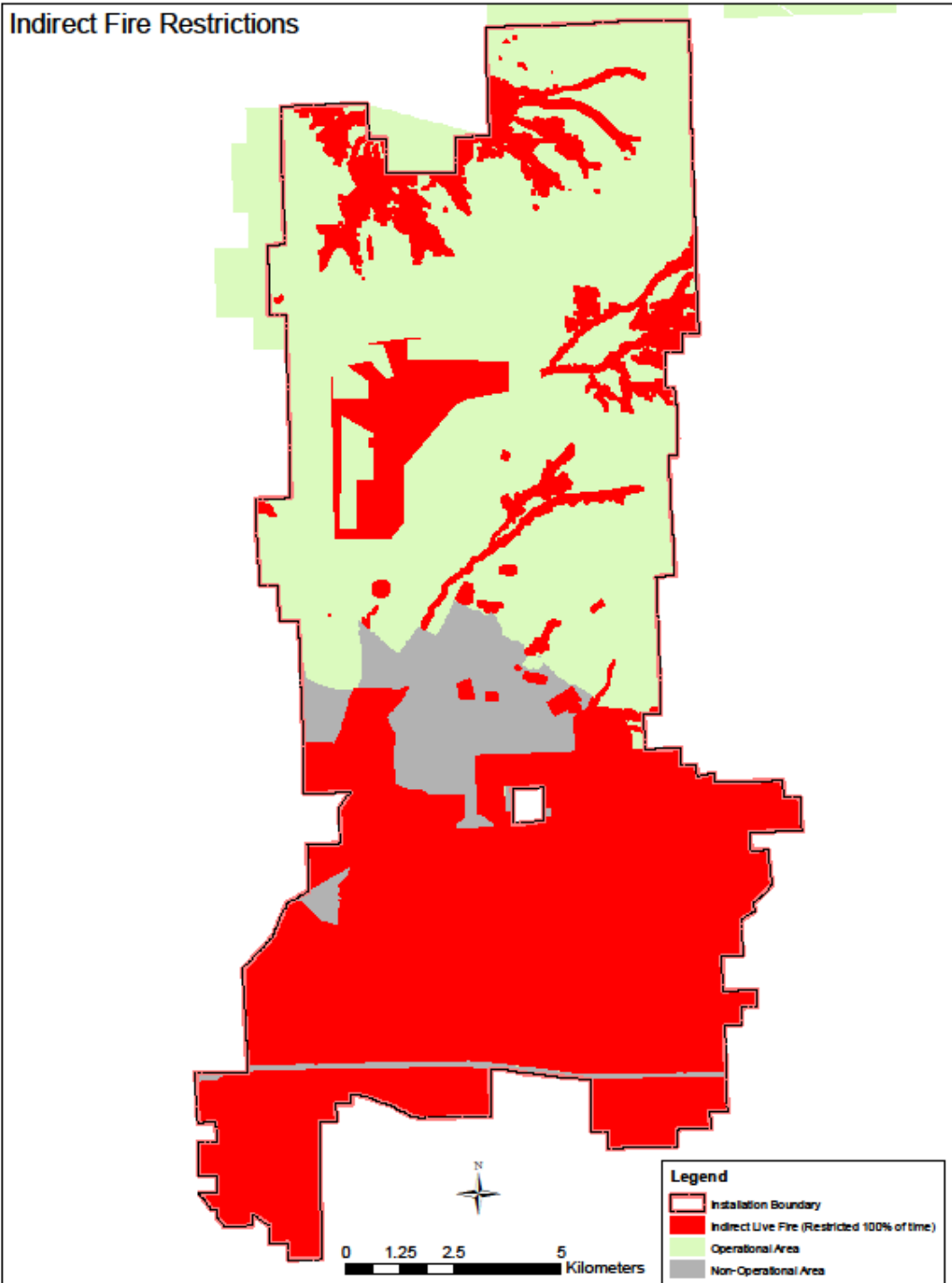


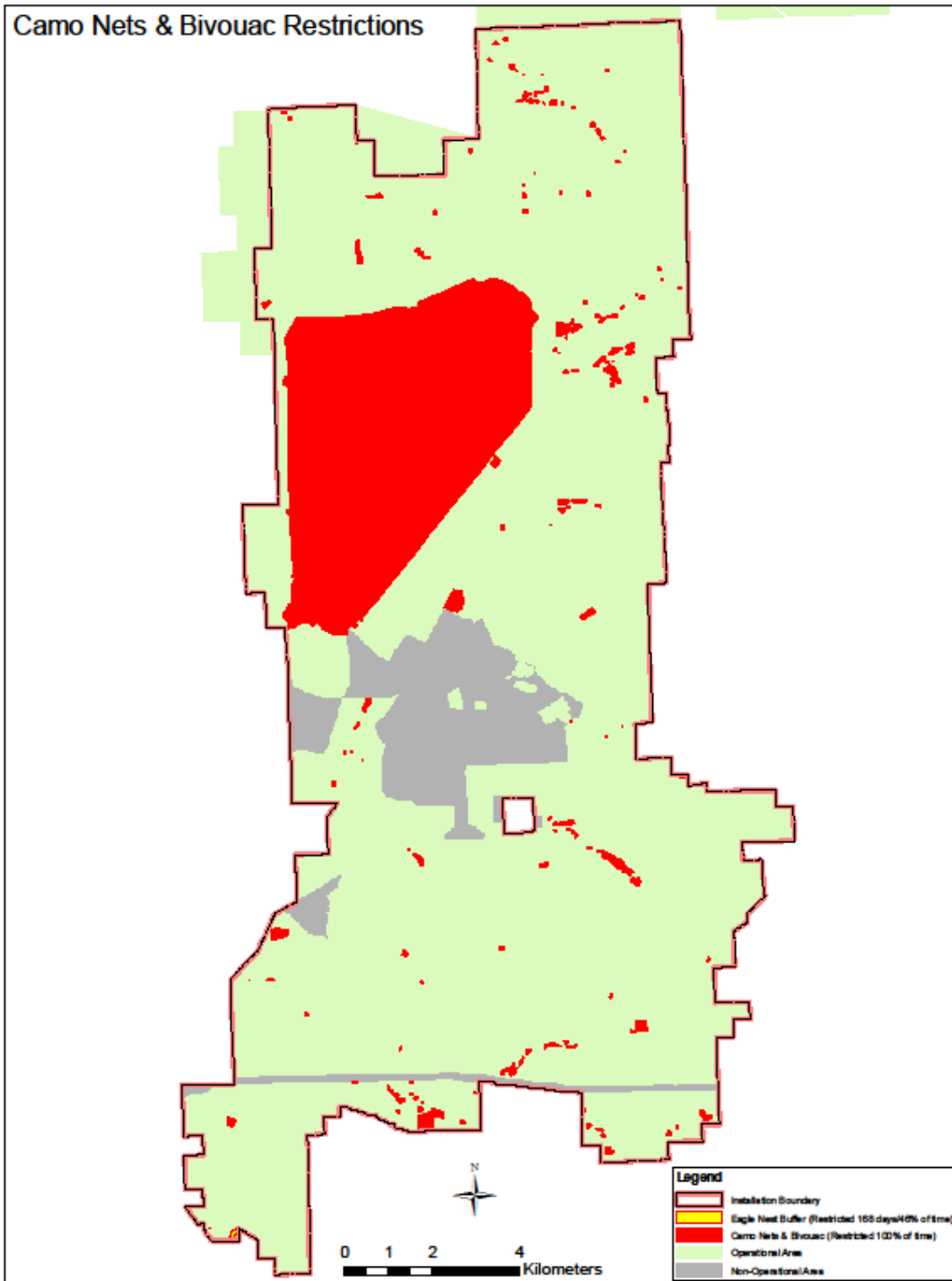




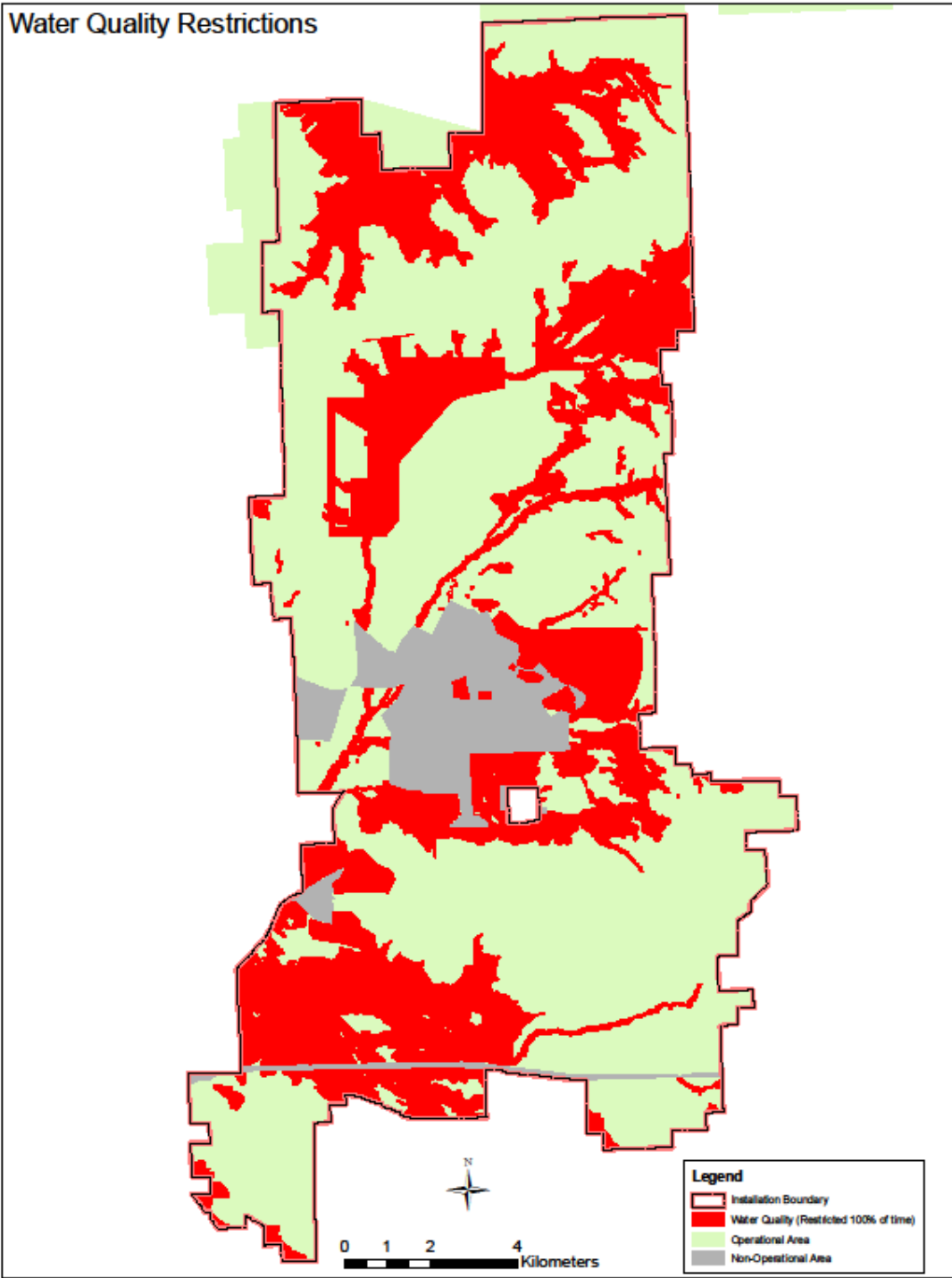


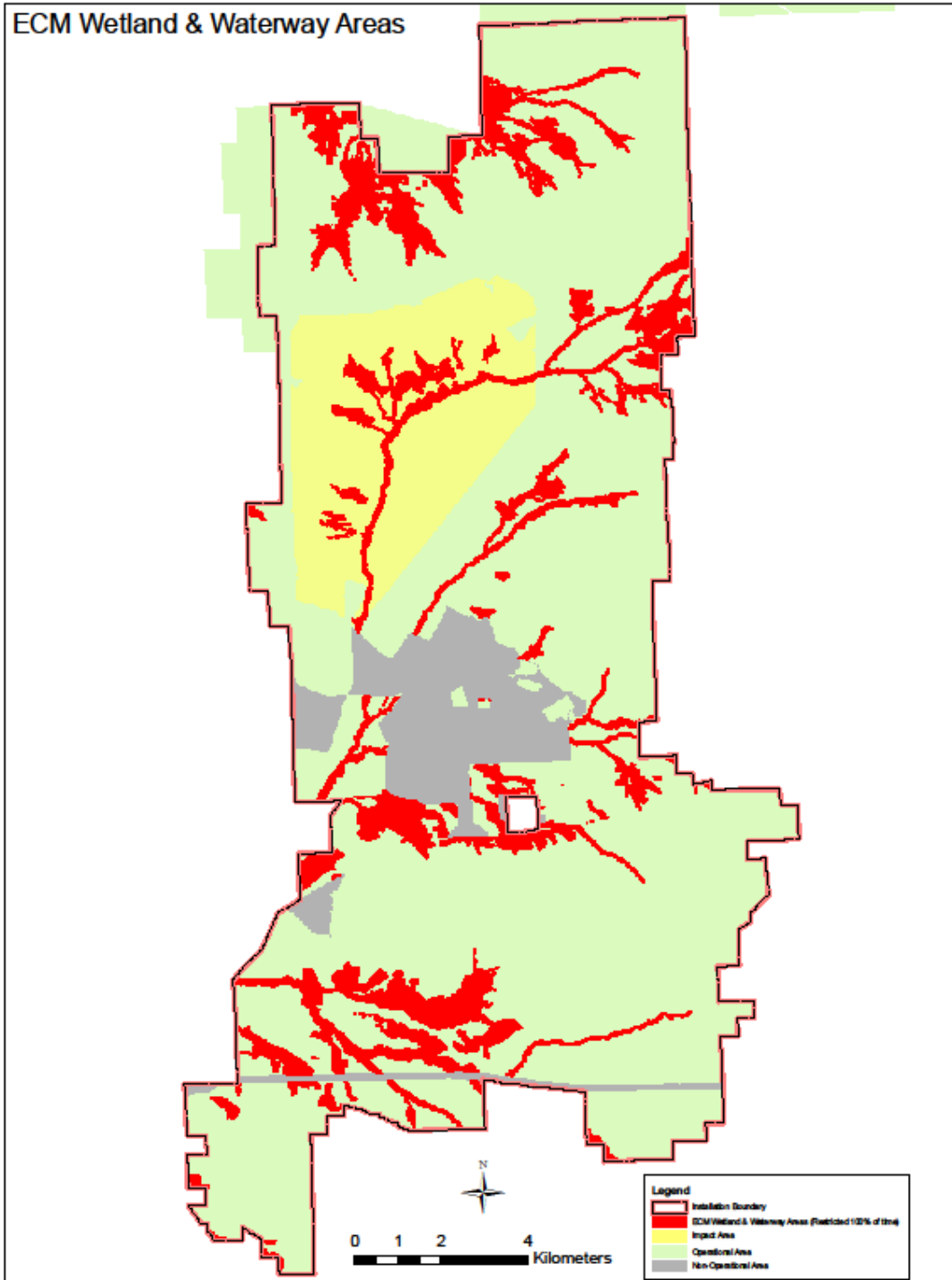




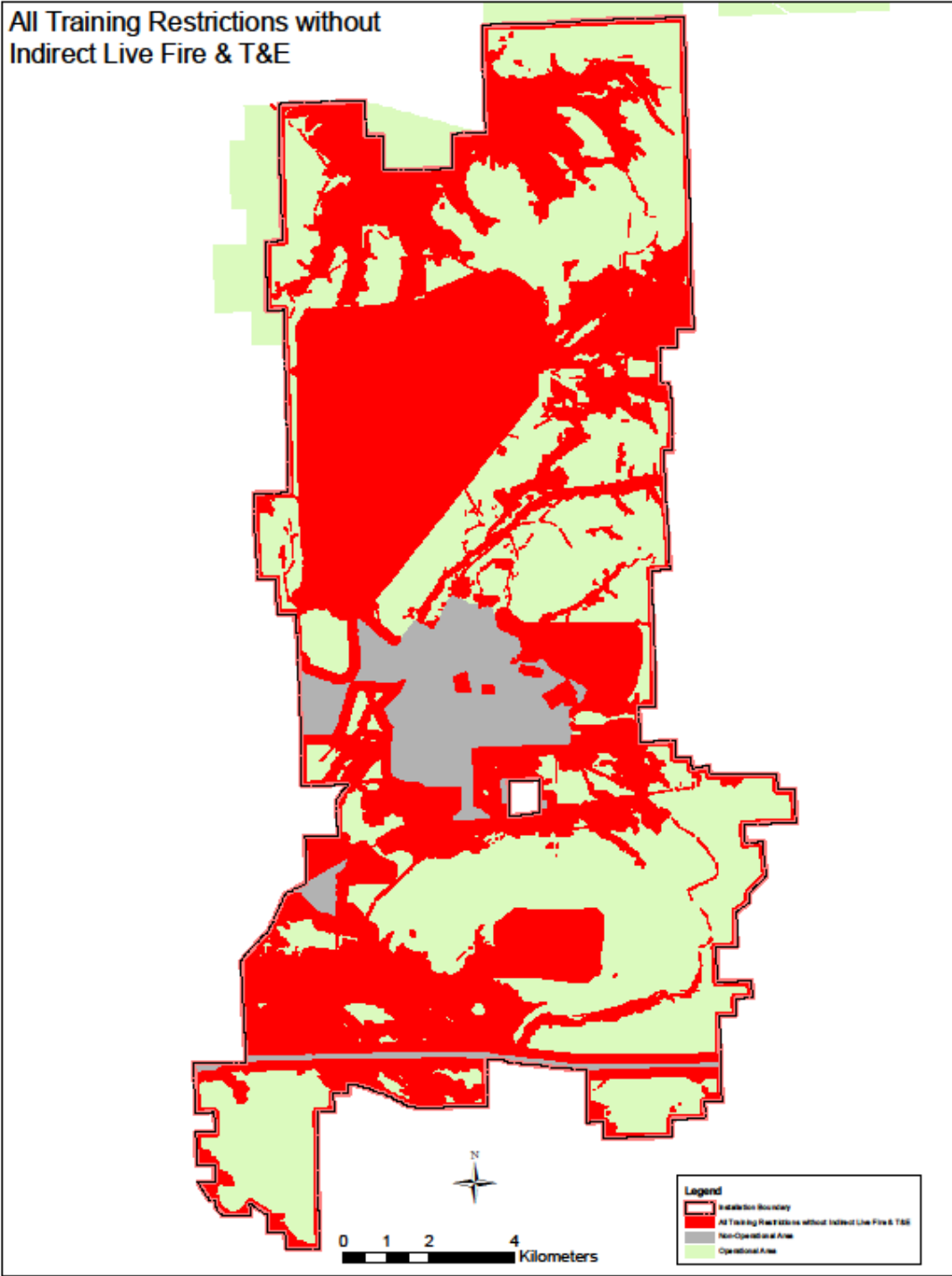




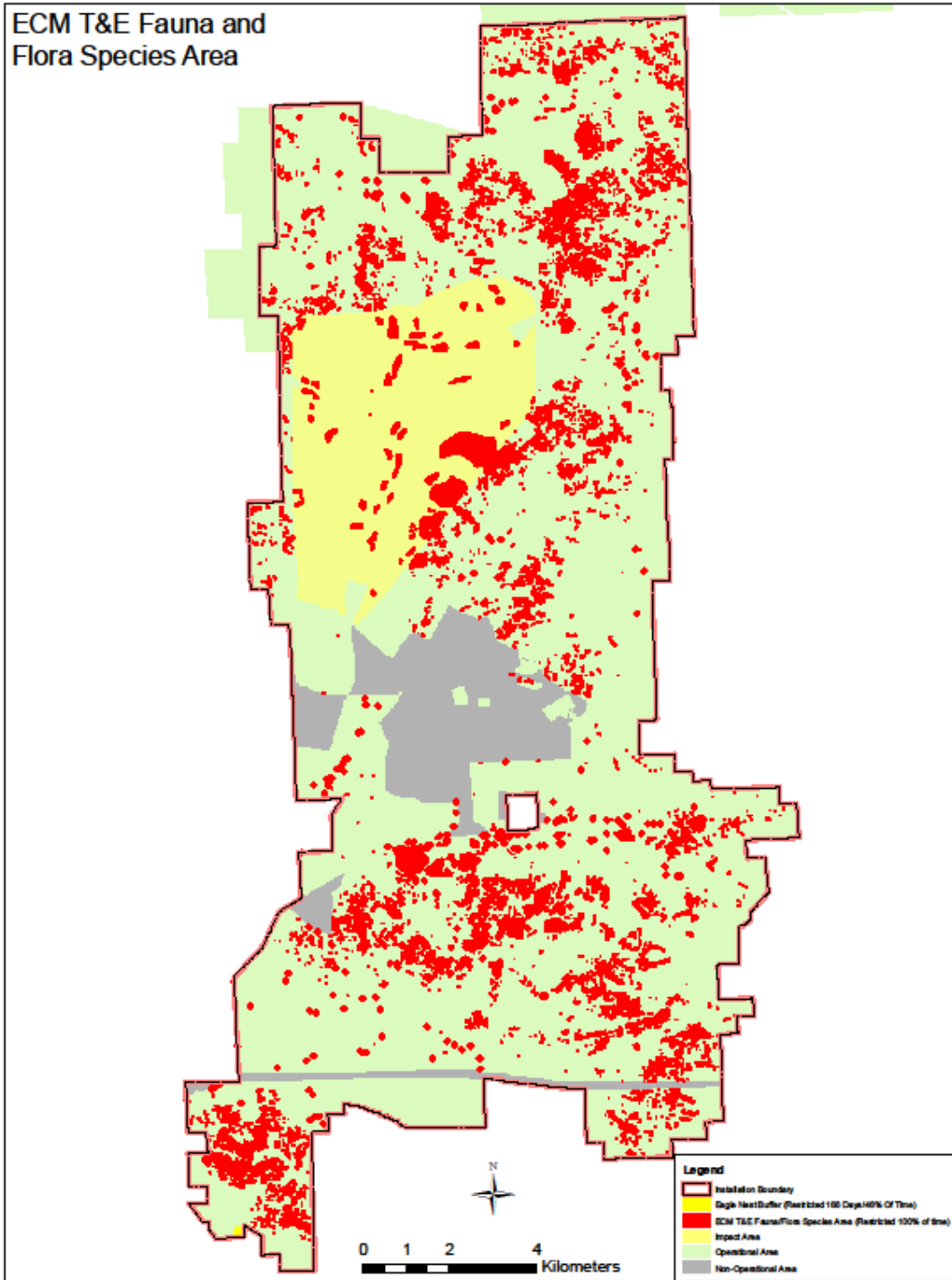


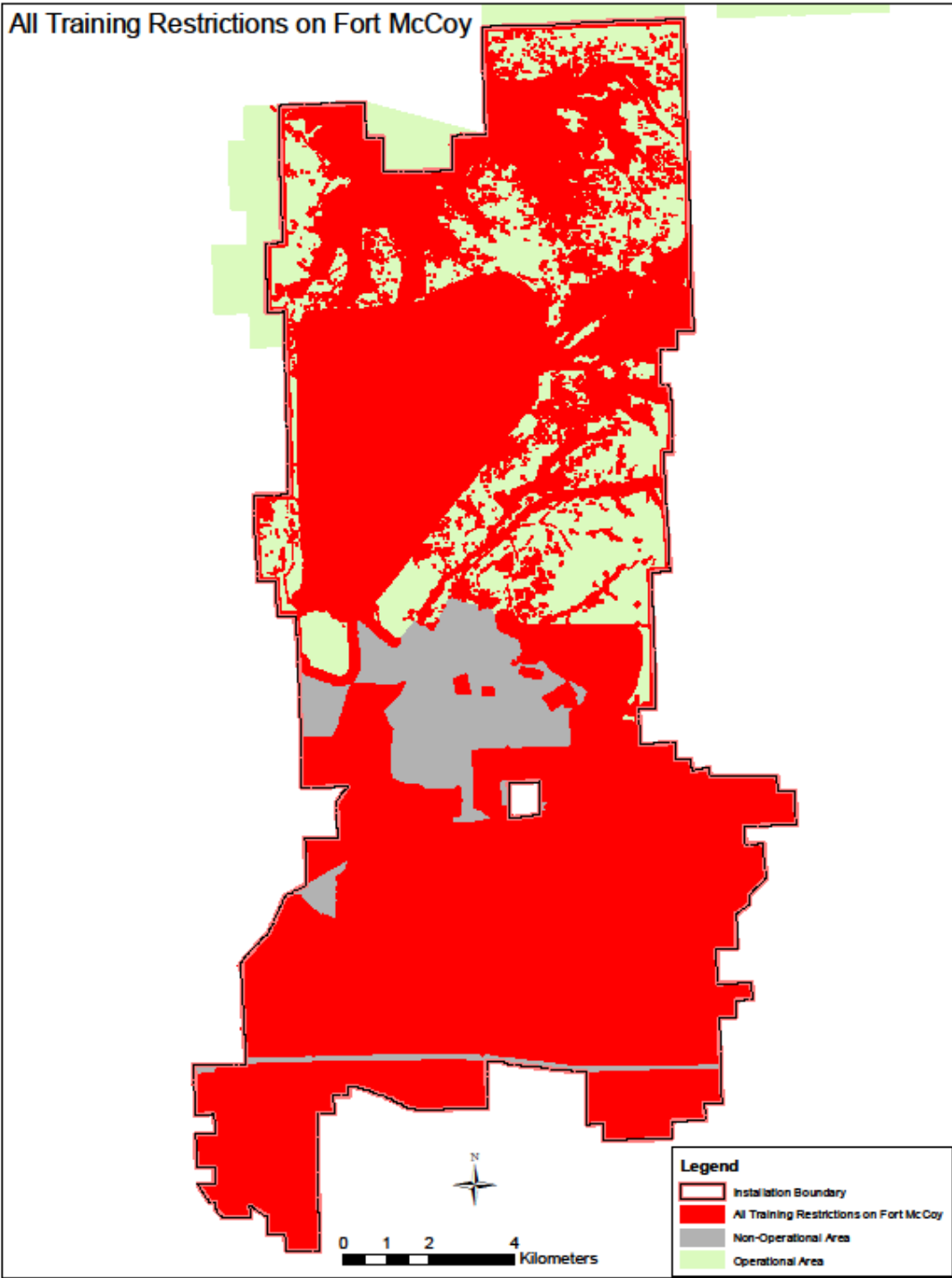


All Training Restrictions without  
Indirect Live Fire & T&E



ECM T&E Fauna and  
Flora Species Area





## **ENVIRONMENTAL RESTRICTIONS**

**Air Quality:** Fort McCoy does not have any air quality encroachment areas identified within the operational area.

**Cultural Resources Sites:** There are 168 cultural resources sites encompassing approximately 386.5 acres currently known to exist within the Fort McCoy operational land area, restricted 365 days a year. Of Fort McCoy's 55,127.5 number of operational area acres, 33,841 acres have been surveyed for cultural resources and 7773.2 acres of the NIA cannot be surveyed due to UXO issues; therefore additional sites could be found on the remaining 13,513.3 acres that have not yet been surveyed. There is always the slight potential that the archaeological survey may have missed a site. Any newly discovered site within an already surveyed area would also be restricted to training or development. Under AR 200-1, in order to protect the integrity of unique and significant archaeological and cultural sites, the following training activities are not allowed on those sites: heavy and light vehicle maneuver (dismounted/foot training is allowed); digging; bivouac activities; indirect live fire activities; and activities which require construction or building; other special site request activities must be reviewed prior to approval.

**Solid Waste Landfill Area:** There are five historical /capped landfills, 51.8 acres, within Fort McCoy operational area that impact training, restricted 365 days a year. All of these locations are prohibited for digging operations, heavy and light mounted maneuvers, indirect live fire, and land conversion/construction projects due to possible health safety issues related to buried material. Additionally, two of these landfills (46.6 acres) are capped and vented systems which have additional prohibition for pyrotechnics and simulator use (due to possibility of release of gases from vents).

**Contaminated Soils:** There is one location within the Fort McCoy operational area that was used to bury material dredged from Fort McCoy impoundments; the site totals 3.3 acres in size, restricted 365 days a year. Due to possible health safety issues related to buried material this site is generally prohibited from digging, heavy and light mounted maneuver, indirect live fire, and land conversion/construction projects.

**Fauna Critical Habitat:** Fort McCoy does not have any critical habitat identified as defined in the Endangered Species Act. Fort McCoy does have one federally endangered species using Fort McCoy operational lands, the Karner Blue Butterfly (KBB). The gray wolf, also occurring on Fort McCoy, was removed from the federal endangered species list on 27 January 2012, but this species does still have some management requirements. No "Critical Habitat" has been identified on Fort McCoy. Narratives reviewing the encroachment issues associated with these species however, have been identified in the next paragraph, "Fauna Federal and State Listed or Species of Concern".

## **Fauna Federal and State Listed or Species of Concern:**

**Karner Blue Butterfly (KBB):** There are two major factors associated with the KBB influencing training, there are nine KBB Core Areas totally 56 acres and there are 4,336.8 acres of wild lupine throughout the operational area. The KBB is a federally endangered species found on the installation. Wild lupine is the sole host plant for the KBB larvae.

Through consultation with the Fish and Wildlife Service (FWS), Fort McCoy has been given an “incidental take permit” allowance for various activities that may take place on Fort McCoy annually. In conjunction with this “take permit” Fort McCoy maintains an Endangered Species Management Plan (ESMP) for the KBB and works to ensure reasonable and prudent measures are implemented to avoid and minimize harm to the KBB and its habitat during the course of its activities. As part of the ESMP Fort McCoy has established nine KBB Core Areas, all military training except for dismounted training is prohibited in these areas, which encompass a total of 56 acres within Fort McCoy’s operational land area (See the enclosed ECM Factor and Training Impact Matrix for Fort McCoy), restricted 365 days a year. These KBB Core Areas are scheduled to be reopened to general maneuvers by June of 2012 as a result of consultations with the FWS. Though not considered critical habitat by FWS definition, wild lupine has an impact on training when considering land conversion/construction projects, such as building new ranges. Wild lupine is not considered an encroachment for most other training activities that occur on Fort McCoy. In addition, there are 17 KBB management areas on the installation. The sighting of building construction within KBB management areas will be avoided whenever possible since these sites generally have the highest KBB populations and are the most important areas for Fort McCoy to reach its conservation goals. In general, attempts are made to site construction projects in areas without lupine since these projects permanently remove lupine from the landscape. If impacts to lupine are unavoidable, mitigation actions to off-set the loss of lupine are required.

Gray Wolf: The gray wolf has been removed from the federal endangered species list on 27 January 2012. Two wolf packs currently occur on the installation. The approved Wolf Management Plan requires protection of active den and rendezvous sites when found. The den associated with the south post wolf pack was found in 2011. It is believed that the most critical elements of gray wolf habitat are den and rendezvous sites. In general, Fort McCoy provides protection to active den and rendezvous sites (if found/identified) by maintaining a 100 meter buffer zone around these areas from March 1 through July 1, as well as protecting the site location(s) and buffer for one year thereafter. The buffer zone would prohibit most training activities, new construction or land conversion activities, as well as land management activities, with the exception of maintenance activities that must be conducted for safety or infrastructure repair/maintenance purposes.

Bald Eagle: Currently there is one site within Fort McCoy operational area considered impacts to training. The bald eagle was removed from the federal threatened list in 2007, but still receives protection under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. Protection of eagle nest is of primary importance. Generally a buffer zone around an active nest site would prohibit the following activities from March 1 to August 15th (168 days or 46% of the year): a 200 meter buffer for digging, heavy maneuver, indirect live fire, or new construction/land conversion activities; 100 meter buffer for light maneuver, dismounted training, pyrotechnic use, indirect live fire/targeting, smoke and obscurant use, aviation overflight, and bivouac/camouflage net use. These buffer zones will be maintained, unless it can be determined through consultation with the FWS that the eagles are tolerant of these activities in close proximity to their nesting locations (i.e. a mating pair selects and attends a nest site in

close proximity to active events that would normally be prohibited).

Army Species at Risk; Federal Species of Concern & State Listed Species: Species that fall within these categories are currently an impact to training only in circumstances of construction and land conversion projects. Fort McCoy contains three Army species at risk (i.e. Henslow's sparrow, red-tailed prairie leafhopper, and the regal fritillary butterfly) and numerous federal species of concern (Blanding's turtle and phlox moth) and state listed species (wood turtle, Bate's crested butterfly, osprey, slender glass lizard, frosted elfin, cerulean warbler, and hooded warbler) (See the enclosed ECM Factor and Training Impact Matrix for Fort McCoy for the number of sighted locations/acreages for each species). In general, there are no restrictions placed on military training activities from Army species at risk, federal species of concern, or state listed species. Fort McCoy is committed to the wise stewardship of the natural resources found on the installation, to include rare and sensitive species. Attempts are made to minimize impacts to these species from training activities, construction, and maintenance activities whenever feasible. Impacts to these species from construction projects are considered under the National Environmental Policy Act Review process. If a construction project (i.e. building or range construction) will impact state listed species, the Wisconsin Department of Natural Resources requires alternatives be considered that do not impact these species or, if that is not possible, minimize impacts to these species.

Flora Critical Habitat: Fort McCoy does not have any critical habitat for flora species identified as defined in the Endangered Species Act.

Flora Federal and State Listed or Species of Concern; Army Species at Risk; Federal Species of Concern & State Listed Species: Species that fall within these categories are an impact to training only in circumstances of construction and land conversion projects currently. Fort McCoy contains no flora Army species at risk and numerous federal species of concern (prairie flame flower, bog bluegrass) and state listed species (rough white lettuce, dwarf milkweed, evening campion, creamy gentian, smooth sheathed sedge, prairie parsley, and brittle prickly pear cactus) (See the enclosed ECM Factor and Training Impact Matrix for Fort McCoy for the number of sighted locations/acreages for each species; and the ECM T&E Fauna and Flora Species Area). In general, there are no restrictions placed on military training activities from Army species at risk, federal species of concern, or state listed species. Fort McCoy is committed to the wise stewardship of the natural resources found on the installation, to include rare and sensitive species. Attempts are made to minimize impacts to these species from training activities, construction, and maintenance activities whenever feasible. Impacts to these species from construction projects are considered under the National Environmental Policy Act Review process. If a construction project (i.e. building or range construction) will impact state listed species, the Wisconsin Department of Natural Resources requires alternatives be considered that do not impact these species or, if that is not possible, minimize impacts to these species.

Noise Pollution Areas: Fort McCoy does not currently have noise pollution areas within their operational training lands.

Wetlands: Two wetland associated encroachment factors on Fort McCoy are: jurisdictional wetlands/waterways (4039.2 acres) and a 25 meter buffer around all wetlands and waterways (2341.8 acres of buffer area), (6,381.3 acres combined),



restricted 365 days a year (See the enclosed ECM Factor and Training Impact Matrix for Fort McCoy). Jurisdictional Wetlands – there are 4039.2 acres of potential jurisdictional wetlands within Fort McCoy operational area. Jurisdictional wetlands have significant impact on sighting of ranges/construction projects, requiring special federal and sometimes state permits, as well as in many cases, a need to mitigate impacts. The maps also include all open water lakes, and permanent streams. Based on hydrology, plant, and soil changes over time, as well as methods utilized to interpret/create the boundaries for these wetlands the acreages and areas are an approximate tool. Ground verification per the United States Army Corp of Engineers wetlands survey methods are the only way to truly validate current wetlands boundaries. Even surveys conducted to these standards are only accepted as accurate if they have been conducted within 5 years of a project start date. Best management practices (BMP) at Fort McCoy also prohibit maneuver by wheeled and tracked vehicles within the jurisdictional wetlands and waterways; and within a 25 meter buffer around them. This BMP creates an additional 2341.8 acres of restrictions (6,381.8 acres combined). This practice is to limit impacts to wetlands and waterways by maneuvering units, but does not limit dismounted training or bivouac operations (without vehicles). The 25 meter buffer also does not have a direct impact on sighting for range or other land conversion construction projects.

Shallow Water Table: Shallow water tables encroachment up to 15,543.8 acres of training land and are restricted 365 days a year. Areas with a water table within 2.3 feet of the soil surface (7,479.6 acres) are generally prohibited for training associated with refueling operations. Areas with a water table generally within 4.5 feet of the soil surface (15,539.9 acres (8,064.2 acres additional to 2.3 foot shallow water table area)) are generally prohibited from training associated with discharge of water/field latrines that require sumps or similarly excavated discharge/percolation systems. Fort McCoy soils are dominated by very sandy soils that are highly leachable; therefore any spills or discharges that take place within shallow water table areas could potentially contaminate the groundwater resources of Fort McCoy.

Wellhead Protection: Impacts to training associated with wellhead recharge protection zones impact four sites totaling 2,169.2 acres; restricted 365 days a year. High capacity wells which support the Fort McCoy Cantonment area, south family housing, and airfield have a restriction of no refueling, grey water, or unit maintenance activities within the five year water recharge area to protect the water resources from potential spills/discharges. Fort McCoy soils are dominated by very sandy soils that are highly leachable; therefore any spills/discharges that take place within wellhead protection zones could potentially contaminate the groundwater and drinking water resources of Fort McCoy.

Well Buffer Zones: In addition to wellhead recharge restriction areas that supply water to the major infrastructure locations within Fort McCoy's non-operational areas, there are individual wells located within the operational area that support individual ranges or training sites. Due to similar issue associated with the potential for contamination of these wells from spills/discharges, etc. there is a 100 foot buffer around each such well for no refueling operations or grey water discharge, restricted 365 days a year. There are a total of 63 wells, covering 42.9 acres.

Military Air Restricted Sites: There are no encroachment factors on military air within

the Fort McCoy operational areas, beyond issues covered for the Bald Eagle nesting site (100 meter buffer 1 March – 15 August).

Natural Areas: Fort McCoy has four natural area sites (three natural areas), totaling 593.5 acres, within the operational area, per agreements with the Wisconsin Department of Natural Resources. Activities prohibited in these areas are heavy or light mounted (vehicle) training, digging, indirect live fire, and construction/land conversion projects, restricted 365 days a year.

La Crosse River NIA Buffer: The La Crosse River runs directly through the heart of Fort McCoy's impact (NIA) area. To minimize impacts to this water resource and the biotic communities associated with it, there is a policy of no targeting for indirect fire weaponry or placement of small arms/direct fire weapons targets within 150 meters of the river edges (a 537.0 acre area), restricted 365 days a year. White Phosphorous No Fire Zone: A no white phosphorous zone impacts 1,889.3 acres within the NIA indirect fire targeting zone, restricted 365 days a year. Due to concerns of white phosphorous residue on migratory waterfowl, the La Crosse River system and other biotic aspects of the river, indirect fire of white phosphorous ordnance has been restricted to four blocks within the NIA. These sites are more upland areas within the targeting zone thereby limiting residue that would directly reach the La Crosse River corridor.

### **SAFETY RESTRICTIONS**

Unexploded Ordnance (UXO): There are three sites, restricted 365 days a year, with an overall area of 1,120.8 acres in size of potential subsurface UXO within Fort McCoy operational areas, to exclude the NIA itself (see NIA Paragraph). These were historical impact areas. One site 129.4 acres was sub surface cleared in FY11. These sites have not been actively used since the early 1970's. Each has been surface cleared, but there is still potential for unexploded ordinance to be found below the soil surface in these locations. Based on this, these areas are not available for digging (See the enclosed figure for Digging Restrictions), and must have UXO subsurface clearance conducted prior to any building or land conversions to take place.

North Impact Area (NIA): The NIA on Fort McCoy is 7,773.2 acres in size (boundary limit/signed area). It includes the only duded impact area on Fort McCoy. The NIA is generally off limits to entry for land maneuver/training use, except on maneuverable range footprints that have been surface/subsurface cleared. Beyond this limited training the NIA is off limits for training events such as digging, bivouac, and general entry or force on force maneuvering scenarios, restricted 365 days a year. Areas within the NIA that have been surface and subsurface cleared to a depth of 3.5 feet total 236.9 acres in size an increase of 32.7 acres in FY11. These are associated with specific range footprints for access by troops training on these ranges and for Range Maintenance personnel to conduct maintenance as needed.

Indirect Live Fire Restrictions: There are several factors restricting indirect live fire activities on Fort McCoy (29,778.9 acres total). Fort McCoy land mass is nearly divided in two segments, a north post and a south post area. North post encompasses the only duded impact area (NIA) on post, and contains the Cantonment area of Fort McCoy. South post is generally separated from north post and the impact area by State Highway

21 and the Cantonment area. Due this fact indirect live fire cannot occur from south post locations, as projectiles would have to pass over the Cantonment/nonoperational area. This makes 23,930.7 acres on south post unavailable for indirect weapon systems to fire from, restricted 365 days a year. Additionally, the Fort McCoy duded impact area overlaps La Crosse River water way. McCoy is near the headwaters of this major river system which leaves Fort McCoy and travels to the Black and Mississippi River Systems. Based on concerns for water quality and the riparian ecosystem, Fort McCoy has in place two restrictions: a La Crosse River NIA Buffer and a White Phosphorous No Fire Zone; see the paragraphs above associated with each of these restrictions for more details. Additionally, as indirect firing systems can often create heavy disturbance in locations they are placed (firing from) these systems may not fire from wetlands/waterways or within the 25 meter buffer, cultural resources sites, 200 meter eagle nest buffer, natural areas, the solid waste landfill areas, or the contaminated soil site (See the enclosed ECM Factor and Training Impact Matrix for Fort McCoy).

FAA Regulation Areas: There are currently no FAA Regulation Areas on Fort McCoy which are considered an encroachment factor on training.

Airfield: The Fort McCoy airfield (538.2 acres) is off limits to heavy and light mounted general maneuver by units, restricted 365 days a year.

No Smoke Area: Smoke generation for training is not allowed within 200 meters of the installation boundary and south family housing area; non-operational areas associated with the Fort McCoy Airfield, ski hill, campground, the ammunition supply point, the railhead, and State Highway 21; and anywhere within the Cantonment. This entails 5,683.2 acres of encroachment, reduced in FY 11 by 8,850.0 acres by reducing the restriction from 500m to 200m, restricted 365 days a year. See the enclosed ECM Factor and Training Impact Matrix for Fort McCoy and the figure for Smoke and Obscurant Restrictions) for a further listing of factors impacting the use of smoke.

Underground Utilities: There are underground utilities, sewer/septic systems, waterworks, etc. that run within the Fort McCoy operational area that could be damaged/create safety issues if digging were to occur. Overall there are 417.6 acres prohibiting digging within the operational area due to these resources, restricted 365 days a year. This acreage was figured utilizing the locations of the utilities as well as a 2.5 meter buffer to each side of the buried utility. Most of these areas run parallel to improved roads or are on improved sites such as range footprints, hardened training sites, etc

Enclosed and associated maps depicted encroachments are as follows: Fort McCoy Operational/Non-Operational Areas; Heavy Maneuver Restrictions; Light Maneuver Restrictions; Restrictions to Dismounted Training; Digging Restrictions; Aviation Restrictions; Smoke and Obscurant Restrictions; Pyrotechnic and Simulator Restrictions; Indirect Live Fire Restrictions; Camouflage Net and Bivouac Restrictions; Water Quality Restrictions; ECM Wetland and Waterway Areas; ECM T&E Fauna and Flora Species Area; and All Training Restrictions on Fort McCoy. See the enclosed ECM Factor and Training Impact Matrix for Fort McCoy for factor encroachments associated with each training type/map listed below.

### **Fort McCoy Operational/Non-Operational Areas**

There are no Off Limit Areas within the Fort McCoy Operational Area that are off limits to all facets of training/testing. The only area that might fall within this definition would be the non-operational area of 4,533.0 acres of land. These lands are zoned for most of the consolidated infrastructure, support, and developed administrative, billeting, warehousing, and support buildings, recreational areas, as well as a family housing area, an ammunition supply point, and the interstate corridor which through the south end of Fort McCoy. Even these areas however are often used for training of soldiers in various ways. The remaining 55,127.5 acres of land are considered available for operational training requirements, to include the NIA and the Fort McCoy airfield.

### **Heavy Maneuver Restrictions and Light Maneuver Restrictions**

Fort McCoy has provided a Heavy Maneuver and Light Maneuver Restrictions Map. Heavy and light maneuver is limited on Fort McCoy by: cultural resources sites; KBB Core Areas; eagle nest buffer (46% of year); wetlands and waterways with a 25 meter buffer; Fort McCoy NIA (except on UXO cleared range footprints); solid landfill sites; contaminated soil site; natural areas; and the Fort McCoy airfield. See each encroachment factor paragraph for specific details. Overall Restrictions are 16,263.9 acres/ 30% Heavy and 29% Light encroachment.

#### Restrictions to Dismounted Training

Dismounted infantry maneuver training is generally allowed on all Fort McCoy operational areas, except for the 7773.2 acre NIA, signed boundary, due to hazards associated with UXO. This relates an encroachment of 14% of the operational area.

#### Digging Restrictions

Digging restrictions are restricted due to: cultural resources sites; KBB core areas; eagle nest buffer (46% of year); Fort McCoy NIA; UXO areas; solid waste landfill sites; contaminated soil site; natural areas; and underground utilities such as fiber, gas lines, electrical lines, water/sewer lines, etc. See each encroachment factor paragraph for specific detail. Overall encroachment due to these factors is: 10,356.5 acres/ 19% encroachment.

#### Aviation Restrictions

Restrictions to aviation within the operational area of Fort McCoy are limited to an eagle nest site. See each the encroachment factor paragraph for specific details. Overall encroachment due to this factor is: 4.3 acres, less than 1% encroachment on the operational area.

#### Smoke and Obscurant Restrictions

Restriction associated with the use/generation of smoke/obscurant is the No Smoke Use 200 meter buffer area, KBB core areas, and the eagle nest buffer. See each encroachment factor paragraph for specific details. Overall encroachment due to these factors is: 5,739.7 acres/ 10% encroachment acres.

#### Pyrotechnic and Simulator Restrictions

Restrictions to the use of pyrotechnics and simulators within the operational area are: KBB core areas; eagle nest buffer location; and two of the five solid waste landfill sites.

See each encroachment factor paragraph for specific details. Overall encroachment due to these factors is: 115.1 acres/ less than 1% encroachment.

#### Indirect Live Fire Restrictions

There are no restrictions for live or blank firing on Fort McCoy within the operational areas as defined, however Fort McCoy has provided an “Indirect Live Fire” restrictions map as there are some areas that have restrictions associated with the ability to fire artillery and other indirect firing systems. Restrictions are: cultural area sites; KBB core areas; wetlands and waterways with a 25 meter buffer; natural areas; solid waste landfills; contaminated soils site; the La Crosse River corridor buffer; the white phosphorous no fire zone; all of south post south (Indirect Live Fire Restrictions) of State Hwy 21 (to include the airfield). See each encroachment factor paragraph for specific details. Overall encroachment due to these factors is: 29,787.9 acres/ 54% encroachment.

#### Camouflage Net and Bivouac Restrictions

Restrictions impacting camouflage use, bivouac, or fixed locations are: cultural resources sites; eagle nest buffers; KBB core areas; NIA; two of the five solid waste landfill sites; and the contaminated soils site. See each encroachment factor paragraph for specific details. Overall encroachment due to these factors is: 8216.2 acres/ 15% encroachment. Other installation specific restrictions not captured.

#### Water Quality Restrictions

This narrative does not directly discuss those issues already addressed under wetlands or indirect fire restrictions. Beyond jurisdictional wetlands, a 25 meter buffer around all wetlands and waterways, a no indirect fire targeting zone along the La Crosse River, and restriction zones for white phosphorous ordnance there are three major restrictions to protect groundwater resources. There are four wellhead (5 year) recharge areas, 63 other wells within the training areas, and two shallow water table zones utilized to restrict refueling, maintenance operations, and similar activities and restricting grey water discharge below the ground surface. Overall encroachment due to these factors is: 18,543.2 acres/ 34%.

#### ECM Wetland and Waterway Areas

As a point of reference, a map showing the wetlands and waterways with a 25 meter buffer has been included in this chapter. This map is not a “Restriction to...” map, but simply added to show the overall are impacted by this factor. Acreage is 6,381.3 total (12% encroachment); the buffer accounts for 2341.8 (4% encroachment) acres of this area.

#### All Training Restrictions w/o Indirect Live Fire & T&E

The all restrictions map includes all of the encroachment factors graphically, EXCEPT FOR the Indirect Live Fire Restrictions and the Flora and Fauna Species Restrictions. The Indirect Live Fire Restrictions are such a limited encroachment on the single type of training, and this would mask all other encroachment impact issues on all of south post. See each encroachment factor paragraph for specific details. Overall encroachment due to these factors is: 28,855.9/52% reduced from 34,815.5 acres/63% the previous year.

#### ECM T&E Fauna and Flora Species Area

Due to the sensitive issue related to listed/rare flora and fauna species locations, all species been lumped into one map without reference to their individual identities. For details the acreages or number of occurrences of each species of impact on Fort McCoy,

refer to the enclosed ECM Factor and Training Impact Matrix for Fort McCoy and each encroachment factor paragraph for specific details. Overall encroachment due to these factors is: 4,652.7 acres and 710 points (no acreage associated) identifying locations of observed species. This includes the mapped lupine locations within the operational area. Internal analysis at Fort McCoy through consultation with the Fort McCoy Endangered Species Biologist is conducted for each and every species as required for various projects. Species not federally listed do not impact general training events; they are more of an impact on land construction/conversion projects.

#### All Training Restrictions on Fort McCoy

This map depicts all encroachment factors to training on one map. Overall acreage of encroachments is 43,101.7 acres or 78% of the operational area. It must be understood that this consolidated number reflects all factors lumped together (and does not double count overlapping acreages/factors) and that individual acreage restrictions may impact only one type of training or event. The training requirement that is most impacted by encroachment is construction/land conversion projects, such as range construction. Since these projects often cover natural maneuver lands into buildings, parking lots, or hardened areas there can be a significant impact to many or all of the encroachment factors.

## APPENDIX E

STREAM NAME	PORTION TROUT WATERS	BROOK	BROWN	RAINBOW	CLASS I PORTION	MI.	CLASS II PORTION	MI.	CLASS III PORTION	MI.	PUBLIC LANDS
Clear Cr (S Br Robinson Cr)	All (Ft. McCoy)	n			W line S7, T19N, R2W, upstream	2.0			Jct of Ranch Cr downstream	1.0	x
Farmers Valley Cr	All	n	n		Interstate 90 upstream	10.4	Interstate 90 downstream	1.0			x
La Crosse R	All Perch L upstream (Ft. McCoy)	n	n	x	Trout Falls upstream	12.7	Between Perch L and Trout Falls	7.7			x
Ranch Cr	All (Ft. McCoy)	x						2.3			x
Showen Cr	All	x						0.7			x
Silver Cr	All (Ft. McCoy)	n	n	x		10.4					x
Sparta Cr	All (Ft. McCoy)	n	n	x		1.7					x
Squaw Cr	All (Ft. McCoy)	n	x	x	Squaw L upstream	5.6			Squaw L downstream	0.2	x
Stillwell Cr	All (Ft. McCoy)	x	x				Cranberry impoundment upstream	1.9	Cranberry impoundment downstream	2.8	x
Swamp Cr	All (Ft. McCoy)	n						1.9			x
Tarr Cr	All (Ft. McCoy)	n	n			7.1					x
UNNAMED STREAMS											
Creek 15-13	T17N, R3W CTH AA downstream (Ft. McCoy)	x								1.5	x
Creek 24-5 (Coles Valley Cr)	All T17N, R3W	n				5.3					x
Creek 20-11	All T18N, R2W (Ft. McCoy)		x			1.1					x
Creek 29-8	All T18N, R2W (Ft. McCoy)	n				0.8					x
Creek 12-4	All T18N, R3W (Ft. McCoy)	x						0.4			x
Creek 23-12	All T18N, R3W (Ft. McCoy)	n				1.2					x
Creek 23-11	All T18N, R3W (Ft. McCoy)	n				3.1					x
Creek 34-5	All T18N, R3W (Ft. McCoy)		x					0.8			x
Creek 29-11	All T19N, R2W (Ft. McCoy)	n				2.1					x
Creek 29-12	All T19N, R2W (Ft. McCoy)	n				0.6					x
Creek 29-15	All T19N, R2W (Ft. McCoy)	n				0.7					x
Stream	Totals				Class I	64.8	Class II	16.7	Class III	5.5	

Mileage extends beyond Fort McCoy boundary

Mileage extends beyond Fort McCoy boundary

Mileage extends beyond Fort McCoy boundary

Fort McCoy Streams



Lake	Area (acres)	Max Depth (feet)	Public Access	Dam Inspectic	Lake Type	Watershed	N. Pike	Walleye	LM bass	Panfish	Trout	Catfish	Mercury in fish
Alderwood Lake	*	*	BR, PF	Y	DG	La Crosse River					P		
Big Sandy	17	21	BR, P, PF	N	SE	Silver Creek			C	C	C		
East Silver Lake	6	13	PF	Y	DG	Silver Creek					C		
Hazel Dell	3	9	P,PF	Y	DG	La Crosse River					P		
North Flowage	247	16	BR, P, PF	Y	DG	Clear Creek	P		C	A	P		Y
Ranch Creek (Lost Lake)	48	11	BR, PF	Y	DG	Clear Creek			C	C			Y
Sandy Lake	12	18	BR, P, PF	N	SE	Silver Creek			C	C	C		
Sparta Pond	4	11	PF	Y	DG	Sparta Creek			P	C	C		
Squaw Lake	15	16	PF	Y	DG	Squaw Creek			C	C	C		
Stillwell Pond	6	12	P, PF	Y	DG	Stillwell Creek		C		A	C		
Swamp Pond	4	14	P, PF	Y	DG	Swamp Creek			P	P	C		
West Sandy Lake	10	18	BR, PF	N	SE	La Crosse River			C	C		P	
West Silver Wetland	*	*	PF	Y	DG	Silver Creek					P		
Total lake acres	372												

Key to Codes

P: PIER

Y: Yes

DG: Drainage

P: Present

Y: Yes

PF: PUBLIC FISHING N: No

SE: Seepage

A: Abundant

BR: BOAT RAMP

C: Common

\* Shallow water wetland areas less than 2' deep. Alderwood Lake was partially drained in preparation for dam removal and stream restoration.

### Fort McCoy Lakes

Dam Location	Priority List	Project #	Cost (\$K)	
	NRB	DPW (GSI)	Estimated	
				Notes (see also Kraft 2003 - Dam Rept)
Alderwood	#1	P-8090	250	Remove dam and bridge
West Silver Wetland	#2	P-6029	150	Water control structure is fractured, requires extensive renovation
Sparta Pond	#3	P-5053	15	Dam upgraded in 2004; work order to increase water holding capacity
Lower Sparta (X-Road)	#4	P-8091	100	Remove and update culvert structure
Tarr Cr (former WAC Pond)	#5	P-21500	50	Remove culvert structure
Upper Squaw	#6	P-5033	150	Remove culvert and stoplog structure
East Silver Lake	#7	P-8295	5	Minor structural repairs required stoplogs
Stillwell Lake	#8	P-8204	5	Minor structural repairs required stoplogs
Swamp Pond	#9	P-6024	0	Dam is new, renovation completed in 2008
Squaw Lake	#10	P-5028	0	Dam is new, renovation completed in 2011
Former Impoundments/Structures:				
I-90 (Daniel's Pond)		n/a		Removed 2006
Hazel Dell		P-8091		Removed 2011

Dams on Fort McCoy. Rated by priority of servicing.

## APPENDIX F

## Appendix F, Table 1. Fish Species Documented on Fort McCoy.<sup>1</sup>

Family	Species Name	Common Name
<b>Catostomidae</b>	<i>Catostomus commersoni</i>	White sucker
<b>Centrarchidae</b>	<i>Lepomis cyanellus</i>	Green sunfish
	<i>Lepomis gibbosus</i>	Pumpkinseed
	<i>Lepomis gulosus</i>	Warmouth
	<i>Lepomis macrochirus</i>	Bluegill
	<i>Micropterus salmoides</i>	Largemouth bass
	<i>Pomoxis nigromaculatus</i>	Black crappie
<b>Cottidae</b>	<i>Cottus bairdi</i>	Mottled sculpin
<b>Cyprinidae</b>	<i>Notemigonus crysoleucas</i>	Golden shiner
	<i>Pimephales notatus</i>	Bluntnose minnow
	<i>Pimephales promelas</i>	Fathead minnow
	<i>Rhinichthys atratulus</i>	Blacknose dace
	<i>Semotilus atromaculatus</i>	Creek chub
<b>Esocidae</b>	<i>Esox lucius</i>	Northern pike
	<i>Esox americanus vermiculatus</i>	Grass pickerel
<b>Gasterosteidae</b>	<i>Culaea inconstans</i>	Brook stickleback
<b>Ictaluridae</b>	<i>Ameiurus melas</i>	Black bullhead
	<i>Ameiurus natalis</i>	Yellow bullhead
	<i>Ameiurus nebulosus</i>	Brown bullhead
	<i>Ictalurus punctatus</i>	Channel catfish
<b>Percidae</b>	<i>Etheostoma exile</i>	Iowa darter
	<i>Etheostoma nigrum</i>	Johnny darter
	<i>Perca flavescens</i>	Yellow perch
	<i>Percina maculata</i>	Blackside darter
	<i>Sander vitreus</i>	Walleye
<b>Petromyzontidae</b>	<i>Lampetra appendix</i>	American brook lamprey
<b>Salmonidae</b>	<i>Oncorhynchus mykiss</i>	Rainbow trout
	<i>Salmo trutta</i>	Brown trout
	<i>Savelinus fontinalis</i>	Brook trout
<b>Umbridae</b>	<i>Umbrina limi</i>	Central mudminnow

<sup>1</sup>Family, common and scientific names were cited from the following publication:  
 Becker, George C. 1983. Fishes of Wisconsin. 1052 pp. Changes in scientific names are noted as found from the American Fisheries Society 1991 list.

**Appendix F, Table 2. Amphibians and Reptiles Documented on Fort McCoy.<sup>1</sup> Other species listed could occur on Fort McCoy.<sup>2</sup>**

<u>Family Species Name</u>	<u>Common Name</u>
<b>Ambystomatidae</b>	
<i>Ambystoma laterale</i>	Blue-spotted Salamander
<b>Anguidae</b>	
<i>Ophisaurus attenuatus attenuatus</i>	Western Slender Glass Lizard
<b>Bufo</b>	
<i>Bufo americanus americanus</i>	American Toad
<b>Chelydridae</b>	
<i>Chelydra serpentina serpentina</i>	Common Snapping Turtle
<b>Colubridae</b>	
<i>Coluber constrictor foxi</i>	Blue racer
<i>Diadophis punctatus edwardsi</i>	Northern Ringneck Snake
<i>Elaphe vulpina vulpina</i>	Western Fox Snake
<i>Heterodon platyrhinos</i>	Eastern Hognose Snake
<i>Lampropeltis triangulum triangulum</i>	Eastern Milk Snake
<i>Nerodia sipedon sipedon</i>	Northern Water Snake
<i>Opheodrys vernalis blanchardi</i>	Western Smooth Green Snake
<i>Pituophis melanoleucus sayi</i>	Bullsnake
<i>Storeria dekayi wrightorum</i>	Midland Brown Snake
<i>Storeria occipitomaculata occipitomaculata</i>	Northern Red-bellied Snake
<i>Thamnophis radix radix</i>	Eastern Plains Garter Snake <sup>2</sup>
<i>Thamnophis sirtalis sirtalis</i>	Eastern Garter Snake
<b>Emydidae</b>	
<i>Emydoidea blandingi</i>	Blanding's Turtle
<i>Chrysemys picta belli</i>	Western Painted Turtle
<i>Chrysemys picta marginata</i>	Midland Painted Turtle
<i>Clemmys insculpta</i>	Wood Turtle
<i>Graptemys spp.</i>	Map Turtles <sup>2</sup>
<b>Hylidae</b>	
<i>Acris crepitans blanchardi</i>	Blanchards Cricket Frog
<i>Hyla chrysoscelis</i>	Cope's Gray Tree Frog
<i>Hyla crucifer crucifer</i>	Northern Spring Peeper
<i>Hyla versicolor</i>	Eastern Gray Tree Frog
<i>Pseudacris triseriata triseriata</i>	Western Chorus Frog
<b>Kinosternidae</b>	
<i>Sternotherus odoratus</i>	Stinkpot <sup>2</sup>
<b>Plethodontidae</b>	
<i>Hemidactylium scutatum</i>	Four-toed Salamander
<i>Plethodon cinereus cinereus</i>	Red-backed Salamander
<b>Ranidae</b>	
<i>Rana clamitans melanota</i>	Green Frog
<i>Rana palustris</i>	Pickerel Frog
<i>Rana pipiens</i>	Leopard Frog
<i>Rana sylvatica</i>	Wood Frog
<b>Salamandridae</b>	
<i>Notophthalmus viridescens louisianensis</i>	Central Newt <sup>2</sup>
<b>Scincidae</b>	
<i>Eumeces fasciatus</i>	Five-lined Skink
<b>Teiidae</b>	
<i>Cnemidophorus sexlineatus</i>	Six-lined Racerunner
<b>Trionychidae</b>	
<i>Trionyx spiniferus spiniferus</i>	Eastern Spiny Softshell Turtle <sup>2</sup>

Family Species Name	Common Name
<b>Viperidae</b>	
<i>Crotalus horridus</i>	Timber Rattlesnake <sup>2</sup>
<i>Sistrurus catenatus catenatus</i>	Eastern Massasauga <sup>2,3</sup>

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<sup>1</sup>Family names were cited from Conant (1958); common and scientific names were cited from Vogt (1981):  
 Conant, R. 1958. A field guide to reptiles and amphibians of eastern and central North American. 2nd. ed., Houghton Mifflin Co., Boston, Mass. 429 pp.  
 Vogt, R.C. 1981. Natural history of amphibians and reptiles in Wisconsin. Milwaukee Public Museum, Milw., WI. 205 pp.

<sup>2</sup>Amphibian and reptile species that have not been documented on Fort McCoy as of April, 1992 are also listed; however, they reasonably could be expected to occur within the area because of certain habitat types found on the fort (personal communication, Daniel Nedrelo, Route 3, Viroqua, Wisconsin 54665).

<sup>3</sup>Species have been observed within 12 miles of Fort McCoy.

## Appendix F, Table 3. Mammals Documented on Fort McCoy.<sup>1</sup>

Family	Sp.Code	Species Name	Common Name
<b>Canidae (Dogs and Allies)</b>			
	CALU	<i>Canis lupus</i>	Grey Wolf
	CALA2	<i>Canis latrans</i>	Coyote
		<i>Canis latrans x Canis familiaris</i>	Coyote-dog Hybrid (Coydog)
	URCI	<i>Urocyon cinereoargenteus</i>	Gray Fox
	VUVU	<i>Vulpes vulpes</i>	Red Fox
<b>Castoridae (Beavers)</b>			
	CACA8	<i>Castor canadensis</i>	Beaver
<b>Cervidae (Deer and Allies)</b>			
	ODVI	<i>Odocoileus virginianus</i>	White-tailed Deer
<b>Didelphidae (Opossums)</b>			
	DIVI	<i>Didelphis virginiana</i>	Opossum
<b>Dipodidae (Jumping Mice)</b>			
	ZAHU	<i>Zapus hudsonius</i>	Meadow Jumping Mouse
<b>Erethizontidae (Porcupines)</b>			
	ERDO	<i>Erethizon dorsatum</i>	Porcupine
<b>Felidae (Cats and Allies)</b>			
	LYRU	<i>Lynx rufus</i>	Bobcat
	FESI	<i>Felis sylvestrus</i>	House Cat
<b>Geomyidae (Pocket Gophers)</b>			
	GEBU	<i>Geomys bursarius</i>	Pocket Gopher
<b>Leporidae (Hares and Rabbits)</b>			
	LEAM	<i>Lepus americanus</i>	Snowshoe Hare
	SYFL	<i>Sylvilagus floridanus</i>	Eastern Cottontail
<b>Muridae (Old World Rats and Mice)</b>			
	CLGA	<i>Clethrionomys gapperi</i>	Red-backed Vole
	MIOC	<i>Microtus ochrogaster</i>	Prairie Vole
	MIPE	<i>Microtus pennsylvanicus</i>	Meadow Vole
	MUMU	<i>Mus musculus</i>	House Mouse
	ONZI	<i>Ondatra zibethicus</i>	Muskrat
	PELE1	<i>Peromyscus leucopus</i>	White-footed Mouse
	PEMA1	<i>Peromyscus maniculatus bairdii</i>	Prairie Deer Mouse
	RANO	<i>Rattus norvegicus</i>	Norway Rat
	REMO	<i>Reithrodontomys montanus</i>	Plains Harvest Mouse
	SYCO	<i>Synaptomys cooperi</i>	Southern bog lemming
<b>Mustelidae (Weasels and Allies)</b>			
	LUCA1	<i>Lutra canadensis</i>	Otter
	MAPE	<i>Martes pennanti</i>	Fisher
	MEME1	<i>Mephitis mephitis</i>	Striped Skunk
	MUER	<i>Mustela erminea</i>	Short-tailed Weasel
	MUFR	<i>Mustela frenata</i>	Long-tailed Weasel
	MUNI1	<i>Mustela nivalis</i>	Least Weasel
	MUVI	<i>Mustela vison</i>	Mink
	TATA	<i>Taxidea taxus</i>	Badger
<b>Procyonidae (Raccoons)</b>			
	PRLO	<i>Procyon lotor</i>	Raccoon
<b>Sciuridae (Squirrels)</b>			
	GLSA	<i>Glaucomys sabrinus</i>	Northern Flying Squirrel
	GLVO	<i>Glaucomys volans</i>	Southern Flying Squirrel
	MAMO	<i>Marmota monax</i>	Woodchuck
	SCNI	<i>Sciurus niger</i>	Fox Squirrel
	SCCA	<i>Sciurus carolinensis</i>	Gray Squirrel

Family	Sp.Code	Species Name	Common Name
<b>Sciuridae (Squirrels) - Continued</b>			
	SPTR	<i>Spermophilus tridecemlineatus</i>	Thirteen-lined Ground Squirrel
	TAST	<i>Tamias striatus</i>	Eastern Chipmunk
	TAMI	<i>Tamias minimus</i>	Least Chipmunk
	TAHU	<i>Tamiasciurus hudsonicus</i>	Red Squirrel
<b>Soricidae (Shrews)</b>			
	BLBR	<i>Blarina brevicauda</i>	Short-tailed Shrew
	SOCI	<i>Sorex cinereus</i>	Cinerius Shrew
	SOHO	<i>Sorex hoyi</i>	Pygmy Shrew
<b>Talpidae (Moles)</b>			
	COCR	<i>Condylura cristata</i>	Star-nosed Mole
	SCAQ	<i>Scalopus aquaticus</i>	Eastern Garden Mole
<b>Ursidae (Bears)</b>			
	URAM	<i>Ursus americanus</i>	Black Bear
<b>Vespertilionidae (Common Bats)</b>			
	EPFU	<i>Eptesicus fuscus</i>	Big Brown Bat
	LABO	<i>Lasiurus borealis</i>	Red Bat
	LACI	<i>Lasiurus cinereus</i>	Hoary Bat
	MYLU1	<i>Myotis lucifugus</i>	Little Brown Bat
		<i>Myotis septentrionalis</i>	Northern Long-eared Bat
		<i>Perimyotis subflavus</i>	Eastern Pipistrelle
		<i>Lasionycteris noctivagans</i>	Silver-haired Bat

<sup>1</sup>Family, common and scientific names were cited from:

Jackson, H.H.T. 1961. Mammals of Wisconsin. Univ. of Wisconsin Press. 504 pp.



**Appendix F, Table 4. Birds Documented to Occur on or Near Fort McCoy.<sup>1</sup>**

Family	Sp.Code	Scientific Name	Common Name	Status <sup>bcd</sup> e
<b>Gaviidae (Loons)</b>				
	GAIM	<i>Gavia immer</i>	Common Loon	B
<b>Podicipedidae (Grebes)</b>				
	POAU	<i>Podiceps auritus</i>	Horned Grebe	M <sub>1</sub>
	POGR	<i>Podiceps grisegena</i>	Red-necked Grebe	
	POPO	<i>Podilymbus podiceps</i>	Pied-billed Grebe	B
<b>Phalacrocoracidae (Cormorants)</b>				
	PHAU	<i>Phalacrocorax auritus</i>	Double-crested Cormorant	M
<b>Ardeidae (Bitterns, Herons and Egrets)</b>				
	ARHE	<i>Ardea herodias</i>	Great Blue Heron	B
	BOLE	<i>Botaurus lentiginosus</i>	American Bittern	V <sub>3</sub>
	BUIB	<i>Bubulcus ibis</i>	Cattle Egret	M <sub>3</sub>
	BUST	<i>Butorides striatus</i>	Green-backed Heron	B
	CAAL2	<i>Casmerodius albus</i>	Common Great Egret	V <sub>2</sub>
	EGCA	<i>Egretta caerulea</i>	Little Blue Heron	V <sub>1 3</sub>
	IXEX	<i>Ixobrychus exilis</i>	Least Bittern	B <sub>1</sub>
	NYNY	<i>Nycticorax nycticorax</i>	Black-crowned Night-Heron	B <sub>2</sub>
	NYVI	<i>Nycticorax violaceus</i>	Yellow-crowned Night-Heron	
<b>Gruidae (Cranes)</b>				
	GRCA1	<i>Grus canadensis</i>	Sandhill Crane	B
<b>Anatidae (Swans, Geese and Ducks)</b>				
	AISP	<i>Aix sponsa</i>	Wood Duck	B
	ANAC	<i>Anas acuta</i>	Northern Pintail	M
	ANAM	<i>Anas americana</i>	American Wigeon	M
	ANCL	<i>Anas clypeata</i>	Northern Shoveler	M
	ANCR	<i>Anas crecca</i>	Green-winged Teal	M
	ANCY	<i>Anas cyanoptera</i>	Cinnamon Teal	
	ANDI	<i>Anas discors</i>	Blue-winged Teal	B
	ANPL	<i>Anas platyrhynchos</i>	Mallard	B
	ANRU	<i>Anas rubripes</i>	American Black Duck	M
	ANST	<i>Anas strepera</i>	Gadwall	M
	ANAL	<i>Anser albifrons</i>	Greater White-fronted Goose	M <sub>1 3</sub>
	AYAF	<i>Aythya affinis</i>	Lesser Scaup	M
	AYAM	<i>Aythya americana</i>	Redhead	M
	AYCO	<i>Aythya collaris</i>	Ring-necked Duck	M B <sub>1</sub>
	AYMA	<i>Aythya marila</i>	Greater Scaup	M
	AYVA	<i>Aythya valisineria</i>	Canvasback	M
	BRCA1	<i>Branta canadensis</i>	Canada Goose	B <sub>1</sub>
	BUAL	<i>Bucephala albeola</i>	Bufflehead	M
	BUCL	<i>Bucephala clangula</i>	Common Goldeneye	M
	CHCA	<i>Chen caerulescens</i>	Snow Goose	M
	CYBU	<i>Cygnus buccinator</i>	Trumpeter Swan	M <sub>1 3</sub>
	CYCO1	<i>Cygnus columbianus</i>	Tundra Swan	M
	CYOL	<i>Cygnus olor</i>	Mute Swan	M <sub>1 3</sub>
	LOCU1	<i>Lophodytes culcullatus</i>	Hooded Merganser	B
	MEME2	<i>Mergus merganser</i>	Common Merganser	M
	MESE	<i>Mergus serrator</i>	Red-breasted Merganser	M
	OXJA	<i>Oxyura jamaicensis</i>	Ruddy Duck	M
<b>Rallidae (Rails)</b>				
	CONO	<i>Coturnicops noveboracensis</i>	Yellow Rail	
	FUAM	<i>Fulica americana</i>	American Coot	M
	GACH	<i>Gallinula chloropus</i>	Common Moorhen	M <sub>1 3</sub>
	POCA1	<i>Porzana carolina</i>	Sora	B

Family	Sp.Code	Scientific Name	Common Name	Status <sup>b</sup> cde
	RAEL	<i>Rallus elegans</i>	King Rail	M <sub>1</sub> 3
	RALI	<i>Rallus limicola</i>	Virginia Rail	M <sub>1</sub>
<b>Recurvirostridae (Stilts)</b>				
	REAM	<i>Recurvirostra americana</i>	Avocet	M <sub>1</sub> 2
<b>Charadriidae (Plovers)</b>				
	CHSE	<i>Charadrius semipalmatus</i>	Semipalmated Plover	M
	CHVO	<i>Charadrius vociferus</i>	Killdeer	B
	PLDO1	<i>Pluvialis dominica</i>	Lesser Golden-Plover	M <sub>1</sub>
	PLSQ	<i>Pluvialis squatarola</i>	Black-bellied Plover	M
<b>Scolopaciidae (Shorebirds)</b>				
	ACMA	<i>Actitis macularia</i>	Spotted Sandpiper	B
	ARIN	<i>Arenaria interpres</i>	Ruddy Turnstone	M <sub>1</sub> 2
	BALO	<i>Bartramia longicauda</i>	Upland Sandpiper	B
	CAAL	<i>Calidris alba</i>	Sanderling	M <sub>1</sub>
	CAPU	<i>Calidris pusilla</i>	Semipalmated Sandpiper	M
	CAMA1	<i>Calidris mauri</i>	Western Sandpiper	M <sub>1</sub> 2
	CAMI1	<i>Calidris minutilla</i>	Least Sandpiper	M
	CAFU	<i>Calidris fuscicollis</i>	White-rumped Sandpiper	M <sub>1</sub>
	CABA	<i>Calidris bairdii</i>	Baird's Sandpiper	M
	CAME1	<i>Calidris melanotos</i>	Pectoral Sandpiper	M
	CAAL1	<i>Calidris alpina</i>	Dunlin	M <sub>1</sub>
	CAHI	<i>Calidris himantopus</i>	Stilt Sandpiper	M <sub>1</sub>
	CASE	<i>Catoptrophorus semipalmatus</i>	Willet	M <sub>1</sub> 3
	GAGA	<i>Gallinago gallinago</i>	Common Snipe	B
	LIGR	<i>Limnodromus griseus</i>	Short-billed Dowitcher	M
	LISC	<i>Limnodromus scolopaccus</i>	Long-billed Dowitcher	M <sub>1</sub>
	LIFE	<i>Limosa fedoa</i>	Marbled Godwit	M <sub>1</sub> 2
	LIHA	<i>Limosa haemastica</i>	Hudsonian Godwit	M <sub>1</sub>
	NUPH	<i>Numenius phaeopus</i>	Whimbrel	
	PHLO	<i>Phalaropus lobatus</i>	Red-necked Phalarope	
	PHTR	<i>Phalaropus tricolor</i>	Wilson's Phalarope	M <sub>1</sub> 2
	SCMI	<i>Scolopax minor</i>	American Woodcock	B
	TRFL	<i>Tringa flavipes</i>	Lesser Yellowlegs	M
	TRME	<i>Tringa melanoleuca</i>	Greater Yellowlegs	M
	TRSO	<i>Tringa solitaria</i>	Solitary Sandpiper	M
<b>Laridae (Gulls and Terns)</b>				
	CHNI	<i>Chlidonias niger</i>	Black Tern	M V
	LAAR	<i>Larus argentatus</i>	Herring Gull	M V
	LADE	<i>Larus delawarensis</i>	Ring-billed Gull	M V
	LAPH	<i>Larus philadelphia</i>	Bonaparte's Gull	M V
	LAPI	<i>Larus pipixcan</i>	Franklin's Gull	M <sub>1</sub> 3
	STCA1	<i>Sterna caspia</i>	Caspian Tern	M V
	STFO	<i>Sterna forsteri</i>	Forester's Tern	M V
	STHI	<i>Sterna hirundo</i>	Common Tern	M V
<b>Cathartidae (Vultures)</b>				
	CAAU	<i>Cathartes aura</i>	Turkey Vulture	B
<b>Accipitridae (Hawks and Eagles)</b>				
	ACCO	<i>Accipiter cooperii</i>	Cooper's Hawk	B
	ACGE	<i>Accipiter gentilis</i>	Northern Goshawk	B <sub>3</sub>
	ACST	<i>Accipiter striatus</i>	Sharp-shinned Hawk	M
	AQCH	<i>Aquila chrysaetos</i>	Golden Eagle	M
	BUJA	<i>Buteo jamaicensis</i>	Red-tailed Hawk	B
	BULA	<i>Buteo lagopus</i>	Rough-legged Hawk	M
	BULI	<i>Buteo lineatus</i>	Red-shouldered Hawk	B
	BUPL	<i>Buteo platypterus</i>	Broad-winged Hawk	B
	CICY	<i>Circus cyaneus</i>	Northern Harrier	B

Family	Sp.Code	Scientific Name	Common Name	Status <sup>bcd</sup> e
	HALE	<i>Haliaeetus leucocephalus</i>	Bald Eagle	B
<b>Pandionidae (Osprey)</b>				
	PAHA	<i>Pandion haliaetus</i>	Osprey	B
<b>Falconidae (Falcons)</b>				
	FACO	<i>Falco columbarius</i>	Merlin	M <sub>2</sub>
	FAPE	<i>Falco peregrinus</i>	Peregrine Falcon	M
	FARU	<i>Falco rusticolus</i>	Gyr Falcon	M <sub>1</sub> 3
	FASP	<i>Falco sparverius</i>	American Kestrel	B
<b>Phasianidae (Pheasants, Grouse and Turkeys)</b>				
	BOUM	<i>Bonasa umbellus</i>	Ruffed Grouse	B
	COVI	<i>Colinus virginianus</i>	Northern Bobwhite	B
	MEGA	<i>Meleagris gallopavo</i>	Wild Turkey	B
	PEPE	<i>Perdix perdix</i>	Gray Partridge	B <sub>1</sub>
	PHCO	<i>Phasianus colchicus</i>	Ring-necked Pheasant	B <sub>2</sub>
<b>Columbidae (Pigeons and Doves)</b>				
	COLI	<i>Columba livia</i>	Rock Dove	B
	ZEMZ	<i>Zenaidura macroura</i>	Mourning Dove	B
<b>Cuculidae (Cuckoos)</b>				
	COAM	<i>Coccyzus americanus</i>	Yellow-billed Cuckoo	B
	COER	<i>Coccyzus erythrophthalmus</i>	Black-billed Cuckoo	B
<b>Strigidae (Owls)</b>				
	AEAC	<i>Aegolius acadicus</i>	Northern Saw-whet Owl	B <sub>2</sub>
	ASFL	<i>Asio flammeus</i>	Short-eared Owl	V <sub>2</sub>
	ASOT	<i>Asio otus</i>	Long-eared Owl	V <sub>3</sub>
	BUVI	<i>Bubo virginianus</i>	Great Horned Owl	B
	NYSC	<i>Nyctea scandiaca</i>	Snowy Owl	M <sub>3</sub>
	OTAS	<i>Otus asio</i>	Eastern Screech-Owl	B
	STVA	<i>Strix varia</i>	Barred Owl	B
<b>Tytonidae (Owls)</b>				
	TYAL	<i>Tyto alba</i>	Common Barn Owl	
<b>Caprimulgidae (Nightjars)</b>				
	CAVO	<i>Caprimulgus vociferus</i>	Whip-poor-will	B
	CHMI	<i>Chordeiles minor</i>	Common Nighthawk	B
<b>Apodidae (Swifts)</b>				
	CHPE	<i>Chaetura pelagica</i>	Chimney Swift	B
<b>Trochilidae (Hummingbirds)</b>				
	ARCO	<i>Archilochus colubris</i>	Ruby-throated Hummingbird	B
<b>Alcedinidae (Kingfishers)</b>				
	CEAL	<i>Ceryle alcyon</i>	Belted Kingfisher	B
<b>Picidae (Woodpeckers)</b>				
	COAU	<i>Colaptes auratus</i>	Northern Flicker	B
	DRPI	<i>Dryocopus pileatus</i>	Pileated Woodpecker	B
	MECA	<i>Melanerpes carolinus</i>	Red-bellied Woodpecker	B
	MEER	<i>Melanerpes erythrocephalus</i>	Red-headed Woodpecker	B
	PIPU	<i>Picoides pubescens</i>	Downy Woodpecker	B
	PIVI	<i>Picoides villosus</i>	Hairy Woodpecker	B
	SPVA1	<i>Sphyrapicus varius</i>	Yellow-bellied Sapsucker	M
<b>Tyrannidae (Flycatchers)</b>				
	COBO	<i>Contopus borealis</i>	Olive-sided Flycatcher	M
	COV11	<i>Contopus virens</i>	Eastern Wood-Pewee	B
	EMAL	<i>Empidonax alnorum</i>	Alder Flycatcher	M <sub>1</sub>
	EMFL	<i>Empidonax flaviventris</i>	Yellow-bellied Flycatcher	M
	EMMI1	<i>Empidonax minimus</i>	Least Flycatcher	B
	ENTR	<i>Empidonax traillii</i>	Willow Flycatcher	B
	ENVI	<i>Empidonax vireescens</i>	Acadian Flycatcher	M <sub>1</sub>
	MYCR	<i>Myiarchus crinitus</i>	Great Crested Flycatcher	B

Family	Sp.Code	Scientific Name	Common Name	Status <sup>bcde</sup>
	SAPH	<i>Sayornis phoebe</i>	Eastern Phoebe	B
	TYTY	<i>Tyrannus tyrannus</i>	Eastern Kingbird	B
	TYVE	<i>Tyrannus verticalis</i>	Western Kingbird	
<b>Alaudidae (Larks)</b>				
	ERAL	<i>Eremophila alpestris</i>	Horned Lark	B
<b>Hirundinidae (Swallows)</b>				
	HIPY	<i>Hirundo pyrrhonota</i>	Cliff Swallow	B
	HIRU	<i>Hirundo rustica</i>	Barn Swallow	B
	PRSU	<i>Progne subis</i>	Purple Martin	B
<b>Hirundinidae (Continued)</b>				
	RIRI	<i>Riparia riparia</i>	Bank Swallow	B
	STSE	<i>Stelgidopteryx serripennis</i>	Northern Rough-winged Swallow	B
	TABI	<i>Tachycineta bicolor</i>	Tree Swallow	B
<b>Corvidae (Jays, Crows and Ravens)</b>				
	COBR1	<i>Corvus brachyrhynchos</i>	American Crow	B
	COCO2	<i>Corvus corax</i>	Common Raven	B <sub>1</sub>
	CYCR	<i>Cyanocitta cristata</i>	Blue Jay	B
<b>Paridae (Tits)</b>				
	PAAT	<i>Parus atricapillus</i>	Black-capped Chickadee	B
	PABI	<i>Parus bicolor</i>	Tufted Titmouse	M <sub>3</sub>
<b>Certhiidae (Creepers)</b>				
	CEAM	<i>Certhia americana</i>	Brown Creeper	M
<b>Sittidae (Nuthatches)</b>				
	SICA1	<i>Sitta canadensis</i>	Red-breasted Nuthatch	M <sub>2</sub>
	SICA2	<i>Sitta carolinensis</i>	White-breasted Nuthatch	B
<b>Troglodytidae (Wrens)</b>				
	CIPA	<i>Cistothorus palustris</i>	Marsh Wren	M <sub>1</sub> B <sub>1</sub>
	CIPL	<i>Cistothorus platensis</i>	Sedge Wren	M <sub>1</sub>
	THBE	<i>Thryomanes bewickii</i>	Bewick's Wren	
	THLU	<i>Thryothorus ludovicianus</i>	Carolina Wren	
	TRAE	<i>Troglodytes aedon</i>	House Wren	B
	TRTR	<i>Troglodytes troglodytes</i>	Winter Wren	M
<b>Muscicapidae (Kinglets, Gnatcatchers and Thrushes)</b>				
	CAFU2	<i>Catharus fuscescens</i>	Veery	B
	CAGU	<i>Catharus guttatus</i>	Hermit Thrush	M
	CAMI2	<i>Catharus minimus</i>	Gray-cheeked Thrush	M
	CAUS	<i>Catharus ustulatus</i>	Swainson's Thrush	M
	HYMI	<i>Hylocichla mustelina</i>	Wood Thrush	B
	IXNA	<i>Ixoreus naevius</i>	Varied Thrush	M <sub>3</sub>
	POCA	<i>Poloptila caerulea</i>	Blue-gray Gnatcatcher	B
	RECA	<i>Regulus calendula</i>	Ruby-crowned Kinglet	M
	RESA	<i>Regulus satrapa</i>	Golden-crowned Kinglet	M
	SISI	<i>Sialia sialis</i>	Eastern Bluebird	B
	TUMI	<i>Turdus migratorius</i>	American Robin	B
<b>Laniidae (Shrikes)</b>				
	LAEX	<i>Lanius excubitor</i>	Northern Shrike	M
	LALU	<i>Lanius ludovicianus</i>	Loggerhead Shrike	M <sub>2</sub>
<b>Mimidae (Mimics)</b>				
	DUCA	<i>Dumetella carolinensis</i>	Gray Catbird	B
	MIPO	<i>Mimus polyglottos</i>	Northern Mockingbird	
	TORU	<i>Toxostoma rufum</i>	Brown Thrasher	B
<b>Motacillidae (Pipits)</b>				
	ANSP	<i>Anthus spinoletta</i>	Water Pipit	M <sub>1</sub>
<b>Bombycillidae (Waxwings)</b>				
	BOCE	<i>Bombycilla cedrorum</i>	Cedar Waxwing	B
	BOGA	<i>Bombycilla garrulus</i>	Bohemian Waxwing	M <sub>1</sub>

Family	Sp.Code	Scientific Name	Common Name	Status <sup>bcde</sup>
<b>Sturnidae (Starling)</b>	STVU	<i>Sturnus vulgaris</i>	European Starling	B
<b>Vireonidae (Vireos)</b>	VIBE	<i>Vireo bellii</i>	Bell's Vireo	V
	VIFL	<i>Vireo flavifrons</i>	Yellow-throated Vireo	B
	VIGI	<i>Vireo gilvus</i>	Warbling Vireo	B
	VIGR	<i>Vireo griseus</i>	White-eyed Vireo	
	VIOL	<i>Vireo olivaceus</i>	Red-eyed Vireo	B
	VIPH	<i>Vireo philadelphicus</i>	Philadelphia Vireo	M
	VISO	<i>Vireo solitarius</i>	Solitary Vireo	M
<b>Emberizidae (Warblers, Sparrows, Blackbirds, etc.)</b>	AGPH	<i>Agelaius phoeniceus</i>	Red-winged Blackbird	B
	AMCA1	<i>Ammodramus caudacutus</i>	Sharp-tailed Sparrow	
	AMHE	<i>Ammodramus henslowii</i>	Henslow's Sparrow	V <sub>1</sub>
	AMLE	<i>Ammodramus leconteii</i>	Le Conte's Sparrow	M <sub>1</sub>
	AMSA	<i>Ammodramus savannarum</i>	Grasshopper Sparrow	B
	CALA	<i>Calcarius lapponicus</i>	Lapland Longspur	M
	CACA4	<i>Cardinalis cardinalis</i>	Northern Cardinal	B
	CHGR	<i>Chondestes grammacus</i>	Lark Sparrow	B
	DECA1	<i>Dendroica caerulescens</i>	Black-throated Blue Warbler	
	DECA2	<i>Dendroica castanea</i>	Bay-breasted Warbler	M
	DECE	<i>Dendroica cerulea</i>	Cerulean Warbler	B <sub>1</sub>
	DECO	<i>Dendroica coronata</i>	Yellow-rumped Warbler	B
	DEDI	<i>Dendroica discolor</i>	Prairie Warbler	
	DEFU	<i>Dendroica fusca</i>	Blackburnian Warbler	M
	DEKI	<i>Dendroica kirtlandii</i>	Kirtland's Warbler	
	DEMA	<i>Dendroica magnolia</i>	Magnolia Warbler	M
	DEPA	<i>Dendroica palmarum</i>	Palm Warbler	M
	DEPE	<i>Dendroica pensylvanica</i>	Chestnut-sided Warbler	B
	DEPE1	<i>Dendroica petechia</i>	Yellow Warbler	B
	DEPI	<i>Dendroica pinus</i>	Pine Warbler	M
	DEST	<i>Dendroica striata</i>	Blackpoll Warbler	M
	DETI	<i>Dendroica tigrina</i>	Cape May Warbler	M
	DEVI	<i>Dendroica virens</i>	Black-throated Green Warbler	M
	DOOR	<i>Dolichonyx oryzivorus</i>	Bobolink	B
	EUCA1	<i>Euphagus carolinus</i>	Rusty Blackbird	M
	EUCY	<i>Euphagus cyanocephalus</i>	Brewer's Blackbird	B
	GETR	<i>Geothlypis trichas</i>	Common Yellowthroat	B
	HEVE	<i>Helmitheros vermivorus</i>	Worm-eating Warbler	
	ICVI	<i>Icteria virens</i>	Yellow-breasted Chat	V <sub>3</sub>
	ICGA	<i>Icterus galbula</i>	Northern Oriole	B
	ICSP	<i>Icterus spurius</i>	Orchard Oriole	M <sub>2</sub>
	JUHY	<i>Junco hyemalis</i>	Dark-eyed Junco	M
	MEME	<i>Melospiza melodia</i>	Song Sparrow	B
	MELI	<i>Melospiza lincolni</i>	Lincoln's Sparrow	M
	MEGE	<i>Melospiza georgiana</i>	Swamp Sparrow	B
	MNVA	<i>Mniotilta varia</i>	Black-and-white Warbler	B
	MOAT	<i>Molothrus ater</i>	Brown-headed Cowbird	B
	OPAG	<i>Oporornis agilis</i>	Connecticut Warbler	M
	OPFO	<i>Oporornis formosus</i>	Kentucky Warbler	M <sub>1</sub>
	OPPH	<i>Oporornis philadelphia</i>	Mourning Warbler	B
	PAAM	<i>Parula americana</i>	Northern Parula	M <sub>1</sub>
	PASA	<i>Passerculus sandwichensis</i>	Savannah Sparrow	B
	PAIL	<i>Passerella iliaca</i>	Fox Sparrow	M
	PACY	<i>Passerina cyanea</i>	Indigo Bunting	B

Family		Sp.Code	Scientific Name	Common Name	Status <sup>bcde</sup>
<b>Emberizidae (Continued)</b>					
	PHLU		<i>Pheucticus ludovicianus</i>	Rose-breasted Grosbeak	B
	PIER		<i>Pipilo erythrophthalmus</i>	Rufous-sided Towhee	B
	PIOL		<i>Piranga olivacea</i>	Scarlet Tanager	B
	PLNI		<i>Plectrophenax nivalis</i>	Snow Bunting	M
	POGR1		<i>Pooecetes gramineus</i>	Vesper Sparrow	B
	PRCI		<i>Protonotaria citrea</i>	Prothonotary Warbler	M <sub>1</sub>
	QUQU		<i>Quiscalus quiscula</i>	Common Grackle	B
	SEAU		<i>Seiurus aurocapillus</i>	Ovenbird	B
	SEMO		<i>Seiurus motacilla</i>	Louisiana Waterthrush	
	SENO		<i>Seiurus noveboracensis</i>	Northern Waterthrush	M
	SERU1		<i>Setophaga ruticilla</i>	American Redstart	B
	SPAM		<i>Spiza americana</i>	Dickcissel	B <sub>1</sub>
	SPAR2		<i>Spizella arborea</i>	American Tree Sparrow	M
	SPPA1		<i>Spizella pallida</i>	Clay-colored Sparrow	B
	SPPA2		<i>Spizella passerina</i>	Chipping Sparrow	B
	SPPU1		<i>Spizella pusilla</i>	Field Sparrow	B
	STMA2		<i>Sturnella magna</i>	Eastern Meadowlark	B
	STNE1		<i>Sturnella neglecta</i>	Western Meadowlark	B
	VECE		<i>Vermivora celata</i>	Orange-crowned Warbler	M
	VECH		<i>Vermivora chrysoptera</i>	Golden-winged Warbler	B
	VEPE		<i>Vermivora peregrina</i>	Tennessee Warbler	M
	VEPI		<i>Vermivora pinus</i>	Blue-winged Warbler	B
	VERU		<i>Vermivora ruficapilla</i>	Nashville Warbler	B
	WICA		<i>Wilsonia canadensis</i>	Canada Warbler	M
	WICI		<i>Wilsonia citrina</i>	Hooded Warbler	
	WIPU		<i>Wilsonia pusilla</i>	Wilson's Warbler	M
	XAXA		<i>Xanthocephalus xanthocephalus</i>	Yellow-headed Blackbird	M <sub>1</sub>
	ZOAL		<i>Zonotrichia albicollis</i>	White-throated Sparrow	M
	ZOLE		<i>Zonotrichia leucophrys</i>	White-crowned Sparrow	M
	ZOQU		<i>Zonotrichia querula</i>	Harris' Sparrow	M <sub>1</sub>
				Brewster's Warbler (Hybrid)	B <sub>3</sub>
<b>Passeridae (Weaver Finches)</b>					
	PADO1		<i>Passer domesticus</i>	House Sparrow	B
<b>Fringillidae (Finches)</b>					
	CAFL		<i>Carduelis flammea</i>	Common Redpoll	M <sub>2</sub>
	CAHO		<i>Carduelis hornemanni</i>	Hoary Redpoll	M <sub>3</sub>
	CAP11		<i>Carduelis pinus</i>	Pine Siskin	M
	CATR		<i>Carduelis tristis</i>	American Goldfinch	B
	CAME2		<i>Carpodacus mexicanus</i>	House Finch	B
	CAPU1		<i>Carpodacus purpureus</i>	Purple Finch	M
	COVE		<i>Coccothraustes vespertinus</i>	Evening Grosbeak	M
	LOCU2		<i>Loxia curvirostra</i>	Red Crossbill	M <sub>2</sub>
	LOLE1		<i>Loxia leucoptera</i>	White-winged Crossbill	M <sub>2</sub>
	PIEN		<i>Pinicola enucleator</i>	Pine Grosbeak	M <sub>2</sub>

<sup>1</sup>References used include:

- (1) Kemper, C.A. 1982. New bird names - new checklist order. The Passenger Pigeon, Vol. 44, No. 4, Pages 142-153.
- (2) Supplement to the Auk 1982, Vol. 99, No. 3.
- (3) American Ornithologist Union (AOU) North American check-list, 6th edition, 1983 and all supplements.

<sup>b</sup>B = known breeder (nester) on Ft. McCoy.

M = migrant to Ft. McCoy during fall, spring or winter.

V = visitor; not known to breed but has been observed during nesting season on Ft. McCoy.

<sup>c</sup>Subscripts:

1 = records for the documentation were made within 10 miles of Ft. McCoy by Eric Epstein, Dennis Kuecherer and/or by reports from other verified sources. (i.e. M<sub>1</sub> indicates that the species migrates through within 10 miles of Fort McCoy.

2 = species activity within intervals of 2-5 years (i.e. M<sub>2</sub> indicates that the species does not migrate through every year. Examples would be Pine Grosbeaks, Snowy Owls that migrate south very irregularly.

3 = species activity observed only once or twice throughout the record history of Fort McCoy. (Accidental)

<sup>d</sup>Birds without a status letter indicate status for that species is unknown, but it could reasonably be expected to occur in westcentral Wisconsin.

<sup>e</sup>Records on Ft. McCoy are from (1) a bird survey conducted from 6-9 August 1979; (2) observations made primarily by Ft. McCoy Fish and Wildlife personnel from September 1978 to July 1992; (3) a breeding bird survey conducted from 23 May through 1 July 1983; and (4) migratory and breeding bird surveys conducted by Dennis Kuecherer between July 1989 through June 1993.

**Appendix F, Table 5. Insect Species Found on Fort McCoy.**

Order	Family	Species Name
Collembola--Springtails	Entomobryidae (Slender Springtails)	
Ephemeroptera--Mayflies	Baetidae (Small Minnow Mayflies)	<i>Baetis</i> sp.
		<i>Baetis brunneicolor</i>
		<i>Baetis tricaudatus</i>
		<i>Baetis cinctutus</i>
		<i>Acerpenna</i> sp.
		<i>Acerpenna macdunnoughi</i>
		<i>Acerpenna pygmaea</i>
	Caenidae	<i>Caenis</i> sp.
	Ephemerellidae (Spiney Crawlers)	<i>Ephemerella</i> sp.
		<i>Ephemerella excrucians</i>
		<i>Ephemerella subvaria</i>
		<i>Ephemerella catawba</i>
		<i>Ephemerella inermis</i> (sp. A)
		<i>Eurylophella funeralis</i>
		<i>Euylophella temporalis</i>
Heptageniidae (Flat-Headed Mayflies)	<i>Stenonema</i> sp.	
	<i>Stenonema terminatum</i>	
	<i>Stenonema vicarium</i>	
Leptophlebiidae (Prong-Gill Mayflies)	<i>Leptophlebia</i> sp.	
	<i>Paraleptophlebia</i> sp.	
	<i>Paraleptophlebia mollis</i>	
Isonychiidae	<i>Isonychia</i> sp.	
Odonata--Dragonflies	Aeshnidae (Darners)	<i>Aeshna</i> sp.
		<i>Aeshna eremita</i>
		<i>Aeshna umbrosa</i>
		<i>Basiaeschna janata</i>
		<i>Boyeria</i> sp.
		<i>Boyeria vinosa</i>
	Calopterygidae (Broad-winged Damselflies)	<i>Calopteryx aequabilis</i>
		<i>Calopteryx maculata</i>
	Coenagrionidae (Narrow-winged Damselflies)	
	Cordulegastridae (Biddies)	<i>Cordulegaster</i> sp.
		<i>Cordulegaster maculata</i>
	Libellulidae (Common Skimmers)	<i>Plathemis lydia</i>



Order	Family	Species Name
Plecoptera--Stoneflies	Capniidae (Small Winter Stoneflies)	<i>Paracapnia angulata</i>
	Leuctridae (Rolled-Wing Stoneflies)	<i>Leuctra</i> sp.
	Nemouridae (Spring Stoneflies)	<i>Amphinemura</i> sp.
		<i>Amphinemura linda</i>
		<i>Nemoura trispinosa</i>
	Perlidae (Common Stoneflies)	<i>Acroneura</i> sp.
		<i>Paragnetina media</i>
	Perlodidae (Predatory Stoneflies)	<i>Isoperla</i> sp.
		<i>Isoperla bilineata</i>
		<i>Isoperla lata</i>
		<i>Isoperla signata</i>
		<i>Isoperla slossonae</i>
		<i>Isoperla transmarina</i>
	Pteronarcyidae (Giant Stoneflies)	<i>Clioperla clio</i>
		<i>Pteronarcys</i> sp.
	Taeniopterygidae (Winter Stoneflies)	<i>Taeniopteryx</i> sp.
<i>Taeniopteryx nivalis</i>		
Orthoptera--Grasshoppers, Crickets	Gryllacrididae (Camel and Cave Crickets)	<i>Ceuthophilus</i> sp.
Mallophaga--Biting Lice	Trichodectidae (Mammal Chewing Lice)	<i>Geomydoecus geomydis</i> (Osborn)
Hemiptera--True Bugs Suborder Heteroptera	Gerridae (Water Striders)	<i>Gerris</i> sp.
		<i>Limnoporus</i> sp.
	Veliidae (Small Water Striders)	<i>Microvelia</i> sp.
	Belostomatidae (Giant Water Bugs)	<i>Belostoma</i> sp.
		<i>Belostoma flumineum</i>
		<i>Lethocerus</i> sp.
	Corixidae (Water Boatmen)	<i>Lethocerus americanus</i> (Leidy)
		<i>Hesperocorixa</i> sp.
	Nepidae (Water Scorpions)	<i>Sigara</i> sp.
		<i>Ranatra</i> sp.
	Notonectidae (Backswimmers)	<i>Notonecta undulata</i> Say
		<i>Notonecta</i> sp.
	Tingidae (Lace Bugs)	<i>Acalypta lillianis</i>
		<i>Corythuca</i> sp.

Order	Family	Species Name
	Miridae (Plant Bugs)	<i>Coquilletia mimetica</i> <i>Adelphocoris lineolatus</i>
	Nabidae (Damsel Bugs)	<i>Nabacula subcoleoptera</i> <i>Nabis</i> sp.
	Anthocordiae (Minute Pirate Bugs)	<i>Xylocoris</i> sp.
	Berytidae (Stilt Bugs)	<i>Neides muticus</i> Say
	Reduviidae (Assassin Bugs)	<i>Empicoris</i> sp. <i>Zelus luridus</i> <i>Zelus tetrocanthus</i> <i>Sinea diadema</i>
	Lygaeidae (Seed Bugs, Bigeyed Bugs, Milkweed Bugs)	<i>Lygaeus kalmii</i> <i>Slaterobius insignis</i> <i>Pilophorus banksianae</i>
	Alydidae (Broad-Headed Bugs)	<i>Alydus compersus</i> <i>Alydus eurinus</i> <i>Alydus</i> sp. <i>Megalotomus quinquespinosus</i> <i>Protenor belfragei</i>
	Coreidae (Leaf-footed Bugs)	<i>Merocoris distinctus</i> <i>Euthochtha galeator</i> <i>Archimerus alternatus</i>
	Rhopalidae (Scentless Plant Bugs)	<i>Arhyssus latevalis</i> vs. <i>nigristernum</i>
	Acanthosomatidae	<i>Elasmotethus cruciatus</i>
	Cydnidae (Burrower or Negro Bugs)	<i>Corimelaena</i> sp.
	Pentatomidae (Stink Bugs)	<i>Stiretrus anchorago fimbriatus</i> <i>Banasa dimidiata</i> <i>Euschistus servus euschistoides</i> <i>Euschistus tristigmus luridas</i> <i>Euschistus polistus</i> <i>Cosmopepla bimaculata</i> <i>Brachymena arborea</i> <i>Apateticus cynicus</i> <i>Acrosternum hilare</i> <i>Acrosternum pennsylvanicum</i> <i>Mormidea lugens</i> <i>Podisus placidus</i> <i>Podisus modestus</i> <i>Meneclis incertus</i>
	Scutelleridae (Shield-back Bugs)	<i>Homaemus aeneifrons</i> <i>Homaemus bujugis</i>

Order	Family	Species Name
		<i>Holcostethus</i> sp.
Suborder Homoptera (Cicadas, Planthoppers, Aphids, Scales)	Cicadidae (Cicadas)	<i>Tibicen canicularis</i>
	Membracidae (Treehoppers)	<i>Stictocephala lutea</i> <i>Ophiderma definita</i> <i>Ophiderma pubescens</i> <i>Pohiderma flavicephala</i> <i>Cyrtolobus</i> sp. <i>Campylenchia latipes</i> <i>Enchenopa binotata</i> <i>Glossonotus acuminatus</i> <i>Telamona tiliae</i> <i>Telamona</i> sp. <i>Carynota mera</i> <i>Smilia camelus</i> <i>Ceresa lutea</i> <i>Ceresa diceros</i> <i>Ceresa inermis</i>
	Cercopidae (Spittlebugs and Froghoppers)	<i>Prosapia ignipectus</i> <i>Aphrophora cibrata</i> <i>Lepyronia gibbosa</i> <i>Clastoptera proteus</i> <i>Clastoptera obtusa</i> <i>Aphrophora saratogenesisis</i> <i>Philaenarcys killa hamilton</i> <i>Philaenus spumarius</i>
	Caliscelidae	<i>Bruchomorpha tristis</i>
	Cicadellidae (Leafhoppers)	<i>Aflexia rubranura</i> <i>Athysanus argenarius</i> <i>Aphrodes</i> sp. <i>Memnonia flavida</i> <i>Draeculacephala paludosa</i> <i>Draeculacephala antica</i> <i>Draeculacephala zeae</i> <i>Prairiana? kansana</i> <i>Extrusanus oryssus</i> <i>Empoasca</i> sp. <i>Erythroneura</i> sp. <i>Typhlocyva scripta</i> <i>Kyboasca</i> sp. <i>Paraphlepsius umbrosus</i> <i>Paraphlepsius electus</i> <i>Neokolla hieroglyphica</i> <i>Gyponana salsa</i> <i>Gyponana</i> sp. <i>Panona scarlatina</i> <i>Ponana pectoralis</i> <i>Ponana rubidia</i> <i>Penthimia americana</i>

Order	Family	Species Name
		<i>Limnotettix (Scleroracus) dasidus</i>
		<i>Texananus majestus</i>
		<i>Dorycara platyrhynchus</i>
		<i>Scaphytopius</i> sp.
		<i>Menosoma cincta</i>
		<i>Agalliopsis</i> sp.
		<i>Osbornellus consors</i>
		<i>Scaphoideus</i> sp.
		<i>Hecalus viridis</i>
		<i>Jikradia olitoria</i>
		<i>Cedusa obscura</i>
	Derbidae	<i>Scolops sulcipes</i>
	Fulgoridae (Fulgorid Planthoppers)	<i>Catonia</i> sp.
		<i>Epiptera fusca</i>
	Achilidae	<i>Synecdoche</i> sp.
		<i>Liburniella ornata</i>
	Delphacida (Delphacid Planthoppers)	<i>Cixius basalis</i>
	Cixiidae (Cixiid Planthoppers)	<i>Metcalfa pruinosa</i>
	Acanaloniidae (Acanaloniid Planthoppers)	<i>Acanalonia bivittata</i>
Megaloptera--Dobsonflies and Alderflies	Corydalidae (Dobsonflies and Fishflies)	<i>Chauliodes</i> sp.
		<i>Nigronia serricornis</i>
	Sialidae (Alderflies)	<i>Sialis</i> sp.
Coleoptera--Beetles	Cupedidae (Reticulated Beetles)	<i>Cupes concolor</i>
	Dryopidae	<i>Helichus</i> sp.
		<i>Helichus lithophilus</i>
		<i>Helichus striatus</i>
	Gyrinidae (Whirlygig Beetles)	<i>Gyrinus maculiventris</i>
		<i>Gyrinus</i> sp.
		<i>Dineutus</i> sp.
		<i>Dineutus hornii</i>
		<i>Dineutus assimilis</i>
	Haliplidae (Crawling Water Beetles)	<i>Haliplus immaculicollis</i>
		<i>Haliplus</i> sp.
		<i>Peltodytes</i> sp.
		<i>Peltodytes edentulus</i>
	Dytiscidae (Predaceous Diving Beetles)	<i>Liodessus affinis</i>
		<i>Agabus</i> sp.
		<i>Agabus confusus</i>
		<i>Rhantus</i>

Order	Family	Species Name
		<i>Acilius</i>
		<i>Hydroporus</i> sp.
		<i>Hydroporus oblitus</i> group
		<i>Hygrotus</i>
		<i>Potamonectes</i> sp.
		<i>Laccophilus</i> sp.
		<i>Laccophilus maculosus</i>
		<i>Lioporeus triangularis</i>
		<i>Sanfilippodytes</i> sp.
	Carabidae (Tiger and Ground Beetles)	
		<i>Megacephala virginica</i>
		<i>Cicindela scutellaris</i>
		<i>Cicindela repanda</i>
		<i>Cicindela sexguttata</i>
		<i>Cicindela lepida</i>
		<i>Cicindela formosa generosa</i>
		<i>Cicindela punctulata</i>
		<i>Cicindela patruela</i>
		<i>Cicindela repens</i>
		<i>Omophron americanum</i>
		<i>Omophron tessellatus</i>
		<i>Carabus goryi</i>
		<i>Carabus sylvosus</i>
		<i>Carabus serratus</i>
		<i>Calosoma calidum</i>
		<i>Sphaeroderus stenostomus lecontei</i>
		<i>Helluomorphoides praeustus bicolor*</i>
		<i>Dyschirius truncatus</i>
		<i>Dyschirius sextoni**</i>
		<i>Dyschirius integer</i>
		<i>Dyschirius montana</i>
		<i>Clivina impressifrons</i>
		<i>Pasimachus elongatus</i>
		<i>Bembidion inaequale</i>
		<i>Bembidion rapidum</i>
		<i>Bembidion patrule</i>
		<i>Bembidion bifossulatum</i>
		<i>Elaphropus anceps</i>
		<i>Badister neopulchellus.</i>
		<i>Amara cupeolata</i>
		<i>Amara rubrica</i>
		<i>Geopinus incrassatus</i>
		<i>Harpalus caliginosa</i>
		<i>Harpalus eraticus</i>
		<i>Harpalus indianus*</i>
		<i>Harpalus herbivagus</i>
		<i>Harpalus indigenus*</i>
		<i>Hartonymus hoodi</i>
		<i>Stenolophus lineola</i>
		<i>Stenolophus comma</i>
		<i>Stenolophus ochropezus</i>
		<i>Acupalus</i> sp.
		<i>Selenophorus opalinus</i>
		<i>Selenophorus planipennis*</i>

Order	Family	Species Name
		<i>Euryderus grossus</i>
		<i>Cratacanthus dubius</i>
		<i>Anisodactylus rusticus</i>
		<i>Anisodactylus sanctaecrucis</i>
		<i>Amphasia sericea</i>
		<i>Notiobia terminata</i>
		<i>Chlaenius niger</i>
		<i>Chlaeniuis pennsylvanicus</i>
		<i>Cyclotrachelus sodalis</i>
		<i>Cyclotrachelus seximpressus</i>
		<i>Poecilus chalcites</i>
		<i>Poecilus lucublandus</i>
		<i>Pterostichus pennsylvanicus</i>
		<i>Pterostichus stygicus</i>
		<i>Pterostichus mutus</i>
		<i>Calathus gregarius</i>
		<i>Platynus decentis</i>
		<i>Agonum placidum</i>
		<i>Agonum errans</i>
		<i>Lebia atriventris</i>
		<i>Lebia pumila</i>
		<i>Lebia viridis</i>
		<i>Lebia vittata</i>
		<i>Lebia solea</i>
	Hydraenidae	<i>Hydraena</i> sp.
	Hydrophilidae (Water Scavenger Beetles)	<i>Anacaena</i> sp.
		<i>Berosus</i> sp.
		<i>Calleida purpurea</i>
		<i>Crenitus digesta</i>
		<i>Cymbiodyta</i> sp.
		<i>Cymbiodyta chamerlaini</i>
		<i>Cymindis planipennis</i> LeConte*
		<i>Hydrobius</i> sp.
		<i>Hydrobius melaenus</i>
		<i>Paracymus</i> sp.
		<i>Sperchopsis tessellata</i>
		<i>Tropisternus</i> sp.
	Histeridae (Hister Beetles)	<i>Geomysaprinus rugosifrons</i> *
		<i>Atholus</i> sp.*
	Scydmaenidae (Antlike Stone Beetles)	
	Leiodidae (Round Fungus Beetles)	
	Ptiliidae (Feather Wing Beetles)	
	Silphidae (Carrion and Burying Beetles)	<i>Nicrophorus orbicollis</i>
		<i>Nicrophorus defodiens</i>
		<i>Nicrophorus tomentosus</i>
		<i>Nicrophorus pustulatus</i>
		<i>Nicrophorus sayi</i>

Order	Family	Species Name
		<i>Nicrophorus vespilloides</i>
		<i>Nicrophorus marginatus fabricias</i>
		<i>Necrophilia americana.</i>
		<i>Oiceoptoma noveboracense</i>
		<i>Heterosilpha ramosa</i>
		<i>Thanatophilus lapponicus</i>
		<i>Necrodes surinamensis</i>
	Staphylinidae (Rove Beetles)	<i>Ontholestes cingulatus</i>
		<i>Creophilus maxillosus</i>
		<i>Philonthus cyanipennis</i>
	Lucanidae (Stag Beetles)	<i>Ceruchus piceus</i>
		<i>Lucanus capreolus</i>
		<i>Lucanus placidus</i>
	Geotrupidae (Earth-boring Dung Beetles)	<i>Geotrupes balyi</i>
		<i>Geotrupes splendidus</i>
		<i>Geotrupes hornii</i>
	Ochodaeidae	<i>Ochodaeus musculus</i>
	Glaresidae	<i>Glaresis inducta</i>
	Trogidae (Skin Beetles)	<i>Trox aequalis</i>
		<i>Trox hamatus</i>
		<i>Trox unistriatus</i>
		<i>Trox variolatus</i>
	Scarabaeidae (Scarab Beetles)	<i>Aphodius campestris</i> *
		<i>Aphodius concavus</i> *
		<i>Aphodius distinctus</i>
		<i>Aphodius erraticus</i>
		<i>Aphodius fimetarius</i>
		<i>Aphodius granarius</i>
		<i>Aphodius insolitus</i> *
		<i>Aphodius kirni</i> *
		<i>Aphodius leopardus</i>
		<i>Aphodius magnificens</i> *
		<i>Aphodius peculiosus</i> *
		<i>Aphodius prodromus</i>
		<i>Aphodius rubripennis</i> *
		<i>Aphodius rusicola</i>
		<i>Aphodius stercorosus</i>
		<i>Ataenius imbricatus</i>
		<i>Ataenius punctifrons</i>
		<i>Ataenius strigatus</i>
		<i>Psammodytes sp.*</i>
		<i>Neopsammodytes interruptus</i>
		<i>Dialytes striatulus</i>
		<i>Dialytes truncatus</i>
		<i>Dialytes ulkei</i> *
		<i>Copris fricator</i>
		<i>Canthon chalcites*</i>

Order	Family	Species Name
		<i>Melanocanthon nigricornis</i> *
		<i>Phaneus vindex</i>
		<i>Onthophagus hecate</i>
		<i>Onthophagus nuchicornis</i>
		<i>Onthophagus orpheus</i>
		<i>Onthophagus pennsylvanicus</i>
		<i>Onthophagus striatulus</i>
		<i>Onthophagus</i> sp.*
		<i>Serica georgiana lecontei</i>
		<i>Serica intermixta</i>
		<i>Serica parallela</i>
		<i>Serica sericea</i>
		<i>Diplotaxis sordida</i>
		<i>Phyllophaga anxia</i>
		<i>Phyllophaga balia</i>
		<i>Phyllophaga crenulata</i>
		<i>Phyllophaga drakei</i>
		<i>Phyllophaga gracilis</i>
		<i>Phyllophaga prunina</i>
		<i>Phyllophaga tristis</i>
		<i>Dichelonyx albicollis</i>
		<i>Dichelonyx elongata</i>
		<i>Macroductylus subspinosus</i>
		<i>Hoplia modesta</i>
		<i>Hoplia trifasciata</i>
		<i>Anomala binotata</i>
		<i>Anomala ludoviciana</i>
		<i>Anomala undulata</i>
		<i>Strigoderma arboricola</i>
		<i>Aphonus tridentatus</i>
		<i>Ligyris gibbosus</i>
		<i>Euphoria fulgida</i>
		<i>Euphoria inda</i>
		<i>Cremastocheilus castanae</i>
		<i>Gnorimella maculosa</i>
		<i>Osmoderma eremicola</i>
		<i>Osmoderma scabra</i>
		<i>Trichiotinus assimilis</i>
		<i>Trichiotinus piger</i>
		<i>Trichiotinus viridans</i> *
	Scirtidae (Marsh Beetles)	<i>Elodes</i> sp.
		<i>Flavohelodes</i> sp.
		<i>Prioncyphon</i> sp.
	Buprestidae (Metallic Wood-boring Beetles)	<i>Buprestis salisburyensis</i>
		<i>Buprestis maculipennis</i>
		<i>Chalocophora liberta</i>
		<i>Chrysobothris sexsignata</i>
		<i>Chrysobothris quadriimpressa</i>
		<i>Chrysobothris scabripennis</i>
		<i>Chrysobothris rugosiceps</i>
		<i>Chrysobothnis dentipes</i>
		<i>Chrysobothnis cribraria</i>



Order	Family	Species Name
		<i>Agrilus ruficollis</i>
		<i>Agrilus obsoletoguttatus</i>
		<i>Agrilus anxius</i>
		<i>Agrilus acutipennis</i>
		<i>Agrilus politus</i>
		<i>Agrilus quadriimpressus</i>
		<i>Agrilus bilineatus</i>
		<i>Agrilus frosti</i>
		<i>Agrilus geminatus</i>
		<i>Agrilus criddlei</i>
		<i>Anthaxia viridifrons</i>
		<i>Anthaxia inornata</i>
		<i>Anthaxia quercicola</i>
		<i>Dicerca divaricata</i>
		<i>Acmaeodera pulchella</i>
		<i>Brachy ovatus</i>
		<i>Sphenoptera jugoslavica</i>
	Byrrhidae (Pill Beetles)	<i>Cytilus alternatus</i>
		<i>Cytilus alternatus</i>
	Elmidae (Riffle Beetles)	<i>Ancyronyx variegata</i>
		<i>Dubiraphia</i> sp.
		<i>Dubiraphia bivittata</i>
		<i>Macronychus glabratus</i>
		<i>Optioservus</i> sp.
		<i>Optioservus fastiditus</i>
		<i>Stenelmis</i> sp.
		<i>Stenelmis crenata</i>
	Heteroceridae (Variegated Mud-loving Beetles)	<i>Centuriatus auromicans</i>
		<i>Lapsus tristus</i>
		<i>Heterocerus undatus</i>
		<i>Lanternarius brunneus</i>
	Ptilodactylidae	<i>Ptilodactyla serricollis</i>
	Eucnemidae (False Click Beetles)	<i>Isorhipis obliqua</i>
		<i>Rhagomicrus bonvouloiri</i>
		<i>Microrhagus pectinatus</i>
		<i>Microrhagus subsinuatus</i>
		<i>Entomophthalmus ruficollis</i>
		<i>Deltometopus amoenicornis</i>
		<i>Dromaeolus cylindricollis</i>
	Elateridae (Click Beetles)	<i>Ctenicera tarsalis</i>
		<i>Ctenicera pyrrhos</i>
		<i>Lacon discoides</i>
		<i>Lacon avitus</i>
		<i>Danosoma obtecta</i>
		<i>Hemicrepidius memnonius</i>
		<i>Cardiophorus cardisce*</i>
		<i>Conoderus auritus</i>
		<i>Dalopius vagus</i>

Order	Family	Species Name
		<i>Negastrius arnetti</i>
		<i>Agrioties stabilis</i>
		<i>Agrioties isabellinus</i>
		<i>Oxygonus obesus</i>
		<i>Ampedus nigricans</i>
		<i>Ampedus apicatus</i>
		<i>Ampedus luctuosus</i>
		<i>Ampedus melanotoides</i>
		<i>Ampedus areolatus</i>
		<i>Pseudanostirus hieroglyphicus</i>
		<i>Athous cucullatus</i>
		<i>Limonius basilaris</i>
		<i>Dolerosomus silaceus</i>
		<i>Melanotus hyslopi</i>
		<i>Melanotus similis</i>
		<i>Melanotus trapezoideus</i>
	Lycidae (Net-winged Beetles)	
		<i>Calopteron terminale</i>
		<i>Calopteron reticulatum</i>
	Phengodida (Glowworms)	
		<i>Phengodes fusiceps</i>
	Lampyridae (Lightning Bugs or Fireflies)	
		<i>Lucidota</i> sp.
		<i>Pyraconema</i> sp.
		<i>Pyropyga</i> sp.
		<i>Ellychina</i> sp.
	Cantharidae (Soldier Beetles)	
		<i>Chauliognathus pennsylvanicus</i>
		<i>Polemium</i> sp.
		<i>Cantharis</i> sp.
		<i>Podarus lucidatus</i>
		<i>Silis percomis</i>
	Dermestidae (Dermestid Beetles, Skin and Larder Beetles±)	
	Bostrichidae (Branch and Twig Borers, Horned, or False Powder-Post Beetles)	
		<i>Lichnophanes bicornis</i>
		<i>Lyctus planicollis</i>
	Anobiidae (Death-watch Beetles, Drugstore Beetles)	
	Trogossitidae (Bark-Gnawing Beetles)	
		<i>Grynocharis quadrilineata</i>
		<i>Thymalus marginicollis</i>
		<i>Tenebroides</i> sp.
	Cleridae (Checkered Beetles)	
		<i>Trichodes nutalli</i>
		<i>Enclerus nigrifrans</i>
		<i>Enclerus nigripes</i>
		<i>Enclerus nigripes</i>
		<i>Thanasimus dubius</i>
		<i>Pyllaboenus pallipennis</i>
		<i>Pyllaboenus verticalis</i>
		<i>Pyllaboenus humeralis</i>
		<i>Cymatodera bicolor</i>
		<i>Isohydnocera tabida</i>

Order	Family	Species Name
		<i>Chariessa pilosa</i>
		<i>Placopterus thoracicus</i>
		<i>Zenodosus sanguineus</i>
	Melyridae (Soft-winged Flower Beetles)	<i>Collops quadrimaculatus</i>
		<i>Attalus terminalis</i>
	Sphindidae	<i>Odontosphindus denticollis</i>
		<i>Spindus</i> sp.
	Nitidulidae (Sap Beetles)	<i>Phenolia grossa</i>
		<i>Glischrochilius sanguinolenius</i>
		<i>Glischrochilius fasciatus</i>
		<i>Glischrochilius</i>
		<i>Glischrochilius siepmanni</i>
		<i>Glischrochilius obtusus</i>
		<i>Omosita colon</i>
	Monotomidae	
	Silvanidae	
	Passandridae	<i>Catogenus rufus</i>
	Laemophloeidae	<i>Laemophlaeus biguttatus</i>
	Phalacridae (Shining Flower Beetles)	
	Cryptophagidae (Silken Fungus Beetles)	<i>Antherophagus ochraceus</i>
	Languriidae (Lizard Beetles)	<i>Acropteroxys gracilis</i>
	Erotylidae (Pleasing Fungus Beetles)	<i>Triplax thoracica</i>
		<i>Triplax flavicollis</i>
		<i>Triplax dissimulator</i>
		<i>Tritoma pulchra</i>
		<i>Tritoma humeralis</i>
		<i>Tritoma sanguinipennis</i>
	Cerylonidae	<i>Philothermus glabriculusm</i>
		<i>Cerylon</i> sp.
	Biphyllidae	
	Byturidae (Fruitworm Beetles)	<i>Byturus unicolor</i>
	Endomychidae (Handsome Fungus Beetles)	<i>Lycoperdina ferruginea</i>
		<i>Aphorista vittata</i>
		<i>Danae testacea</i>
		<i>Endomycus biguttatus</i>
		<i>Mycetina perpulchra</i>
	Coccinellidae (Ladybugs and Ladybird Beetles)	<i>Brachiacantha ursina</i>
		<i>Brumoides septentrionis</i>

Order	Family	Species Name
		<i>Hyperaspis</i> sp.
		<i>Coleomegilla maculata</i>
		<i>Hippodamia parenthesis</i>
		<i>Coccinella septempunctata</i> L.
		<i>Coccinella novemnota</i>
		<i>Anatis 15-punctata</i>
		<i>Anatis mali</i>
	Corylophiidae (Minute Fungus Beetles)	
	Lathridiidae (Minute Brown Scavenger Beetles)	
	Mycetophagidae (Hairy Fungus Beetles)	
		<i>Mycetophagus flexuosus</i>
		<i>Mycetophagus punctata</i>
		<i>Antherophaga ochraceus</i>
		<i>Litargus</i> sp.
	Ciidae (Minute Tree-fungus Beetles)	
	Tetratomidae	
		<i>Penthe obliquata</i>
		<i>Tetratoma</i> sp.
	Melandryidae (False Darkling Beetles)	
		<i>Eustrophus tomentosus</i>
		<i>Melandrya striata</i>
		<i>Eustrophinus bicolor</i>
		<i>Dircaea liturata</i> .
	Mordellidae (Tumbling Flower Beetles)	
	Rhipiphoridae (Wedge-shaped Beetles)	
		<i>Macrosiagon limbatum</i>
		<i>Macrosiagon sayi</i>
	Colydiidae (Cylindrical Bark Beetles)	
		<i>Bitoma quadriguttata</i>
		<i>Synchita fulginosa</i>
		<i>Microsicus parvulus</i>
	Tenebrionidae (Darkling Beetles)	
		<i>Eleodes tricostata</i>
		<i>Hapladrus fulvipes</i>
		<i>Upis ceramboides</i>
		<i>Meracantha contracta</i>
		<i>Centronopus calcaratus</i>
		<i>Neatus tenebriodes</i>
		<i>Diaperis maculata</i>
		<i>Bolitotherus cornutus</i>
	Synchroidae	
		<i>Synchroa punctata</i>
	Meloidae (Blister Beetles)	
		<i>Asclera puncticollis</i>
	Pyrochroidae (Fire-colored Beetles)	
		<i>Pedilus terminalis</i>
		<i>Pedilus impressus</i>
		<i>Pedilus lugubris</i>
		<i>Pedilus labiatus</i>
		<i>Pedilus canaliculatus</i>

Order	Family	Species Name
		<i>Neopyrochroa flabellata</i>
		<i>Neopyrochroa femoralis</i>
		<i>Dendroides concolor</i>
		<i>Dendroides canadensis</i>
	Salpingidae	<i>Rhinosimus viridiaeneus</i>
	Boridae	<i>Boros unicolor</i>
	Anthicidae (Ant-Like Flower Beetles)	<i>Notoxus desertus</i>
		<i>Notoxus anchora</i>
	Aderidae	<i>Elonus basalis</i>
		<i>Elonus nebulosus</i>
		<i>Zonantes fasciatus</i>
	Scraptiidae	
	Cerambycidae (Longhorn Beetles)	<i>Orthosoma brunneum</i>
		<i>Parandra b. brunnea</i>
		<i>Strangalia luteicornis</i>
		<i>Strangalia bicolor</i>
		<i>Strangalia famelica</i>
		<i>Strangalepta abbreviata</i>
		<i>Strangalepta pubera</i>
		<i>Typocerus octonata</i>
		<i>Typocerus velutinus</i>
		<i>Trycerus conflues</i>
		<i>Analepta lineola</i>
		<i>Leptura subhamata</i>
		<i>Encyclops caeruleae</i>
		<i>Trigonarthis proxima</i>
		<i>Xestoleptura octonata</i>
		<i>Obera flavipes</i>
		<i>Obera ulmicola</i>
		<i>Oberea bimaculata</i>
		<i>Oberea erythrocephala</i>
		<i>Oberea tripunctata</i>
		<i>Brachyleptura champlaini</i>
		<i>Brachyleptura circumdata</i>
		<i>Strophiona nitens</i>
		<i>Callimoxys sanguinicollis</i>
		<i>Molochrus bimaculatus</i>
		<i>Batyla suturale</i>
		<i>Trachysida mutabilis</i>
		<i>Gaturotes cyanipennis</i>
		<i>Clytus ruricola</i>
		<i>Xylotrechus colonus</i>
		<i>Xylotrechus sagittatus</i>
		<i>Xylotrechus undulatus</i>
		<i>Neoclytus acuminata</i>
		<i>Neoclytus jouteli</i>
		<i>Megacyllene robiniae</i>
		<i>Megacyllene decora</i>

Order	Family	Species Name
		<i>Rhagium inquisitor</i>
		<i>Sarosesthes fulminans</i>
		<i>Eutrichillus biguttatus</i>
		<i>Monochamus scutellatus</i>
		<i>Tetropes tetrophthalmus</i>
		<i>Tetropes annulatus</i>
		<i>Tetropes quinquemaculatus</i>
		<i>Knulliana cinctus</i>
		<i>Cyrtophorus verrucosus</i>
		<i>Saperda vestita</i>
		<i>Necydalis mellita</i>
		<i>Eburia quadigeminata</i>
	Orsodacnidae	<i>Orsodacne altra</i>
		<i>Psyrassa unicolor</i>
	Chrysomelidae (Plant and Leaf Beetles)	<i>Apthona flava</i>
		<i>Apthona lacertosa</i>
		<i>Apthona nigriscutis</i>
		<i>Diabrotica undecimpunctata howardi</i>
		<i>Labidomera clivicollis</i>
		<i>Chrysochus auratus</i>
		<i>Anomoea laticlaya</i>
		<i>Diabrotica barberi</i>
		<i>Lema collaris</i>
	Anthribidae (Fungus Weevils)	<i>Euparius marmereus</i>
	Attelabidae (Leaf-Rolling Weevils)	<i>Merhynchites bicolor</i>
		<i>Attelabus nigripes</i>
		<i>Apion</i> sp.
	Brentidae (Straight-Snouted Weevils)	<i>Arrhenoides minutus</i>
	Ithyceridae (New York Weevil)	<i>Ithycerus noveboracensis</i>
	Curculionidae (Snout Beetles)	<i>Pachyhinus elegans</i>
		<i>Odontocorynus scutellum-album</i>
		<i>Rhyssomatus lineaticollis</i> (
		<i>Curculio</i> sp.
		<i>Gymnetron tetrum</i>
		<i>Phyllobius</i> sp.
		<i>Ctiorhynchus ovatus</i>
		<i>Hypera punctata</i>
		<i>Pissodes strobi</i>
		<i>Hylobius radialis</i>
		<i>Larinus minutus</i>
		<i>Larinus obtusus</i>
		<i>Bangasternus fausti</i>
		<i>Cyphocleonus achaetes</i>
		<i>Magdalis gentilis</i>
		<i>Magdalis barbata</i>
		<i>Dryophthorus americanus</i>
		<i>Anthonomus</i> sp.

Order	Family	Species Name
Diptera--True Flies		<i>Tychiuis picrostis</i>
	Athericidae	<i>Atherix</i> sp. <i>Atherix variegata</i>
	Cecidomyiidae (Gall Midges)	<i>Spurgia esulae</i>
	Ceratopogonidae	<i>Culicoides</i> sp. <i>Probezzia</i> sp. <i>Nilobezzia</i> sp. <i>Dasyhelea</i> sp. <i>Ceratopogon</i> sp. <i>Ceratopogon culicoidithorax</i>
	Chironomidae (Midges)	<i>Brillia</i> sp. <i>Cardiocladius</i> sp. <i>Chironomus</i> sp. <i>Cladotanytarsus</i> sp. <i>Corynoneura</i> sp. <i>Cricotopus</i> sp. <i>Cricotopus bicinctus</i> <i>Cricotopus intersectus</i> <i>Cricotopus</i> sp. <i>Cryptochironomus</i> sp. <i>Diamesa</i> sp. <i>Dicrotendipes</i> sp. <i>Diplocladius</i> sp. <i>Eukiefferiella</i> sp. <i>Glyptotendipes</i> sp. <i>Larsia</i> sp. <i>Limnophyes</i> sp. <i>Micropsectra</i> sp. <i>Microtendipes</i> sp. <i>Nanocladius</i> sp. <i>Natarsia</i> sp. <i>Odontomesa</i> sp. <i>Pagastia</i> sp. <i>Paracladopelma</i> sp. <i>Paratanytarsus</i> sp. <i>Pentaneura</i> sp. <i>Phaenopsectra</i> sp. <i>Polypedilum</i> sp. <i>Polypedilum convictum</i> <i>Polypedilum fallax</i> <i>Polypedilum halteralis</i> <i>Polypedilum scalaenum</i> <i>Potthastia</i> sp. <i>Procladius</i> sp. <i>Prodiamesa</i> sp. <i>Psectrocladius</i> sp. <i>Pseudochironomus</i> sp. <i>Pseudorthocladius</i> sp. <i>Rheocricotopus</i> sp.

Order	Family	Species Name
		<i>Rheotanytarsus</i> sp.
		<i>Stempellina</i> sp.
		<i>Stempellinella</i> sp.
		<i>Stictochironomus</i> sp.
		<i>Tanytarsus</i> sp.
		<i>Thienemanniella</i> sp.
		<i>Tribelos</i> sp.
		<i>Zavreliomyia</i> sp.
		<i>Tvetenia</i> sp.
		<i>Xylotopus</i> sp.
		<i>Xylotopus par</i>
		<i>Conchapelopia</i> sp.
		<i>Tanypodinae</i> sp.
		<i>Macropelopia</i> sp.
		<i>Orthocladus</i> sp.
		<i>Robackia</i> sp.
		<i>Parachaetocladus</i> sp.
		<i>Chironominae</i> sp.
	Empididae	<i>Hemerodromia</i> sp.
		<i>Chelifera</i> sp.
		<i>Dolichocephala</i> sp.
	Ephydriidae (Shore Flies)	
	Muscidae (House Flies)	
	Psychodidae (Moth Flies)	
		<i>Pericoma</i> sp.
	Simuliidae (Black Flies)	<i>Simulium</i> sp.
		<i>Simulium euryadminiculum</i>
		<i>Simulium corbis</i>
		<i>Simulium tuberosum</i>
		<i>Simulium venustum</i>
		<i>Simulium verecundum</i>
		<i>Simulium vittatum</i>
		<i>Simulium pictipes</i>
		<i>Simulium fibrinflatum</i>
		<i>Prosimulium</i> sp.
		<i>Prosimulium mysticum</i>
		<i>Prosimulium mixtum</i>
		<i>Prosimulium fuscum</i>
		<i>Stegopterna mutata</i>
	Tabanidae (Horse and Deer Flies)	<i>Chrysops</i> sp.
		<i>Tabanus</i> sp.
	Asilidae (Robber Flies)	<i>Asilus sericeus</i>
		<i>Holopogon guttulus</i>
		<i>Stichopogon trifasciatus</i>
		<i>Proctacanthus hinei</i>
		<i>Proctacanthus philadelphicus</i>
		<i>Laphria aktis</i>
		<i>Laphria posticata</i>



Order	Family	Species Name
		<i>Diogmites neoternatus</i>
	Syrphidae (Flower Flies)	<i>Eristalis tenax</i> <i>Chrysotoxum radiosum</i>
	Tephritidae (Fruit Flies)	<i>Urophora affinis</i> <i>Urophora quadrifasciata</i>
	Tipulidae (Crane Flies)	<i>Antocha</i> sp. <i>Dicranota</i> sp. <i>Erioptera</i> sp. <i>Hesperoconopa</i> sp. <i>Hexatoma</i> sp. <i>Limonia</i> sp. <i>Limnophila</i> sp. <i>Pedicia</i> sp. <i>Pilaria</i> sp. <i>Pseudolimnophila</i> sp. <i>Tipula</i> sp. <i>Prionocera</i> sp.
	Dixidae	<i>Dixa</i> sp.
	Ptychopteridae (Phantom Crane Flies)	<i>Bittacomorpha</i> sp. <i>Bittacomorpha clavipes</i> <i>Ptychoptera</i> sp.
	Sciomyzidae (Marsh Flies)	
	Scathophagidae	
Lepidoptera--Butterflies and Moths		
	Hesperiidae (Skippers)	<i>Amblyscirtes vialis</i> <i>Atrytone logan</i> <i>Epargyreus clarus</i> <i>Erynnis brizo</i> <i>Erynnis icelus</i> <i>Euphyes conspicua</i> <i>Euphyes vestris metacomet</i> <i>Hesperia leonardus leonardus</i> <i>Hesperia ottoe</i> <i>Hesperia sassacus</i> <i>Pholisora catullus</i> <i>Poanes hobomok</i> <i>Poanes massasoit</i> <i>Polites mystic</i> <i>Polites origenes.</i> <i>Polites themistocles</i> <i>Thorybes pylades</i> <i>Wallengrenia egeremet</i>
	Papilionidae (Swallowtail Butterflies)	<i>Papilio polyxenes asterias</i> <i>Papilio glaucus</i>
	Pieridae (Whites, Sulphurs, and Orangetips)	

Order	Family	Species Name
		<i>Colias eurytheme</i>
		<i>Colias interior</i>
		<i>Colias philodice</i>
	Lycaenidae (Hairstreaks, Coppers, and Blues)	<i>Callophrys irus</i>
		<i>Celastrina ladon</i>
		<i>Glaucopsyche lygdamus</i>
		<i>Everes comyntas</i>
		<i>Feniseca tarquinius</i>
		<i>Harkenclenus titus</i>
		<i>Lycaeides melissa samuelis</i>
		<i>Lycaena phlaeas americana</i>
		<i>Satyrium calanus falacer</i>
		<i>Satyrium liparops strigosum</i>
		<i>Satyrium edwardii</i> Grote &
		<i>Strymon melinus</i>
	Nymphalidae (Brush-footed Butterflies)	<i>Asterocampa celtis</i>
		<i>Limenitis arthemis arthemis</i>
		<i>Limenitis arthemis astyanax</i>
		<i>Charidryas gorgone carlota</i>
		<i>Charidryas harrisii</i>
		<i>Charidryas nycteis</i>
		<i>Boloria bellona</i>
		<i>Boloria selene myrina</i>
		<i>Euptoietia claudia</i>
		<i>Nymphalis antiopa</i>
		<i>Nymphalis milberti</i>
		<i>Nymphalis vau-album</i>
		<i>Phyciodes batesii</i>
		<i>Phyciodes cocyta</i>
		<i>Phyciodes tharos</i>
		<i>Polygonia comma</i>
		<i>Speyeria cybele</i>
		<i>Speyeria aphrodite</i>
		<i>Speyeria idalia</i>
		<i>Vanessa atalanta</i>
		<i>Vanessa cardui</i>
		<i>Vanessa virginiensis</i>
	Satyridae (Nymphs and Satyrs)	<i>Cercyonis pegala nephele</i>
		<i>Enodia anhedon</i>
		<i>Megisto cymela</i>
		<i>Satyrodes eurydice</i> nr. <i>fumom</i>
	Danaidae (Milkweed Butterflies)	<i>Danaus plexippus</i>
	Drepanidae	<i>Drepana arcuata</i>
		<i>Drepana bilineata</i>
	Cochylidae	<i>Agapeta zoegana</i>
	Sesiidae (Clear-Winged Moths)	<i>Synauthedou pictipes</i>
	Pyralidae (Snout and Meal Moths)	

Order	Family	Species Name
		<i>Crambus</i> sp.
	Geometridae (Geometer Moths)	<i>Itame subcessaria</i> <i>Semiothisa maculifascia</i> <i>Semiothisa transitaria</i> <i>Semiothisa denticulata</i> <i>Ectropis crepuscularia</i> <i>Cabera erythemaria</i> <i>Cabera variolaria</i> <i>Campaea perlata</i> <i>Erastria coloraria</i> <i>Euchlaena amoenaria</i> <i>Euchlaena johnsonaria</i> <i>Euchlaena serrata</i> <i>Pero honestaria</i> <i>Pero morrisonaria</i> <i>Anavitrinella pampinaria</i> <i>Besma endropiaria</i> <i>Besma quercivoraria</i> <i>Eusarca confusaria</i> <i>Haematopsis grataria</i> <i>Lobocleta plemyraria</i> <i>Idaea demissaria</i> <i>Nepytia canosaria</i> <i>Scopula inductata</i> <i>Scopula limboundata</i> <i>Eulithis testata</i> <i>Eulithis explanata</i> <i>Eubaphe mendica</i> <i>Ennomos magnaria</i>
	Lasiocampidae	<i>Phyllodesma americana</i> <i>Malacosoma disstria</i> <i>Malacosoma americanum</i> <i>Tolyte velleda</i>
	Saturniidae (Giant Silkworm and Royal Moths)	<i>Antheraea polyphemus</i> <i>Automeris io</i> <i>Automeris</i> sp. <i>Dryocampa cubicunda</i>
	Sphingidae (Hawk Moths and Sphinx Moths)	<i>Smerinthus jamaicensis</i> <i>Smerinthus cerisyi</i> <i>Sphecodina abbottii</i> <i>Sphinx canadensis</i> <i>Sphinx poecila</i> <i>Sphinx</i> sp. <i>Pachysphinx modesta</i> <i>Paonias excaecatus</i> <i>Paonias myops</i> <i>Darapsa myron</i> <i>Darapsa pholus</i> <i>Hemaris diffinis</i> <i>Hemaris thysbe</i>

Order	Family	Species Name
		<i>Hyles lineata</i>
		<i>Lapara bombycoides</i>
	Notodontidae	<i>Clostera albosigma</i>
		<i>Clostera strigosa</i>
		<i>Dasylophia anguina</i>
		<i>Datana ministra</i>
		<i>Datana perspicua</i>
		<i>Furcula borealis</i>
		<i>Heterocampa obliqua</i>
		<i>Hyarpax aurora</i>
		<i>Lochmaeus manteo</i>
		<i>Macurocampa marthesia</i>
		<i>Nadata gibbosa</i>
		<i>Hyperaeschra georgica</i>
		<i>Peridea angulosa</i>
		<i>Pheosia rimosa</i>
		<i>Notodonta scitipennis</i>
		<i>Gluphisia septentrionis</i>
		<i>Oligocentria lignicolor</i>
		<i>Oligocentria semirufescens</i>
	Arctiidae (Tiger Moths)	<i>Apantesis carlotta</i>
		<i>Apantesis phalerata</i>
		<i>Clemensia albata</i>
		<i>Hypoprepia fucosa</i>
		<i>Holomelina aurantiaca</i>
		<i>Holomelina ferruginosa</i>
		<i>Spilosoma congrua</i>
		<i>Spilosoma virginica</i>
		<i>Phragmatobia fuliginosa</i>
		<i>Protorthodes incincta</i>
		<i>Grammia oithona</i>
		<i>Grammia virguncula</i>
		<i>Grammia phyllira</i>
		<i>Grammia parthenice</i>
		<i>Grammia arge</i>
		<i>Halysidota tessellaris</i>
		<i>Hypanthis cunea</i>
		<i>Cycnia inopinatus</i>
		<i>Cycnia tenera</i>
		<i>Euchaetes egle</i>
		<i>Pygarctia spraguei</i>
		<i>Cisseps fulvicollis</i>
		<i>Crambidia casta</i>
		<i>Crambidia pallida</i>
		<i>Crambidia pura</i>
		<i>Ctenucha virginica</i>
	Noctuidae (Owlet, Cutworm, and Underwing Moths)	<i>Idia americalis</i>
		<i>Idia aemula</i>
		<i>Idia diminuendis</i>
		<i>Idia lubricalis</i>

Order	Family	Species Name
		<i>Idia rotundalis</i>
		<i>Phalaenophana pyramusalis</i>
		<i>Zanclognatha laevigata</i>
		<i>Zanclognatha literalis</i>
		<i>Zanclognatha ochreipennis</i>
		<i>Meropleon ambifusum</i>
		<i>Selicanis cinereola</i>
		<i>Ochropleura plecta</i>
		<i>Peridroma saucia</i>
		<i>Phalaenostola metonalis</i>
		<i>Phalaenostola larentioides</i>
		<i>Bleptina caradrinalis</i>
		<i>Pangrapta decoralis</i>
		<i>Panopoda rufimargo</i>
		<i>Parallelia bistriaris</i>
		<i>Baileya doubledayi</i>
		<i>Caenurgina crassiuscula</i>
		<i>Caenurgina erechtea</i>
		<i>Callopietria mollissima</i>
		<i>Capis curvata</i>
		<i>Caradrina meralis</i>
		<i>Catocala abbreviatella</i>
		<i>Catocala antinympha</i>
		<i>Catocala coccinata</i>
		<i>Catocala concumbens</i>
		<i>Catocala ilia</i>
		<i>Catocala lineella</i>
		<i>Catocala relict</i>
		<i>Catocala similis</i>
		<i>Catocala whitneyi</i>
		<i>Catocala amestris</i>
		<i>Allagrapha aerea</i>
		<i>Anagrapha falcifera</i>
		<i>Anaplectoides prasina</i>
		<i>Anepia capsularis</i>
		<i>Marathyssa inficita</i>
		<i>Nola cilicoides</i>
		<i>Eudryas unio</i>
		<i>Graphiphora haruspica</i>
		<i>Heliothus phloxiphagus</i>
		<i>Heliothus zea</i>
		<i>Heptagrotis phyllophora</i>
		<i>Homorthodes furfurata</i>
		<i>Lithacodia bellicula</i>
		<i>Lithacodia albidula</i> (
		<i>Lithacodia carneola</i>
		<i>Maliattha synochitis</i>
		<i>Anterastria teratophora</i>
		<i>Spirameter lutra</i>
		<i>Tarachidia candefacta</i>
		<i>Tarachidia tortricina</i>
		<i>Panthea furcilla</i>
		<i>Acronicta falcula</i>
		<i>Acronicta hasta</i>

Order	Family	Species Name
		<i>Acronicta ovata</i>
		<i>Acronicta afflicta</i>
		<i>Acronicta impressa</i>
		<i>Acronicta superans</i>
		<i>Apamea verbascoides</i>
		<i>Apamea lignicolora</i>
		<i>Apamea devastator</i>
		<i>Apamea relicina</i>
		<i>Oligia fractilinea</i>
		<i>Aletia oxygala</i>
		<i>Alypia octomaculata</i>
		<i>Amolita fessa</i>
		<i>Amphipoea velata</i>
		<i>Amphipoea americana</i>
		<i>Amphipyra pyramidoides</i>
		<i>Amphipyra tragopoginis</i>
		<i>Charadra deridens</i>
		<i>Chytonix palliatricula</i>
		<i>Chytonix sensilis</i>
		<i>Athetis miranda</i>
		<i>Crymodes devastator</i>
		<i>Crymodes relicina</i>
		<i>Cryptocala acadensis</i>
		<i>Dasychira</i> sp.
		<i>Elaphria festivooides</i>
		<i>Condica videns</i>
		<i>Ogdoconta cinereola</i>
		<i>Chaetagnathia cerata</i>
		<i>Cosmia calami</i>
		<i>Oncocnemis riparia</i>
		<i>Oncocnemis saundersiana</i>
		<i>Papaipema inquisita</i>
		<i>Papaipema lysimachiae</i>
		<i>Papaipema necopina</i>
		<i>Papaipema pterisii</i>
		<i>Scoliopteryx libatrix</i>
		<i>Sideridis rosea</i>
		<i>Phlogophora periculosa</i>
		<i>Platyperigea meralis</i>
		<i>Platysenta videns</i>
		<i>Polia detracta</i>
		<i>Polia imbrifera</i>
		<i>Polia purpurissata</i>
		<i>Hadena capsularis</i>
		<i>Ipimorpha pleoneta</i>
		<i>Lacanobia subjuncta</i>
		<i>Lacinipolia lorea</i>
		<i>Lacinipolia meditata</i>
		<i>Lacinipolia olivacea</i>
		<i>Lacinipolia anguina</i>
		<i>Lacinipolia vicina</i>
		<i>Lacinipolia renigera</i>
		<i>Macrochilo absorptalis</i>
		<i>Melanchra assimilis</i>

Order	Family	Species Name
		<i>Nephelodes minians</i>
		<i>Faronta diffusa</i>
		<i>Faronta rubripennis</i>
		<i>Leucania linda</i>
		<i>Leucania multilinea</i>
		<i>Leucania commoides</i>
		<i>Leucania inermis</i>
		<i>Leucania insueta</i>
		<i>Leucania pseudargyria</i>
		<i>Leucania phragmatidicola</i>
		<i>Ulolonche culea</i>
		<i>Ulolonche modesta</i>
		<i>Orthodes crenulata</i>
		<i>Orthodes obscura</i>
		<i>Agrotis gladiaria</i>
		<i>Agrotis venerabilis</i>
		<i>Agrotis vetusta</i>
		<i>Agrotis volubilis</i>
		<i>Eucptocnemis fimbriaris</i>
		<i>Feltia geniculata</i>
		<i>Feltia herilis</i>
		<i>Feltia jaculifera</i>
		<i>Feltia subgothica</i>
		<i>Feltia tricola</i>
		<i>Tricoplusia ni</i>
		<i>Trichordestra legitima</i>
		<i>Trichosilia geniculata</i>
		<i>Eugraphe subrosea</i>
		<i>Euxoa albipennis</i>
		<i>Euxoa detera personata</i>
		<i>Euxoa niveilinea</i>
		<i>Euxoa redimicula</i>
		<i>Euxoa scandens</i>
		<i>Euxoa tessellata</i>
		<i>Euxoa velleripennis</i>
		<i>Euagrotis forbesi</i>
		<i>Euagrotis illapsa</i>
		<i>Protolampra brunneicollis</i>
		<i>Abagrotis alternata</i>
		<i>Spaelotis clandestina</i>
		<i>Tricholita signata</i>
		<i>Xestia bugrai</i>
		<i>Xestia c-nigrum adela</i>
		<i>Xestia dolosa</i>
		<i>Xestia normaniana</i>
		<i>Xestia smithii</i>
		<i>Protothordes incincta</i>
		<i>Protothordes oviduca</i>
		<i>Proxenus miranda</i>
		<i>Pseudaletia unipuncta</i>
		<i>Renia flavipunctalis</i>
		<i>Renia sobrialis</i>
		<i>Schinia arcigera</i>
		<i>Schinia florida</i>

Order	Family	Species Name
		<i>Schinia indiana</i>
		<i>Schinia lynx</i>
		<i>Schinia rivulosa</i>
Lymantriidae		<i>Lymantria dispar</i>
	Limacodidae	<i>Apoda biguttata</i>
		<i>Euclea delphinii</i>
		<i>Lithacodes fasciola</i>
Trichoptera--Caddisflies		
	Brachycentridae	<i>Brachycentrus</i> sp.
		<i>Brachycentrus americanus</i>
		<i>Brachycentrus numerosus</i>
		<i>Brachycentrus occidentalis</i>
		<i>Micrasema klwane</i>
	Glossosomatidae	<i>Glossosoma</i> sp.
	Hydropsychidae (Common Net-Spinning Caddisflies)	<i>Cheumatopsyche</i> sp.
		<i>Hydropsyche</i> sp.
		<i>Hydropsyche betteni</i>
		<i>Diplectrona modesta</i>
		<i>Parapsyche apicalus</i>
		<i>Ceratopsyche</i> sp.
		<i>Ceratopsyche alhedra</i>
		<i>Ceratopsyche morosa bifida</i>
		<i>Ceratopsyche slossonae</i>
		<i>Ceratopsyche sparna</i>
	Hydroptilidae (Purse Casemaker Caddisflies)	<i>Hydroptila</i> sp.
		<i>Oxyethira</i> sp.
	Lepidostomatidae	<i>Lepidostoma</i> sp.
	Leptoceridae (Longhorned Caddisflies)	<i>Ceraclea</i> sp.
		<i>Oecetis</i> sp.
		<i>Triaenodes</i> sp.
	Limnephilidae (Northern Casemaker Caddisflies)	<i>Anabolia</i> sp.
		<i>Hesperophylax</i> sp.
		<i>Hesperophylax designatus</i>
		<i>Hydatophylax argus</i>
		<i>Limnephilus</i> sp.
		<i>Oncosmoecus</i> sp.
		<i>Oncosmoecus quadrinotatus</i>
		<i>Platycentropus</i> sp.
		<i>Pycnopsyche</i> sp.
	Molannidae	<i>Molanna</i> sp.
	Philopotamidae (Finger-Net Caddisflies)	<i>Chimarra obscura</i>
	Phryganeidae (Giant Casemaker Caddisflies)	<i>Oligostomis ocelligera</i>



Order	Family	Species Name
		<i>Ptilostomis</i> sp.
		<i>Fabria</i> sp.
	Polycentropodidae (Trumpet-Net Caddisflies)	<i>Neureclipsis</i> sp.
		<i>Polycentropus</i> sp.
	Psychomyiidae	<i>Lype diversa</i>
		<i>Psychomyia flavida</i>
	Rhyacophilidae (Free-Living Caddisflies)	<i>Rhyacophila</i> sp.
		<i>Rhyacophila vibox</i>
	Uenoidae	<i>Neophylax</i> sp.
Hymenoptera--Ants, Bees, and Wasps		
	Agriidae	<i>Arge</i> sp.
	Pamphiliidae (Web-spinning and Leaf-rolling Sawflies)	<i>Onycholyda</i> sp.
		<i>Acantholyda</i> sp.
	Tenthredinidae (Common Sawflies)	<i>Tethredo</i> sp.
		<i>Tethida cordigera</i>
		<i>Lycaota sodalis</i>
		<i>Selandrini</i>
	Braconidae (Braconid Wasps)	<i>Zele mellea</i>
		<i>Zemiotetes maximus</i>
	Ichneumonidae (Ichneumonid Wasps)	<i>Polyblastus pedalis</i>
		<i>Pimpla pedalis</i>
		<i>Pimpla aequalis</i>
		<i>Liotryphon variatipes</i>
		<i>Therion hilaris</i>
		<i>Ichneumon laetus</i>
		<i>Ichneumon subdolus</i>
		<i>Ichneumon centrator</i>
		<i>Ichneumon deliratorius cinctitarsis</i>
		<i>Ichneumon annulatorius</i>
		<i>Ichneumon feriens</i>
		<i>Ichneumon canadicola</i>
		<i>Ichneumon calcatorius</i>
		<i>Diphyus. flebilis</i>
		<i>Diphyus. ormenus</i>
		<i>Phaeogenes</i> sp.
		<i>Oxytorus antennatus</i>
		<i>Barichneumon sores</i>
		<i>Melanichneumon flavocarina</i>
		<i>Melanichneumon lissrufus</i>
		<i>Cratichneumon scitulus</i>
		<i>Cratichneumon anisotae</i>
		<i>Cratichneumon singnatipes</i>
		<i>Cratichneumon vescus</i>
		<i>Cratichneumon paratus</i>
		<i>Cratichneumon takomae</i>

Order	Family	Species Name
		<i>Cratichneumon sublatus</i>
		<i>Gelis</i> sp.
		<i>Homotherus townesi</i>
		<i>Orgichneumon calcatorius</i>
		<i>Coelichneumon leucographus</i>
		<i>Coelichneumon histricus</i>
		<i>Coelichneumon eximis</i>
		<i>Coelichneumon magniscopa</i>
		<i>Coelichneumon maurus</i>
		<i>Spilicheumon bronteus</i>
		<i>Tricholabus nortonii</i>
		<i>Ctenichneumon ultus</i>
		<i>Ephialtes spatulata</i>
		<i>Ephialtes macra</i>
		<i>Dicaelotus</i> sp.
		<i>Vulgichneumon blandii</i>
		<i>Tricyphus apicalis</i>
		<i>Probolus expunctus</i>
		<i>Platylabus metallicus</i>
		<i>Phygadeuon</i> sp.
		<i>Endasys auriculiferus</i>
		<i>Endasys aurigena</i>
		<i>Endasys rugitexanus</i>
		<i>Dichrogaster crassa</i>
		<i>Mastrus</i> sp.
		<i>Cubocephalus carnosus</i>
		<i>Cubocephalus ardens</i>
		<i>Cubocephalus impressus</i>
		<i>Ceratophygadeuon</i> sp.
		<i>Orthizema</i> sp.
		<i>Gambrus canadensis</i>
		<i>Cryptus albitarsis</i>
		<i>Trychosis montivaga montivaga</i>
		<i>Trychosis semirubra</i>
		<i>Trychosis depilis</i>
		<i>Trychosis sulcata</i>
		<i>Diapetimorpha rufigaster</i>
		<i>Ischnus inquisitorius atricollaris</i>
		<i>Echthronomas lexiphaga</i>
		<i>Sinophorus</i> sp.
		<i>Campoplex</i> sp.
		<i>Phobocampe</i> sp.
		<i>Campoctonus carinatus</i>
		<i>Campodoris</i> sp.
		<i>Phobetes</i> sp.
		<i>Hadrodactylus</i> sp.
		<i>Alexeter</i> sp.
		<i>Anoncus</i> sp.
		<i>Chorinaeus aequalis</i>
		<i>Trieces falvifrons</i>
		<i>Spudaeus indigus</i>
		<i>Exochus dorsalis</i>
		<i>Banchus flavescens</i>
		<i>Syzeuctus elegans</i>

Order	Family	Species Name
		<i>Lissonota coracina</i>
		<i>Lissonota</i> sp.
		<i>Cryptopimpla quadrilineata jocosa</i>
		<i>Thyrateles lugubrador</i>
		<i>Cremastus cressoni</i>
		<i>Bassus annulipes</i>
		<i>Syzeuctus elegans</i>
		<i>Atanycolus ulmocola</i>
		<i>Aleiodes burrus</i>
		<i>Agathis longipalpus</i>
	Vespidae (Wasps, Yellowjackets, Hornets)	<i>Parancistrocerus</i> sp.
	Pompilidae (Spider Wasps)	<i>Anoplius illinoensis</i>
		<i>Anoplius insolens</i>
		<i>Anoplius cylindricus</i>
		<i>Anoplius semirufus</i>
		<i>Anoplius cylindricus</i>
		<i>Arachnospila arctus</i>
		<i>Poecilopompilus algidus algidus</i>
	Sphecidae (Sphecid Wasps, Digger, Sand-Loving, and Thread-Waisted Wasps)	<i>Isodontia mexicana</i>
		<i>Spex pennsylvanicus</i>
		<i>Ectemnius continuus</i>
		<i>Lestica producticollis</i>
		<i>Tachysphex pompliformis</i>
		<i>Tachysphex semirufus</i>
		<i>Tachysphex tarsatus</i>
		<i>Tachysphex similis</i>
		<i>Tachysphex antennatus</i>
		<i>Microbembex monodonta</i>
	Mutillidae (Velvet Ants)	<i>Timulla vagens vagens</i>
		<i>Pseudomethoca simillina</i>
		<i>Dasymutilla vesta vesta</i>
		<i>Dasymutilla quadrigutata</i>
		<i>Dasymutilla nigripes</i>
		<i>Dasymutilla canella</i>

\*State Record  
\*\*County Record

**Appendix F, Table 6. Federal and State Endangered, Threatened, and Special Concern Species that have been documented on Fort McCoy as of March 2012.**

**Endangered**

**BIRDS**

Peregrine Falcon(FE/SE)\*  
 Caspian Tern(SE/)\*  
 Forester's Tern(SE)\*  
 Common Tern(SE/FSC)\*  
 Loggerhead Shrike (SE/FSC)\*

**MAMMALS**

**REPTILES & AMPHIBIANS**

Slender Glass Lizard(SE)  
 Blanchard's Cricket  
 Frog(SE)\*\*\*

**INSECTS**

Karner Blue Butterfly(FE)  
 Phlox Moth(SE/FSC)  
 Red-Tailed Prairie  
 Leafhopper(SE/FSC)  
 Regal Fritillary Butterfly(SE/FSC)

**PLANTS**

Rough White  
 Lettuce(SE)  
 Smoothed-Sheathed  
 Sedge (SE)  
 Blue-Stemmed  
 Goldenrod (SE)  
 Prairie Bush-Clover (SE)

**Threatened**

**BIRDS**

Red-shouldered Hawk(ST)\*\*  
 Great Egret (ST)  
 Cerulean Warbler (ST/FSC)\*\*  
 Bell's Vireo(ST)\*  
 Henslow's Sparrow(ST/FSC)\*  
 Hooded Warbler (ST)\*\*

**MAMMALS**

Big Brown Bat(ST)  
 Little Brown Bat(ST)  
 Northern Long-eared Bat(ST)  
 Eastern Pipistrelle(ST)

**REPTILES**

Wood Turtle(ST)  
 Blanding's Turtle(ST/FSC)

**INSECTS**

Frosted Elfin(ST)

**PLANTS**

Yellowish Gentian(ST)  
 Brittle Prickly Pear(ST)  
 Bog Bluegrass(ST/FSC)  
 Prairie Parsley(ST)  
 Dwarf Milkweed(ST)  
 Large Water Starwort(ST)  
 Evening Campion (ST)  
 Midwestern White  
 Heart-Leaved Aster (ST)

**Federal Special Concern**

**BIRDS**

Black Tern\*  
 Common Tern (SE)  
 Cerulean Warbler (ST/FSC)\*  
 Henslow's Sparrow (ST/FSC)\*  
 Northern Goshawk (FSC)\*\*  
 Loggerhead Shrike (SE)\*

**MAMMALS**

**REPTILES**

Blanding's Turtle(ST)

**INSECTS**

Tawny Crescent Spot  
 Phlox Moth(SE/FSC)  
 Red-Tailed Prairie  
 Leafhopper(SE/FSC)  
 Regal Fritillary Butterfly (SE/FSC)

**PLANTS**

Prairie Fame Flower  
 Bog Bluegrass(ST)

FE = Federally Endangered Species

SE = State Endangered Species

FT = Federally Threatened Species

ST = State Threatened Species

FSC = Federal Species of Concern

\* = Occasional/rare visitor, not known to breed on Fort McCoy, normally only observed during spring and/or fall migrations

\*\* = Known to breed on Fort McCoy

\*\*\* = Documented in historical records, not observed within the last 10 years

Appendix F, Table 7. Comprehensive List of Flora for Fort McCoy, WI

Nomenclature and codes follow the guidance of USDA, NRCS, 1999  
National List of Scientific Plant Names, The Plants Database,  
National Plant Data Center, (<http://plants.usda.gov/plants>), Baton Rouge, LA 70874-4490, USA.

PLANTS IN ALL CAPS ARE NON-NATIVE

Status plants are in bold.

Scientific names followed by "SC" are State Special Concern taxon.

Scientific names followed by "END" are State Endangered.

Scientific names followed by "THR" are State Threatened.

Scientific names followed by "FEDTHR" are Federally Threatened.

SCIENTIFIC NAME	VARIATIONS	COMMON NAME	FAMILY
<i>Acalypha virginica</i>		Three seeded mercury	Euphorbiaceae
<i>Acer negundo</i>		Box elder	Aceraceae
<i>Acer rubrum</i>		Red maple	Aceraceae
<i>Acer saccharinum</i>		Silver maple	Aceraceae
<i>Acer spicatum</i>		Mountain maple	Aceraceae
<b>ACHILLEA MILLIFOLIUM</b>		Yarrow	Asteraceae
<i>Actaea pachypoda</i>		White baneberry	Ranunculaceae
<i>Actaea rubra</i>		Baneberry	Ranunculaceae
<i>Adiantum pedatum</i>		Maidenhair fern	Pteridaceae
<i>Agalinis purpurea</i>		Pink gerardia	Scrophulariaceae
<i>Agalinis tenuifolia</i>		Slender gerardia	Scrophulariaceae
<i>Ageratina altissima</i>		White snakeroot	Asteraceae
<i>Ageratina altissima</i>	var. <i>altissima</i>	White snakeroot	Asteraceae
<b>AGRIMONIA EUPATORIA</b>		Agrimony	Rosaceae
<i>Agrimonia gryposepala</i>		Agrimony	Rosaceae
<b>AGROSTIS GIGANTEA</b>		Redtop	Poaceae
<i>Agrostis perennans</i>		Upland bentgrass	Poaceae
<i>Agrostis scabra</i>		Bent grass	Poaceae
<i>Agrostis stolonifera</i>		Red top	Poaceae
<b>AJUGA REPTANS</b>		Bugleweed	Lamiaceae
<i>Aletris farinosa</i>		Colic root	Liliaceae
<i>Alisma subcordatum</i>		American water plantain	Alismataceae
<i>Alisma triviale</i>		Northern water plantain	Alismataceae
<i>Allium tricoccum</i>		Wild leek	Liliaceae
<i>Alnus incana</i>	ssp. <i>rugosa</i>	Speckled alder	Betulaceae
<i>Amaranthus albus</i>		Tumbleweed	Amaranthaceae
<b>AMARANTHUS RETROFLEXUS</b>		Green amaranth	Amaranthaceae
<i>Ambrosia artemisiifolia</i>		Ragweed	Asteraceae
<i>Ambrosia psilostachya</i>		Ragweed	Asteraceae
<i>Ambrosia trifida</i>		Giant ragweed	Asteraceae
<i>Amelanchier arborea</i>		Serviceberry	Rosaceae
<i>Amelanchier bartramiana</i>		Bartrams Juneberry	Rosaceae
<i>Amelanchier interior</i>		Pacific serviceberry	Rosaceae
<i>Amelanchier sanguinea</i>		Juneberry	Rosaceae
<i>Amelanchier stolonifera</i>		Running serviceberry	Rosaceae
<i>Ammophila breviligulata</i>		Beach grass	Poaceae
<i>Amorpha canescens</i>		Lead plant	Fabaceae
<i>Amorpha fruticosa</i>		False indigo	Fabaceae
<i>Amphicarpaea bracteata</i>		Hog peanut	Fabaceae
<i>Anaphalis margaritacea</i>		Pearly everlasting	Asteraceae
<i>Andropogon gerardi</i>		Big bluestem	Poaceae
<i>Androsace occidentalis</i>		Western rockjasmine	Primulaceae
<i>Anemone canadensis</i>		Canada anemone	Ranunculaceae
<i>Anemone cylindrica</i>		Thimbleweed	Ranunculaceae
<i>Anemone quinquefolia</i>		Wood anemone	Ranunculaceae
<i>Anemone virginiana</i>		Thimbleweed	Ranunculaceae
<i>Angelica atropurpurea</i>		Purplestem angelica	Apiaceae

SCIENTIFIC NAME	VARIATIONS	COMMON NAME	FAMILY
Antennaria neglecta		Pussy-toes	Asteraceae
Antennaria plantaginifolia		Plantain leaved pussy toes	Asteraceae
ANTHEMIS COTULA		Dog fennel	Asteraceae
Apios americana		Ground nut	Fabaceae
Apocynum androsaemifolium		Dogbane	Apocynaceae
Apocynum cannabinum		Indian hemp	Apocynaceae
Apocynum X floribundum		Intermediate dogbane	Apocynaceae
Aquilegia canadensis		Columbine	Ranunculaceae
ARABIDOPSIS THALIANA		Mouse eared cress	Brassicaceae
Arabis canadensis		Sickle pod	Brassicaceae
Arabis glabra		Tower rockcress	Brassicaceae
Arabis hirsuta		Hairy rockcress	Brassicaceae
Arabis lyrata		Rock cress	Brassicaceae
Aralia hispida		Bristly sarsaparilla	Araliaceae
Aralia nudicaulis		Wild sarsaparilla	Araliaceae
Aralia racemosa		Spikenard	Araliaceae
ARCTIUM MINUS		Burdock	Asteraceae
Arctostaphylos uva-ursi		Bearberry	Ericaceae
ARENARIA SERPYLLIFOLIA		Thyme leaved sandwort	Caryophyllaceae
Arisaema triphyllum	ssp. triphyllum	Jack in the pulpit	Araceae
Aristida basiramea		Forked threeawn	Poaceae
<b>Aristida dichotoma "SC"</b>		Poverty grass	Poaceae
Aristida longespica	var. geniculata	Slimspike threeawn	Poaceae
Aristida oligantha		Prairie threeawn	Poaceae
Aristida purpupascens		Arrowfeather threeawn	Poaceae
Aristida tuberculosa		Triple awn grass	Poaceae
ARMORACIA RUSTICANA		Horseradish	Brassicaceae
ARRHENATHERUM ELATIUS		Tall oats grass	Poaceae
Artemisia campestris		Wormwood	Asteraceae
Artemisia campestris	ssp. caudata	Tall wormwood	Asteraceae
<b>Artemisia frigida "SC"</b>		Prairie sagewort	Asteraceae
Artemisia ludoviciana		White sage	Asteraceae
Asarum canadense		Wild ginger	Aristolochiaceae
Asclepias amplexicaulis		Blunt leaved milkweed	Asclepiadaceae
Asclepias exaltata		Poke milkweed	Asclepiadaceae
Asclepias incarnata		Swamp milkweed	Asclepiadaceae
<b>Asclepias ovalifolia "THR"</b>		Oval leaved milkweed	Asclepiadaceae
Asclepias perennis		Milkweed	Asclepiadaceae
<b>Asclepias purpurascens "END"</b>		Purple milkweed	Asclepiadaceae
Asclepias syriaca		Milkweed	Asclepiadaceae
Asclepias tuberosa		Butterfly weed	Asclepiadaceae
Asclepias verticillata		Whorled milkweed	Asclepiadaceae
ASPARAGUS OFFICINALIS		Asparagus	Liliaceae
Asplenium platyneuron		Ebony spleenwort	Aspleniaceae
Athyrium filixfemina	ssp. angustum	Subarctic ladyfern	Polypodiaceae
Athyrium filixfemina		Lady fern	Polypodiaceae
Aureolaria grandiflora		False foxglove	Scrophulariaceae
Aureolaria pedicularia		Fern leaved false foxglove	Scrophulariaceae
Aureolaria pedicularia	var. ambigens	Fern leaved false foxglove	Scrophulariaceae
AVENA SATIVA		Oats	Poaceae
Baptisia alba	var. macrophylla	Wild white indigo	Fabaceae
Baptisia bracteata		Prairie wild indigo	Fabaceae
Baptisia bracteata	var. leucophaea	Prairie wild indigo	Fabaceae
<b>Baptisia tinctoria "SC"</b>		Wild indigo	Fabaceae
BARBAREA VULGARIS		Winter cress	Brassicaceae
<b>Bartonia virginica "SC"</b>		Screwstem	Gentianaceae
BERBERIS THUNBERGII		Barberry	Berberidaceae
BERTEROA INCANA		Hoary alyssum	Brassicaceae
Betula alleghaniensis		Yellow birch	Betulaceae
Betula papyrifera		Paper birch	Betulaceae

SCIENTIFIC NAME	VARIATIONS	COMMON NAME	FAMILY
Betula pumila		Swamp birch	Betulaceae
Bidens bipinnata		Spanish needles	Asteraceae
Bidens cernua		Beggar ticks	Asteraceae
Bidens connata		Beggar ticks	Asteraceae
Bidens coronata		Bur marigold	Asteraceae
Bidens frondosa		Beggar ticks	Asteraceae
Bidens tripartita		Beggar ticks	Asteraceae
Boehmeria cylindrica		False nettle	Urticaceae
Botrychium dissectum		Grape fern	Ophioglossaceae
Botrychium virginianum		Rattlesnake fern	Ophioglossaceae
Bouteloua curtipendula		Side oats gramma	Poaceae
Bouteloua hirsuta		Gramma grass	Poaceae
Brachyelytrum septentrionale		Northern shorthusk	Poaceae
Brasenia schreberi		Water shield	Cabombaceae
Bromus ciliatus		Fringed brome	Poaceae
BROMUS INERMIS	ssp. inermis	Awnless brome grass	Poaceae
BROMUS JAPONICUS		Japanese brome	Poaceae
Bromus kalmii		Artic brome	Poaceae
Bromus latiglumis		Earlyleaf brome	Poaceae
BROMUS TECTORUM		Cheatgrass	Poaceae
BUGLOSSOIDES ARVENSIS		Corn gromwell	Boraginaceae
Calamagrostis canadensis		Bluejoint	Poaceae
<b>Callitriche heterophylla "THR"</b>		Large water starwort	Callitrichaceae
Calopogon tuberosis		Grass pink	Orchidaceae
Caltha palustris		Marsh marigold	Ranunculaceae
Calystegia sepium	ssp. americana	Hedge bindweed	Convolvulaceae
Calystegia silvatica	ssp. fraterniflora	Hedge bindweed	Convolvulaceae
Calystegia spithamea	ssp. spithamea	Erect bindweed	Convolvulaceae
Camassia quamash		Small camas	Liliaceae
Campanula aparinoides		Marsh bellflower	Campanulaceae
Campanula rotundifolia		Harebell	Campanulaceae
CANNABIS SATIVA		Marijuana	Cannabaceae
CAPSELLA BURSAPASTORIS		Pick pocket	Brassicaceae
CARAGANA ARBORESCENS		Siberian peashrub	Fabaceae
Cardamine pennsylvanica		Bitter cress	Brassicaceae
CARDARIA DRABA		Whitetop	Brassicaceae
Carex aggregata		Glomerate sedge	Cyperaceae
Carex albicans	var. emmonsii	Emmon's sedge	Cyperaceae
Carex annectens		Yellowfruit sedge	Cyperaceae
Carex aquatilis		Water sedge	Cyperaceae
Carex arctata		Drooping sedge	Cyperaceae
Carex bicknellii		Bicknell's sedge	Cyperaceae
Carex bromoides		Bromelike sedge	Cyperaceae
Carex brunnescens		Brownish sedge	Cyperaceae
Carex buxbaumii		Buxbaum's sedge	Cyperaceae
Carex canescens		Silvery sedge	Cyperaceae
Carex crawfordii		Crawford's sedge	Cyperaceae
Carex crinita	var. crinita	Fringed sedge	Cyperaceae
Carex cristatella		Crested sedge	Cyperaceae
Carex debilis		White edge sedge	Cyperaceae
Carex diandra		Lesser panicled sedge	Cyperaceae
Carex disperma		Softleaf sedge	Cyperaceae
Carex echinata		Star sedge	Cyperaceae
Carex festucacea		Fescue sedge	Cyperaceae
Carex filifolia		Threadleaf sedge	Cyperaceae
Carex foenea		Dry spike sedge	Cyperaceae
<b>Carex folliculata "SC"</b>		Northern long sedge	Cyperaceae
Carex frankii		Frank's sedge	Cyperaceae
Carex gracillima		Graceful sedge	Cyperaceae
Carex gynandra		Nodding sedge	Cyperaceae

SCIENTIFIC NAME	VARIATIONS	COMMON NAME	FAMILY
Carex houghtoniana		Houghton's sedge	Cyperaceae
Carex hystericina		Bottlebrush sedge	Cyperaceae
Carex intumescens		Greater bladder sedge	Cyperaceae
Carex lacustris		Hairy sedge	Cyperaceae
Carex laxiflora		Broad looseflower sedge	Cyperaceae
<b>Carex lenticularis "THR"</b>		Lakeshore sedge	Cyperaceae
Carex leptoneura		Nerveless woodland sedge	Cyperaceae
Carex lurida		Shallow sedge	Cyperaceae
Carex muehlenbergii		Muhlenberg's sedge	Cyperaceae
Carex muskingumensis		Muskingum sedge	Cyperaceae
Carex normalis		Greater straw sedge	Cyperaceae
Carex oligosperma		Fewseed sedge	Cyperaceae
Carex pennsylvanica		Pennsylvania sedge	Cyperaceae
Carex praegracilis		Clustered field sedge	Cyperaceae
Carex projecta		Necklace sedge	Cyperaceae
Carex rosea		Rosy sedge	Cyperaceae
Carex rostrata		Beaked sedge	Cyperaceae
Carex scoparia		Broom sedge	Cyperaceae
Carex sterilis		Dioecious sedge	Cyperaceae
Carex stipata		Owlfruit sedge	Cyperaceae
Carex stricta		Upright sedge	Cyperaceae
<b>Carex suberecta "SC"</b>		Prairie straw sedge	Cyperaceae
Carex tosa		Shaved sedge	Cyperaceae
Carex tribuloides		Blunt broom sedge	Cyperaceae
Carex trisperma		Three seeded sedge	Cyperaceae
Carex vesicaria		Blister sedge	Cyperaceae
Carex vulpinoidea		Fox sedge	Cyperaceae
Carpinus caroliniana		Blue beech	Betulaceae
Carya cordiformis		Bitternut hickory	Juglandaceae
Carya ovata		Shagbark hickory	Juglandaceae
Castilleja coccinea		Indian paintbrush	Scrophulariaceae
Catalpa speciosa		Northern catalpa	Bignoniaceae
Caulophyllum thalictroides		Blue cohosh	Berberidaceae
Ceanothus americanus		New Jersey tea	Rhamnaceae
Ceanothus herbaceus		New Jersey tea	Rhamnaceae
Celastrus scandens		American bittersweet	Celastraceae
Cenchrus longispinus		Sandbur	Poaceae
CENTAUREA BIEBERSTEINII		Spotted knapweed	Asteraceae
CENTAUREA NIGRA		Black knapweed	Asteraceae
CERASTIUM FONTANUM		Mouse eared chickweed	Caryophyllaceae
CERASTIUM FONTANUM	ssp. VULGARE	Chickweed	Caryophyllaceae
Cerastium nutans		Mouse eared chickweed	Caryophyllaceae
CHAENORHINUM MINUS		Dwarf snapdragon	Scrophulariaceae
Chamaedaphne calyculata		Leather leaf	Ericaceae
Chamaesyce glyptosperma		Spurge	Euphorbiaceae
Chamaesyce maculata		Milk purslane	Euphorbiaceae
Chamerion angustifolium		Fireweed	Onagraceae
Chelone glabra		Turtle head	Scrophulariaceae
Chenopodium album		Lambs quarters	Chenopodiaceae
Chenopodium leptophyllum		Narrowleaf goosefoot	Chenopodiaceae
Chenopodium simplex		Maple leaved goosefoot	Chenopodiaceae
Chimaphila umbellata		Pipsissewa	Pyrolaceae
Chrysosplenium americanum		American golden saxifrage	Saxifragaceae
CICHORIUM INTYBUS		Chicory	Asteraceae
Cicuta bulbifera		Water hemlock	Apiaceae
Cicuta maculata		Water hemlock	Apiaceae
Cinna arundinacea		Sweet woodreed	Poaceae
Cinna latifolia		Drooping woodreed	Poaceae
Circaea alpina		Small enchanter's nightshade	Onagraceae
Circaea lutetiana	ssp. canadensis	Enchanters nightshade	Onagraceae



SCIENTIFIC NAME	VARIATIONS	COMMON NAME	FAMILY
CIRSIIUM ARVENSE		Canada thistle	Asteraceae
Cirsium discolor		Field thistle	Asteraceae
Cirsium muticum		Swamp thistle	Asteraceae
CIRSIIUM VULGARE		Bull thistle	Asteraceae
Clematis virginiana		Virgin's bower	Ranunculaceae
Clinopodium vulgare		Wild basil	Lamiaceae
Clintonia borealis		Corn lily	Liliaceae
Comandra umbellata		Toad flax	Santalaceae
Comptonia peregrina		Sweet fern	Myricaceae
CONVOLVULUS ARVENSIS		Field bindweed	Convolvulaceae
Conyza canadensis		Horseweed	Asteraceae
Coptis trifolia		Goldthread	Ranunculaceae
Coreopsis palmata		Stiff coreopsis	Asteraceae
Cornus alternifolia		Dogwood	Cornaceae
Cornus amomum		Silky dogwood	Cornaceae
Cornus canadensis		Bunchberry	Cornaceae
Cornus racemosa		Dogwood	Cornaceae
Cornus rugosa		Roundleaf dogwood	Cornaceae
Cornus sericea	ssp. sericea	Red osier dogwood	Cornaceae
CORONILLA VARIA		Crown vetch	Fabaceae
Corylus americana		Hazelnut	Betulaceae
Corylus cornuta		Beaked hazelnut	Betulaceae
Crataegus pruinosa		Hawthorn	Rosaceae
Crataegus chrysoarpa		Hawthorn	Rosaceae
Crataegus punctata		Hawthorn	Rosaceae
CREPIS CAPILLARIS		Hawk's beard	Asteraceae
CREPIS TECTORUM		Hawk's beard	Asteraceae
<b>Crotalaria sagittalis "SC"</b>		Rattlebox	Fabaceae
Cryptotaenia canadensis		Honewort	Apiaceae
Cuscuta gronovii		Dodder	Convolvulaceae
Cycloloma atriplicifolium		Winged pigweed	Chenopodiaceae
Cyperus bipartitus		Slender flatsedge	Cyperaceae
Cyperus filiformis		Wiry flatsedge	Cyperaceae
Cyperus houghtonii		Houghton's flatsedge	Cyperaceae
Cyperus lupulinus	ssp. lupulinus	Nut grass	Cyperaceae
Cyperus odoratus		Fragrant flatsedge	Cyperaceae
Cyperus schweinitzii		Schweinitz's flatsedge	Cyperaceae
Cyperus strigosus		Straw colored flatsedge	Cyperaceae
Cypripedium acaule		Pink lady slipper	Orchidaceae
<b>Cypripedium parviflorum "SC"</b>		Small yellow lady slipper	Orchidaceae
Cypripedium pubescens	var. pubescens	Yellow lady slipper	Orchidaceae
Cystopteris tenuis		Fragile fern	Dryopteridaceae
Dactylis glomerata	ssp. glomerata	Orchard grass	Poaceae
Dalea candida		White prairie clover	Fabaceae
Dalea purpurea		Purple prairie clover	Fabaceae
Danthonia spicata		Wild oats grass	Poaceae
DAUCUS CAROTA		Queen Anne's Lace	Apiaceae
Delphinium carolinianum	ssp. virescens	Prairie larkspur	Ranunculaceae
<b>Deschampsia cespitosa "SC"</b>		Tufted hairgrass	Poaceae
<b>Deschampsia flexuosa "SC"</b>		Wavy hairgrass	Poaceae
Desmodium canadense		Canada tick trefoil	Fabaceae
Desmodium glutinosum		Tick trefoil	Fabaceae
Desmodium nudiflorum		Tick trefoil	Fabaceae
DIANTHUS ARMERIA		Deptford pink	Caryophyllaceae
Dichanthelium boreale		Northern panic grass	Poaceae
Dichanthelium acuminatum	var. fasciculatum	Western panic grass	Poaceae
Dichanthelium clandestinum		Deer tongue grass	Poaceae
Dichanthelium commutatum		Variable panic grass	Poaceae
Dichanthelium depauperatum		Starved panic grass	Poaceae
Dichanthelium dichotomum		Cypress panic grass	Poaceae

SCIENTIFIC NAME	VARIATIONS	COMMON NAME	FAMILY
Dichanthelium latifolium		Broadleaf rosette grass	Poaceae
Dichanthelium leibergii		Leiberg's panic grass	Poaceae
Dichanthelium linearifolium		Slimleaf panic grass	Poaceae
Dichanthelium oligosanthes		Heller's rosette grass	Poaceae
Dichanthelium ovale		Eggleaf rosette grass	Poaceae
Dichanthelium sabulorum	var. thinium	Hemlock rosette grass	Poaceae
Dichanthelium villosissimum	var. villosissimum	Whitehair rosette grass	Poaceae
Dichanthelium xanthophyllum		Slender rosette grass	Poaceae
Diervilla lonicera		Bush honeysuckle	Caprifoliaceae
Digitaria cognata	var. cognata	Fall witch grass	Poaceae
DIGITARIA ISCHAEMUM		Crab grass	Poaceae
Digitaria sanguinalis		Hairy crabgrass	Poaceae
Digitaria texana		Texas crabgrass	Poaceae
Dioscorea villosa		Wild yam	Dioscoreaceae
Doellingeria umbellata	var. umbellata	Flat topped aster	Asteraceae
Doellingeria umbellata	var. pubens	Parasol whitetop	Asteraceae
Draba reptans		Carolina draba	Brassicaceae
Drosera intermedia		Sundew	Droseraceae
Drosera rotundifolia		Sundew	Droseraceae
Dryopteris carthusiana		Spinulose woodfern	Dryopteridaceae
<b>Dryopteris clintoniana "SC"</b>		Clinton's woodfern	Dryopteridaceae
Dryopteris cristata		Crested shield fern	Dryopteridaceae
<b>Dryopteris expansa "SC"</b>		Spreading woodfern	Dryopteridaceae
Dulichium arundinaceum		Three way sedge	Cyperaceae
ECHINOCHLOA CRUSGALLI		Barnyard grass	Poaceae
Echinochloa muricata		Barnyard grass	Poaceae
Echinocystis lobata		Wild cucumber	Cucurbitaceae
ELAEAGNUS ANGUSTIFOLIA		Russian olive	Elaeagnaceae
Elaeagnus commutata		Silverberry	Elaeagnaceae
ELAEAGNUS UMBELLATA		Autumn olive	Elaeagnaceae
Eleocharis acicularis		Spike rush	Cyperaceae
Eleocharis obtusa		Blunt spike rush	Cyperaceae
Eleocharis palustris		Spikerush	Cyperaceae
Elodea canadensis		Waterweed	Hydrocharitaceae
Elymus canadensis		Wild rye	Poaceae
Elymus hystrix	var. hystrix	Bottle brush grass	Poaceae
ELYMUS REPENS		Quackgrass	Poaceae
Elymus riparius		Riverbank rye	Poaceae
Elymus trachycaulus	ssp. trachycaulus	Slender wheatgrass	Poaceae
Elymus villosus		Wild rye	Poaceae
Epigaea repens		Trailing arbutus	Ericaceae
Epilobium ciliatum	ssp. ciliatum	Willow herb	Onagraceae
Epilobium ciliatum	ssp. glandulosum	Fringed willow herb	Onagraceae
Epilobium coloratum		Purpleleaf willow herb	Onagraceae
Epilobium leptophyllum		Bob willow herb	Onagraceae
Equisetum arvense		Horsetail	Equisitaceae
Equisetum fluviatile		Water horsetail	Equisitaceae
Equisetum hyemale	var. affine	Scouring rush	Equisitaceae
Equisetum laevigatum		Smooth scouring rush	Equisitaceae
Equisetum pratense		Meadow horsetail	Equisitaceae
Equisetum sylvaticum		Horsetail	Equisitaceae
Eragrostis capillaris		Lace grass	Poaceae
ERAGROSTIS CILIANENSIS		Stink grass	Poaceae
ERAGROSTIS MINOR		Little love grass	Poaceae
Eragrostis pectinacea		Love grass	Poaceae
Eragrostis spectabilis		Purple love grass	Poaceae
Erechtites hieraciifolia		Burnweed	Asteraceae
Erigeron annuus		Daisy fleabane	Asteraceae
Erigeron pulchellus		Fleabane	Asteraceae
Erigeron strigosus		Fleabane	Asteraceae

SCIENTIFIC NAME	VARIATIONS	COMMON NAME	FAMILY
Eriophorum angustifolium		Cotton grass	Cyperaceae
Eriophorum tenellum		Fewnerved cotton grass	Cyperaceae
Eriophorum virginicum		Tawny cotton grass	Cyperaceae
Erysimum inconspicuum		Shy wallflower	Brassicaceae
Eupatorium fistulosum		Trumpetweed	Asteraceae
Eupatorium maculatum	var. maculatum	Joe pye weed	Asteraceae
Eupatorium perfoliatum		Boneset	Asteraceae
Eupatorium semiserratum		Smallflower thoroughwort	Asteraceae
Euphorbia corollata		Flowering spurge	Euphorbiaceae
EUPHORBIA CYPARISSIAS		Cypress spurge	Euphorbiaceae
Euphorbia dentata		Toothed spurge	Euphorbiaceae
EUPHORBIA ESULA		Leafy spurge	Euphorbiaceae
Euphorbia heterophylla		Fire-on-the mountain	Euphorbiaceae
Eurybia furcata		Aster	Asteraceae
Eurybia macrophylla		Large leaf aster	Asteraceae
Euthamia graminifolia		Grass leaved goldenrod	Asteraceae
Euthamia gymnospermoides		Texas goldentop	Asteraceae
FAGOPYRUM ESCULENTUM		Buckwheat	Polygonaceae
FAGOPYRUM TATORICUM		Buckwheat	Polygonaceae
FESTUCA OVINA		Sheep's fescue	Poaceae
Festuca rubra		Red fescue	Poaceae
Festuca subverticillata		Nodding fescue	Poaceae
Floerkea proserpinacoides		False mermaid	Limnanthaceae
Fragaria vesca	ssp. americana	Woodland strawberry	Rosaceae
Fragaria virginiana		Wild strawberry	Rosaceae
FRANGULA ALNUS		European buckthorn	Rhamnaceae
Fraxinus nigra		Black ash	Oleaceae
Fraxinus pennsylvanica		Green ash	Oleaceae
Froelichia floridana		Cottonweed	Amaranthaceae
Galium aparine		Bedstraw	Rubiaceae
Galium asprellum		Rough bedstraw	Rubiaceae
Galium boreale		Northern bedstraw	Rubiaceae
Galium circaezans		Licorice bedstraw	Rubiaceae
Galium concinnum		Bedstraw	Rubiaceae
Galium obtusum	ssp. filifolium	Bluntleaf bedstraw	Rubiaceae
<b>Galium palustre "SC"</b>		Marsh bedstraw	Rubiaceae
Galium triflorum		Fragrant bedstraw	Rubiaceae
Gaultheria procumbens		Wintergreen	Ericaceae
Gaylussacia baccata		Huckleberry	Ericaceae
<b>Gentiana alba "THR"</b>		Cream gentian	Gentianaceae
Gentiana andrewsii		Closed gentian	Gentianaceae
Gentianopsis crinita		Fringed gentian	Gentianaceae
Geranium bicknellii		Cranesbill	Geraniaceae
Geranium maculatum		Wild geranium	Geraniaceae
Geum canadense		Avens	Rosaceae
Geum lacinatedum		Rough avens	Rosaceae
Geum macrophyllum		Large leaved avens	Rosaceae
Geum triflorum		Prairie smoke	Rosaceae
Geum virginianum		Cream colored avens	Rosaceae
GLECHOMA HEDERACEA		Ground ivy	Lamiaceae
Gleditsia triacanthos		Honey locust	Fabaceae
Glyceria canadensis		Rattlesnake manna grass	Poaceae
Glyceria grandis	ssp. grandis	Reed meadow grass	Poaceae
Glyceria striata		Fowl meadow grass	Poaceae
GLYCINE MAX		Soybean	Fabaceae
GNAPHALIUM ULIGINOSUM		Everlasting	Asteraceae
Goodyera pubescens		Rattlesnake plantain	Orchidaceae
Gratiola neglecta		Clammy hedge hyssop	Scrophulariaceae
Grindelia squarrosa		Gumweed	Asteraceae
Hackelia virginiana		Stickseed	Boraginaceae

SCIENTIFIC NAME	VARIATIONS	COMMON NAME	FAMILY
Hamamelis virginiana		Witch hazel	Hamamelidaceae
Hedeoma hispida		Grass leaved pennyroyal	Lamiaceae
Hedeoma pulegioides		American pennyroyal	Lamiaceae
Helenium autumnale		Sneezeweed	Asteraceae
Helianthemum bicknellii		Frostweed	Cistaceae
Helianthemum canadense		Frostweed	Cistaceae
Helianthus giganteus		Tall sunflower	Asteraceae
Helianthus grosseserratus		Sawtooth sunflower	Asteraceae
Helianthus hirsutus		Sunflower	Asteraceae
Helianthus mollis		Ashy sunflower	Asteraceae
Helianthus occidentalis		Naked sunflower	Asteraceae
Helianthus pauciflorus	ssp. subrhomboideus	Stiff sunflower	Asteraceae
Helianthus strumosus		Woodland sunflower	Asteraceae
Helianthus X laetiflorus		Showy sunflower	Asteraceae
Heliopsis helianthoides		Ox eye	Asteraceae
HEMEROCALLIS FULVA		Day lily	Liliaceae
Hepatica nobilis		Hepatica	Ranunculaceae
Hesperostipa spartea		Needle grass	Poaceae
Heuchera americana		Alum-root	Saxifragaceae
Heuchera richardsonii		Alum-root	Saxifragaceae
HIERACIUM AURANTICUM		Orange hawkweed	Asteraceae
HIERACIUM CAESPITOSUM		Field hawkweed	Asteraceae
Hieracium canadense		Hawkweed	Asteraceae
Hieracium gronovii		Queendevil	Asteraceae
Hieracium longipilum		Hairy hawkweed	Asteraceae
Hieracium paniculatum		Allegheny hawkweed	Asteraceae
Hieracium scabrum		Rough hawkweed	Asteraceae
HIERACIUM X FLORIBUNDUM		King devil	Asteraceae
Hierochloa odorata		Vanilla grass	Poaceae
Hordeum jubatum	ssp. jubatum	Squirrel tail grass	Poaceae
Houstonia longifolia		Long leaf bluets	Rubiaceae
Humulus lupulus		Hops	Moraceae
Huperzia lucidula		Shining clubmoss	Lycopodiaceae
Hydrocotyle americana		Water pennywort	Apiaceae
Hydrophyllum virginianum		Shawnee salad	Hydrophyllaceae
Hypericum ascyron		Great St. John's wort	Clusiaceae
Hypericum canadense		Canadian St. John's wort	Clusiaceae
Hypericum drummondii		St. John's wort	Clusiaceae
Hypericum kalmianum		St. John's wort	Clusiaceae
Hypericum majus		St. John's wort	Clusiaceae
Hypericum mutilum		St. John's wort	Clusiaceae
HYPERICUM PERFORATUM		St. John's wort	Clusiaceae
Hypericum prolificum		Shrubby St. John's wort	Clusiaceae
Hypericum punctatum		St. John's wort	Clusiaceae
Hypoxis hirsuta		Stargrass	Amaryllidaceae
Ilex decidua		Possumhaw	Aquifoliaceae
Ilex verticillata		Winterberry	Aquifoliaceae
Impatiens capensis		Jewelweed	Balsaminaceae
IRIS PSEUDACORUS		Yellow iris	Iridaceae
Iris versicolor		Blue flag	Iridaceae
Iris virginica		Virginia iris	Iridaceae
Iris virginica	var. shrevei	Shreve's iris	Iridaceae
Isotria verticillata		Whorled pogonia	Orchidaceae
Juglans cinerea		Butternut	Juglandaceae
Juglans nigra		Black walnut	Juglandaceae
Juncus acuminatus		Tapertip rush	Juncaceae
Juncus alpinoarticulatus	ssp. nodulosus	Northern green rush	Juncaceae
Juncus brachycephalis		Smallhead rush	Juncaceae
Juncus brevicaudatus		Narrowpanicle rush	Juncaceae
Juncus canadensis		Canadian rush	Juncaceae

SCIENTIFIC NAME	VARIATIONS	COMMON NAME	FAMILY
Juncus effusus	var. solutus	Soft rush	Juncaceae
Juncus greenii		Greene's rush	Juncaceae
Juncus interior		Path rush	Juncaceae
Juncus nodosus		Rush	Juncaceae
Juncus tenuis		Path rush	Juncaceae
Juniperus communis		Juniper	Cupressaceae
Juniperus virginiana		Red cedar	Cupressaceae
Koeleria macrantha		June grass	Poaceae
Krigia biflora		Two flowered Cynthia	Asteraceae
Krigia caespitosa		Weedy dwarf dandelion	Asteraceae
Krigia virginica		Virginia dwarf dandelion	Asteraceae
Lactuca biennis		Lettuce	Asteraceae
Lactuca canadensis		Canada lettuce	Asteraceae
Lactuca hirsuta		Hairy lettuce	Asteraceae
Lactuca ludoviciana		Lettuce	Asteraceae
LACTUCA SERRIOLA		Prickly lettuce	Asteraceae
LAMIUM PURPUREUM		Purple dead nettle	Lamiaceae
Laportea canadensis		Stinging nettle	Urticaceae
LARIX DECIDUA		European larch	Pinaceae
Larix laricina		Tamarack	Pinaceae
Lathyrus ochroleucus		Cream pea	Fabaceae
Lathyrus palustris		Vetchling	Fabaceae
Layia carnosa		Beach tidytips	Asteraceae
Lechea mucronata		Hairy pinweed	Cistaceae
Lechea pulchella		Pinweed	Cistaceae
Lechia intermedia		Pinweed	Cistaceae
Lechia stricta		Pinweed	Cistaceae
Lechia tenuifolia		Narrow leaved pinweed	Cistaceae
Leersia oryzoides		Rice cut grass	Poaceae
Lemna minor		Duckweed	Lemnaceae
LEONURUS CARDIACA		Motherwort	Lamiaceae
Lepidium densiflorum		Pepperweed	Brassicaceae
LEPIDIUM RUDERALE		Pepperweed	Brassicaceae
Lepidium virginicum		Pepperweed	Brassicaceae
Lespedeza capitata		Bush clover	Fabaceae
<b>Lespedeza leptostachya "FEDTHR"</b>		Bush clover	Fabaceae
LEUCANTHEMUM VULGARE		Ox eye daisy	Asteraceae
Liatris aspera	var. aspera	Rough blazing star	Asteraceae
Liatris aspera	var. intermedia	Rough blazing star	Asteraceae
Liatris cylindracea		Cylindric blazing star	Asteraceae
Liatris pycnostachya		Gayfeathers	Asteraceae
Lilium michiganense		Michigan lily	Liliaceae
Lilium philidelphicum		Wood lily	Liliaceae
LINARIA VULGARIS		Butter and eggs	Scrophulariaceae
Linum striatum		Flax	Linaceae
Linum sulcatum		Yellow flax	Linaceae
Linum virginianum		Wild yellow flax	Linaceae
Liparis liliifolia		Twayblade	Orchidaceae
Lithospermum canescens		Puccoon	Boraginaceae
Lithospermum caroliniense		Puccoon	Boraginaceae
Lobelia inflata		Indian tobacco	Lobeliaceae
Lobelia siphilitica		Great lobelia	Lobeliaceae
Lobelia spicata		Slender lobelia	Lobeliaceae
Lobelia spicata	var. spicata	Highbelia	Lobeliaceae
LOLIUM PERENNE		English rye grass	Poaceae
LOLIUM PRATENSE		Meadow fescue	Poaceae
Lonicera canadensis		American fly honeysuckle	Caprifoliaceae
Lonicera dioica		Limber honeysuckle	Caprifoliaceae
LONICERA MAACKII		Amur honeysuckle	Caprifoliaceae
LONICERA TATARICA		Honeysuckle	Caprifoliaceae

SCIENTIFIC NAME	VARIATIONS	COMMON NAME	FAMILY
LONICERA XYLOSTEUM		Fly honeysuckle	Caprifoliaceae
LOTUS CORNICULATUS		Bird's foot trefoil	Fabaceae
Lupinus perennis		Wild lupine	Fabaceae
Luzula acuminata		Hairy woodrush	Juncaceae
Luzula multiflora		Wood rush	Juncaceae
Lycopodium annotinum		Stiff clubmoss	Lycopodiaceae
Lycopodium clavatum		Running pine	Lycopodiaceae
Lycopodium complanatum		Ground cedar	Lycopodiaceae
Lycopodium obscurum		Ground pine	Lycopodiaceae
Lycopus americanus		Cut leaved water horehound	Lamiaceae
Lycopus uniflorus		Water horehound	Lamiaceae
Lycopus virginicus		Horehound	Lamiaceae
Lysimachia ciliata		Fringed loosestrife	Primulaceae
Lysimachia hybrida		Lance leaved loosestrife	Primulaceae
Lysimachia lanceolata		Lance leaved loosestrife	Primulaceae
LYSIMACHIA NUMMULARIA		Moneywort	Primulaceae
Lysimachia quadrifolia		Whorled loosestrife	Primulaceae
Lysimachia terrestris		Loosestrife	Primulaceae
Lysimachia thrysofolia		Tufted loosestrife	Primulaceae
Maianthemum canadense		Wild lily of the valley	Liliaceae
Maianthemum racemosum	ssp. racemosum	False Solomon's seal	Liliaceae
Maianthemum stellatum		False Solomon's seal	Liliaceae
Malus spp.		Apple	Rosaceae
MALVA NEGLECTA		Cheeses	Malvaceae
MEDICAGO LUPULINA		Black medic	Fabaceae
MEDICAGO SATIVA		Alfalfa	Fabaceae
Megalodonta beckii		Water marigold	Asteraceae
MELILOTUS ALBA		White sweet clover	Fabaceae
MELILOTUS OFFICINALIS		Yellow sweet clover	Fabaceae
Menispermum canadense		Moon seed	Menispermaceae
Mentha arvensis		Wild mint	Lamiaceae
MENTHA X PIPERATA		Peppermint	Lamiaceae
Milium effusum	var. cisotlanticum	Milletgrass	Poaceae
Mimulus glabratus		Monkey flower	Scrophulariaceae
Mimulus ringens		Monkey flower	Scrophulariaceae
Mirabilis nyctaginea		Wild four o'clock	Nyctaginaceae
Mitchella repens		Partridge berry	Rubiaceae
Mollugo verticillata		Carpet weed	Molluginaceae
Monarda fistulosa		Wild bergamot	Lamiaceae
Monarda punctata	var. villicaulis	Dotted mint	Lamiaceae
Monotropa uniflora		Indian pipe	Monotropaceae
Muhlenbergia bushii		Nodding muhly	Poaceae
Muhlenbergia frondosa		Muhly grass	Poaceae
Muhlenbergia mexicana		Muhly grass	Poaceae
Muhlenbergia racemosa		Muhly grass	Poaceae
Myriophyllum spp.		Water milfoil	Haloragaceae
Najas guadalupensis		Southern water nymph	Najadaceae
Nemopanthus mucronatas		Mountain holly	Aquifoliaceae
NEPETA CATARIA		Catnip	Lamiaceae
Nuttallanthus canadensis		Canada toadflax	Scrophulariaceae
Nymphaea odorata		Fragrant water lily	Nymphaeaceae
Oclemena nemoralis		Bog aster	Asteraceae
Oenothera biennis		Evening primrose	Onagraceae
Oenothera clelandii		Evening primrose	Onagraceae
Oenothera lacinata		Cut leaved evening primrose	Onagraceae
Oenothera perennis		Evening primrose	Onagraceae
Oenothera rhombipetala		Evening primrose	Onagraceae
Oligoneuron album		Upland white aster	Asteraceae
Oligoneuron album		White aster	Asteraceae
Oligoneuron ohioense		Goldenrod	Asteraceae

SCIENTIFIC NAME	VARIATIONS	COMMON NAME	FAMILY
Oligoneuron rigidum	var. rigidum	Hard leaved goldenrod	Asteraceae
Onoclea sensibilis		Sensitive fern	Dryopteridaceae
<b>Opuntia fragilis "THR"</b>		Brittle prickly pear	Cactaceae
Opuntia humifusa	var. humifusa	Prickly pear	Cactaceae
<b>Orobanche uniflora "SC"</b>		One flowered cancer root	Orobanchaceae
Oryzopsis asperifolia		Roughleaf ricegrass	Poaceae
Osmorhiza claytoni		Sweet cicely	Apiaceae
Osmunda cinnamomea		Cinnamon fern	Osmundaceae
Osmunda claytoniana		Interrupted fern	Osmundaceae
Osmunda regalis	var. spectabilis	Royal fern	Osmundaceae
Ostrya virginiana		Ironwood	Betulaceae
Oxalis corniculata		Wood sorrel	Oxalidaceae
Oxalis stricta		Yellow wood sorrel	Oxalidaceae
Oxalis violacea		Violet wood sorrel	Oxalidaceae
Packera paupercula		Golden ragwort	Asteraceae
Panax quinquefolius		Ginseng	Araliaceae
Panax trifolius		Dwarf ginseng	Araliaceae
Panicum capillare		Old witch grass	Poaceae
Panicum verrucosum		Warty panic grass	Poaceae
Panicum virgatum		Prairie switch grass	Poaceae
Parietaria pensylvanica		Pellitory	Urticaceae
Parthenocissus quinquefolia		Virginia creeper	Vitaceae
Parthenocissus vitacea		Woodbine	Vitaceae
Paspalum setaceum		Thin paspalum	Poaceae
PASTINACA SATIVA		Meadow parsnip	Apiaceae
Pedicularis canadensis		Lousewort	Scrophulariaceae
Pedicularis lanceolata		Swamp lousewort	Scrophulariaceae
Pellaea glabella		Smooth cliff brake fern	Pteridaceae
PENNISETUM GLAUCUM		Yellow foxtail	Poaceae
Penstemon gracilis		Beardtongue	Scrophulariaceae
Penstemon grandiflorus		Large flowered beardtongue	Scrophulariaceae
Penthorum sedoides		Ditch stonecrop	Crassulaceae
Phalaris arundinacea		Reed canary grass	Poaceae
Phegopteris connectilis		Long beach fern	Thelypteridaceae
PHLEUM PRATENSIS		Timothy	Poaceae
Phlox divaricata		Wild blue phlox	Polemoniaceae
Phlox paniculata		Fall phlox	Polemoniaceae
Phlox pilosa		Downy phlox	Polemoniaceae
Photinia melanocarpa		Chokecherry	Rosaceae
Phyrma leptostachya		Lopseed	Verbenaceae
Physalis heterophylla		Clammy ground cherry	Solanaceae
Physalis virginiana		Virginia ground cherry	Solanaceae
Physocarpus opulifolius		Ninebark	Rosaceae
Phytolacca americana		American pokeweed	Phytolaccaceae
PICEA ABIES		Norway spruce	Pinaceae
PICEA PUNGENS		Colorado blue spruce	Pinaceae
Pilea fontana		Clearweed	Urticaceae
Pilea pumila		Clearweed	Urticaceae
Pinus banksiana		Jack pine	Pinaceae
Pinus resinosa		Red pine	Pinaceae
Pinus strobus		White pine	Pinaceae
Piptatherum pungens		Mountain ricegrass	Poaceae
Piptatherum racemosum		Blackseed ricegrass	Poaceae
PLANTAGO LANCEOLATA		Narrowleaf plantain	Plantaginaceae
Plantago major		Plantain	Plantaginaceae
Plantago patagonica		Sand plantain	Plantaginaceae
Plantago rugelii		Plantain	Plantaginaceae
Plantago virginica		Hoary seed plantago	Plantaginaceae
Platanthera clavellata		Club spur orchid	Orchidaceae
Platanthera clavellata		Club spur orchid	Orchidaceae

SCIENTIFIC NAME	VARIATIONS	COMMON NAME	FAMILY
Platanthera psycodes		Purple fringed orchid	Orchidaceae
POA ANNUA		Annual bluegrass	Poaceae
POA COMPRESSA		Canada blue grass	Poaceae
<b>Poa paludigena "THR"</b>		Bog bluegrass	Poaceae
Poa palustris		Fowl meadow grass	Poaceae
Poa pratensis		Kentucky blue grass	Poaceae
Poa secunda		Sandberg bluegrass	Poaceae
Podophyllum peltatum		May apple	Berberidaceae
Pogonia ophioglossoides		Pagonia	Orchidaceae
Polanisia dodecandra		Clammy weed	Capparaceae
Polemonium reptans		Jacob's ladder	Polemoniaceae
<b>Polygala cruciata "SC"</b>		Milkwort	Polygalaceae
Polygala polygama		Racemed milkwort	Polygalaceae
Polygala sanguinea		Field milkwort	Polygalaceae
Polygonatum biflorum		Solomon's seal	Liliaceae
Polygonatum biflorum	var. commutatum	Great Solomon's seal	Liliaceae
Polygonatum pubescens		Downy Solomon's seal	Liliaceae
Polygonella articulata		Jointweed	Polygonaceae
Polygonum amphibium	var. emersum	Long root smartweed	Polygonaceae
POLYGONUM ARENASTRUM		Oval leaf knotweed	Polygonaceae
Polygonum arifolium		Tear thumb	Polygonaceae
POLYGONUM AVICULARE		Prostrate knotweed	Polygonaceae
Polygonum careyi		Carey's smartweed	Polygonaceae
Polygonum cilinode		False buckwheat	Polygonaceae
Polygonum convolvulus		Black bindweed	Polygonaceae
POLYGONUM HYDROPIPER		Marshpepper knotweed	Polygonaceae
Polygonum pennsylvanicum		Smartweed	Polygonaceae
Polygonum persicaria		Spotted lady's thumb	Polygonaceae
Polygonum punctatum		Dotted smartweed	Polygonaceae
Polygonum ramosissimum		Bushy knotweed	Polygonaceae
Polygonum sagittatum		Tear thumb	Polygonaceae
Polygonum scandens		Climbing false buckwheat	Polygonaceae
Polygonum tenue		Knotweed	Polygonaceae
<b>Polytaenia nuttallii "THR"</b>		Prairie parsley	Apiaceae
Populus deltoides		Cottonwood	Salicaceae
Populus grandidentata		Bigtooth aspen	Salicaceae
POPULUS NIGRA		Lombardy poplar	Salicaceae
Populus tremuloides		Trembling aspen	Salicaceae
POTAMOGETON CRISPUS		Pondweed	Potamogetonaceae
Potamogeton diversifolius		Pondweed	Potamogetonaceae
Potamogeton epihydrus		Pondweed	Potamogetonaceae
Potamogeton illinoensis		Illinois pondweed	Potamogetonaceae
Potamogeton nodosus		Pondweed	Najadaceae
POTENTILLA ARGENTEA		Cinquefoil	Rosaceae
Potentilla arguta		Tall cinquefoil	Rosaceae
Potentilla canadensis		Dwarf cinquefoil	Rosaceae
Potentilla norvegica		Norwegian cinquefoil	Rosaceae
POTENTILLA RECTA		Sulphur cinquefoil	Rosaceae
Potentilla rivalis		Brook cinquefoil	Rosaceae
Potentilla simplex		Cinquefoil	Rosaceae
Prenanthes alba		White lettuce	Asteraceae
<b>Prenanthes aspera "END"</b>		Rough white lettuce	Asteraceae
Prunella vulgaris	ssp. lanceolata	Heal all	Lamiaceae
Prunus americana		Wild plum	Rosaceae
Prunus pensylvanica		Pin cherry	Rosaceae
Prunus pumila		Sand cherry	Rosaceae
PRUNUS SALICINA		Japanese plum	Rosaceae
Prunus serotina		Black cherry	Rosaceae
Prunus virginiana		Chokecherry	Rosaceae
Pseudognaphalium obtusifolium	ssp. obtusifolium	Sweet everlasting	Asteraceae



SCIENTIFIC NAME	VARIATIONS	COMMON NAME	FAMILY
Pteridium aquilinum		Bracken fern	Dennstaedtiaceae
Pulsatilla patens	ssp. multifida	Pasque flower	Ranunculaceae
Pycnanthemum tenuifolium		Narrowleaf mountain mint	Lamiaceae
Pycnanthemum virginianum		Mountain mint	Lamiaceae
Pyrola asarifolia		Liverleaf wintergreen	Pyrolaceae
Pyrola elliptica		Shinleaf	Pyrolaceae
Quercus alba		White oak	Fagaceae
Quercus bicolor		Swamp white oak	Fagaceae
Quercus ellipsoidalis		Northern pin oak	Fagaceae
Quercus macrocarpa		Bur oak	Fagaceae
Quercus rubra		Red oak	Fagaceae
Quercus velutina		Black oak	Fagaceae
Ranunculus abortivus		Buttercup	Ranunculaceae
Ranunculus acris		Tall buttercup	Ranunculaceae
Ranunculus fascicularis		Buttercup	Ranunculaceae
Ranunculus hispidus		Buttercup	Ranunculaceae
Ranunculus hispidus	var. nitidus	Bristly buttercup	Ranunculaceae
Ranunculus longirostris		Long beak buttercup	Ranunculaceae
Ranunculus micranthus		Rock buttercup	Ranunculaceae
Ranunculus pensylvanicus		Bristly crowfoot	Ranunculaceae
Ranunculus recurvatus		Hooked buttercup	Ranunculaceae
Ranunculus rhomboideus		Labrador buttercup	Ranunculaceae
Ranunculus trichophyllus	var. trichophyllus	White water crowfoot	Ranunculaceae
RHAMNUS CATHARTICA		Buckthorn	Rhamnaceae
<b>Rhexia virginica "SC"</b>		Meadow beauty	Melastomataceae
Rhus copallinum		Winged sumac	Anacardiaceae
Rhus glabra		Smooth sumac	Anacardiaceae
Rhus hirta		Staghorn sumac	Anacardiaceae
Rhynchospora capitellata		Brownish beak sedge	Cyperaceae
Rhynchospora careyana		Beak rush	Cyperaceae
Rhynchospora recognita		Beak sedge	Cyperaceae
Ribes americanum		American black currant	Grossulariaceae
Ribes cynosbati		Pasture gooseberry	Grossulariaceae
Ribes lacustre		Bristly black currant	Grossulariaceae
Ribes missouriense		Missouri gooseberry	Grossulariaceae
Ribes rotundifolium		Roundleaf gooseberry	Grossulariaceae
Robinia hispida		Bristly locust	Fabaceae
Robinia pseudoacacia		Black locust	Fabaceae
Rorippa nasturtiumaquaticum		Water cress	Brassicaceae
Rorippa palustris	ssp. fernaldiana	Marsh cress	Brassicaceae
Rorippa palustris	ssp. palustris	Marsh cress	Brassicaceae
Rorippa sessiliflora		Marsh cress	Brassicaceae
Rosa blanda		Smooth rose	Rosaceae
Rosa carolina		Wild rose	Rosaceae
ROSA EGLANTERIA		Rose	Rosaceae
ROSA RUGOSA		Rugosa rose	Rosaceae
Rubus allegheniensis		Blackberry	Rosaceae
Rubus flagellaris		Northern dewberry	Rosaceae
Rubus hispidus		Bristly dewberry	Rosaceae
Rubus idaeus		Raspberry	Rosaceae
Rubus idaeus	ssp. strigosus	Red raspberry	Rosaceae
Rubus occidentalis		Black raspberry	Rosaceae
Rubus pensylvanicus		Pennsylvania blackberry	Rosaceae
Rubus pubescens		Dwarf red blackberry	Rosaceae
Rudbeckia hirta		Black-eyed Susan	Asteraceae
Rudbeckia hirta	var. pulcherrima	Black-eyed Susan	Asteraceae
Rudbeckia laciniata		Tall coneflower	Asteraceae
RUMEX ACETOSELLA		Red sorrel	Polygonaceae
Rumex altissimus		Pale dock	Polygonaceae
RUMEX CRISPUS		Curled dock	Polygonaceae

SCIENTIFIC NAME	VARIATIONS	COMMON NAME	FAMILY
RUMEX OBTUSIFOLIUS		Bitter dock	Polygonaceae
RUMEX PATIENTIA		Patience dock	Polygonaceae
Rumex verticillatus		Swamp dock	Polygonaceae
Sagittaria latifolia		Arrowhead	Alismataceae
Salix amygdaloides		Peachleaf willow	Salicaceae
Salix bebbiana		Bebb willow	Salicaceae
Salix discolor		Pussy willow	Salicaceae
Salix eriocephala		Cordate willow	Salicaceae
Salix humilis		Prairie willow	Salicaceae
Salix interior		Sandbar willow	Salicaceae
Salix pedicellaris		Bog willow	Salicaceae
Salix petiolaris		Meadow willow	Salicaceae
<b>Salix sericea "SC"</b>		Silky willow	Salicaceae
Salix serissima		Autumn willow	Salicaceae
Sambucus nigra	ssp. canadensis	Elderberry	Caprifoliaceae
Sanguinaria canadensis		Bloodroot	Papaveraceae
Sanicula marilandica		Snakeroot	Apiaceae
Sanicula odorata		Blake snakeroot	Apiaceae
SAPONARIA OFFICINALIS		Bouncing bet	Caryophyllaceae
Schizachne purpurascens		Bluejoint	Poaceae
Schizachyrium scoparium		Little blue stem	Poaceae
Schoenoplectus acutus	var. acutus	Hard stem bulrush	Cyperaceae
S. tabernaemontani		Great bul-rush	Cyperaceae
Scirpus cyperinus		Wool grass	Cyperaceae
Scirpus microcarpus		Bulrush	Cyperaceae
Scirpus polyphyllus		Leafy bulrush	Cyperaceae
SCLERANTHUS ANNUUS		German knotgrass	Caryophyllaceae
<b>Scleria triglomerata "SC"</b>		Whip nutrush	Cyperaceae
Scrophularia lanceolata		Figwort	Scrophulariaceae
Scrophularia marilandica		Figwort	Scrophulariaceae
Scutellaria galericulata		Marsh scullcap	Lamiaceae
Scutellaria lateriflora		Side flowered scullcap	Lamiaceae
Scutellaria parvula	var. missouriensis	Scullcap	Lamiaceae
SECALE CEREALE		Rye	Poaceae
Selaginella rupestris		Northern selaginella	Selaginellaceae
SETARIA VERTICILLATA		Foxtail	Poaceae
SETARIA VIRIDIS		Green foxtail	Poaceae
Shepherdia argentea		Silver buffalo berry	Elaeagnaceae
Silene antirrhina		Sleepy catchfly	Caryophyllaceae
SILENE LATIFOLIA	ssp. alba	White campion	Caryophyllaceae
<b>Silene nivea "THR"</b>		White campion	Caryophyllaceae
SILENE VULGARIS		Bladder campion	Caryophyllaceae
Silphium perfoliatum		Cup plant	Asteraceae
SISYMBRIUM ALTISSIMUM		Tumbling mustard	Brassicaceae
Sisyrinchium albidum		Blue-eyed Grass	Iridaceae
Sisyrinchium campestre		Blue-eyed Grass	Iridaceae
Sisyrinchium montanum		Blue eyed grass	Iridaceae
Smilax glauca		Sawbrier	Smilacaceae
Smilax lasioneura		Carrion flower	Smilacaceae
Smilax rotundifolia		Greenbrier	Smilacaceae
Smilax tamnoides		Greenbrier	Smilacaceae
Solanum carolinense		Horse nettle	Solanaceae
SOLANUM DULCAMARA		Bittersweet	Solanaceae
SOLANUM NIGRUM		Black nightshade	Solanaceae
Solanum ptycanthum		West Indian nightshade	Solanaceae
<b>Solidago caesia "END"</b>		Blue stemmed goldenrod	Asteraceae
Solidago canadensis		Canada goldenrod	Asteraceae
Solidago canadensis	var. scabra	Tall goldenrod	Asteraceae
Solidago flexicaulis		Zig zag goldenrod	Asteraceae
Solidago gigantea		Goldenrod	Asteraceae

SCIENTIFIC NAME	VARIATIONS	COMMON NAME	FAMILY
Solidago hispida		Hairy goldenrod	Asteraceae
Solidago juncea		Early goldenrod	Asteraceae
Solidago missouriensis	var. fasciculata	Missouri goldenrod	Asteraceae
Solidago nemoralis		Field goldenrod	Asteraceae
Solidago puberula		Downy goldenrod	Asteraceae
Solidago rugosa		Rough stemmed goldenrod	Asteraceae
<b>Solidago sciaphila "SC"</b>		Cliff goldenrod	Asteraceae
Solidago speciosa		Goldenrod	Asteraceae
Solidago speciosa	var. erecta	Slender goldenrod	Asteraceae
Solidago uliginosa		Bog goldenrod	Asteraceae
Solidago ulmifolia		Elm leaved goldenrod	Asteraceae
SONCHUS ARVENSIS		Field sow thistle	Asteraceae
SONCHUS OLERACEUS		Sow thistle	Asteraceae
SORBARIA SORBIFOLIA		False spiraea	Rosaceae
SORBUS AUCUPARIA		Mountain ash	Rosaceae
Sorghastrum nutans		Indian grass	Poaceae
SORGHUM BICOLOR		Sorghum	Poaceae
Sparganium eurycarpum		Burreed	Sparganiaceae
Spartina gracilis		Cord grass	Poaceae
Spartina pectinata		Cord grass	Poaceae
Sphenopholis intermedia		Wedge grass	Poaceae
Spiraea alba	var. latifolia	Meadow sweet	Rosaceae
Spiraea alba	var. alba	Meadow sweet	Rosaceae
Spiraea alba		White meadowsweet	Rosaceae
Spiraea tomentosa		Steeplebush	Rosaceae
Spiranthes casei		Ladies tresses	Orchidaceae
Spiranthes cernua		Ladies tresses	Orchidaceae
Sporobolus cryptandrus		Sand drop seed	Poaceae
Sporobolus heterolepis		Prairie drop seed	Poaceae
Sporobolus vaginiflorus		Poverty grass	Poaceae
Stachys aspera		Hyssopleaf hedge nettle	Lamiaceae
Stachys palustris		Rough hedge nettle	Lamiaceae
Staphylea trifolia		Bladdernut	Staphyleaceae
Stellaria longifolia		Starwort	Caryophyllaceae
Stellaria media		Chickweed	Caryophyllaceae
<b>Streptopus amplexifolius "SC"</b>		Twisted stalk	Liliaceae
Streptopus lanceolatus	var. roseus	Twisted stalk	Liliaceae
Symphoricarpos orbiculatus		Coralberry	Caprifoliaceae
Symphyotrichum boreale		Bog aster	Asteraceae
Symphyotrichum cordifolium		Aster	Asteraceae
Symphyotrichum cordifolium		Arrow aster	Asteraceae
Symphyotrichum ericoides	var. ericoides	Heath aster	Asteraceae
Symphyotrichum laeve	var. laeve	Smooth aster	Asteraceae
Symphyotrichum lanceolatum	var. lanceolatum	Marsh aster	Asteraceae
Symphyotrichum novaeangliae		New England aster	Asteraceae
Symphyotrichum oolentangiense	var. oolentangiense	Aster	Asteraceae
Symphyotrichum pilosum	var. pilosum	Heath aster	Asteraceae
Symphyotrichum prenanthoides		Zig zag aster	Asteraceae
Symphyotrichum puniceum	var. puniceum	Red stemed aster	Asteraceae
Symphyotrichum sericeum		Western silvery aster	Asteraceae
Symplocarpus foetidus		Skunk cabbage	Araceae
SYRINGA VULGARIS		Lilac	Oleaceae
<b>Talinum rugospermum "SC"</b>		Fame flower	Portulacaceae
TANACETUM VULGARE		Tansy	Asteraceae
Taraxacum officinale		Dandelion	Asteraceae
Tephrosia virginiana		Devil's shoestrings	Fabaceae
Teucrium canadense		Germander	Lamiaceae
Thalictrum dasycarpum		Meadow rue	Ranunculaceae
<b>Thalictrum revolutum "SC"</b>		Wax leaved meadow rue	Ranunculaceae
Thalictrum thalictroides		Rue anenome	Ranunculaceae

SCIENTIFIC NAME	VARIATIONS	COMMON NAME	FAMILY
<i>Thelypteris noveboracensis</i>		New York fern	Thelypteridaceae
<i>Thelypteris palustris</i>		Eastern marsh fern	Thelypteridaceae
<b><i>Thelypteris simulata</i> "SC"</b>		Bog fern	Thelypteridaceae
<i>Tilia americana</i>		Basswood	Tiliaceae
<i>Torreyochloa pallida</i>	var. <i>fernaldii</i>	Fernalds' false manna grass	Poaceae
<i>Toxicodendron radicans</i>		Poison ivy	Anacardiaceae
<i>Toxicodendron vernix</i>		Poison sumac	Anacardiaceae
<i>Tradescantia ohiensis</i>		Spiderwort	Commelinaceae
<i>Tradescantia virginiana</i>		Spiderwort	Commelinaceae
TRAGOPOGON DUBIUS		Meadow goatsbeard	Asteraceae
TRAGOPOGON PRATENSIS		Meadow goatsbeard	Asteraceae
<i>Triadenum fraseri</i>		Marsh St.John's wort	Clusiaceae
<i>Triadenum virginicum</i>		Marsh St.John's wort	Clusiaceae
<i>Trientalis borealis</i>		Starflower	Primulaceae
<i>Trifolium amoenum</i>		Yellow clover	Fabaceae
<i>Trifolium aureum</i>		Golden clover	Fabaceae
TRIFOLIUM CAMPESTRE		Hop clover	Fabaceae
TRIFOLIUM HYBRIDUM		Alsike clover	Fabaceae
TRIFOLIUM PRATENSE		Red clover	Fabaceae
TRIFOLIUM REPENS		White clover	Fabaceae
<i>Trillium cernuum</i>		Trillium	Liliaceae
<i>Trillium flexipes</i>		Trillium	Liliaceae
<i>Trillium grandiflorum</i>		Trillium	Liliaceae
<i>Triodanis perfoliata</i>		Venus looking glass	Campanulaceae
<i>Triplasis purpurea</i>		Purple sandgrass	Poaceae
TYPHA ANGUSTIFOLIA		Narrow leaved cattail	Typhaceae
<i>Typha latifolia</i>		Cattail	Typhaceae
<i>Ulmus americana</i>		American elm	Ulmaceae
ULMUS PUMILA		Dwarf elm	Ulmaceae
<i>Ulmus rubra</i>		Slippery elm	Ulmaceae
<i>Ulmus thomasi</i>		Rock elm	Ulmaceae
<i>Urtica dioica</i>		Stinging nettle	Urticaceae
<i>Utricularia macrorhiza</i>		Bladderwort	Lentibulariaceae
<i>Uvularia grandiflora</i>		Bellwort	Liliaceae
<i>Uvularia sessilifolia</i>		Sessile bellwort	Liliaceae
<i>Vaccinium angustifolium</i>		Blueberry	Ericaceae
<i>Vaccinium macrocarpon</i>		Cranberry	Ericaceae
<i>Vaccinium myrtilloides</i>		Velvet leaf blueberry	Ericaceae
<i>Vaccinium pallidum</i>		Blue Ridge blueberry	Ericaceae
<i>Vallisneria americana</i>		Tape grass	Hydrocharitaceae
VERBASCUM THAPSUS		Mullein	Scrophulariaceae
<i>Verbena bracteata</i>		Bigbract verbena	Verbenaceae
<i>Verbena hastata</i>		Blue vervain	Verbenaceae
<i>Verbena stricta</i>		Hoary vervain	Verbenaceae
<i>Vernonia fasciculata</i>		New York ironweed	Asteraceae
<i>Veronica americana</i>		Brookline	Scrophulariaceae
VERONICA ARVENSIS		Corn speedwell	Scrophulariaceae
<i>Veronica officinalis</i>		Speedwell	Scrophulariaceae
<i>Veronica peregrina</i>		Speedwell	Scrophulariaceae
<i>Veronica scutellata</i>		Marsh speedwell	Scrophulariaceae
<i>Veronica serpyllifolia</i>		Thyme leaved speedwell	Scrophulariaceae
<i>Veronica verna</i>		Spring speedwell	Scrophulariaceae
<i>Veronicastrum virginicum</i>		Culver's root	Scrophulariaceae
<i>Viburnum acerifolium</i>		Maple leaved viburnum	Caprifoliaceae
VIBURNUM LANTANA		Wayfaring tree	Caprifoliaceae
<i>Viburnum lentago</i>		Sheepberry	Caprifoliaceae
<i>Viburnum rafinesquianum</i>		Downy arrowwood	Caprifoliaceae
<i>Vicia caroliniana</i>		Wood vetch	Fabaceae
VICIA CRACCA		Cow vetch	Fabaceae
VICIA VILLOSA		Hairy vetch	Fabaceae

SCIENTIFIC NAME	VARIATIONS	COMMON NAME	FAMILY
<i>Viola affinis</i>		Sand violet	Violaceae
<i>Viola bicolor</i>		Field pansy	Violaceae
<i>Viola conspersa</i>		American dog violet	Violaceae
<i>Viola cucullata</i>		Blue marsh violet	Violaceae
<i>Viola lanceolata</i>		Lance leaf violet	Violaceae
<i>Viola macloskeyi</i>	ssp. <i>pallens</i>	Wild white violet	Violaceae
<i>Viola pedata</i>		Bird's foot violet	Violaceae
<i>Viola pedatifida</i>		Prairie violet	Violaceae
<i>Viola pubescens</i>		Downy yellow violet	Violaceae
<i>Viola sagittata</i>		Arrow-leaf violet	Violaceae
<i>Viola sagittata</i>	var. <i>ovata</i>	Ovate leaved violet	Violaceae
<i>Viola sororia</i>		Meadow violet	Violaceae
VIOLA TRICOLOR		Pansy	Violaceae
<i>Vitis aestivalis</i>		Summer grape	Vitaceae
<i>Vitis palmata</i>		Red grape	Vitaceae
<i>Vitis riparia</i>		Riverbank grape	Vitaceae
<i>Vitis vulpina</i>		Winter grape	Vitaceae
<i>Vulpia octoflora</i>	var. <i>glauca</i>	Six weeks fescue	Poaceae
<i>Waldsteinia fragarioides</i>		Strawberry	Rosaceae
<i>Woodsia obtusa</i>		Blunt lobed woodsia	Dryopteridaceae
<i>Xyris torta</i>		Yellow eyed grass	Xridaceae
<i>Zanthoxylum americanum</i>		Northern prickly ash	Rutaceae
ZEA MAYS		Corn	Poaceae
<i>Zizania aquatica</i>		Wild rice	Poaceae
<i>Zizia aurea</i>		Golden Alexanders	Apiaceae

## APPENDIX G

**MOUND PRAIRIE SACRED AREA  
MANAGEMENT PLAN  
FORT McCOY, WI**

June 29, 2010

Prepared and Submitted By:

**Fort McCoy Directorate of Public Works  
Environmental Division  
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**Background:** On July 27, 2009 a hail storm caused substantial forest damage to a portion of Training Area A-4 of Fort McCoy. The pines damaged during this storm were eventually infected with Diplodia shoot blight. This infection will kill the majority of pine trees so it was necessary to salvage the trees quickly before timber value was lost due to fungus and insect attacks. Approximately 600 acres was harvested by May 1, 2010.

The contractor harvesting the trees has the equipment to remove and grind timber slash (tops and branches remaining after harvest) to use as biofuels. There may be very little slash left on the site after the harvest is complete. The entire area will have an invasive plant survey to identify the type and extent of invasive species. This information will help determine the best approach for control in each area. A schedule for accomplishing the projects outlined within this plan is found in table 1 and a graphic timeline can be found in appendix A.

Project	Start date	End date
Timber Sale	March 2010	May 2010
Invasive plant survey	June 2010	October 2010
Shredding	October 2010	March 2012
Herbicide & assessments	November 2010	August 2015
Prescribe burning (5)	October 2011	May 2012
Plant seed gathering	August 2012	September 2013
Plant seeding	April 2013	October 2013
Tree Planting	April 2013	May 2013
Mowing (2)	June 2014	June 2014
Mowing (2)	June 2015	June 2015
Prescribe burning (2,5)	As needed	

Table 1. Schedule for projects.



**Management by Area:** Figure 1 shows the Mound Prairie area divided into seven management areas. These areas were created based on the pre-existing vegetation, soil conditions, and cultural resources present. The numbered paragraphs correspond to the management areas identified in figure 1.

Map Deleted

Figure 1. Mound Prairie Management Areas.



Figure 2. Naturally occurring white pine and hardwoods in Management Area 1.

**(1) Management Area 1.**

- **Size**-15 acres.
- **Description**-Recently clear cut red pine plantation with red maple and white pine seedlings and some larger trees (fig. 2). *Rubus* spp. and exotic honeysuckle are present. The water table is within 3 feet of surface.
- **Goal**-Naturally regenerated forest of white pine, red maple, oak, and other associated tree species.
- **Management Recommendations**-Control exotic plants using the herbicides applied with basal stem treatment or foliar spot treatment. Allow naturally occurring tree seedlings and saplings to reforest the area.



Figure 3. Black walnut plantation in Management Areas 2 and 3.

**(2) Management Area 2.**

- **Size**-3 acres.
- **Description**-Black walnut plantation within the Mound Prairie Sacred Area. Use is restricted to foot traffic only. Walnut trees are small, about 10 to 25 ft tall and in rows with a thick sod-layer of smooth brome (fig. 3).
- **Goal**-Create a savanna community with black walnut as the dominant tree species.
- **Management Recommendations**-Work toward the stated goal for this area starting with one of two options (paragraphs 1 or 2), then proceed with paragraph 3.
  1. Broadcast spray the area (avoid driving over the mounds but still spray the mounds) with a herbicide that will control the brome grass. This will be required for at least two consecutive years. Broadcast spraying is recommended because it will use less herbicide in the long term than light sprayings over more years.
  2. Use a combination of herbicides and geofabric to control the brome grass. All areas except the mounds will be sprayed. The geo-fabric will be placed over the mounds for two or more years to inhibit growth of the smooth brome and heat the soil and seed bank to reduce future brome

germination. Geo-fabric will require metal stakes pushed into the ground to hold the fabric in place.

3. After the brome has been controlled, native prairie grass and forb seed (either locally collected and cleaned or purchased) will be hand seeded on the mounds and machine planted in the rest of the area. The vegetation will be mowed for two consecutive years in order to encourage root growth of the native plants, add duff layer to return nutrients to the system, and prevent invasive plants from setting seed (mid-June). After mowing is completed, prescribed burning will be used to maintain the savanna vegetation. Prevent fire killing on about 25% of the walnut trees by applying fire-retardant foam to the base of the trees during the burn. Burning will remove up to 75% of the trees that are in poor form or stunted.

**(3) Management Area 3.**

- **Size**-5 acres.
- **Description**-Black walnut plantation. Walnut trees are small, about 10 to 25 ft tall and in rows with a thick sod-layer of smooth brome (fig. 3).
- **Goal**-To increase growth and value on the existing black walnut trees.
- **Management Recommendations**-Continue to manage as a black walnut plantation. Prevent the brome from expanding out into other management areas by broadcast spraying herbicides as needed. Select the highest quality black walnut trees for further timber management.



Figure 4. Limited tree regeneration and exposed soil in Management Area 4.

**(4) Management Area 4.**

- **Size**-23 acres.
- **Description**-Red pine plantation was clear-cut in 2010. Area also has scattered white pine and oak seedlings and saplings (fig. 4). The amount of vegetation is less than in some of the other management areas and more bare soil was exposed during the harvest operation. Some exotic honeysuckle is present.
- **Goal**-Red and white pine forest.
- **Management Recommendations**-Hand plant red pine to augment the existing trees and control honeysuckle using herbicides.



Figure 5. Background shows advance brush growth on a mound with recently cut area in the foreground of Management Area 5.

**(5) Management Area 5.**

- **Size**-15 acres.
- **Description**-Red pine plantation was clear-cut in 2010. This area encompasses a large portion of the Mound Prairie Sacred Site and is restricted to foot traffic only. Buckthorn and honeysuckle, two exotic plant species, are abundant and will be a problem if not controlled (fig. 5). Some of the area has thick white pine seedlings present.
- **Goal**-Restore an oak savanna plant community and manage with prescribe burning.
- **Management Recommendations**- Control buckthorn and honeysuckle through shredding, cutting and herbicide treatments. Follow-up as needed to keep the plants under control. Prescribe burns and native prairie plant seeding will follow the exotic plant treatments to establish a native prairie plant community. Bur oak and swamp white oak saplings will be planted when the prairie plants are established. No tree plantings will be done on the identified mounds.



Figure 6. The lack of existing tree seedlings illustrates why hand planting is needed after the salvage harvest in Management Area 6.

**(6) Management Area 6.**

- **Size**-22 acres.
- **Description**-Red pine plantation was clear-cut and approximately 5 acres of salvaged jack pine was cut in 2010. The area also has scattered areas of red and white pine seedlings (fig. 6). The ground cover is sparse compared to other management areas and more bare soil was exposed during the harvest operation. Exotic honeysuckle is present.
- **Goal**-Red, jack, and white pine forest.
- **Management Recommendations** -Hand plant red pine to augment the existing trees and control honeysuckle through mechanical/manual removal and herbicide applications.



Figure 7. Storm damaged timber and seedlings in Management Area 7 after the harvest.

**(7) Management Area 7.**

- **Size**-9 acres.
- **Description**-This management area contains the Mound Prairie Sacred Site and is restricted to foot traffic only. This area was not harvested due to potential damage to this site. The area was expanded to make use of existing trails as the boundary. Buckthorn and honeysuckle, two exotic plant species are abundant and will be a problem if not controlled. Some of the area has numerous white pine seedlings present (fig. 7). This section will remain as white, red and jack pine forest.
- **Goal**-Maintain as a pine forest and protect the cultural site.
- **Management Recommendations**-Control the invasive plants by treating individual plants with herbicides.



**Estimated Project Costs:** The estimated cost for all the projects suggested for the Mound Prairie area comes to \$35,350. A breakdown of the cost by project, area, and year is located in appendix B. It should be noted that the ability to complete these projects will be subject to the availability of funding and a shortfall may necessitate a modification in the planned actions. In the event of funding shortfalls, Fort McCoy will consider alternative options including volunteer labor and partnering with interested stakeholders who might be able to provide assistance in meeting these management goals.

**Conclusion:** The U.S. Army and Fort McCoy are committed to the proper management of all cultural resources as well as supporting the military mission by prescribing natural resource conservation measures that are integrated and consistent with Federal stewardship requirements. This management plan takes all of these responsibilities into account in order to sustain the military mission, natural resources, and cultural resources to meet the current and future needs of the military and those of future generations.

APPENDIX A

	2010				2011				2012				2013				2014				2015																											
	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
Timber Sale																																																
Invasive plant survey																																																
Shredding																																																
Herbicide																																																
Prescribe burning (5)																																																
Seed gathering																																																
Plant seeding																																																
Tree Planting																																																
Mowing (2)																																																

Timeline for management activities at Mount Prairie

APPENDIX B

Estimated Costs of Mound Prairie Plan

Project	Areas	Cost per year					
		2010	2011	2012	2013	2014	2015
Invasive Plant Survey	all areas	\$1,500.00	\$1,500.00			\$1,500.00	
Shredding	5	\$750.00	\$1,500.00	\$750.00			
Herbicide	all areas	\$4,000.00	\$2,000.00	\$2,000.00	\$1,000.00	\$500.00	\$500.00
Prescribe burning	5		\$1,000.00	\$1,000.00			
Seed Gathering	2,5			\$1,500.00	\$500.00		
Seed Planting	2,5				\$500.00		
Tree planting	1,4,6				\$12,350.00		
Mowing	2,5					\$500.00	\$500.00
<b>Total by Year</b>		<b>\$6,250.00</b>	<b>\$6,000.00</b>	<b>\$5,250.00</b>	<b>\$14,350.00</b>	<b>\$2,500.00</b>	<b>\$1,000.00</b>

Total Cost                    \$35,350.00

## APPENDIX H

**FORT MCCOY BURN PRESCRIPTION PLAN**

**1. LOCATION:**

Training Area A-1, range 101      Burn # A1.3, A1.1

**2. EMERGENCY ASSISTANCE:**

	<u>Phone</u>	<u>Radio Channel</u>
Fire	608-388-2508	_____
PMO	608-388-2266	_____

**3. Notification:** See attached phone list

**4. AREA DESCRIPTION:**

<u>Vegetation Type</u>	<u>Fuel Models</u>	<u>Size of Area</u>	<u>% Slope</u>	<u>Aspect</u>
Oak forest	9	24 ac	3	NE
Mowed grass	1	16 ac	0	N/A
Clearcut w/slash	12	17 ac	0	N/A

Area Description: Maps Attached   X  

Downrange of range 101, oak forest with a couple pockets of jack pine and mowed range area. There is a steep, grass covered range berm. Far southern edge is the clearcut area with slash. Small portions have been shredded.

**5. PRESCRIBED BURN JUSTIFICATION:**

Reason for Burn (e.g. ecological management, forestry management, hazard reduction, training, research, etc.);

Fire hazard reduction by removing fuels as early as possible in the spring. The range will be firing tracers in the following weekends. The forested area will benefit for ecosystem burning

Specific Burn Objectives and Benefits To Military Training and/Or Ecosystem:

Burning the range will prevent the range being shut down while wildfires are suppressed by the Fire Department.

Forestry Concerns:

The forested areas have been repeatedly burned, may be contaminated with metal and are low quality oak. Suppress escapes to the east and west in the oak woods to prevent the fires from reaching pine plantations. Snow in woods will slow escape fires.

Endangered and Threatened Species Concerns:

A Karner Blue Butterfly core area is located immediately south of line B-C and west of line C-D. Must prevent escapes in that direction.

Wildlife Concerns:

None

Exotic Species Concerns:

ITAM/LCTA/Grounds:

Cultural Resources:

Poison Sumac Present? \_\_\_\_\_yes    \_\_\_X\_\_\_no  
Munitions Found in the Past? \_\_\_X\_\_\_yes    \_\_\_\_\_no    \_\_\_\_\_unknown  
Fire Department Assistance Needed? \_\_\_X\_\_\_yes    \_\_\_\_\_no

**6. ACCEPTABLE FIRE BEHAVIOR**

Fuel Model

#      1      9      12       

Max. Headfire Flame Length  
 Min. Headfire Flame Length  
 Max. Backfire Flame Length  
 Min. Backfire Flame Length  
 Max. HF Rate of Spread  
 Min. HF Rate of Spread  
 Max. BF Rate of Spread  
 Min. BF Rate of Spread  
 Max. Scorch Height

8 ft	7 ft	6 ft	
1 ft	1 ft	1 ft	
3 ft	2 ft	2 ft	
0.5 ft	1 ft	1 ft	
345 c/h	40 c/h	40 c/h	
50 c/h	5 c/h	5 c/h	
10 c/h	5 c/h	5 c/h	
3 c/h	0.9 c/h	.5 c/h	
NA	15 ft	10 ft	

**7. FUEL AND WEATHER PRESCRIPTION**

**DATE** \_\_\_\_\_

Required Parameters:

Conditions at Burn Time:

		Hour	1	2	3	4	5
Wind Direction	NW		_____	_____	_____	_____	_____
Effective Windspeed	10		_____ mph	_____	_____	_____	_____
1-Hour Fuel Moist	2		_____ %	_____	_____	_____	_____
10-Hour Fuel Moist	30		_____ %	_____	_____	_____	_____
100-Hour Fuel Moist	50		_____ %	_____	_____	_____	_____
Live Fuel Moisture	30		_____ %	_____	_____	_____	_____

Guidance Parameters:

Air Temperature      55   \_\_\_\_\_  
 Relative Humidity    30%  \_\_\_\_\_  
 Days Since Rain      3   \_\_\_\_\_  
 Other                    \_\_\_\_\_

**8. SMOKE MANAGEMENT PLAN**

List smoke sensitive areas:

I-90 and state highway 16 to the north. Private residences to the west of the burn.

Describe desirable smoke behavior:

Smoke rises and disperses high in the atmosphere in calm weather or there is a steady west/northwest breeze.

**9. CREW ORGANIZATION**

Fire leader(s): Charles Mentzel

# Personnel 8

Number of crews 2

Crew description

The crews consist of one ignitor using a drip torch, one 5-gallon backpack, and a swatter or firerake. An ATV with 10 gallon water tank and one or more brush trucks are stationed along line A-F to watch trouble areas and respond where needed.

**10. EQUIPMENT**

First aid kit X Weather kit X Protective clothing X

	<u>Number</u>		<u>Number</u>
Radios	<u>8</u>	Fire rake	<u>2</u>
Backpack sprayer	<u>2</u>	Council rake	<u>0</u>
4x4 ATV w/water tank	<u>1</u>	Flappers	<u>2</u>
Drip torch	<u>4</u>	Fusee	<u>0</u>
Jeeps	<u>1</u>		

**11. BURN DURATION (preparation, spreading fire, and mop-up)**

Coordinate with range scheduling to burn the area as early as possible in the spring. Burning usually starts about 1000 hrs when the fuel has been dried by the sun and can carry a fire. Ignition ends near 1330 hours.

**12. MANAGING THE BURN:**

Fire break preparation:

Line B-C must be inspected prior to the burn. A fire plow line was made on that line in spring 2003. This line is overgrown and must be wetlined. The rest of firebreaks are existing sand trails and have had the grass mowed recently. Snow is present on many of the firebreaks.



#### Fire techniques and ignition pattern:

Start firing in a downwind corner, "E" or "C" with two crews if the wind is from the NW or "A" if wind is from SE. Each crew light along lines in opposite directions from the start and run spot fires through the burn area, connecting the lines, to keep flame lengths low. Burn mowed area in a ring technique to keep fires as hot as possible.

#### Crew communication:

The radios are set to one of the Fire Dept frequencies.

#### Fire behavior and weather monitoring:

The fire boss or someone designated by him will frequently monitor the weather with the weather kit and monitor the weather channel. He will also monitor the fire behavior to make sure the burn is accomplishing the stated goals.

#### Holding:

If a fire escapes anywhere along the firebreak, all crews are ordered to stop firing until the escape is suppressed or the burn boss decides there is enough resources available to suppress without calling in another crew. PMO may be asked to control traffic if smoke obscures the highways.

#### Fire sensitive area or hazards:

Unfired rounds may be present. Jack pine may crown fire near corner I but should not carry far. Take care while firing on berm near corner F, tripping can cause dangerous falls. .

#### Contingencies:

The 3,000 gallon water tanker and fire plow will be on site if needed or ready at the station. A secondary break is located south of the burn, the highways are north and firebreaks, sand trails are east and west of the burn.

#### Mop-up:

Put out any fires within 50 feet of the lines. Fell and extinguish any burning snags at any distance from the line since they can throw sparks a long way.

#### Public relations:

PAO is informed of the fire so they can handle questions from the public.

#### Follow-up assignments:

Reinspect the burn the morning after the burn is complete to make sure there are no escapes or smoldering fuel that can reignite.

**13. Post Burn Assessment**

Good\_\_\_\_\_ Fair\_\_\_\_\_ Poor\_\_\_\_\_

Why?

General Burn Description:

Areas of Interest in the Future?

Was the Crew and Equipment adequate for the burn?

Were the Burn Objectives and Concerns met?

## APPENDIX I

***FINDING OF NO SIGNIFICANT IMPACT  
FOR THE  
IMPLEMENTATION OF THE INTEGRATED NATURAL RESOURCES  
MANAGEMENT PLAN  
AT FORT MCCOY, WISCONSIN***

**1. INTRODUCTION:**

The Natural Resources Branch of the Directorate of Public Works (DPW) at Fort McCoy, Wisconsin has prepared an Environmental Assessment (EA) to identify and evaluate potential environmental impacts associated with the implementation of the Integrated Natural Resources Management Plan (INRMP) at Fort McCoy. The EA was prepared in accordance with the National Environmental Policy Act (NEPA) and the Council on Environmental Quality Regulations for Implementing the Procedural Provision of NEPA (CEQ Regulations, 40 CFR Part 1500-1508), and Environmental Analysis of Army Actions (32 CFR 651). This INRMP is a revision and update of the existing Integrated Natural Resources Management Plan which covered the period from 2005 to 2010. This revision will cover the period from 2011 until revised.

**2. DESCRIPTION OF PROPOSED ACTIONS AND ALTERNATIVES:**

The proposed action for this EA is to implement the Fort McCoy INRMP. Under the Sikes Act (16 U.S.C. 670) the elements of the INRMP must be consistent with the use of the military installation to ensure the preparedness of the Armed Forces. The elements of the plan are to provide for: 1) fish and wildlife management, land management, forest management and fish and wildlife-oriented recreation; 2) fish and wildlife habitat enhancement or modifications; 3) wetland protection, enhancement, and restoration, where necessary for support of fish or wildlife; 4) integration of, and consistency among, the various activities conducted under the plan; 5) the establishment of specific natural resource management objectives and time frames for proposed action; 6) the sustained use by the public of natural resources to the extent such use is not inconsistent with the needs of fish and wildlife resources management; 7) public access to the military installation that is necessary or appropriate for the use described in number 6, above, subject to requirements necessary to ensure safety and military security; 8) for the enforcement of natural resource laws and regulations; 9) no net loss in the capability of the installation land to support the military mission of the installation.

**Alternatives Considered:** The No Action Alternative and the Preferred Alternative are the only two alternatives considered for the proposed action.

a. The preferred alternative is to implement the revised Integrated Natural Resource Management Plan at Fort McCoy: This alternative is required by statute (16 U.S.C. 670). It is also required by Army Regulation 200-1.

b. No Action: This alternative is not feasible. Fort McCoy would be in violation of 16 U.S.C. 670 and AR 200-1.

**3. SUMMARY OF ENVIRONMENTAL EFFECTS:**

This is a focused Environmental Assessment. The following valued environmental components (VECs) have been categorically excluded from this EA because no significant adverse effects are anticipated: Land Use; Air Space; Geology and Soils; Vegetation and Forestry; Invasive Species; Wildlife and Fisheries; Threatened and Endangered Species; Groundwater; Surface Water & Wetlands; Air Quality; Noise; Hazardous Materials & Hazardous Waste; Fire Management; Public Access and Recreation; Socioeconomics and Environmental Justice; Human Health and Safety; Cultural Resources; Visual Resources; Traffic and Transportation; and Infrastructure. The Integrated Natural Resources Management Plan, by design, provides beneficial impacts to the Natural Resources of Fort McCoy and to the

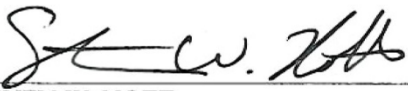
environment in general. These beneficial impacts are discussed in the INRMP. The Sikes Act requires the INRMP to provide for the integration of, and consistency among, the various activities conducted under the INRMP. The Fort McCoy INRMP has been prepared and peer reviewed by qualified, experienced natural resources professionals at Fort McCoy. No known adverse impacts were included in the plan. This Environmental Assessment, along with the INRMP itself, will go out for public review. Any significant comments will be addressed in the final documents.

4. **CONCLUSION WHICH LED TO A FINDING OF NO SIGNIFICANT IMPACT:**

No significant adverse impact is expected from the implementation of the Fort McCoy Integrated Natural Resource Management Plan because the plan is designed and intended to be beneficial to the natural resources and general environment at Fort McCoy.

5. **PUBLIC REVIEW AND COMMENT.** This Finding of No Significant Impact (FONSI) as well as the Environmental Assessment (EA) and the Integrated Natural Resources Management Plan will all go out for public review. Any Significant comments will be incorporated or included in the final INRMP, EA and FONSI.

6. **FINDING OF NO SIGNIFICANT IMPACT.** After careful review of the EA, I have concluded that implementation of the Proposed Action would not generate significant controversy or have a significant adverse impact on the quality of the human or natural environment. This analysis fulfills the requirement of NEPA and the CEQ Regulations. An Environmental Impact Statement will not be prepared, and the Fort McCoy Garrison is issuing this Finding of No Significant Impact.

  
\_\_\_\_\_  
STEVEN W. NOTT  
Colonel, IN  
Commanding

July 20, 2012  
Date

## APPENDIX J



## United States Department of the Interior

### FISH AND WILDLIFE SERVICE

Green Bay ES Field Office  
2661 Scott Tower Drive  
New Franken, Wisconsin 54229-9565  
Telephone 920/866-1717  
FAX 920/866-1710

May 3, 2012

Mr. Alan Balliett  
Chief, Environmental Division  
Directorate of Public Works  
Department of the Army  
Fort McCoy, Wisconsin 54656-5136

re: Draft Integrated Natural Resources  
Management Plan  
Fort McCoy  
Monroe County, Wisconsin

Dear Mr. Balliett:

The U.S. Fish and Wildlife Service (Service) has received your letter dated March 16, 2012, requesting our review of the Draft Fort McCoy Integrated Natural Resources Management Plan (2011) (INRMP). Our comments follow.

#### **General comments:**

The INRMP refers to the gray wolf as a federally-listed species. The wolf was delisted in 2012. For information pertaining to bald eagle nest protection, please refer to the following Service website: <http://www.fws.gov/midwest/eagle/>. Guidance from that website can be used to assess the bald eagle nest protection plan noted in Appendix D, 5.c. Bald Eagle (page 21).

#### **Re: 1.5.6.1.1 United States Fish and Wildlife Service (USFWS)**

We recommend adding the following to this section: *Fort McCoy routinely consults with the Service, in accordance with section 7 of the Endangered Species Act (as amended in 1973) on military and non-military activities that may adversely affect federally-listed threatened and endangered species.*

#### **Re: 3.9 Climate Change Vulnerability Assessment**

Consider noting in this section that a vulnerability assessment has been completed for the Karner blue butterfly. The assessment was completed by Olivia LeDee (Wisconsin Initiative on Climate Change Impacts 2011, Wildlife Working Group Report) and found that climate change may cause increases in Karner blue butterfly larval as well as adult mortality.

*Reference:*

Wisconsin Initiative on Climate Change Impacts. 2011. Wisconsin's changing climate: impacts and adaptation. Nelson Institute for Environmental Studies, University of Wisconsin-Madison and the Wisconsin Department of Natural Resources, Madison, Wisconsin. 157 pp. + Appendix + 15 Working Group Reports. Full report available at the following website: [www.wicci.wisc.edu/publications.php](http://www.wicci.wisc.edu/publications.php).

**Re: 3.3 Natural Resources Consultation Requirements**

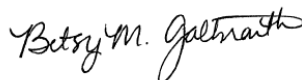
We suggest revising this section slightly as follows: Fort McCoy has completed Biological Assessments for activities that may affect the federally endangered KBB and the gray wolf (*the gray wolf was delisted in 2012*). Section 7 consultation with the USFWS now occurs when Fort McCoy anticipates exceeding the amount of incidental take currently authorized *in the USFWS's March 24, 1994, Biological Opinion and subsequent amendments*, or new activities will be conducted that have not yet been assessed.

Based on a review of the remainder of the Draft INRMP we have no additional comments other than those sent to Fort McCoy in 2011 on an earlier draft of the INRMP. The Service comments dated June 14, 2011, pertaining to Section 3 of the INRMP have been incorporated into your updated 2011 draft INRMP. Please refer to the Service comments in our letters dated February 23, 2011 (pertaining to Sections 1 and 2 of the INRMP), and August 1, 2011 (pertaining to Sections 4, 5 and 6 of the INRMP). If you would like copies of those letters, please contact Ms. Catherine Carnes.

The INRMP appears thorough and will help conserve the natural resources at Fort McCoy including the Karner blue butterfly (federally-listed as endangered), gray wolf, additional rare species and ecosystems, the bald eagle and wetland and stream habitats.

Thank you for the opportunity to respond. Should you have any questions pertaining to these comments please contact Ms. Catherine Carnes of my staff at 920-866-1732 or via Email: [cathy\\_carnes@fws.gov](mailto:cathy_carnes@fws.gov).

Sincerely,



*for*  
Peter J. Fasbender  
Field Supervisor

cc: James Kerkman, Fort McCoy, Wisconsin





DEPARTMENT OF THE ARMY  
US ARMY INSTALLATION MANAGEMENT COMMAND  
HEADQUARTERS, UNITED STATES ARMY GARRISON, FORT MCCOY  
2171 SOUTH 8<sup>TH</sup> AVENUE  
FORT MCCOY, WI 54656-6136

July 26, 2012

Environmental Division

Cathy Carnes  
U.S. Fish and Wildlife Service  
Division of Ecological Services  
2661 Scott Tower Road  
New Franken, Wisconsin 54229

Dear Ms. Carnes:

Thank you for taking the time to review and comment on the draft Fort McCoy Integrated Natural Resources Management Plan (INRMP). Below is a summary of the changes made to the INRMP based on your comments:

- a. References to the gray wolf as a federally-listed species has been removed.
- b. The recommended addition to section 1.5.6.1.1 was added.
- c. A sentence concerning potential increases of Karner blue butterfly mortality resulting from climate change was added.
- d. Section 3.3 was revised as requested.

Your agencies comments in earlier reviews were taken into account in the latest draft INRMP you received.

If you have any questions please contact Mr. James Kerkman at (608) 388-2102.

Sincerely,

A handwritten signature in black ink that reads "Alan L. Balliett".

Alan L. Balliett  
Chief, Environmental Division  
Directorate of Public Works



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 5  
77 WEST JACKSON BOULEVARD  
CHICAGO, IL 60604-3590

MAR 28 2012

REPLY TO THE ATTENTION OF:

E-19J

James Kerkman  
U.S. Army Installation Management Command  
DPW, ATTN: IMMC-PWE-N (James Kerkman)  
Fort McCoy, Wisconsin 54656

**Re: Draft Environmental Assessment for Fort McCoy Integrated Natural Resources Management Plan, Fort McCoy, Monroe County, Wisconsin**

Dear Mr. Kerkman:

The NEPA Implementation Section has received the document listed above. Under the National Environmental Policy Act (NEPA), the Council on Environmental Quality regulations, and Section 309 of the Clean Air Act, U.S. EPA reviews and comments on major federal actions. Typically, these reviews focus on Environmental Impact Statements, but we also have the discretion to review and comment on other environmental documents prepared under NEPA, if interest and resources permit.

The document was given a cursory review, and we determined that there were no significant concerns meriting comment. EPA does, however, recommend including measures for prevention and remediation of gully erosion. Additionally, we recommend placement of a woodchip berm or shrubbery in down-wind areas of the existing shale and sand quarry as a preventative measure to avoid large-scale sand entrainment events caused by high winds, as was described in the Draft Environmental Assessment.

Please send us future NEPA documents on this project as they become available. If you have any questions, please call Mike Sedlacek of my staff at 312-886-1765 or e-mail him at [sedlacek.michael@epa.gov](mailto:sedlacek.michael@epa.gov).

Sincerely,

A handwritten signature in black ink, appearing to read "Kenneth A. Westlake".

Kenneth A. Westlake, Chief  
NEPA Implementation Section  
Office of Enforcement and Compliance Assurance

Recycled/Recyclable • Printed with Vegetable Oil Based Inks on 100% Recycled Paper (50% Postconsumer)



DEPARTMENT OF THE ARMY  
US ARMY INSTALLATION MANAGEMENT COMMAND  
HEADQUARTERS, UNITED STATES ARMY GARRISON, FORT MCCOY  
2171 SOUTH 8<sup>TH</sup> AVENUE  
FORT MCCOY, WI 54656-5136

July 26, 2012

Environmental Division

Kenneth Westlake  
U.S. Environmental Protection Agency  
Region V  
Ralph Metcalfe Federal Building  
77 West Jackson Blvd  
Chicago, IL 60604-3590

Dear Mr. Westlake:

Thank you for taking the time to review and comment on the draft Fort McCoy Integrated Natural Resources Management Plan (INRMP). As requested, we will send you future National Environmental Policy Act (NEPA) documents as appropriate for your review as they become available. Your comments on erosion are addressed either with changes in the INRMP or an explanation in this letter:

a. The one active sand pit is inspected and photographed each year by the Fort McCoy Environmental Division to determine if it is operating in compliance with the Non-Metallic Mining Permit. The results of this inspection are summarized in the Annual Facility Site Compliance Inspection Report and filed with the Wisconsin Department of Natural Resources. After the pit is closed, the Directorate of Plans, Training, Mobilization and Security will use a portion of the sand borrow pit as their difficult driving course and vehicle extraction site. This will keep part of the sand pit as bare sand and their Integrated Training Area Management Staff will take over maintaining the site.

b. Section 4.11 addresses land management and soil erosion and did not include a subsection describing the management activities. The following has been added to the INRMP. The section was revised to read as follows:

**4.11 Land Management (Soil Erosion)**

The Fisheries program (see section 4.4) helps identify and resolve erosion problems. The LRAM program completes erosion control when the training mission is determined to be the cause.

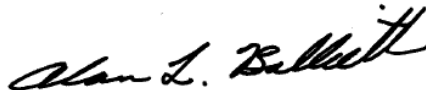
The DPW is responsible for control work when the erosion is natural or resulting from improved roads, shale quarries or sand pits. If erosion poses an immediate threat to safety or surface water quality, it is given a higher priority in the work order process and control may occur quickly. More information about LRAM erosion control work can be found in the five year ITAM plan.

**4.11.1 Management Activities**

- Identify and prioritize erosion resulting from abandoned shale quarries and submit work orders for DPW.
- Annually inspect active shale quarries and sand borrow pits to determine erosion control measures required. Emphasize project phasing to minimize the area of soil disturbance. Recommend project site solutions, offering best management practices (BMPs) to minimize soil loss.
- Ensure BMPs for erosion control are implemented in contracts that involve construction, timber harvests, or other operations disturbing vegetation that contribute to soil erosion.

If you have any questions please contact Mr. James Kerkman at (608) 388-2102.

Sincerely,



Alan L. Balliett  
Chief, Environmental Division  
Directorate of Public Works

From: Crossley, Alan X - DNR [Alan.Crossley@Wisconsin.gov]  
Sent: Thursday, May 03, 2012 11:15 AM  
To: Kerkman, James R CIV (US)  
Cc: Wydeven, Adrian P - DNR; Bartz, Armund D - DNR; Hauge, Tom M - DNR;  
Schroeder, Rebecca S - DNR; Belling, Kristin M - DNR; Kalvelage, Karen M -  
DNR  
Subject: Comments on INRMP

James Kerkman  
DWP  
IMMC-PWE-N  
Fort McCoy, WI 54656

Dear Jim:

Armund Bartz and I were asked to review the INRMP for our respective bureaus (Endangered Resources and Wildlife Management). Overall, we greatly appreciate the ongoing emphasis that is being placed on managing the valuable natural resources on the Fort. Your continued commitment to endangered and threatened species management and to providing public hunting, fishing, trapping and other public access opportunities are particularly noteworthy and appreciated.

We thought there were several opportunities in the plan to add more credence to the important role Fort McCoy plays in managing natural resources in Wisconsin by citing documents that specifically point to that role. For example in section 3.8 you could add mention of the fact that Fort McCoy is included as part of a larger Conservation Opportunity Area (COA) within the federally approved Wisconsin Wildlife Action Plan (2005). The property (and surrounding area) is identified as the "Fort McCoy Barrens and Oak Savanna" COA and is of "Continental Significance" because of the rare natural communities and species it contains. Here is a link to the map of the Ecological Landscape:

[http://dnr.wi.gov/org/land/er/wwap/implementation/pdfs/Map\\_COA\\_EL\\_11.pdf](http://dnr.wi.gov/org/land/er/wwap/implementation/pdfs/Map_COA_EL_11.pdf)  
<[http://dnr.wi.gov/org/land/er/wwap/implementation/pdfs/Map\\_COA\\_EL\\_11.pdf](http://dnr.wi.gov/org/land/er/wwap/implementation/pdfs/Map_COA_EL_11.pdf)>  
and a link to the narrative:  
[http://dnr.wi.gov/org/land/er/wwap/implementation/pdfs/Priority\\_rpt\\_EL\\_11.pdf](http://dnr.wi.gov/org/land/er/wwap/implementation/pdfs/Priority_rpt_EL_11.pdf)  
<[http://dnr.wi.gov/org/land/er/wwap/implementation/pdfs/Priority\\_rpt\\_EL\\_11.pdf](http://dnr.wi.gov/org/land/er/wwap/implementation/pdfs/Priority_rpt_EL_11.pdf)>  
>

Likewise, we also recommend adding reference somewhere in the plan to Fort McCoy being listed as a Land Legacy Place in Wisconsin:

[http://dnr.wi.gov/master\\_planning/land\\_legacy/documents/wcoulee.pdf](http://dnr.wi.gov/master_planning/land_legacy/documents/wcoulee.pdf)  
<[http://dnr.wi.gov/master\\_planning/land\\_legacy/documents/wcoulee.pdf](http://dnr.wi.gov/master_planning/land_legacy/documents/wcoulee.pdf)>

The Wisconsin Bird Conservation Initiative recognizes the Fort McCoy-Robinson Creek area as an Important Bird Area:

<http://www.wisconsinbirds.org/IBA/sites/FortMcCoy.htm>  
<<http://www.wisconsinbirds.org/IBA/sites/FortMcCoy.htm>>

And Fort McCoy is identified in the Great Wisconsin Birding and Nature Trail guide for the Central Sands Prairie Region.

<http://www.wisconsinbirds.org/Trail/docs/central-sands-guide.pdf>  
<<http://www.wisconsinbirds.org/Trail/docs/central-sands-guide.pdf>>

We also have a few section specific comments to offer.

Comments on 1.3.2.2 and 2.6.2.4.1:

Maintaining identification and restrictions that are compatible with the long term viability of Karner populations within these cores (9 sites totaling 57 acres) is vital to the maintenance and possible recovery of this federally listed species. Karner's within these cores likely serve as source populations within the Fort meta population that populate surrounding habitat patches as they become available and serve to mitigate and offset loss of populations at other sites within the property. Additionally, these sites likely harbor the state endangered Frosted Elfin butterfly which utilizes lupine as its' sole larval food plant in Wisconsin and requires much larger lupine patch sizes and number of individual plants than does the Karner blue butterfly. For the stated reasons, the Department recommends maintaining restrictions that are compatible with the long term viability of Karner populations within these cores.

The Department recommends maintaining the training limitations on State Natural Areas as identified in management plans and MOU's. These limitations are in place to maintain the ecological integrity of the sensitive resources found within.

Comments on 1.3.2.4

Fort McCoy unquestionably contains the largest block of quality, intact Midwest oak barrens/oak savanna in the upper Midwest (and thus its identification as a Conservation Opportunity Area in the Wisconsin Wildlife Action Plan). Size, composition, and connectivity of the rare resources within the property provide a level of oak barrens/oak savanna ecosystem function unmatched by any other known property. Therefore, the Department recommends maintaining at least the 13,675 acres of high quality habitat on the property. The Department also recognizes that training exercises can co-occur with barrens/savanna maintenance and in some situations, preparation of training sites (via timber harvest and burning) can restore moderate quality savanna.

Comments on 2.3.3:

When options exist, we hope that FOBs/Contingency Operating Locations, mock villages, Mounted Operation Urban Training (MOUT) sites and Logistical Support Areas (LSA) would be planned for and sited to avoid the highest quality barrens/savanna areas; especially if they eliminate the habitat by permanent conversion to something else.

Comments on 2.3.5

You identify in this section the possibility of mitigating impacts to KBBs from projects occurring on the installation at off-site locations such as the Black River State Forest. The State Forest would be open to assistance with their KBB Federal Recovery goals.

Comments on 3.9

We are pleased to see section 3.9 of your report that begins to address climate change. We think you could update your narrative in section 3.9 by citing the completed WICCI report as well as some of the adaptation strategy reports that have been completed. There are elements of those reports that could help inform and update sections 3.9.1 through 3.9.5. We're providing links to key elements of the WICCI report that could serve as fodder for an

update to those sections.

The full WICCI website: <http://www.wicci.wisc.edu/index.php>

<<http://www.wicci.wisc.edu/index.php>>

A link to the full report: <http://www.wicci.wisc.edu/publications.php>

<<http://www.wicci.wisc.edu/publications.php>>

A link to the wildlife working group report:

<http://www.wicci.wisc.edu/report/Wildlife.pdf>

<<http://www.wicci.wisc.edu/report/Wildlife.pdf>>

Comments on 4.1.3.1 Gray Wolf Management Activities I asked Adrian Wydeven to take a look at your wolf management activities in light of all the recent changes in Wisconsin regarding wolves. Adrian indicated that he reviewed your wolf plan last winter. The Fort represents the most southwest breeding population of wolves in the state. The packs in the Fort have so far not caused depredation problems. If open to harvest, the Fort could easily be over harvested, and because it represent the only breeding packs west of I-94 could become isolated. Adrian has suggested the addition of the following bullet to this section of the plan to address that concern:

\* Will cooperate with WDNR on wolf harvest management when such harvest serve important conservation needs, but the Fort may restrict where such harvest may occur and expects most often that most of the Fort would be closed to wolf harvests to protect the regional wolf population.

Adrian also predicted that we may run into situations where we may need to have USDA-APHIS-Wildlife Services (WS) trap partially on the Fort if depredations occur with livestock or pets in areas adjacent to the Fort. Currently the Fort is located in Wolf Zone 3. Within this zone the department allows WS to trap reactively up to 5 miles from wolf depredation situations. Adrian said it had been proposed in the next wolf plan to add Fort McCoy and the northern half of DMU 72 to Wolf Zone 2. This would reduce reactive wolf controls by WS to 1 mile. Adrian has suggested adding the following bullet to this section of the plan to reflect this situation:

\* Will authorize WS to trap and euthanize up to 1 mile into the Fort wolves that depredate on livestock or pets near residential areas adjacent to the Fort.

Since this has not occurred yet, Adrian suspects it will be an uncommon occurrence. WS does have to get permission from any landowner where they trap, and have trapped on county, state and national forest when depredations occur in adjacent private areas. That would obviously be the case here.

Lastly – Adrian suggested that instead of referring to the Animal Plant and Health Inspection Service in the following bullet that you instead refer more specifically to that branch of APHIS actually involved in this effort (Wildlife Services)

\* Continue to work with the WDNR and with USDA-APHIS-Wildlife Services (WS) in an attempt to capture and place a telemetry collar on a minimum of one wolf. The WDNR aircraft utilized to monitor wolves will be allowed access to

Fort McCoy airspace when the military training mission allows.

Those are the extent of our comments. Thank you for the opportunity to review the document and for the good work the Fort does in managing its ecological and recreational resources.

Alan Crossley  
Public Lands Wildlife Management Specialist Wisconsin Department of Natural  
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**DEPARTMENT OF THE ARMY**  
**US ARMY INSTALLATION MANAGEMENT COMMAND**  
**HEADQUARTERS, UNITED STATES ARMY GARRISON, FORT MCCOY**  
**2171 SOUTH 8<sup>TH</sup> AVENUE**  
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July 26, 2012

Environmental Division

Alan Crossley  
Public Lands Wildlife Management Specialist  
Wisconsin Department of Natural Resources  
PO Box 7921  
Madison, WI 53703

Dear Mr. Crossley:

I would like to thank you and Mr. Bartz for taking the time to review and comment on the draft Fort McCoy Integrated Natural Resources Management Plan (INRMP). The Natural Resources Branch has incorporated many of your concerns and comments into the INRMP and would like to reply to those comments and concerns that we did not use:

a. We added your suggestions to emphasize the role Fort McCoy plays in Wisconsin's significant conservation areas by adding references to the Conservation Opportunity Area, the Land Legacy Places and the Wisconsin Bird Conservation Initiative. We declined to add references to the Great Wisconsin Birding and Nature Trail Guide to avoid encouraging individuals to contact Fort McCoy for access when they would be told that access is not available in some of the highlighted areas due to training concerns.

b. To help ensure the long-term survival of Karner blue butterflies (KBB) on Fort McCoy, core population areas were identified in 1996, and signage was placed in the field to designate their boundaries. Use restrictions in these areas included vehicle traffic, bivouacking, and digging; foot traffic was allowed. When KBBs were first documented on Fort McCoy and the initial management plan was completed in 1995, the amount of disturbance occurring on the landscape from military training activities was not known. The main purpose of the core areas was to ensure there would be KBB habitat areas on the landscape that would not be disturbed from military training activities. These areas would serve to re-populate surrounding areas if widespread

disturbance occurred. Since 1995, no widespread disturbances have occurred on the landscape and it is now believed that it is unlikely that any will occur in the future. Due to this fact, core areas designations were removed in April 2012.

c. Fort McCoy intends to keep the training restrictions in place for the Fort McCoy Natural Areas in the near future. Future changes in the training mission are difficult to forecast so the option to change or ease the restrictions must be left open.

d. The INRMP recognizes the global importance of the oak savanna/barrens habitat and will maintain or increase its present levels as the training mission allows.

e. New training facilities such as mock villages or urban training sites are located using a National Environmental Policy Act (NEPA) project review process. This will ensure that the highest quality barrens/savanna areas are not permanently converted to another use unless it is absolutely necessary for the military mission. If a land use conversion occurs, Fort McCoy will do everything possible to minimize the loss of quality habitat.

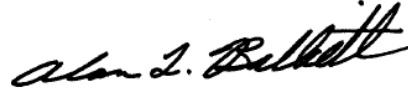
f. Thank you for your offer to work with Fort McCoy in mitigating KBB impacts.

g. The section on climate change has been updated as suggested.

h. Many of your recommended wolf management activities have been added to the INRMP. In regards to a future wolf harvest, the following was included within the INRMP: Fort McCoy will coordinate future wolf harvest activities with the WDNR. It is likely that not all harvest methods currently approved in Wisconsin will be allowed on Fort McCoy. For instance, the use of hounds to hunt wolves will not be allowed on the installation. Since Fort McCoy wolf pack territories extend off the installation, Fort McCoy intends to be conservative when setting harvest levels since it is possible wolves from these packs could be killed off the installation.

If you have any questions please contact Mr. James Kerkman  
at (608) 388-2102.

Sincerely,

A handwritten signature in black ink, appearing to read "Alan L. Balliett". The signature is written in a cursive style with a prominent loop at the end.

Alan L. Balliett  
Chief, Environmental Division  
Directorate of Public Works