MINNESOTA ARMY NATIONAL GUARD

CAMP RIPLEY TRAINING CENTER AND ARDEN HILLS ARMY TRAINING SITE

2014 CONSERVATION PROGRAM REPORT

Cover Photography: Radio-transmittered, female northern long-eared myotis (*Myotis septentrionalis*), Camp Ripley Training Center, 2014. Photography by Chris Smith, MNDNR Nongame Region 3.

Minnesota Army National Guard

Camp Ripley Training Center

and

Arden Hills Army Training Site

2014 Conservation Program Report

January 1 – December 31, 2014

Division of Ecological and Water Resources
Minnesota Department of Natural Resources
for the
Minnesota Army National Guard

Compiled by
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MINNESOTA DEPARTMENT OF NATURAL RESOURCES
CAMP RIPLEY SERIES REPORT NO. 24

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Signature Page for Camp Ripley and AHATS INRMP updates.

Document Title:	**Approval:**
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Approval: Mr. Keith Parker Regional Director MN-DNR Central Region **Signature:** [signature] **Date:** 12/2/14	**Approval:** Mr. Peter Fastbender for Project Leader USFWS , Twin Cities Field Office **Signature:** Lisa Mandell **Date:** 12/2/14

Update/Review Requirements:

The 2014 Conservation Program Report provides Integrated Natural Resources Management Program (INRMP) accomplishments and therefore represents an annual update to the Camp Ripley Training Center and Arden Hills Army Training Site (AHATS) INRMPs. This report outlines accomplishments for the year of January 1 to December 31, 2014. The report summarizes accomplishments and provides updates to the goals and objectives for the INRMP's of the JFMN (Army). The program areas are as follows: natural resources, cultural resources, flora and fauna surveys, threatened and endangered species management, pest management, noise management, land use management, outreach and recreation.

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Applicability: This document applies to all employees/members of JFMN (Army)

Document History

Document	Effective Date	Update Summary
Camp Ripley INRMP	Jan 1998	2014 Conservation Report
AHATS INRMP	Oct 2001	2014 Conservation Report

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EXECUTIVE SUMMARY

This Conservation Program Report provides Integrated Natural Resources Management Plan (INRMP) accomplishments and therefore meets the requirements of an annual update to the 2003 Camp Ripley Training Center and 2007 Arden Hills Army Training Site (AHATS) INRMPs. The INRMPs are intended to support and complement the military mission of the Minnesota Army National Guard (MNARNG) while also promoting sound conservation stewardship principles.

The INRMP goals and objectives that have been accomplished are addressed in this report for the year January 1 to December 31, 2014; and updates to the INRMP goals and objectives are included. Accomplishments for the Conservation Program of the MNARNG are summarized within the following program areas: cultural resources, natural resources, land use management, and outreach and recreation.

In 2014 the Minnesota State Historic Preservation Office (MNSHPO) concurred that there were no projects conducted by the MNARNG that would have an adverse affect on any historic properties managed by the MNARNG. There were an additional 2,095 acres of Camp Ripley surveyed in maneuver area K-1 and in maneuver area I. The phase one archaeological survey of the K-1 maneuver area is now considered complete. The bulk of the southern portion of Maneuver area I is now complete as well. During the surveys 33 new archaeological sites were discovered and included in the report. There were five previously identified sites which were updated in the report. All of the newly identified sites as well as the previously identified and updated sites are considered potentially eligible for the National Register of Historic Places and will remain protected and avoided until a Phase II survey can be completed and eligibility determined.

In 2014, eight tracts of timber totaling 413 acres were prepared for sale; however, two tracts did not receive a bid at the auction on Camp Ripley. Thirty-five individuals acquired fuel wood permits harvesting 195 cords of wood in 2014. The Department of Military Affairs and Minnesota Department of Corrections again worked together to facilitate a fuel wood program for families of deployed soldiers. During the 2008 session, the Minnesota Legislature enacted legislation to allow the Adjutant General to accumulate Camp Ripley timber sale proceeds for the purposes of forest management and established the land fund. Expenditures from the land fund included forest regeneration, forest health, and harvest treatment along with jack pine seedling protection.

Prescribed fire was implemented on Camp Ripley for hazard reduction (11,394 acres) and training enhancement (1,333.5 acres) burns. In 2014, the Department of Biological Sciences at St. Cloud State University conducted large scale terrestrial invasive plant management for spotted knapweed, common tansy, leafy spurge, and baby's breath.

Sixty-nine and thirty-nine species in greatest conservation need (SGCN) have been identified at Camp Ripley and AHATS, respectively. Additional research will be directed toward identifying other SGCN species and management or conservation actions that could be implemented to benefit these species. Camp Ripley songbird surveys were conducted on permanent plots. A red-shouldered hawk play call back survey was conducted with occupied territory decreasing significantly. The satellite transmitter that was on a red-shouldered hawk failed in January 2013, this transmittered bird was again observed in May 2014 using the same nest territory. Additional species were monitored

including osprey, bluebirds, wood ducks, black terns, trumpeter swans, bald eagles, owls, and tiger and burying beetles.

At the beginning of 2014, only one of three radio-collared wolves were still on Camp. Three wolves were monitored via radio collars in 2014. One radio-collared wolf was illegally killed. Due to a Federal court decision, wolves in the western Great Lakes area (including Michigan, Minnesota, and Wisconsin) were relisted under the Endangered Species Act, effective December 19, 2014. Wolves now are federally classified as threatened in Minnesota.

Ground and aerial radio-tracking were used to monitor reproductive success, movements, and mortality of eight collared black bears on Camp Ripley through 2014. Camp Ripley, in cooperation with Central Lakes College, continued research as part of the DNR fisher project; seven fishers were radio-collared and nine monitored. Summer stationary and mobile acoustic bat surveys were conducted. Camp Ripley was selected as one of two study sites for a preliminary northern long-eared bat, a proposed federally endangered species, summer habitat use study. Four female northern long-eared bats where radio-transmittered, and 15 roost trees were identified.

Surveyors again searched Camp Ripley for Blanding's turtles and their nests. Twelve Blanding's turtles were observed, two nests were protected, and 17 hatchlings were produced. Frog and toad monitoring surveys were conducted. Results from the 2013 amphibian Chytridiomycosis study to understand the detection, distribution, and frequency of the disease are presented. A fisheries survey was conducted on Ferrell Lake.

To date, 372 willing landowners have expressed interest in Camp Ripley's Army Compatible Use Buffer program. These landowners represent 46,000 acres of land. Over 95 percent of the interested landowners desire permanent conservation easements rather than acquisition. ACUB accomplishments through 2014 are presented in this document.

Also included in this report is a summary of the Integrated Training Area Management program and how its five component programs are used to meet all environmental laws and regulations, and to maintain and improve the condition of natural resources for training at Camp Ripley. A summary of Geographic Information Systems support of conservation programs and resource management plans is discussed.

In 2014, the environmental team gave presentations or tours to 85 groups totaling 4,500 people. Also in 2014, Camp Ripley hosted the tenth annual Disabled American Veterans (DAV) wild turkey hunt, sixth annual deployed soldiers turkey hunt, and the thirteenth annual youth archery deer hunt. Camp Ripley also held the ninth annual deployed soldiers archery deer hunt in conjunction with the twenty-third annual DAV firearms deer hunt. Camp Ripley's general public archery deer hunt, which is one of the largest archery deer hunts in the United States, was again held in 2014.

AHATS has been surveyed for cultural resources in its entirety and no eligible resources are present at this time. The Land Use Control Remedial Design for the New Brighton/Arden Hills Superfund Site condition must be honored by the MNARNG relative to long-range planning, land use, and land management practices.

AHATS was surveyed during the National Audubon Society's annual Christmas Bird Count. Breeding bird monitoring was conducted on ten plots. State endangered Henslow's sparrows were not documented in 2014 but have been observed six of the past ten years. One pair of trumpeter swans nested and raised five cygnets during 2014. Sixty-four white-tailed deer were counted during the AHATS aerial survey. A one-day road survey for Blanding's turtles resulted in no observations. AHATS participated in the statewide frog and toad monitoring survey. A tiger beetle survey was conducted and no state-listed tiger beetles were observed. A butterfly survey was conducted by the Saint Paul Audubon Society on July 3, 2014. At AHATS, the sixth annual deployed soldiers archery wild turkey hunt, ninth annual deployed soldiers archery deer hunt, and a volunteer archery deer hunt were also held.

Of the 63 statewide armory and maintenance facilities, lands totaling 397.4 acres, 25 need to be documented to determine need for further study. Three of the armories surveyed for eligibility on the National Register of Historic Places are eligible for the register, but not yet nominated. The New Ulm armory is on the National Register.

INTRODUCTION

The purpose of this report is to summarize accomplishments for the Conservation and Integrated Training Area Management programs of the Minnesota Army National Guard (MNARNG) during calendar year 2014. The Camp Ripley and Arden Hills Army Training Site (AHATS) Integrated Natural Resources Management Plans (INRMP) (MNARNG 2003, MNARNG 2007) provide a comprehensive five-year plan, and document the policies and desired future direction of the Conservation Programs for the MNARNG. The preparation, implementation, and annual updates of INRMPs are required by the Sikes Act (16 USC 670a et seq.), Army policy, and several other Federal directives including regulations and guidance issued by the U.S. Department of Defense. The INRMPs focus on strategic goals, objectives, and policies that will be implemented for each of the Conservation Program areas. INRMP accomplishments and updates to the goals and objectives will be tracked and reported in this annual Conservation Program Report, and therefore, meets the requirement for an annual update for both the Camp Ripley and AHATS INRMPs (Appendices A and B). Other program areas such as cultural resources (Camp Ripley Environmental Office 2009), operational noise (MNARNG 2006 and USAPHC 2011), and pest management (MNARNG 2004) have individual management plans, and their accomplishments are also addressed in this report.

Under the guidelines of 32CFR 651 and selected AR 200-1 references the annual update to INRMP documents require that an Army National Guard Record of Environmental Consideration and Army National Guard Environmental Checklist be completed. The baseline document for review will be the original Environmental Assessment that was written for Camp Ripley Training Site in 1998 (MNARNG 1998) and AHATS in 2001 (MNARNG 2001). After review of the two INRMP documents it has been determined that there is no significant change to environmental practices. The current Army National Guard Record of Environmental Consideration therefore is still valid and will remain in place until there is a major revision of the INRMP. If there is a significant change to environmental practices prior to the revision year the Army National Guard Record of Environmental Consideration will need to be updated.

RESPONSIBILITIES

Camp Ripley Command-Environmental (MNNG-CRE) personnel are responsible for Conservation Program planning and implementation for the MNARNG. This includes, but is not limited to, preparing plans, developing projects, implementing projects, conducting field studies, securing permits, geographic information system support, preparing reports, and facilitating land use activities between military operations and other natural resource agencies. The environmental personnel who work directly for the Garrison Commander are responsible for MNARNG's Conservation Programs statewide. Environmental personnel who work directly for the Facilities Management Office (FMO) have statewide responsibility for MNARNG's compliance, restoration, and pollution prevention programs.

PARTNERSHIPS

In the interest of sound conservation, the MNARNG has developed partnerships with a variety of organizations and resource agencies. Some of these partnerships have resulted in formal interagency agreements with the Minnesota Department of Natural Resources (DNR), Division of

Ecological and Water Resources and Division of Forestry, Saint Cloud State University, and Central Lakes College in Brainerd, Minnesota. These have been extremely cost effective and beneficial. The MNARNG also relies on expertise of personnel from other state and federal agencies and organizations who contribute significantly to the support of the MNARNG Conservation Program, including: Minnesota Board of Water and Soil Resources, U.S. Fish and Wildlife Service, Minnesota Department of Corrections, Minnesota Department of Transportation, Minnesota Department of Agriculture, Minnesota Department of Health, Minnesota Pollution Control Agency, Minnesota Deer Hunters Association, and Minnesota State Archery Association. Other partners include: The Nature Conservancy, Morrison Soil and Water Conservation District, Crow Wing Soil and Water Conservation District, and Cass Soil and Water Conservation District.

The success of the Conservation Program for the MNARNG is also attributed to a partnership between the environmental and military operations offices, represented by a shared Training Area Coordinator position. This partnership has enabled the MNARNG to provide a quality training experience for its soldiers without sacrificing the integrity of the Conservation Program.

CLIMATE CHANGE

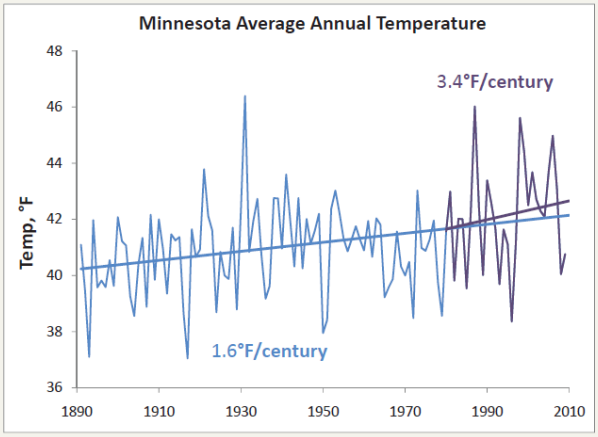
The effect of climate change on MNARNG installations has the potential to impact the military mission. Each installation requires diverse landscapes with healthy ecosystems to support the training mission and ensure military readiness. In addition, the projected increase in extreme weather events may increase demand for the National Guard for disaster relief support.

Climate change may pose great challenges to natural resource management, and will impact the health and productivity of the land and water, and the animals and plants that depend on them. In Minnesota it may have direct impacts on forests, grasslands, wetlands, lakes, and streams. The climate change threat may exacerbate current threats from habitat loss, invasive species, and diseases affecting fish, wildlife, and plants.

Presidential Executive Orders 13514 and 13653 require federal agencies "to evaluate climate change risks and vulnerabilities to manage both short- and long-term effects of climate change" on the mission and operation of the federal agency. In addition, Executive Order 13653 requires "each agency shall develop or continue to develop, implement, and update comprehensive plans that integrate climate change into agency operations" (U.S. Department of Defense 2014).

Minnesota's average annual temperature has increased by 1.9° F. since 1895. Warming rates are accelerating, especially in winter (Figure 1). Annual precipitation in Minnesota has increased by about 3.1 inches since 1895 at a rate of 2.7 inches per century (Figure 2) (MNDNR 2011a).

Figure 1. Average annual and winter minimum temperature, Minnesota, 1895-2009. Blue line is change rate from 1895-1979; purple line is change rate for 1980-2009. Source: Minnesota State Climatology Office. (DNR 2011a)



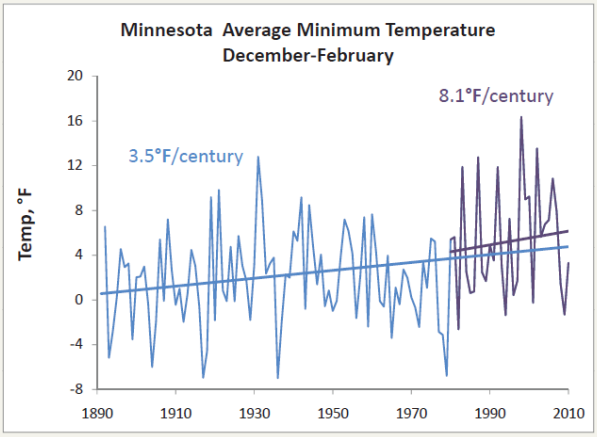
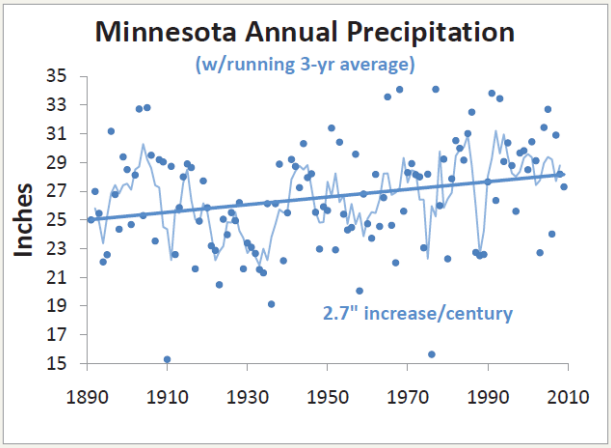


Figure 2. Annual precipitation, Minnesota, 1890-2009. Rate of change per century based on actual data. Source: Minnesota State Climatology Office. (DNR 2011a)



Future climate projections in central Minnesota, according to 16 different climate models, predict an increase in the average temperature between 3° F and 12° F by the year 2080. Precipitation projections are more uncertain; precipitation could increase by up to 38% or decrease by up to 28%. Based on varying scenarios, all habitat types, agriculture and human needs would be impacted. It is projected that by 2060 central Minnesota's climate would be similar to the climate of contemporary northwestern Iowa (MNDNR 2011a).

Projected impacts to natural resources include increased growing season length, large-scale shifts in species ranges and the timing of migration, and an increase in fires, insect pests, invasive species and disease pathogens. Climate change impacts to wetlands, lakes and streams will be complex. Climate projections indicate a large decrease in aspen, a common tree on Camp Ripley, and the forest composition would shift to an oak and hickory dominated landscape (MNDNR 2011a). The intersection of biomes will be the most vulnerable to climate change impacts. Camp Ripley currently lies on the border between the broadleaf and coniferous forest biomes.

Planning and management responses to climate change should include adaptation and mitigation strategies (MNDNR 2011a). There are three broad adaptation categories, resistance, resilience and facilitation. Resistance strategies are useful when climate change impacts are expected

to be minimal or a measure to allow time for other strategies to be implemented. Resilience strategies increase a species or ecosystems ability to absorb or adapt to the effects of climate change. Facilitation strategies use management to encourage adaptation toward a predicted direction of climate change (MNDNR 2011a).

Mitigation strategies are actions that reduce greenhouse gas emissions or remove them from the atmosphere (MNDNR 2011a). Mitigation strategies can include carbon sequestration, bioenergy, conservation based energy strategies, and energy efficiency. Terrestrial carbon sequestration is a natural process that removes carbon dioxide from the atmosphere and stores it in plants or soils. Minnesota's ecosystems provide natural carbon storage and sequestration. Sequestration rates are highest in wetland and forest land. The amount of carbon sequestration occurring in natural habitats will be important for participating in future carbon credit programs (MNDNR 2011a).

Camp Ripley and AHATS environmental staff are beginning to plan management strategies in response to projected climate change impacts.

PROGRAM AREAS

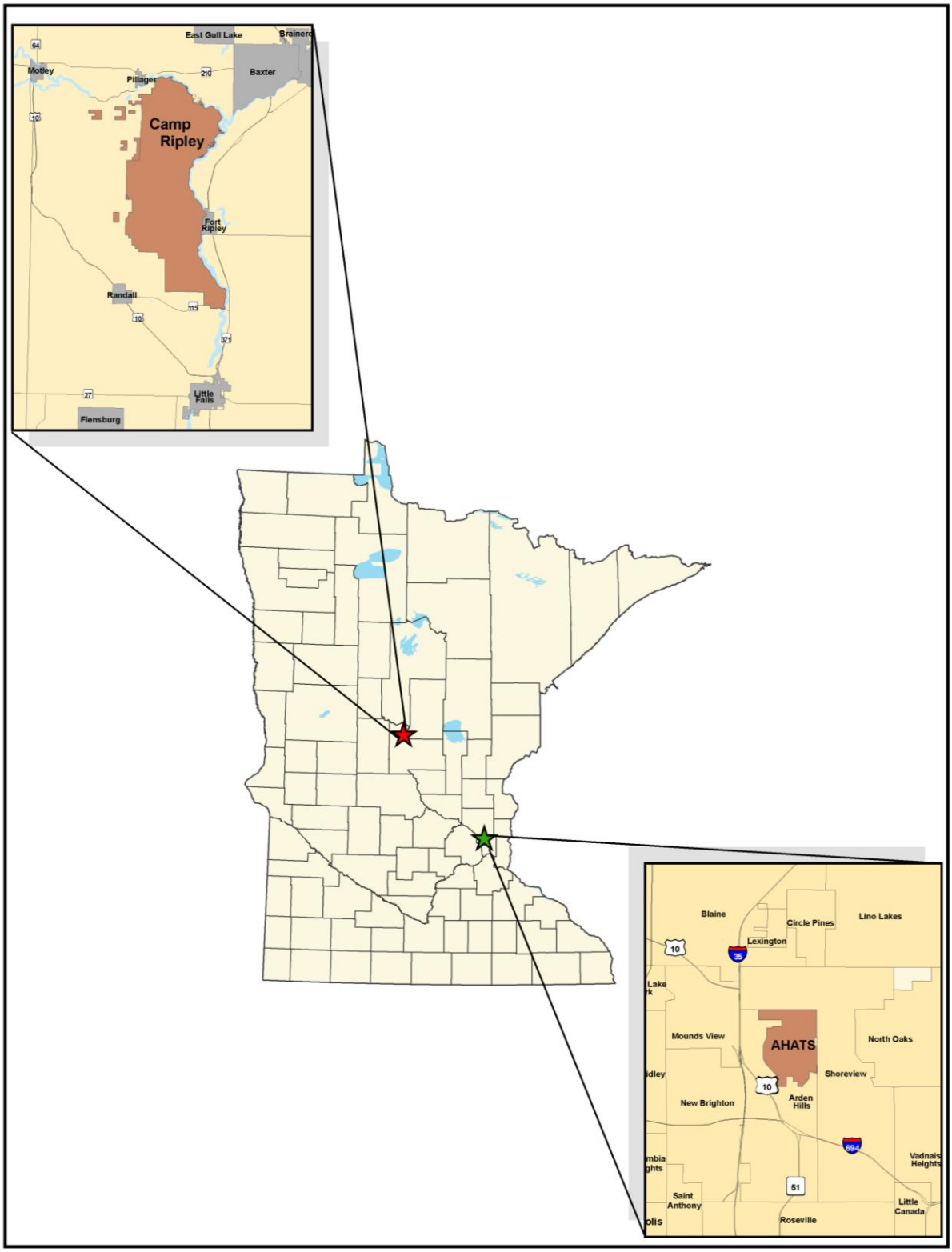
For the purpose of documenting accomplishments for 2014, the Conservation Program of the MNARNG will be divided into the following program areas within each installation: cultural resources, natural resources, land use management, and outreach and recreation.

CAMP RIPLEY TRAINING CENTER

Camp Ripley is located in the central portion of Minnesota approximately 100 miles northwest of the Minneapolis/St. Paul metropolitan area (Figure 3). According to the 2003 property boundary survey, Camp Ripley occupies 52,699 acres (approx. 82 sq. miles) within Morrison County and 59 acres within Crow Wing County (52,758 acres total). Camp Ripley is bordered on the north by 8.5 miles of the Crow Wing River and on the east by 17 miles of the Mississippi River. Land ownership is 98 percent state land under the administration of the Minnesota Department of Military Affairs (DMA), with the remainder under lease from Minnesota Power and Light Company.

Camp Ripley's landscape was sculpted during the last glacial period, the Late Wisconsinan. Because the glaciers receded along the northern two-thirds of Camp, a sharp contrast is evident from north to south, both topographically and biologically. The high diversity of life forms (over 600 plant species, 202 migratory and resident bird species, 51 mammal species, and 23 reptile and amphibian species) is also a result of Camp Ripley's location along the forest transition zone in central Minnesota. Dryland forest dominates the landscape, covering 27,875 acres or 55 percent of the installation. The remainder is almost equally divided between wetlands, dry open grass and brush lands, and other areas.

Figure 3. Location of Camp Ripley Training Center and Arden Hills Army Training Site (AHATS), Minnesota.



Since 1995, when Camp Ripley first started tracking utilization with a military scheduling program, more than five million man days of training has occurred at Camp Ripley. Organizations include: All branches of the military, many international military units, as well as civilians from a variety of organizations including federal, state and local law enforcement agencies. Camp Ripley supports the federal mission for military training as a 7,800 person, year-round training facility for the National Guard, primarily consisting of units from Minnesota, North Dakota, South Dakota, Wisconsin, Iowa, and Illinois. The state training mission focuses primarily on law enforcement activities, natural resource education, environmental agencies, and emergency management activities. The central mission of the natural resource management program is to ensure that the multiple demands for land use can be met without sacrificing the integrity of Camp Ripley's training mission and natural resources management program.

Inventory and monitoring surveys of flora and fauna are an ongoing part of the installation's INRMP, that was completed in December of 2003 (MNARNG 2003) with annual updates in 2007 (Dirks et al. 2008), 2008 (Dirks and Dietz 2009), 2009 (Dirks and Dietz 2010), 2010 (Dirks and Dietz 2011), 2011 (MNDNR and MNARNG 2012), 2012 (MNDNR and MNARNG 2013), 2013 (MNDNR and MNARNG 2014), and 2014 (Appendix A). The data obtained will be used to help manage the conservation program and natural resources of Camp Ripley.

CULTURAL RESOURCES

By Patrick Neumann, Minnesota Department of Military Affairs

Program Overview

Cultural resources management is the identification of culturally, historically, architecturally, and archaeologically significant properties and management of those properties in a manner that is consistent with applicable state and Federal laws and regulations and the mission of Army National Guard and that is respectful of the intrinsic values of the properties. The MNARNG must comply with Federal laws regarding cultural resources if conducting operations considered a Federal undertaking. A Federal undertaking means a project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a Federal agency, including those carried out by or on behalf of a Federal agency; those carried out with Federal assistance; and those requiring a Federal permit, license, or approval. The MNARNG is funded by the Federal government which in turn makes much of its construction, improvements, and activities a Federal undertaking requiring compliance with Federal historic preservation laws. The primary laws regarding cultural resources management are as follows:

1. The National Historic Preservation Act of 1966 (as amended)
2. The Native American Graves Protection and Repatriation Act
3. The National Environmental Policy Act
4. The American Antiquities Act of 1906
5. The Archaeological and Historic Preservation Act of 1974
6. The American Indian Religious Freedom Act of 1978
7. The Energy Independence and Security Act of 2007

There are also several Executive Orders, Department of Defense Directives, Army regulations, and Army memorandums concerning how the MNARNG executes these laws and manages the cultural resources under its care. The MNARNG also complies with state historic preservation laws which can be found at https://www.revisor.mn.gov/pubs/.

Field Survey

There has been an ongoing effort over the last several years by the MNARNG to survey the lands and structures it controls for cultural and archaeological resources. This survey work greatly accelerates the timeframe of compliance with Federal preservation laws. A typical survey for historic structures or land for cultural resources can take anywhere from several weeks to several months depending on the size and complexity of the survey required. The Environmental office of the MNARNG chose to survey the most utilized areas of Camp Ripley as well as its readiness centers across the state (Figure 4). This has led to a greatly reduced turn-around time for permitting construction projects and other maintenance activities. When a federal undertaking is considered, a consultation must occur between the MNARNG and the Minnesota State Historic Preservation Officer (MNSHPO) as well as Tribal representatives and other interested parties. If the undertaking occurs on un-surveyed land or historic structures it could take several months or longer to acquire concurrence from the MNSHPO that the MNARNG's plans do not affect any cultural or historic resources. On surveyed land this is reduced to a 30 day review period barring any concerns by the MNSHPO or interested parties.

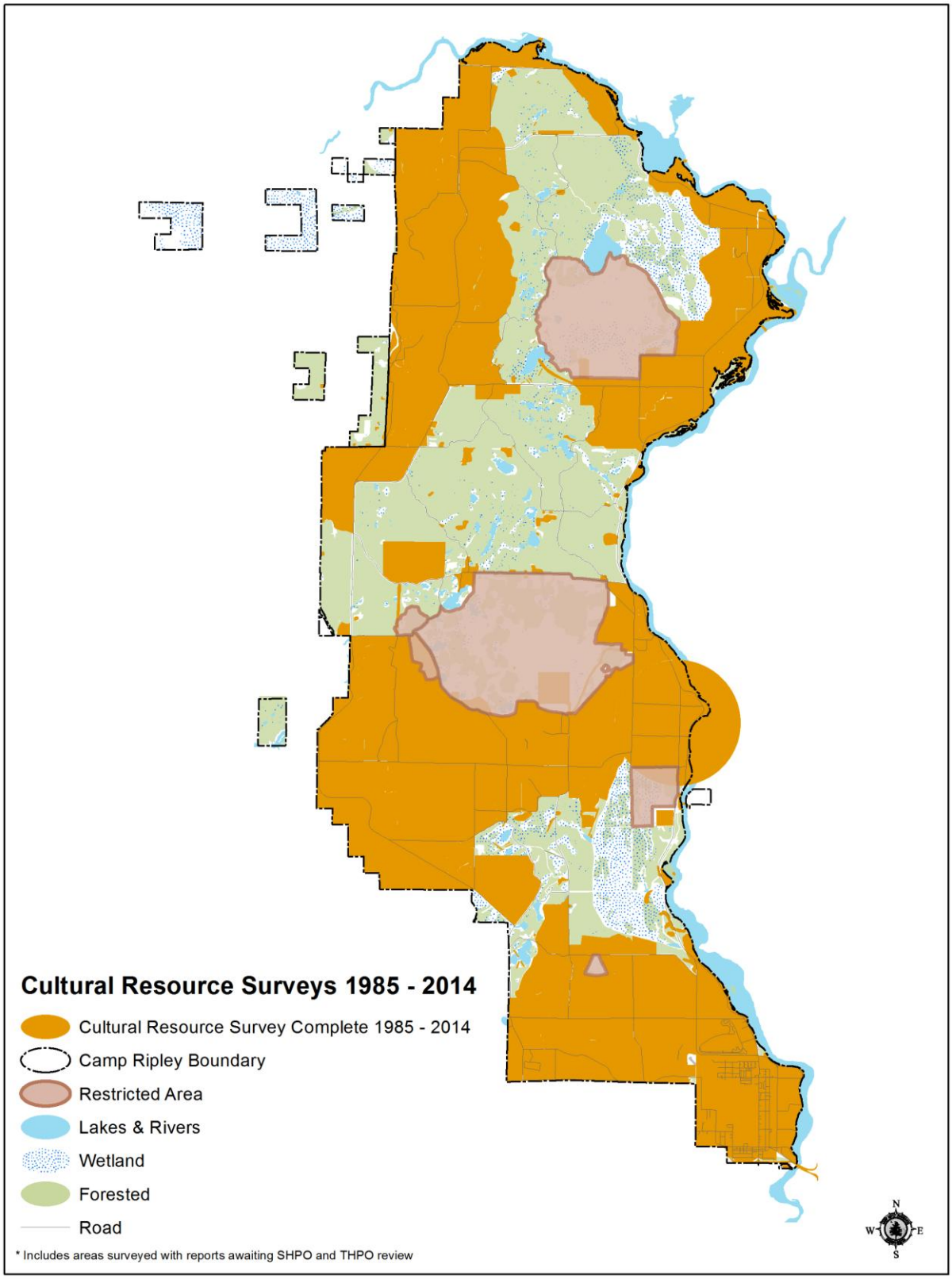
Surveys in 2013-2014 were conducted by the Leech Lake Heritage Sites program in maneuver areas I, K1, D, and B as well as miscellaneous additional parcels. The pedestrian and shovel test surveys covered a total of 2,095 acres. The survey resulted in the discovery of 33 previously undocumented sites and the updating of five previously discovered sites. None of these sites have been evaluated for the National Register of Historic Places and will need further, Phase II, excavations to determine if they are eligible for the register. These sites are avoided by training and construction activities with a 50 foot buffer until eligibility is determined.

At the end of 2014, approximately 29,856 acres of Camp Ripley have been evaluated for cultural resources or are awaiting review by the MNSHPO and Tribes that the MNARNG consults with. All of the data collected in the previous year's survey will be recorded in the cultural resources GIS database.

Partnerships

In November 2014 the Cultural Resources Manager for MNARNG contacted the anthropology department at St. Cloud University to propose a partnership between their department and the MNARNG. This partnership would engage the St. Cloud graduate department to produce a mutually beneficial program that would allow for graduate students to gain experience in an internship capacity while accomplishing work for the MNARNG that is typically contracted out. At present this program

Figure 4. Culturally evaluated areas, Camp Ripley Training Center, 1985-2014.



is in its very early stages. Interest is very high on the part of students and professors and in the coming months this program will be further developed.

Archaeology Day

Camp Ripley's first archaeology day was held in 2014 during Minnesota archaeology week in September. This first attempt at an archaeology day was a success and included topics intended to educate personal and the public on what cultural resources management is and why it is done, the history of Camp Ripley and a flint knapping demonstration. The success of the program is in large part thanks to presentations by representatives of the Minnesota Military Museum as well as Leech Lake Heritage Sites Program.

The first Archaeology day was limited to Camp Ripley personnel and was kept intentionally small to gauge interest and address any unforeseen complications. In the coming years Archaeology day will be opened to the public and advertised through the State Archaeologists Office and the Minnesota Historical Society. The day will coincide bi-yearly with the Camp Ripley open house and will be a part of it as well. The event will be larger and include St Cloud graduate students and professors who will share their projects and expertise.

Submittals

Several construction projects have been submitted to the MNSHPO as well as Tribal consultants for review in 2013-2014. A majority of these projects consisted of renewable energy sources being placed in and around the Camp Ripley cantonment area. All of these projects have been reviewed and MNARNG's finding of no cultural resources being affected by them was concurred with by MNSHPO and Tribal consultants.

Thanks in large part to the previous survey work completed over the last several years, all of these projects were reviewed and found to have no adverse affects in a very short time frame. Without the early and continuous involvement in the planning stages of these projects, the consultation process would have been much longer and much more expensive.

Geographic Information System and Data Management

In 2013 a plan was developed to digitize documents and modernize the methods used to house the extensive amount of data found in the Camp Ripley Environmental Office. This plan involves the scanning of several thousand pages of archaeological and architectural survey reports in a manner that would allow for the instantaneous search for specific terms within the reports. These reports will also be integrated into GIS to allow for easy identification of relevant surveys inside a given project area. Upon completion of the plan, any spot on Camp Ripley will be able to be assessed at a glance to determine its status in regards to cultural resources. As of 2014 the plan is about 25% complete with the framework in place to start building on. The files and much of the remaining integration will continue and could possibly become an internship project with the St. Cloud University program being developed.

Native American Tribal Consultations

Face to face Native American Consultations are held yearly between the Federally recognized Tribes of Minnesota as well as Tribes that have an historical interest in properties now maintained by the MNARNG. This year's Tribal Consultation was held at the Leech Lake Reservation in Cass Lake MN over two days. The Consultation was contracted to be facilitated by Leech Lake Heritage Sites Program, a cultural resources contractor owned by the Leech Lake Band of Ojibwe. The Leech Lake Band, the Mille Lacs Band and White Earth Nation were present for this year's consultation. Heritage Sites has been contracted to host the 2015 Tribal Consultation meeting as well.

Tribal consultations are also part of the section 106 submittal process. The Tribes are allowed the same 30 day review period allotted to the SHPO to address any concerns that they may have regarding Tribal burials, sacred sites, or archaeological sites. During 2014 there were several instances where Tribes did raise concerns about potential impacts, all of which were addressed and found to have no adverse affects to any cultural resources.

NATURAL RESOURCES

Natural resource planning is an integral part of the Conservation Program for the MNARNG. The MNARNG uses the INRMP as the guidance document for implementing the Conservation Program. The planning process used in developing the INRMP focuses on using key stakeholders from the MNARNG, DNR, the U.S. Fish and Wildlife Service, and other organizations that have an interest in the MNARNG's Conservation Program. Together, these stakeholders represent the Integrated Natural Resources Management Planning Committee. The primary responsibility of the Planning Committee is to ensure that the INRMP not only satisfies the military mission but also provides a foundation for sound stewardship principles that adequately address the issues and concerns that are raised by all stakeholders. Annually, stakeholders discuss and review the INRMP for Camp Ripley, and present their annual accomplishments and work plans for the next year. Please refer to Appendix C for the 2014 Camp Ripley annual meeting minutes.

Forestry

Forest Inventory

By Jason Linkert, Minnesota Department of Military Affairs

No forest inventory was completed in 2014. Alterations from range developments and timber cuts continue to be updated and entered into the Forest Inventory Module (FIM) to reflect changes in land composition.

Forest Inventory and Analysis – Northern Research Station

By John Maile, Minnesota Department of Military Affairs

Forest Inventory and Analysis is a national program of the U.S. Department of Agriculture, Forest Service. In cooperation with state forestry agencies, it conducts and maintains comprehensive inventories of forest resources across all lands in the United States. In 1999, Forest Inventory and Analysis began transitioning to a sampling design in which a 6,000 acre hexagonal grid is established, and one sample point is measured within each hexagon. The state of Minnesota is supporting an intensification of the plot grid to one plot per 3,000 acres of land. Each year, one-fifth of the plots, called a 'panel' are measured (see Table 1 and Figure 5 in MNDNR and MNARNG 2012). One plot was surveyed in 2013, located on the north end of Camp Ripley.

Reforestation

By John Maile, Minnesota Department of Military Affairs

As part of Camp Ripley's 2014 interagency agreement with the DNR Forestry office in Little Falls, five sites located throughout Camp Ripley were planted with seedlings of various species totaling 53 acres. These seedlings were bud capped in the fall to protect them from deer browsing. In addition, an Earth Day project involving Camp Ripley staff planted 300+ various species of trees throughout the cantonment area of Camp Ripley. These trees were planted to replace trees that have died off and to act as a natural snow fence along roads. Additional trees were planted within the nursery as inventory for cantonment replacement trees.

Timber Sales

By John Maile, Minnesota Department of Military Affairs

In September, the annual timber auction was conducted by the DNR, Division of Forestry, at Range Control. Eight tracts were prepared for sale; however, three tracts (B012744, B012746, and B012750) received no bid and remain unsold. The auction results are listed in Table 1 and Figure 5. There was greater interest in our wood this year due to a higher demand for pine for stud material.

The status of existing permits on Camp Ripley is listed below (Tables 1-3).

Figure 5. Location of timber sales, Camp Ripley Training Center, 2014.

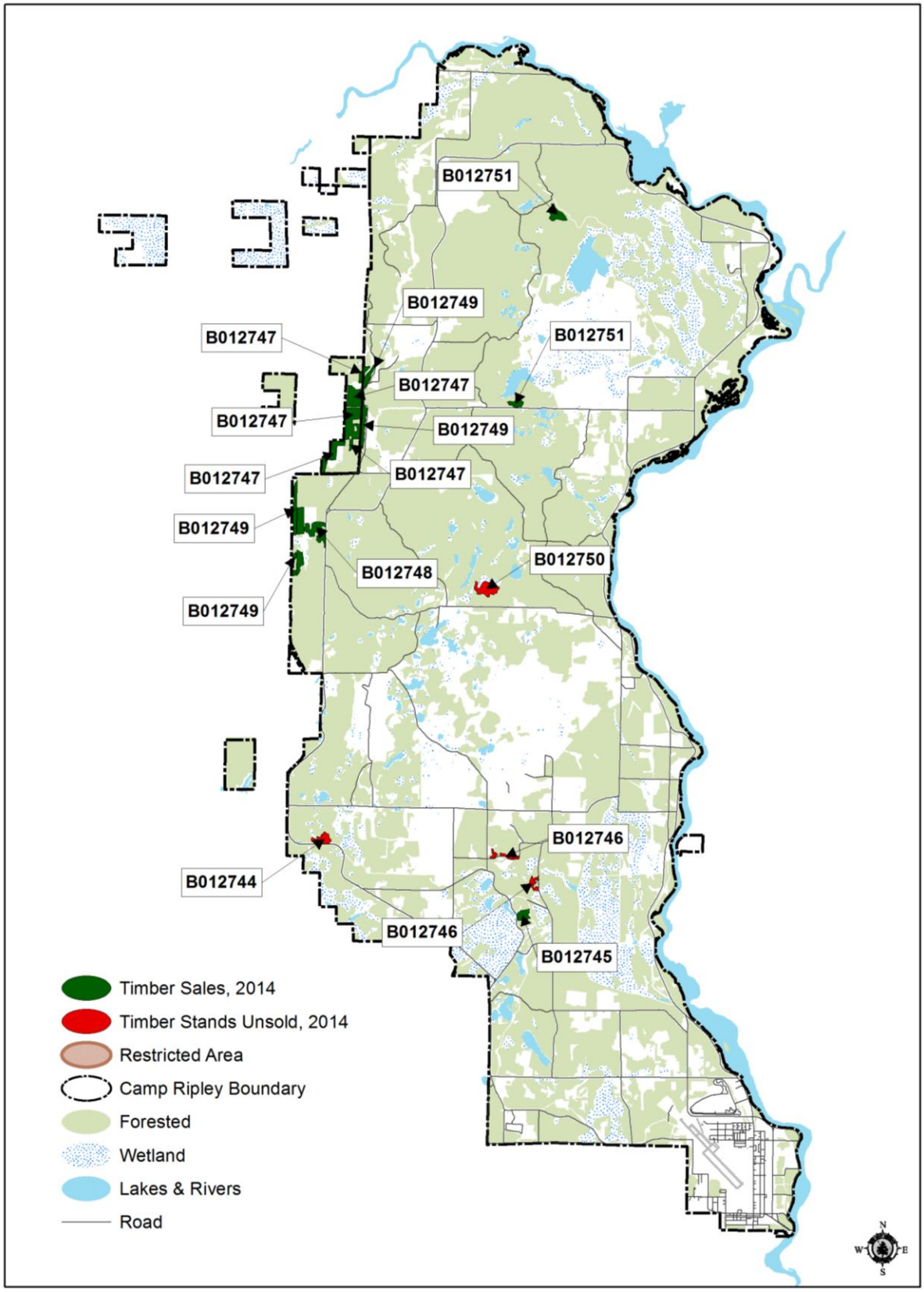


Table 1. Auction timber sales, Camp Ripley Training Center, 2014.

Permit #	Acres	Biomass (tons)[a]	Cords/Species	Revenue	Successful Bidder
B012744	20.7	138	180 Aspen 56 Paper Birch 20 Basswood 17 Red Maple	$3,055.25	Unsold
B012745	16.8	215	310 Aspen 66 Paper Birch 55 Red Oak 6 Red Maple	$8,242.25	Great Northern Logging
B012746	22.7	133	176 Aspen 56 Paper Birch 34 Nrthn Hardwoods	$2,995.30	Unsold
B012747	141.7	769	1,789 Norway Pine	$62,954.91	Edin Logging
B012748	41.1	420	515 Aspen 180 Paper Birch 110 Oak 27 Red Maple 4 Ash	$13,913.20	Great Northern Logging
B012749	107.1	325	687 Norway Pine	$18,372.60	Great Northern Logging
B012750	34.9	110	65 Aspen 39 Maple 61 Oak 23 Paper Birch 5 Ash	$1,715.00	Unsold
B012751	31.5		456 Aspen 59 Paper Birch 40 Basswood 32 Maple 17 Red Oak 9 Mixed Hardwoods	$12,484.66	Great Northern Logging
2014 TOTAL	**416.5**	**2,110**	**5,094 cords**	**$116,429.62**[b]	

[a] Biomass is not totaled into final cords due to different units and whether it is included or added in to sale.

[b] Amount is for only the sold sales and does not include unsold wood.

Table 2. Timber sale permit status, Camp Ripley Training Center, 2010-2014.

Permit Holder	Permit Number	Date Closed	Volume Harvested	Actual Receipts
Informal Sales				
Kent Ginter	F010358	4/6/10	212 cds	$ 2,541.00
Edin Logging, Inc	F010431	4/8/10	445 cds	$ 6,819.00
Edin Logging, Inc	F010486	5/28/10	30 cds	$ 165.00
Carlson Timber Products	F010656	6/15/12	342 cds	$ 5,154.00
Carlson Timber Products	F010657	1/9/12	535 tons	$ 267.35
Hettver Logging LLC	F011082	3/26/14	273 cds	$ 4,064.02
Edin Logging Inc	F011171	4/17/14	349 cds	$ 3,400.50
Edin Logging Inc	F011172	4/17/14	401 cds	$ 4,004.71
Great Northern Logging Inc	F011214	8/4/14	10 cds	$ 50.00
2010 Sales				
Sappi	B011349	9/19/12	2,836 cds	$ 66,514.07
Sappi**	B011350	9/19/12	2,170 cds	$ 54,719.11
CTP Chipping**	B011351	12/30/11	355	$ 5,825.30
Edin Logging**	B011353	Expired	511	$ 1,101.00[b]
2011 Sales				
Great Northern Logging	BO11608	expired	612 cds[c]	$ 2,356.44[b]
Great Northern Logging	BO11685	8/4/14	631 cds[c]	$ 10,841.92
Lester Parker	BO11686	9/18/12	4561.5 cds	$ 60,650.40
Great Northern Logging	BO11687	10/12/14	608 cds[c]	$ 9,695.35
Northern Logging	BO11688	3/22/12	481 cds.	$ 47,863.35
2012 Sales				
Sappi Cloquet LLC	B012053	4/16/13	1547 cds	$ 23,314.65
Sappi Cloquet LLC	B012054	4/16/13	336 cds	$ 5,884.78
Sappi Cloquet LLC	B012057	3/5/13	946 cds	$ 23,636.87
	B012055	Reoffered 2013		
	B012056	Reoffered 2013		
2013 Sales				
Hennen Enterprises LLC	B012438	6/16/14	275 cds	$ 4,014.30
	B012439	Reoffered 2014	273 cds[c]	
	B012440	Reoffered 2014	266 cds[c]	
	B012442	Reoffered 2014	193 cds[c]	
	B012441	Canceled[d]	669 cds[c]	
Hennen Enterprises LLC	B012443	6/16/14	259 cds	$ 2,307.84
	B012444	Canceled[e]	720 cds[c]	

Table 2. Timber sale permit status, Camp Ripley Training Center, 2010-2014.

Permit Holder	Permit Number	Date Closed	Volume Harvested	Actual Receipts
2014 Sales				
	B012744	Unsold	273 cds	
Great Northern Logging	B012745	Active	437 cds[c]	$ 8,242.25
	B012746	Unsold	266 cds[c]	
Edin Logging	B012747	Sold	1,789 cds[c]	$ 62,954.91
Great Northern Logging	B012748	Sold	836 cds[c]	$ 13,913.20
Great Northern Logging	B012749	Active	687 cds	$ 18,372.60
	B012750	Unsold	193 cds[c]	
Great Northern Logging	B012751	Sold	613 cds	$ 12,484.66

** Denotes biomass sale, volume is measured in 1,000 pounds

[a] Sale canceled due to UXO on site, logger refunded

[b] Sale expired without harvest, down payment kept

[c] Appraised volume

[d] Canceled and will be sold over counter at lower price

[e] Canceled, one block sold as permit F011082

Table 3. Timber sales, Camp Ripley Training Center, 2004-2014.

Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014[a]
Acres	218.5	217	139	188	641	402	237	340.5	168.8	190.8	**338.2**
Volume	4040 cds.	4412 cds.	3140 cds.	3624 cds.	12,893 cds.	6,482 cds.	5,505 cds.	6,893.5 cds.	3,452 cds	2676 cds	**4,362 cds**
Appraised Value	$86,943.00	$114,123.00	$85,705.00	$67,140.00	$206,326.00	$87,895.00	$78,846.30	$88,648.05	$64,564.55	$35,129.10	**$124,195.17**
Sold Value	$230,140.00	$413,321.30	$133,740.00	$125,483.56	$406,703.38	$99,786.36	$124,909.25	$98,893.20	$63,291.00	$6,385.75	**$116,429.62**
Type of Harvest	Pine Thinning/ Aspen Regenerate (70 ac.) Remove Aspen from Oak Overstory (53.5 ac.) Release White Pine Understory and Regenerate Aspen (95 ac.)	Regenerate Aspen (124.7 ac.) Pine Release (6 ac.) Oak Thinning (26 ac.) Range Development (60.3 ac.)	Regenerate Aspen (105.4 ac.) Remove Aspen from Oak Overstory (34 ac.)	Regenerate Aspen (138 ac.) Pine Thinning (40 ac.) Military Tactical Training Base (TTB) Development (10 ac.)	Regenerate Aspen (133 ac.) Military Corridor Development (43 ac.) Range Development (464 ac.)	Regenerate Aspen (258 ac.) Military Corridor Development (83 ac.) Pine Thinning (61 ac.)	Regenerate Aspen (32.5 ac.) Digital Multipurpose Training Range (Center Range) (204.5 ac.)	Regenerate Aspen (80.7 ac.) Digital Multipurpose Training Range (Center Range) (228.3 ac.) Remove Aspen from Oak Overstory (31.5 ac.)	Regenerate Aspen (71.6 ac.) Regenerate Jack Pine and Aspen (62.3 ac.) Harwood Thinning (34.9 ac.)	Regenerate Aspen (56.7 ac.) Military Corridor Development (56.2 ac.) Reoffered Sales (77.9 ac.)	Regenerate Aspen (57.9 ac) Pine Thinning (248.8 ac) Timber Stand Improvement (31.5 ac)

[a] Only included sold stands.

Fuel Wood Permits

By Tim Notch, Minnesota Department of Military Affairs

For the permit period from April 1, 2014 through December 31, 2014, there were 42 individuals that acquired fuel wood permits (36 – 5 cord; 5 – 10 cord and 1– pine bough permit), totaling $1,181.12.

In October of 2014, the Sentence to Serve (STS) crew leaders returned to Camp Ripley for their annual chainsaw training. The STS crew felled approximately 70 oak trees killed by a wildfire event several years ago. The downed trees were then made available to fuel wood permit holders. The removal of these trees eliminated a safety hazard for troops training in the North Range complex and saved Camp Ripley valuable staff time while providing a resource for fuel wood permit holders.

Insects and Diseases

By John Maile, Minnesota Department of Military Affairs

During the years of 2012-2013 a couple of diseases and insects were identified within the pine stands of cantonment, *Rhizosphaera* needle cast and pine bark beetle. In addition to the stress inflicted by these insects and diseases and the occurrence of a moderate drought in the fall of 2012 many conifers could not rebound and died. Ryan Blaedow, DNR Regional Forester, visited the site and confirmed the diseases and insects that were affecting the conifer trees. In 2014, a harvest plan was developed and approved for these stands with an anticipated harvest time of winter of 2015.

Land Fund

By John Maile, Minnesota Department of Military Affairs

During the 2008 session, the Minnesota Legislature enacted legislation (MS 190.25 subd. 3A; Appendices H and I in Dirks and Dietz 2010) to allow the Adjutant General to appropriate funds from a special revenue fund. This fund was created to accumulate the proceeds resulting from timber sales on Camp Ripley for the purpose of forest development. The legislation provides a funding source for forest management activities, including timber harvest and reforestation on Camp Ripley.

The timber sale receipts since 2008 are in Table 4. The 2014 forest development projects and expenditures from the Land Fund are outlined in Table 5. The encumbrances since 2008 from the Land Fund are in Table 6.

Table 4. Timber sales receipts for Camp Ripley Training Center's Land Fund, 2008-October 2014.

Year	Permit #	Expires	Status	Sold Value	Bid Guarantee	Security	Added Timber	Over/Under Run	Final Amount
2008									
	X011138	Mar-2011	Closed	$17,532.00				$3,521.95	$21,053.95
	X011139		Closed	$15,231.78				$662.10	$15,893.88
	X011140		Closed	$34,940.50				$0.00	$34,940.50
	X011141		Closed	$32,530.10				(-$9,993.74)	$22,536.36
	B010655		Closed	$157,773.00				(-$38,572.28)	$119,200.72
	B010656		Closed	$153,830.43				$7,735.90	$161,566.33
								2008 Subtotal	**$375,191.74**
2009									
	B011023	Mar-2011	Closed	$6,332.45				(-$642.62)	$5,689.83
	B011024	Mar-2011	Closed	$14,913.60				$0.00	$14,913.60
	B011025	Mar-2012	Closed	$14,046.74				(-$865.02)	$13,181.72
	B011026	Mar-2011	Closed	$16,214.00				$0.00	$16,214.00
	B011027	Mar-2011	Closed	$3,687.90				$0.00	$3,687.90
	B011028	Mar-2011	Closed	$33,424.40				(-$2995.56)	$30,428.84
	B011029	Mar-2012	Canceled	$11,167.17					$0.00
								2009 Subtotal	**$84,115.89**
2010									
	B011349	Mar-2012	Closed	$61,231.90				$5,282.17	$66,514.07
	B011350	Mar-2012	Closed	$49,233.65				$5,485.46	$54,719.11
	B011351	Mar-2012	Closed	$5,825.30				$0.00	$5,825.30
	B011353	Mar-2012	Expired	$8,618.40					$1,101.00
								2010 Subtotal	**$128,159.48**
2011									
	B011608	May 31-2013	Expired	$10,245.40					$2,356.44
	BO11685	May 31-2013	Closed	$10,438.95				$0.00	$10,841.92
	BO11686	May 31-2012	Closed	$60,650.40				$0.00	$60,650.40
	BO11687	May 31-2013	Closed	$9,695.35				$0.00	$9,695.35
	BO11688	May 31-2013	Closed	$7,863.35				$0.00	$7,863.35
								2011 Subtotal	**$91,407.46**

Table 4. Timber sales receipts for Camp Ripley Training Center's Land Fund, 2008-October 2014.

Year	Permit #	Expires	Status	Sold Value	Bid Guarantee	Security	Added Timber	Over/Under Run	Final Amount
2012									
	B012053	March 31-2014	Closed	$27,140.15				(-$3,825.50)	$23,314.65
	BO12054	March 31-2014	Closed	$6,654.75				(-$769.97)	$5,884.78
	BO12055	March 31-2014	Canceled	Unsold					
	BO12056	March 31-2014	Canceled	Unsold					
	BO12057	March 31-2014	Closed	$29,496.10				(-$6,522.22)	$23,636.88
								2012 Subtotal	**$52,836.31**
2013									
	B012438	March 31-2015	Closed	$3,905.00				$109.30	$4,014.30
	BO12439	March 31-2015	Unsold	Unsold					
	BO12440	March 31-2015	Unsold	Unsold					
	BO12441	March 31-2015	Canceled	Canceled					
	BO12442	March 31-2015	Unsold	Unsold					
	B012443	March 31-2015	Closed	$2,480.75				(-$172.92)	$2,307.84
	B012444	March 31-2015	Canceled	Canceled					
								2013 Subtotal	**$6,322.14**
2014									
	B012744	May 31-2016	Unsold	Unsold					
	BO12745	May 31-2016	Active	8,242.25		$8,242.25			
	BO12746	May 31-2016	Unsold	Unsold					
	BO12747	May 31-2016	Sold	$62,954.91	$4,881.29	$4,561.95			
	BO12748	May 31-2016	Sold	$13,913.20		$1,721.59			
	B012749	May 31-2016	Active	$18,372.60		$6,585.73	$594.75		
	B012750	May 31-2016	Unsold	Unsold					
	B012751	May 31-2016	Sold	$12,484.66		$1,280.36			
								2014 Subtotal	**$0.00**
SUBTOTALS					**$4,881.29**	**$22,391.88**	**$594.75**	**(-$41,562.95)**	**$738,033.02**
								Subtotal for Closed 2008 – 2014 Auction Sales	**$738.033.02**
								Subtotal received to date for Closed Sales + Bid Guarantees + Securities+ Added Timber	**$765,900.94**

Table 4. Timber sales receipts for Camp Ripley Training Center's Land Fund, 2008-October 2014.

Year	Permit #	Expires	Status	Sold Value	Bid Guarantee	Security	Added Timber	Over/Under Run	Final Amount
Informal Sales									
	F010327	5/15/2009	Canceled	$65.64					$465.64
	F010358	11/30/2009	Closed	$2,541.00					$2,541.00
	F010384	11/30/2009	Closed	$440.00					$440.00
	F010385	11/30/2009	Closed	$600.00					$600.00
	F010431	1/13/2010	Closed	$6,819.00					$6,819.00
	F010486	3/15/2010	Closed	$165.00					$165.00
	F010656	May-2011	Closed	$5,154.00					$5,154.00
	F010657	May-2011	Closed	$143.00					$267.35
	F011082	3/31/2015	Closed	$3,119.30				$944.72	$4,064.02
	F011171	3/31/2014	Closed	$3,038.54			$420.75		$3,400.50
	F011172	3/31/2014	Closed	$4,504.33					$4,004.71
	F011214	4/15/2014	Closed	$50.00					$50.00
								Informal Sales Subtotal	**$28,391.97**
Fuel Wood Permits (9/25/08 - 10/30/14)									
		185 (5 cords)	$25/each						$4,625.00
		63 (10 cords)	$50/each						$3,150.00
								Fuel Wood Permits Subtotal	**$7,775.00**
								GRAND TOTAL RECEIPTS (9/1/2008 to 11/30/2014)	**$802,067.91**

Table 5. Scope of work for forest development, Camp Ripley Training Center, 2014.

Project Number	Project Description	Estimated Cost
CR-Dev14-001	Regeneration treatment on stand 1108 A55	6,120.00
CR-Dev14-002	Regeneration treatment on stand 2119 A59	1,920.00
CR-Dev14-003	Forest health treatment on stand 3444 O55	20.000.00
CR-Dev14-004	Forest health treatment on stand 734 NP57	480.00
CR-Dev14-005	Forest health treatment on stand 2911 NP57	12,360.00
CR-Dev14-006	Forest health treatment on stand 2877 NP42	2,640.00
CR-Dev14-007	Forest health treatment on stand 799 NP55	3,480.00
CR-Dev14-008	Forest health treatment on stand 2856 NP56	600.00
CR-Dev14-009	Forest health treatment on stand 1079 NP42	3,600.00
CR-Dev14-010	Forest health treatment on stand 1023 NP57	3,840.00
CR-Dev14-011	Forest health treatment on stand 2834 NP67	1,440.00
CR-Dev14-012	Forest health treatment on stand 1192 NP56	600.00
CR-Dev14-013	Forest health treatment on stand 2967 NP58	600.00
CR-Dev14-014	Forest health treatment on stand 698 NP58	1,200.00
CR-Dev14-015	Forest health treatment on stand 1235 NP57	480.00
CR-Dev14-016	Forest health treatment on stand 1180 NP44	2,760.00
CR-Dev14-017	Forest health treatment on stand 731 NP56	2,400.00
CR-Dev14-018	Forest health treatment on stand 2878 NP45	3,360.00
CR-Dev13-019	Provide browse protection to planted jack pine seedlings on site 324JP21	500.00
CR-Dev13-020	Provide browse protection to planted jack pine seedlings on site 2853JP11	1,100.00
CR-Dev13-021	Provide browse protection to planted red and white pine seedlings on site	600.00
CR-Dev14-022	Plant and provide browse protection on site 2162 UG	1,150.00
CR-Dev14-023	Plant and provide browse protection on site 233 UG	1,150.00
CR-Dev14-024	Plant and provide browse protection on site 3006 UG	1,800.00
CR-Dev14-025	Plant and provide browse protection on site 330 UG, 395 UG, 458 UG	6,300.00
CR-Dev14-026	Plant and provide browse protection on site 637 UG	3,800.00
CR-Dev14-027	Remove dead trees in 2822 NP30, 2821 NP31, 2820 NP30, 2819 NP30, 2818 NP30, 2817 NP31	6,600.00
CR-Dev14-028	Reinventory – Check cruise, inventory 1500 acres, type map 1500 acres.	3,000.00
CR-Dev14-029	Update Camp Ripley Forest Management Plan	5,000.00
CR-Dev13-030	Supplies: paint, flagging for timber sale development	1,000.00
	FOREST DEVELOPMENT TOTAL	**$ 100,230.00**

Table 6. Land Fund encumbrances, Camp Ripley Training Center, 2009-2014.

Land Fund Encumbrances			
Date	**Description[a]**	**Category**	**Amount**
5/6/2009	IAA with DNR-Forestry	Professional services	$20,000.00
8/13/2009	IAA with DNR-Forestry	Professional services and tree	$12,700.00
8/20/2009	Supplies	Forestry supplies	$ 3,492.88
1/14/2010	Supplies	Forestry supplies	$ 68.00
3/25/2010	Supplies	Forestry supplies	$ 52.74
7/29/2010	IAA with DNR-Forestry	Professional services	$59,740.00
11/10/2010	IAA with DNR-Forestry	Professional services (2011)	$59,930.00
10/4/2011	IAA with DNR-Forestry	Professional Services (2012)	$73,600.00
3/2/2011	IAA with DNR-Forestry	Professional Services	$46,240.00
7/3/2013	IAA with DNR-Forestry	Professional Services (2013)	$69,000.00
4/01/2014	IAA with DNR-Forestry	Professional Services (2014)	$100,230.00
2014	Adjusted Encumbrances	Canceled tree plantings	-$8,752.00
2015	IAA with DNR-Forestry	Professional Services (2015)	$89,462.00
		TOTAL	**$525,763.62**

[a]IAA – Interagency Agreement

Vegetation Management

Prescribed Fire

By Timothy Notch, Minnesota Department of Military Affairs

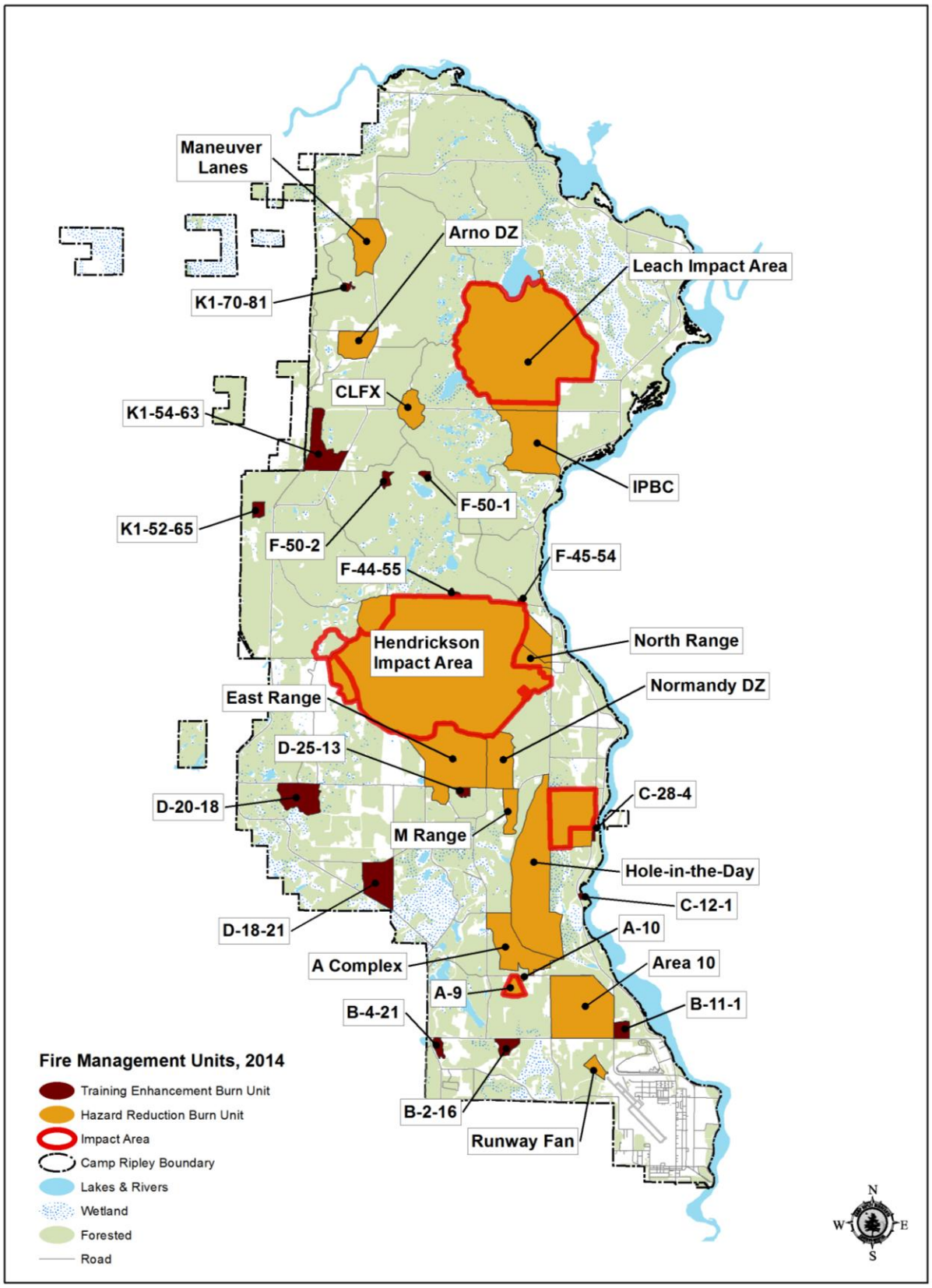
Camp Ripley uses prescribed fire as a management tool to enhance the military training environment, also known as mission-scape. Prescribed fire target objectives include: native prairie grass enhancement, woody encroachment prevention, seed production, brush control, fuel-hazard reduction, forest management, and to improve habitat for species in greatest conservation need. The management strategy for prescribed fire on Camp Ripley is provided within the Integrated Wildland Fire Management Plan (MNARNG 2009b).

Two types of prescribed burns are conducted at Camp Ripley: hazard reduction and training enhancement.

Hazard Reduction

Two of the largest training areas on Camp Ripley are designated as impact areas. These areas are burned every spring along with 14 other firing ranges to reduce fuel build up and minimize wildfires due to military training exercises. A large wetland complex (Training Area 65) is also burned biennially for fire hazard reduction due to its location adjacent to a firing range. These are categorized as hazard reduction burns (Table 7 and Figure 6). The total 2014 acreage of fire hazard reduction burns was 11,394 acres. Not all hazard reduction burns are completed annually due to weather constraints. West Range was

Figure 6. Training enhancement and hazard reduction units burned, Camp Ripley Training Center, 2014.



not burned in 2014 due to construction of the Multi Purpose Machine Gun Range, nor was Center Range. The ISBC was also not burned due to conflicts with existing targets. The airfield was not burned due to the area being mechanically treated in the fall of 2013.

Table 7. Hazard reduction burns, Camp Ripley Training Center, 2014.

Burn Date	Department	Unit Burn	Acres
5-07-14	DPW/FES/ENV	A-Ranges	**362**
5-21-14	DPW/FES/ENV	Maneuver lanes	**267**
5-07-14	DPW/FES/ENV	Hole-in-the-Day marsh	**1,738**
5-05-14	DPW/FES/ENV	Hendrickson Impact	**3,840**
5-05-14	DPW/FES/ENV	East Tank Range	**643**
5-21-14	DPW/FES/ENV	CLFX	**118**
5-16-14	DPW/FES/ENV	Area 10	**612**
Under const.	DPW/FES/ENV	ISBC	189
Under const.	DPW/FES/ENV	West Range	1,116
5-28-14	DPW/FES/ENV	Airfield overrun	**40**
5-15-14	DPW/FES/ENV	IPBC	**503**
Under const.	DPW/FES/ENV	Center Tank Range	991
5-05-14	DPW/FES/ENV	North Range	**80**
4-22-14	DPW/FES/ENV	Leach Range	**2,705**
4-29-14	DPW/FES/ENV	M-Range	**93**
5-05-14	DPW/FES/ENV	Normandy Drop Zone	**235**
5-14-14	DPW/FES/ENV	Arno Drop Zone	**158**
		Total Burned	**11,394**
		Total Unburned	2,296

Training Enhancement

Training enhancement burn units were categorized by highest use for military activities. Some of the areas conflicted with construction of ranges. Some areas were of low priority and were dropped from the fire rotation. A total of 1,333 acres were treated with prescribed fire, which is the largest amount since the onset of the program. The training enhancement burns are of particular importance to the Environmental Program since the reintroduction of fire is critical to the native vegetation on post. Nearly all of Camp Ripley is a fire dependant ecosystem and managing vegetation with fire to meet military objectives also serves to meet ecological management goals. It is of utmost importance that we are able to manage the native vegetation with a historical fire regime to promote a healthy and thriving ecosystem that can withstand the human demands of the area.

Camp Ripley consists of 11 maneuver areas divided into 80 training areas of which 70 contain designated burn units. These burn units are dynamic in respect to size and shape but are directly related to a military land use. Burn plans are carefully written for each burn unit and reviewed by local DNR Forestry personnel prior to execution of the burn. Camp Ripley Fire and Emergency Services partnered with Environmental and DPW-Roads and Grounds staff to implement prescribed fire on these units.

The 2014 prescribed burn units in the original design were not conducive to quality management of time and resources. The units were, in some cases, combined with adjacent units to form a larger burn unit that could be managed from roadways and trails. This process eliminated the need for break installation (e.g., mineral or mowed) and better suits the need for reducing encroachment in grasslands by allowing fire to run through transition zones into forested areas. Enlarging and combining burn units into one larger unit saves money by reducing the amount of staff time since the unit is surrounded by a road 33 feet in width and is more secure.

All goals and objectives were achieved on all completed burn units which demonstrates the effectiveness of phenological timing of the burn events**.** The training enhancement burns (Table 8 and Figure 6) were completed by staff from the environmental office with assistance from DPW and Fire and Emergency Services. The 2015 planned training enhancement burns are found in Appendix A.

Table 8. Mission enhancement burns completed, Camp Ripley Training Center, 2014.

Training Area	Maneuver Area	Unit Name	Grass Acres	Forest Acres	Total Acres	Actual Burn Date
B	11	1	52	47	99	5-16-14
B	2	16	26	20	46	5-16-14
B	4	21	40	104	144	5-22-14
C	12	1	26	67	93	5-20-14
C	28	4	13	6	19	5-20-14
D	18	21	137	63	200	5-16-14
D	20	18	90	87	177	5-16-14
D	**23**	**14**	**15**	**193**	**208**	**Conflict**
D	25	13	17	2	19	5-5-14
F	44	55	9	1	10	5-5-14
F	**44**	**56**	**13**	**10**	**23**	**Conflict**
F	50	1	14	0	14	5-15-14
F	50	2	18.5	3	21.5	5-15-14
F	45	54	6	0	6	5-5-14
K1	52	65	29	0	29	5-15-14
K1	54	63	135	310	445	5-14-14
K1	70	81	11	0	11	5-22-14
		Total	**623.5**	**710**	**1,333.5**	

Invasive Species

By Laura Donahue, St. Cloud State University and Jason Linkert, DMA

Invasive species are non-native species that harm economic, environmental, or human health. These species are a threat to the ecological function of areas around the world due to their capability of changing the biotic and abiotic characteristics of their environment. In response to this economic and ecological threat, an executive order was issued on February 3, 1999 by President William Clinton to address the problem at the federal level. This executive order mandates that each federal agency prevent the introduction of invasive species; detect and respond rapidly to and control populations of such species in a cost-effective and environmentally sound manner; monitor invasive species populations accurately and reliably; provide for restoration of native species and habitat conditions in ecosystems that have been invaded; conduct research on invasive species and develop technologies to prevent introduction and provide for environmentally sound control of invasive species; and promote public education on invasive species and the means to address them (U.S. Department of Agriculture 2009).

The MNARNG receives federal funding and is required to be in compliance with this executive order. In 2014, an Interagency Agreement was established between St. Cloud State University and the Minnesota Department of Military Affairs for invasive species management. Past graduate student researchers that have contributed to this project conducted research into species distribution and appropriate control methods including herbicide combinations and prescribed fire in experimental plots.

Twenty-four terrestrial invasive plant species have been identified at Camp Ripley (see Table 9). Three of these species, leafy spurge (*Euphorbia esula*), common tansy (*Tanacetum vulgare*), and spotted knapweed (*Centaurea maculosa*) are considered primary targeted invasive species and were the main priority for control treatments in 2014. Additional invasive species treated included: glossy and European buckthorn (*Rhamnus cathartica* and *Rhamnus frangula*), baby's breath (*Gypsophilia paniculata*), plumeless thistle (*Carduus acanthoides*), bull thistle (*Cirsium vulgare*), and Canada thistle (*Cirsium arvense*). In locations which posted a threat to the health and safety of training personnel, treatment to control specially regulated species poison ivy (*Toxicodendron radicans*) was conducted.

Additional terrestrial species identified within Camp Ripley boundaries serve as potential threats to the future training activities of the military site. Treatment efforts in 2014 included management strategies for additional invasive species. Some of the additional invasive species addressed included: glossy and European buckthorn (*Rhamnus cathartica* and *Rhamnus frangula*), baby's breath (*Gypsophilia paniculata*), plumeless thistle (*Carduus acanthoides*), bull thistle (*Cirsium vulgare*), and Canada thistle (*Cirsium arvense*). Two populations were identified as possibly Japanese hops (*Humulus japonicas*) and were treated accordingly. Some treatment efforts were also implemented to control specially regulated species poison ivy (*Toxicodendron radicans*) in locations which posted a threat to the health and safety of personnel.

Table 9. Invasive plant species, Camp Ripley Training Center, Minnesota.

Family	Scientific Name	Common Name	Minnesota Department of Agriculture Noxious Weed Listing (MNDA 2014)
Brassicaeae	*Berteroa incana*	Hoary alyssum	Not currently listed
Poaceae	*Bromus inermis*	Smooth brome	Not currently listed
Asteraceae	*Carduus nutans*	Musk thistle	Not currently listed
Asteraceae	*Carduus acanthoides*	Plumeless thistle	Prohibited noxious weed
Asteraceae	*Centurea maculosa*	Spotted knapweed	Prohibited noxious weed
Asteraceae	*Chrysopsis villosa* var. *foliosa*	Golden aster	Not currently listed
Asteraceae	*Cirsium arvense*	Canada thistle	Prohibited noxious weed
Asteraceae	*Grindelia squarrosa*	Gum weed	Not currently listed
Asteraceae	*Cirsium vulgare*	Bull thistle	Not currently listed
Asteraceae	*Tanacetum vulgare*	Common tansy	Prohibited noxious weed
Cannabaceae	*Humulus japonicus*	Japanese hops	Prohibited noxious weed
Caryophyllaceae	*Gypsophilia paniculata*	Baby's breath	Not currently listed
Caryophyllaceae	*Euphorbia cyparissias*	Cypress spurge	Not currently listed
Euphorbiaceae	*Euphorbia esula*	Leafy spurge	Prohibited noxious weed
Guttiferae	*Hypericum perforatum*	St. Johnswort	Not currently listed
Fabaceae	*Melilotus alba*	White sweet clover	Not currently listed
Fabaceae	*Melilotus officinalis*	Yellow sweet clover	Not currently listed
Poaceae	*Phalaris arundinacea*	Reed canary grass	Not currently listed
Poaceae	*Phragmites australis*	Common reed	Not currently listed
Rhamnaceae	*Rhamnus cathartica*	Buckthorn	Restricted noxious weed

Table 9. Invasive plant species, Camp Ripley Training Center, Minnesota.

Family	Scientific Name	Common Name	Minnesota Department of Agriculture Noxious Weed Listing (MNDA 2014)
Rhamnaceae	*Rhamnus frangula*	Glossy buckthorn	Restricted noxious weed
Caryophyllaceae	*Saponaria officinalis*	Bouncing bet	Not currently listed
Anacardiaceae	*Toxicodendron radicans*	Poison ivy (native)	Specially regulated noxious weed
Ulmaceae	*Ulmus pumila*	Siberian elm	Not currently listed
Lythraceae	*Lythrum salicaria*	Purple Loosestrife	Prohibited noxious weed
Euphorbiaceae	*Euphorbia cyparissaias*	Cypress Spurge	Not currently listed
Apiaceae	*Daucus carota*	Queen Anne's Lace	Not currently listed
Iridaceae	*Iris pseudacorus*	Yellow iris	DNR invasive plant

Large Scale Invasive Plant Management

Large scale management completed during 2014 included the treatment of 32 acres of Baby's breath (*Gypsophilia paniculata*) located in Training Areas 30-33 (Figure 7). A tractor-mounted boom sprayer mixed with chemical metsulfuron-methyl and a surfactant was applied by Environmental staff. This initial application appeared successful at controlling stands of this species, with no viable seed heads observed on sites which received an application during the growing season. Future efforts will assess the re-growth of this targeted species to determine the efficacy of the treatment. Several years of intensive large-scale treatment will be necessary to eradicate this species entirely.

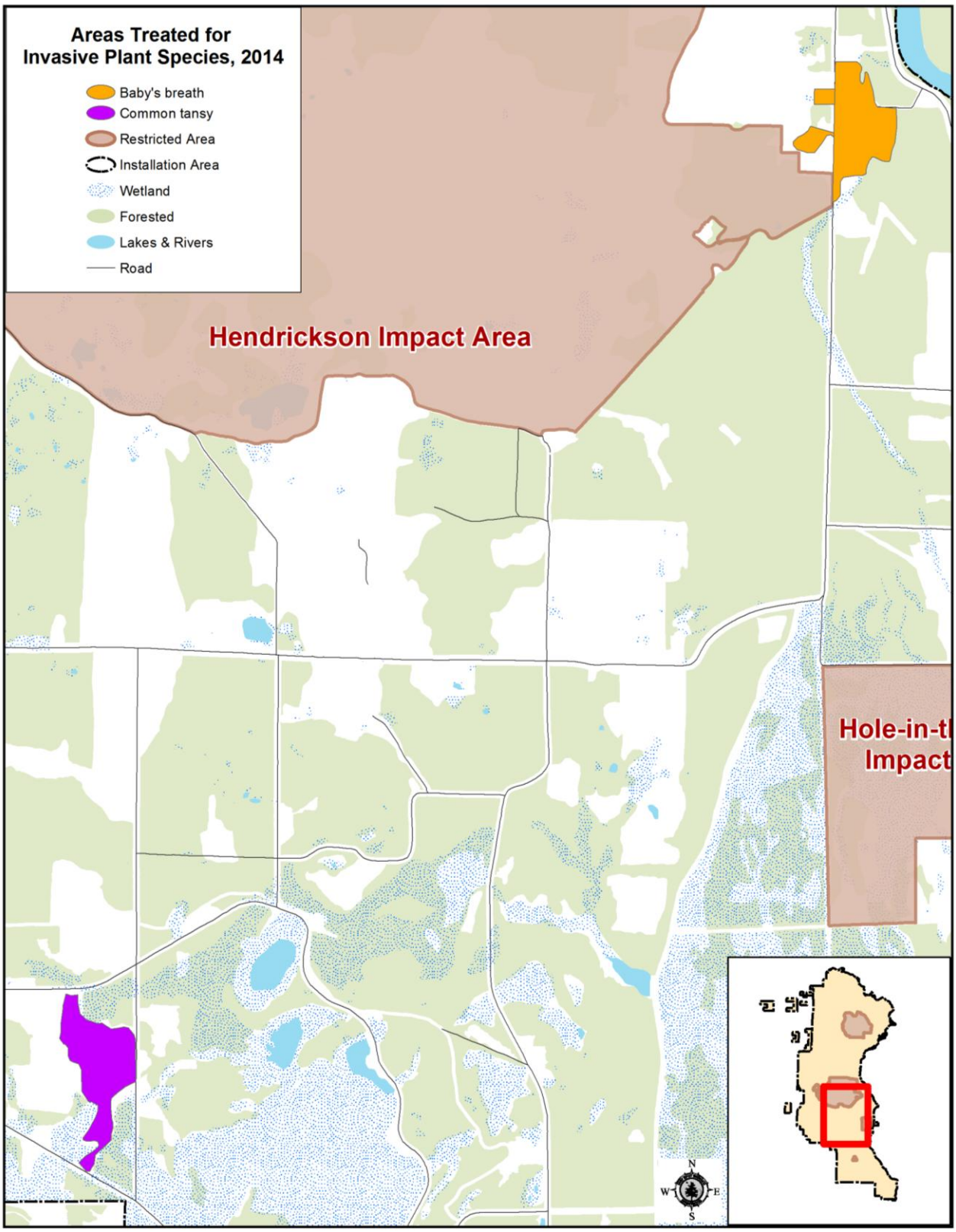
A large infestation of common tansy (*Tanacetum vulgare)* located in Training Area 18 (Figure 7) was also treated in 2014 with metsulfuron-metyl. The area is a former invasive species research area with high maneuver disturbance. A prescribed burn completed in May of 2014 scarified the seedbed and increased the efficacy of the herbicide treatment. A total of 20 acres were treated. Follow up treatments will be necessary to control this infestation.

Selective Invasive Plant Management

Additional 2014 accomplishments include:

- Mechanical removal of all identifiable spotted knapweed plants within populations previously treated in Training Areas 1 to 4.
- Surveys of previously treated common tansy populations indicated effective control one year post-treatment.
- Application of selective herbicide picloram onto known populations of leafy surge was conducted early season with additional follow-up surveys.

Figure 7. Large scale invasive plant treatment areas, Camp Ripley Training Center, 2014.



- Two individual populations of Japanese hops species were identified and treated in 2014.
- Two new Queen Anne's lace populations were identified. Spot applications of the herbicide dimethylamine were applied.
- Approximately 400 seed-head beetles were collected and were released into established populations of spotted knapweed located within the cantonment area of Camp Ripley.
- Treatment of all previously known populations of spotted knapweed and common tansy located along Argonne Road.
- Treatment of all known populations of spotted knapweed along East and West Boundary roads north to their intersection with Cassino Road.
- Located, mapped, and treated thistle populations in Training Areas 54 and 69.
- Surveys completed of area surrounding washing stations indicating that the current washing procedure is effective at removing a portion of the seeds available for dispersal.
- Distribution maps were produced at the start of the 2014 season which included all mapped populations from 2013.

Zebra Mussel (*Dreissena polymorpha*) Survey

During 2014, two zebra mussel plates were placed into Camp Ripley streams flowing into the Mississippi River, a zebra mussel infested waterway. The first plate was placed at the mouth of a small stream which connects the Marne Marsh complex in Training Area 13 to the Mississippi River; the second was placed in a small stream which connects the wetland complex in Training Area 65 to the Mississippi River. No immature or mature zebra mussels were identified on either plate.

Water Resources

Wetland Resources

By John Maile, Minnesota Department of Military Affairs

Wetland Mitigation

During the fall of 2010, the D range wetland mitigation for West Range multipurpose machine gun range was implemented and constructed (Figure 9 in Dirks and Dietz 2011). As part of the mitigation process wetland soil and plant material was dispersed within the newly excavated wetland basin and edge. A follow-up visit to the site on October 28, 2014 shows the wetland has a healthy wetland plant community.

Miller Lake

Miller Lake is a 27-acre basin with a 1,405 acre watershed that drains via Broken Bow Creek into the Mississippi River. Miller Lake's culvert (#376) was replaced in November 2012. Camp Ripley Environmental staff maintained the water level control system in accordance with the plan approved by DNR Fisheries and DNR Nongame (MNDNR 2013a). The managed water level has been maintained at approximately 1211.95' in elevation. Beaver activity has become an issue. Currently the beavers have

raised the water levels to about 20 inches above optimal levels. Nuisance beaver trapping is scheduled for the spring of 2015 along with removal of the beaver dam blocking the water at the control system.

Wildlife

By Nancy J. Dietz and Brian J. Dirks, Minnesota Department of Natural Resources

Species in Greatest Conservation Need

Species in greatest conservation need (SGCN) are defined as native animals whose populations are rare, declining, or vulnerable to decline and are below levels desirable to ensure their long-term health and stability. One of the federal requirements of the Comprehensive Wildlife Conservation Strategy to manage species in greatest conservation need is that all states and territories develop a wildlife action plan. "Tomorrow's Habitat for the Wild and Rare" is Minnesota's response to this congressional mandate. It provides direction and focus for sustaining SGCN into the future (MNDNR 2006). The goal of the wildlife action plan is to 1) stabilize and increase populations of SGCN, 2) improve knowledge about SGCN, and 3) enhance people's appreciation and enjoyment of SGCN. Additional research will be directed toward identifying other SGCN species on Camp Ripley, and management or conservation actions that could be implemented to benefit these species.

In Minnesota, 345 species meet the definition of species in greatest conservation need (MNDNR 2014). All listed species (federal and state) are included on the SGCN list. This set of SGCN includes mammals, birds, reptiles, amphibians, fish, insects, snails, and mollusks, and represents about one-third of the nearly 1,200 animal species in Minnesota that were assessed for this project (MNDNR 2014). Sixty-nine SGCN species, including 51 bird species of which 28 are songbirds, have been identified on Camp Ripley (Appendix D in MNDNR and MNARNG 2013).

The DNR is currently updating its wildlife action plan with targeted completion in 2015. In August 2013, DNR amended its list of state endangered, threatened, and species of concern by changing the status of 302 species of mammals, birds, reptiles and amphibians, fish, mollusks, insects, vascular plants, lichens, mosses and liverworts, and fungi. These amendments to the state listed species will cause many species to be added as SGCN and these changes will be reflected in the updated wildlife action plan in 2015.

Birds

Christmas Bird Count

The Christmas Bird Count (CBC) has been coordinated by the National Audubon Society since 1900, and is the oldest continuous nationwide wildlife survey in North America (Sauer et al. 2008). Counts occur within predetermined 15-mile diameter circles located across North America, Mexico, and South America. The northwest portion of Camp Ripley is within one of these circles (CBC census code: MNPL) (Figure 8). Each count is conducted during a single calendar day within two weeks of Christmas

(December 14 to January 5). For example, the 2014 CBC can occur on the January 1 of the following year. The Pillager CBC was started in 1999, and the census has occurred 16 times (Minnesota Ornithologists' Union 2014). CBC data is primarily used to track winter distribution patterns and population trends of various bird species.

The Pillager CBC occurred on January 1, 2015, and was conducted by Brian Dirks, Camp Ripley Environmental Office. The count lasted three hours. The skies were overcast, with light snow. The temperature was 24° Fahrenheit, with winds of 11 miles per hour (Wunderground 2014a). The Crow Wing River was partially free of ice. The total number of birds counted was similar to 2009 (Table 10); however, the diversity of species was the lower. Trumpeter swans (*Cygnus buccinator*) and common mergansers (*Mergus merganser*) were present during the CBC, this was likely due to the Crow Wing River conditions.

Figure 8. Christmas bird count area within Camp Ripley, since 2002.

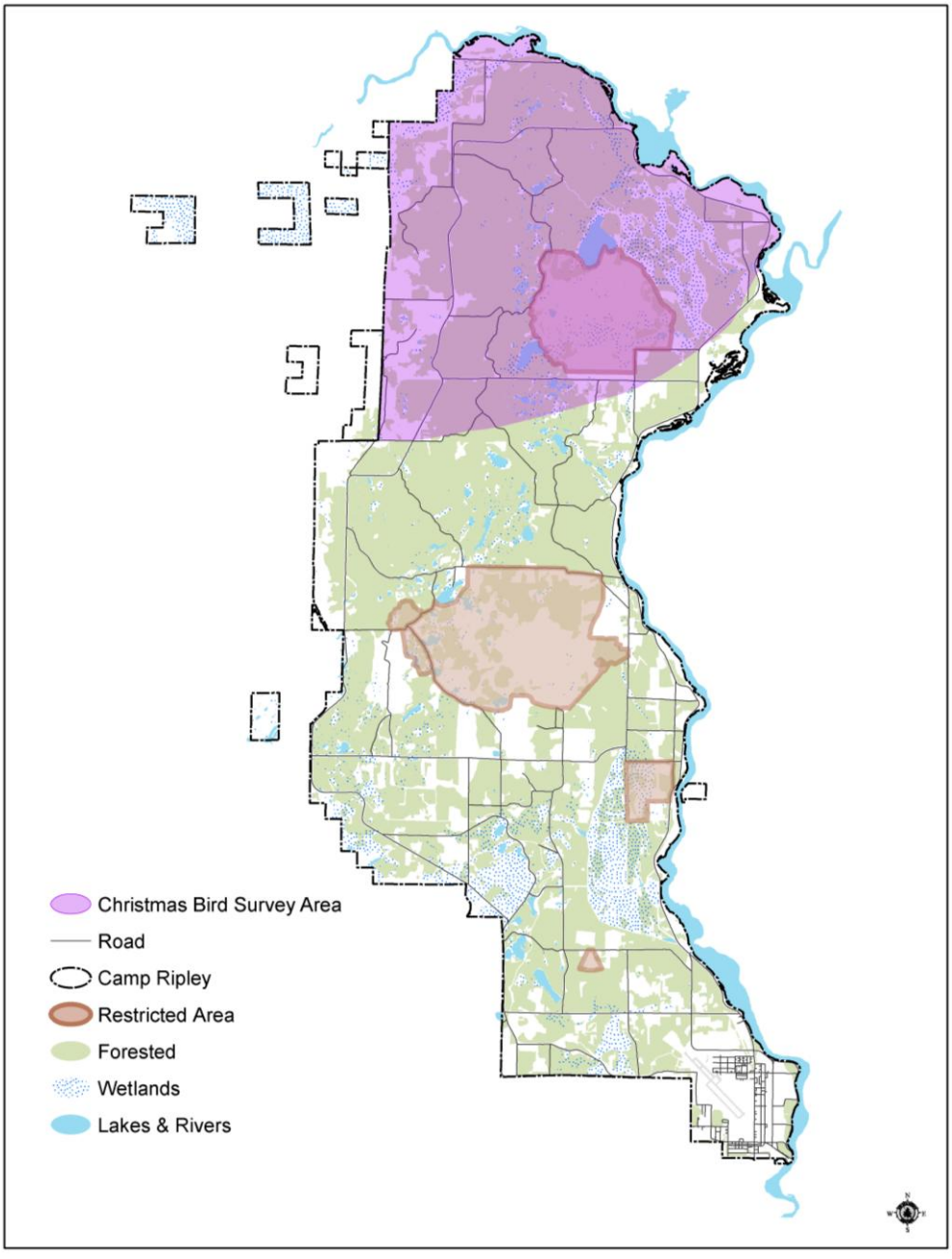


Table 10. Christmas bird count data from Camp Ripley, 2002-2014 [a].

Species	Scientific Name	Count Year											
		2001	2002	2003	2004	2005	2006	2007	2009	2011	2012	2013	2014
Cackling goose	*Branta hutchinsii*	0	0	0	0	0	0	0	7	0	0	0	**0**
Canada goose	*Branta canadensis*	6	344	110	81	2	4	11	0	18	9	0	**0**
Trumpeter swan	*Cygnus buccinator*	0	3	20	28	26	49	60	69	73	145	201	**89**
Mallard	*Anas platyrhynchos*	0	1	70	0	20	0	0	0	0	110	0	**0**
Common merganser	*Mergus merganser*	0	0	10	0	4	12	0	0	2	4	31	**12**
Ruffed grouse	*Bonasa umbellus*	1	1	3	2	0	0	0	0	0	0	0	**0**
Wild turkey	*Meleagris gallopavo*	0	25	10	5	0	0	0	11	0	0	2	**3**
Bald eagle	*Haliaeetus leucocephalus*	6	2	13	3	4	11	0	0	8	0	0	**2**
Northern goshawk	*Accipiter gentilis*	0	0	0	2	0	0	0	0	0	0	0	**0**
Red-tailed hawk	*Buteo jamaicensis*	0	0	0	1	0	0	0	0	0	0	0	**0**
Rough-legged hawk	*Buteo lagopus*	2	3	1	0	0	0	0	0	0	0	0	**0**
Golden eagle	*Aquila chrysaetos*	0	0	1	1	0	0	0	0	0	0	0	**0**
Barred owl	*Strix varia*	1	0	0	0	0	0	0	0	0	0	0	**0**
Belted kingfisher	*Megaceryle alcyon*	0	0	1	1	0	0	0	2	0	0	0	**0**
Red-bellied woodpecker	*Melanerpes carolinus*	0	1	0	0	0	0	0	0	0	0	0	**0**
Downy woodpecker	*Picoides pubescens*	2	1	1	0	1	0	0	0	0	0	1	**0**
Hairy woodpecker	*Picoides villosus*	0	1	0	0	0	0	0	0	0	0	0	**0**
Pileated woodpecker	*Dryocopus pileatus*	1	5	0	0	1	0	0	1	0	1	1	**0**
Northern shrike	*Lanius excubitor*	3	0	1	1	0	0	0	0	0	0	0	**0**
Blue jay	*Cyanocitta cristata*	4	20	8	1	3	0	0	1	0	11	0	**0**
American crow	*Corvus brachyrhynchos*	4	2	13	3	2	3	3	6	0	12	1	**0**
Common raven	*Corvus corax*	1	4	0	0	0	0	0	1	0	0	2	**1**
Black-capped chickadee	*Parus atricaillus*	11	9	6	9	12	1	1	2	0	0	0	**2**
Red-breasted nuthatch	*Sitta canadensis*	6	0	1	3	1	0	0	0	0	0	0	**0**
White-breasted nuthatch	*Sitta carolinesis*	1	4	5	0	3	0	0	0	0	0	0	**0**
Bohemian waxwing	*Bombycilla garrulus*	0	30	0	0	0	0	0	0	0	0	0	**0**
Cedar waxwing	*Bombycilla cedrorum*	0	3	0	0	0	0	0	0	0	0	0	**0**
American tree sparrow	*Spizella arborea*	0	20	0	0	0	0	0	9	0	0	0	**0**
Dark-eyed junco	*Junco hyemalis*	0	1	0	0	0	0	0	0	0	0	0	**0**
Northern cardinal	*Cardinalis cardinalis*	1	0	0	0	0	0	0	0	0	0	0	**0**
Common redpoll	*Acanthis flammea*	0	0	0	32	0	0	0	0	0	225	0	**0**
# Observers		5	3	Unk.	3	4	3	2	2	1	1	1	**1**
TOTAL # INDIVIDUALS		52	480	274	171	79	80	75	109	101	517	239	**109**
TOTAL # SPECIES		15	20	17	15	12	6	4	10	4	8	7	**6**

[a] Due to unsafe road conditions and/or bitter cold weather, no Christmas Bird Count was conducted on Camp Ripley during the 2008 and 2010 count years.

Breeding Bird Monitoring

Camp Ripley provides important breeding and migratory habitat for many birds that are species in greatest conservation need (SGCN). Fifty-one SGCN birds have been identified on Camp Ripley; which

includes both breeding and transient species. Thirty-one SGCN birds including water birds, raptors, and songbirds are known to breed on Camp Ripley. Of these SGCN birds fourteen are often heard during point count surveys.

Breeding bird surveys have been conducted on permanent plots throughout Camp Ripley since 1991. The full breeding bird survey includes 90 plots that are surveyed as part of long-term population monitoring. The number of plots that are surveyed each year varies according to training, weather, and survey strategy (Table 11). Development of new ranges on Camp Ripley and increased military and civilian training in 2014 (training increased 55% over 2007) limited access to most permanent survey points this year. Combined with a decision to put more effort into the first year of the pilot northern long-eared bat study, only eight songbird plots were surveyed in 2014.

Table 11. Songbird survey data, Camp Ripley Training Center, 2000-2014.

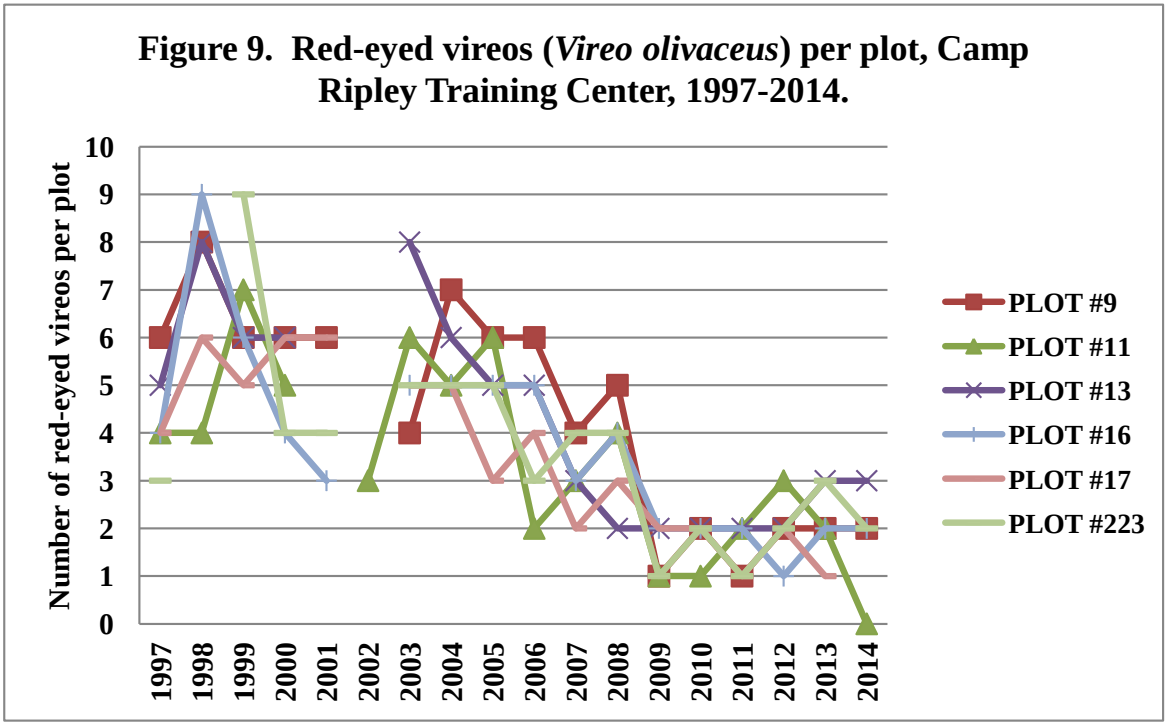
Year	Field Surveyors	Number of Permanent Plots Surveyed	Total Number of Birds Documented	Total Number of Species Documented	Average Number of Birds per Plot	Average Number of Species per Plot
2000	Dirks/Brown	92	1002	66	10.89	6.43
2001	Dirks/Brown	31	316	46	10.19	5.77
2002	Dirks/Brown /DeJong	30	258	42	8.6	5.83
2003	Dirks/Brown /DeJong	90	823	68	9.14	5.37
2004	Dirks/Brown / Burggraff	107	1129	64	10.55	6.14
2005	Dirks/Brown /DeJong	89	897	61	10.08	6.20
2006	Dirks/Brown /DeJong	88	802	64	9.11	5.84
2007	Dirks/Brown /DeJong	91	994	71	10.92	7.02
2008	Dirks/Brown	89	875	70	9.83	6.60
2009	Dirks	57	563	63	9.87	7.26
2010	Dirks	11	122	25	*	*
2011	Dirks	42	383	51	9.12	6.45
2012	Dirks	6	66	16	*	*
2013	Dirks	61	688	68	11.28	8.18
2014	**Dirks**	**8**	**95**	**23**	*****	*****

* Not calculated due to low number of plots surveyed in 2010, 2012, and 2014.

However, even with the limited amount of access an effort was made to survey the six plots identified in previous years as being undisturbed sites with high numbers of red-eyed vireos. These plots were selected because they are in areas that have not been altered through range development or timber harvest; and are often closed to access under Surface Danger Zones and therefore receive little or no military training or other activity throughout the year. In 2014, five of these plots were available to be surveyed (Table 11). We continue to focus on red-eyed vireos because in the past they were much more numerous than any other species detected on survey plots. However, the number of red-eyed vireos per plot and the total number on all plots have declined by more than 70 percent since 2000 (Figure 9). The number of red-eyed vireos on the six focal plots has dropped from a total of 30-33 through 2005 to 9 in 2009 and 2011, 12 in 2012, 11 in 2013, and 9 on five plots in 2014. This drop is very noticeable in the field when counts changed from 4 to 8 red-eyed vireos on each plot in prior years, to 0 to 3 on each plot currently (Figure 9). Although red-eyed vireos are not a SGCN or special concern species, the change in numbers is concerning because in other areas of the state and region their numbers have decreased slightly or increased over the same time period (Sauer et al. 2011). In addition, other species that use similar habitat, such as ovenbirds, have shown large increases on Camp Ripley during the same time period.

In years that access to survey plots is available long-term monitoring will continue on Camp Ripley to determine if this is a permanent decline in the number of red-eyed vireos nesting on Camp Ripley or a natural fluctuation or population adjustment from an unusually high number in the 1990s. Completing the full 90 plot breeding bird survey will continue to be challenging in light of the increase in range development on Camp and subsequent increase in training activity limiting access to survey plots.

Figure 9. Red-eyed vireos (*Vireo olivaceus*) per plot, Camp Ripley Training Center, 1997-2014.



Trumpeter Swan (*Cygnus buccinator*)

Trumpeter swans were a common breeding bird in western Minnesota until the mid-1800s; the last historical record of breeding in the wild was in 1885. Trumpeter swans were considered extirpated in the state. However, reintroduction and recovery efforts, including listing the species as threatened in Minnesota in 1996, have resulted in more than 5,300 free-flying birds in Minnesota. Due to population increases, trumpeter swans are now a special concern species, a SGCN, and are monitored each year (Dirks et al. 2010) through aerial flights and ground observations by field staff.

The first record of trumpeter swans breeding on Camp Ripley occurred in 1990 when an active nest was located in a wetland north of Normandy Road (Dorff and Nordquist 1993). Trumpeter swans have continued to be documented at various lakes throughout Camp Ripley (1991, 1992, 2009-2014) but successful reproduction had not been documented in more than ten years until 2010. In mid-June 2014, breeding pairs were observed on an unnamed pond on the west end of Normandy Road, unnamed pond southeast of Holden Lake, and Mud Lake; however, only six cygnets were observed in a pond along Luzon Road in Training Area 20 and Mud Lake. In July 2014, a pair continued to be observed on Mud Lake with two cygnets and the number of cygnets produced on the unnamed pond is not known (Table 12).

Table 12. Trumpeter swan production, Camp Ripley Training Center, since 1990.

Year	Cygnets Raised
1990	2
2009	Unknown
2010	4
2011	1
2012	8
2013	4
2014	**8**
Known Total	**27**

Osprey (*Pandion haleaetus*)

No ospreys were observed using the Crow Wing River nest platform (new platform established in 2011) in 2014. The nest blew down from the platform on Sylvan Reservoir in 2013 and the ospreys began to rebuild the nest but did not initiate nesting. In 2014, ospreys did not nest on the Sylvan Reservoir platform but nested on the Sylvan Dam platform and raised two young. This platform had not been used since 2002.

Red-shouldered Hawk (*Buteo lineatus*)

Population Survey

The red-shouldered hawk is uncommon in Minnesota and has declined markedly in the northern states since the 1940s. Work in Iowa suggests that the main causes of the population decline are habitat reduction and fragmentation (Bednarz and Dinsmore 1982). The red-shouldered hawk is listed as a state special concern species and a SGCN (MNDNR 2014).

In 2004 and 2005, a red-shouldered hawk study was conducted on Camp Ripley (Henneman 2006). The 2009-2010 survey used a subset (2009, n=64; 2010, n=81) of the same call-broadcast points

used in 2005 by Henneman (2006) (n=130). A subset of call points was selected in 2009-2010 and 2014 due to staff constraints to complete the full call broadcast survey (n=130) conducted during 2004-2005. Call point subset selection criterion in 2009-2010 were: 1) positive response points during 2004 and 2005 (Dirks and Dietz 2010), and 2) points selected were close to existing roads or trails. Call point subset section criterion in 2014 was a stratified, random sample of 2005 call points. Survey techniques used in 2009-2010 and 2014 were described in Henneman (2006), with two exceptions. To minimize staff time and increase the number of call points surveyed, all calls were broadcast at the nearest location to the roadway rather than to walk to the specific 2004 or 2005 point location. In addition, once a red-shouldered hawk responded at a survey call point that point was considered occupied and sampling ceased. The call point identification number for 2009-2010 and 2014 is the same number used by Henneman (2006).

In 2014, a total of 100 call-broadcast points were sampled from April 2 to May 15 (pre-incubation period). Sixty-seven (67%) points were included in the analysis because either a positive response was recorded or they were sampled ≥4 times (Table 13 and Figure 10). Forty-nine percent of these call-broadcast points were occupied in 2014.

Table 13. Red-shouldered hawk call-broadcast surveys, Camp Ripley, 2004, 2005, 2009-2010, and 2014.

Year	No. of call broadcast stations	No. of call broadcast stations sampled ≥4 times	No. of stations with ≥ 1 red-shouldered hawk detection	Apparent Occupancy
2004[a]	90	80	65	72.2%
2005[a]	130	80[b]	87[b]	66.9%
2009	64	61[c]	49[c]	76.5%
2010	81	81[c]	64[c]	79.0%
2014	**100**	**63**[d]	**44**[d]	**49.0%**

[a] Dirks, B. and J. DeJong. 2006. Animal Surveys at the Camp Ripley and Arden Hills Minnesota Army National Guard Training Sites: 2005 Annual Report. Minnesota Department of Natural Resources Camp Ripley Series Report Number 15. 88pp. and Henneman 2006.

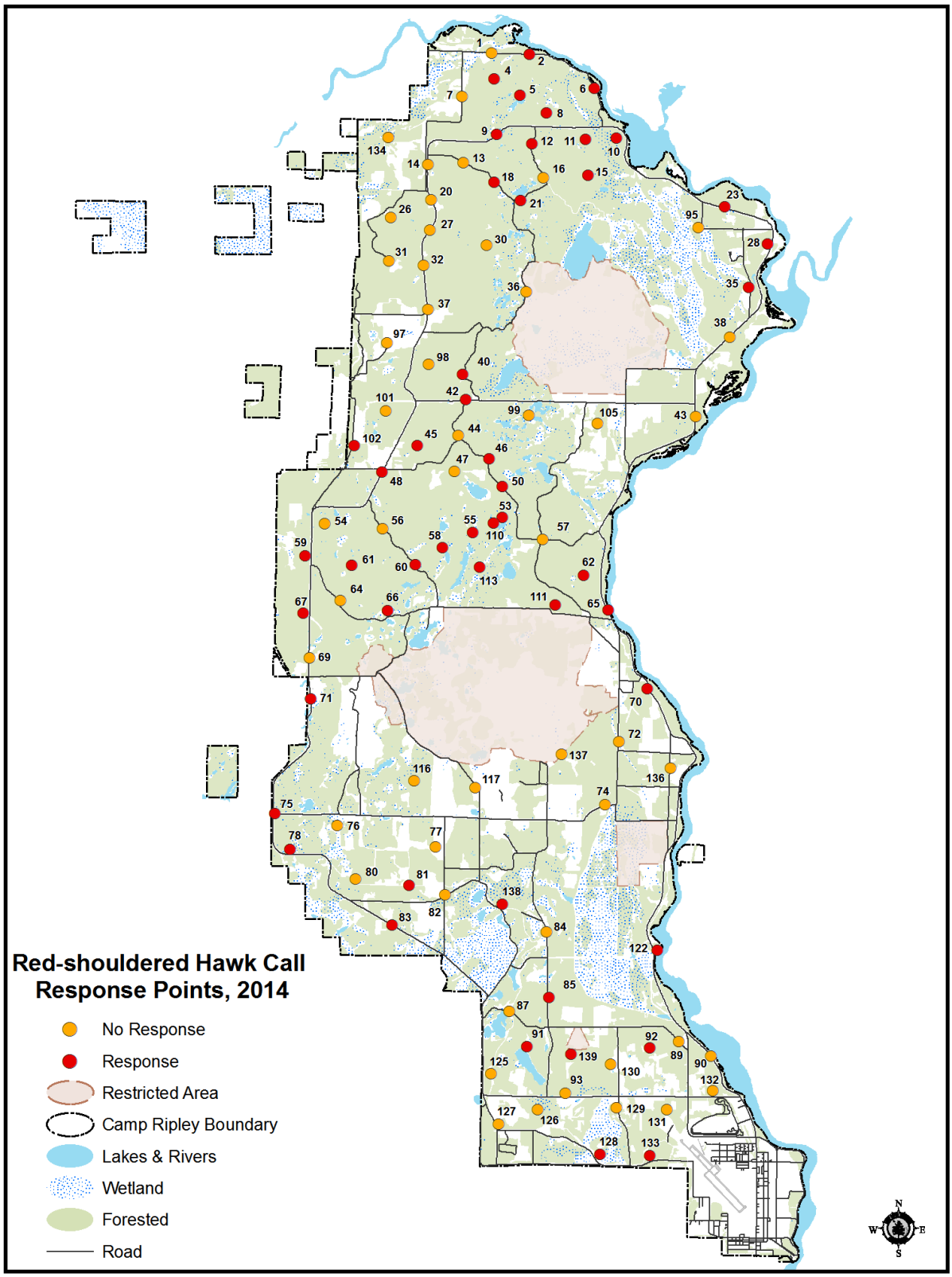
[b] In 2004/2005, positive response call points were sampled up to five times.

[c] In 2009 and 2010, sampled subset of positive response call points from 2004/2005 and surveyed positive response call points were considered occupied territories and sampling ceased.

[d] Stratified, random sample of 2005 call points and surveyed positive response call points were considered occupied territories and sampling ceased.

Selection of surveyed call points was variable in previous survey years (2004, 2009 and 2010). In 2009, the subset of sampled points included only those positive response points from 2004 and 2005. In 2010, all points sampled in 2009 plus four more call points were added south of Normandy Road. The 2009 and 2010 sample selection bias likely increased the overall apparent occupancy. In 2009, thirteen call points (20%) were south of Lake Alott Road (Figure 34 in Dirks and Dietz 2010) whereas 24 points (27%) were in 2004 (Figure 32 in Dirks and Dietz 2010), 46 points (35%) were in 2005 (Figure 33 in Dirks and Dietz 2010), and 30 points (35%) in 2014. In 2005 and 2014, the same proportion of the southern call points were surveyed where fewer red-shouldered hawks reside due to habitat differences; therefore, call point selection bias that occurred in 2009 and 2010 has been resolved and the stratified, random sample of call points in 2014 is comparable to the 2005 data.

Figure 10. Red-shouldered hawk call-broadcast response and sample locations, Camp Ripley Training Center, 2014.



The 49.0% apparent occupancy for red-shouldered hawks in 2014 at Camp Ripley was a 36% decline from 2005 (Figure 11) and a 61.0% decline from 2010 (Table 13). The decline from 2010 to 2014 can be partially attributed to sampling design in 2010 which sampled only previously occupied points. Other factors contributing to the decline are decreases in summer or winter habitat, increased mortality, or a decrease of recruits into the population. Since 2008, several Camp Ripley range improvement projects have caused long-term conversion of about 1,100 acres of mature deciduous forest habitats to either grasslands or savannah habitats, primarily in the northwest portion of Camp. This area (call points #7, #13, #14, #27, #31, and #37) was previously occupied by red-shouldered hawks in 2005 (Figure 11) but not occupied in 2014. Habitat changes from contiguous, mature deciduous forest to non-forest habitats do not promote nesting or occupancy by red-shouldered hawks and is likely contributing to the occupancy decline (Henneman 2006). In addition, as forest habitats become fragmented red-shouldered hawks may occupy some areas but recruitment is decreased significantly by increased predation (Crocoll and Parker 1989), altering food resources, hunting behavior or efficiency (Crocoll 1994), or being displaced by competition with red-tailed hawks. Future forest management should avoid large clear-cut areas and continue the use of forestry practices such as thinning and light-selection cuts that preserve the character of the forest. Or, it may be possible to use small areas of intense timber harvest, within areas of greater than 50% of the landscape with mature forests. A critical nest site characteristic is 70% or greater forest canopy closure. And, a sufficient extent of mature forests needs to be maintained near wetland openings (Perry 1996).

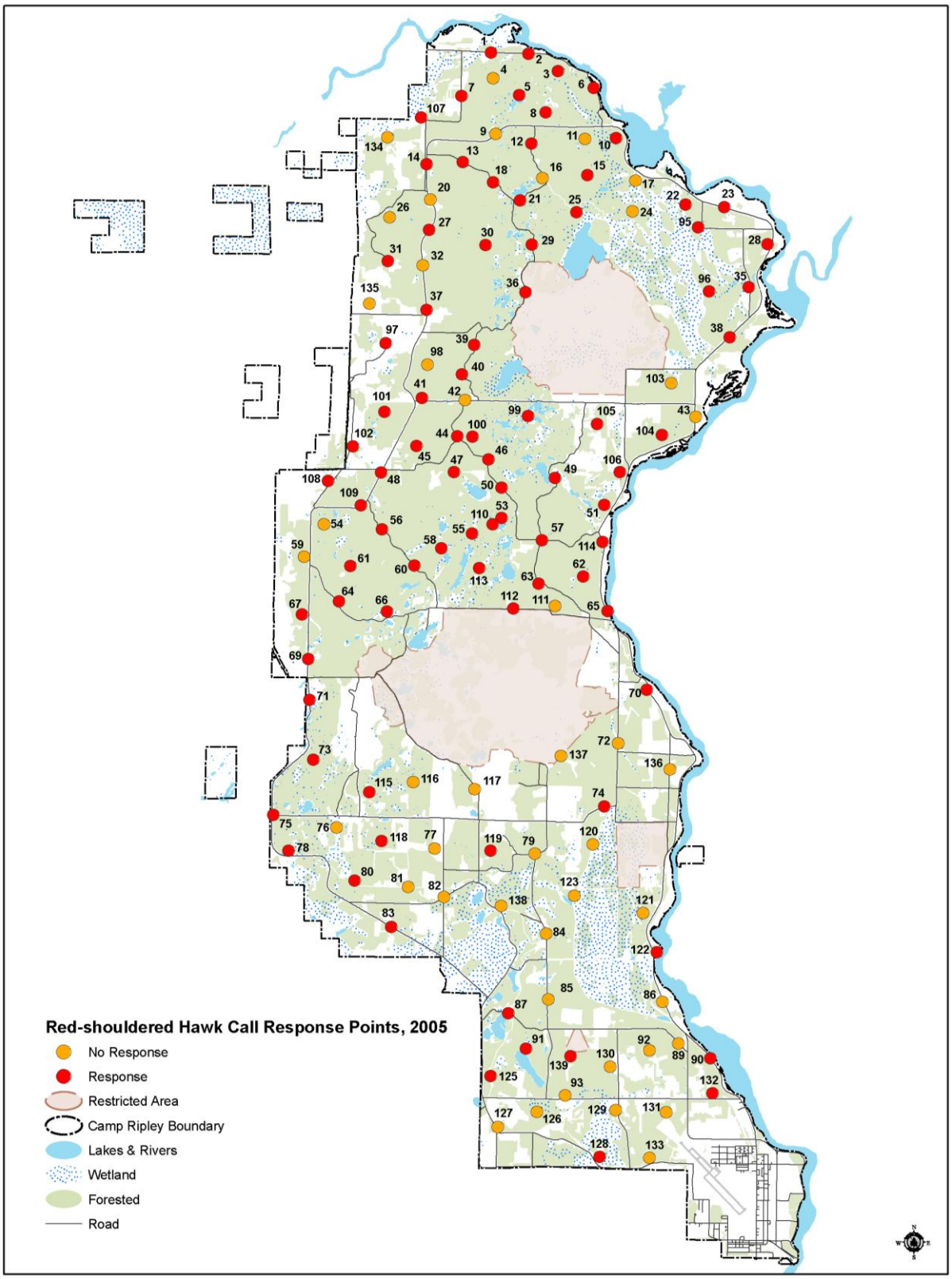
Population monitoring surveys should continue every 4-5 years to examine long-term trends of Minnesota's largest population of red-shouldered hawks. Future call-broadcast surveys should continue to use a stratified, random sample with 35% of selected call points south of Lake Alott Road similar to the sampling effort in 2005 and 2014.

Telemetry Study

Little is known concerning migration routes, stopover sites, or wintering grounds used by Minnesota's red-shouldered hawks. The primary objectives for this project are to 1) determine migration routes, stopover sites, and wintering grounds used by central Minnesota's red-shouldered hawks and 2) to examine methods of using satellite telemetry to determine home ranges and habitat use on Camp Ripley. Information obtained will add to the understanding of this species and may help identify additional threats to Minnesota's population of red-shouldered hawks.

In 2014, a dho-gaza trap was used to try to capture a red-shouldered hawk for the telemetry study (MNDNR and MNARNG 2014). This method requires a territorial pair during their reproductive cycle; therefore, the active 2012 and 2013 nest sites were again monitored, but all were inactive. Searches for red-shouldered hawk nest sites began in late April and continued through late May. Occupied territories located during the 2014 population survey were searched for active nest sites. Two new red-shouldered hawk nest sites were located. Of the new red-shouldered hawk nest sites, only one remained active and the other was destroyed by a predator. Four dho-gaza trapping attempts occurred in late May 2014; however, no hawk was captured. The hawk at this nest was the same bird that was satellite transmittered

Figure 11. Red-shouldered hawk call-broadcast response and sample locations, Camp Ripley Training Center, 2005.



(satellite tag #60020) in 2012 (MNDNR and MNARNG 2013), as the transmitter antennae was visible during several of the trapping attempts.

Bald Eagle (*Haliaeetus leucocephalus*)

In 2007, the bald eagle was removed from the list of endangered and threatened species under the Federal Endangered Species Act. In the lower 48 states, Minnesota has the most nesting pairs at approximately 1,300. The bald eagle will continue to be protected under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. Both of these acts prohibit killing, selling or otherwise harming or disturbing eagles, their nests or eggs. The U.S. Fish and Wildlife Service (USFWS) released Bald Eagle Management Guidelines for people who are engaged in recreation or land use activities around bald eagles. These guidelines provide information and recommendations regarding how to avoid disturbing bald eagles. Camp Ripley will continue to monitor and protect active or alternate bald eagle nests with no disturbance buffers during breeding and nesting seasons as required by the National Guard Bureau's Eagle Policy Guidance (Dirks and Dietz 2009), Bald and Golden Eagle Protection Act (USFWS 2008a), and Bald Eagle Management Guidelines (USFWS 2007).

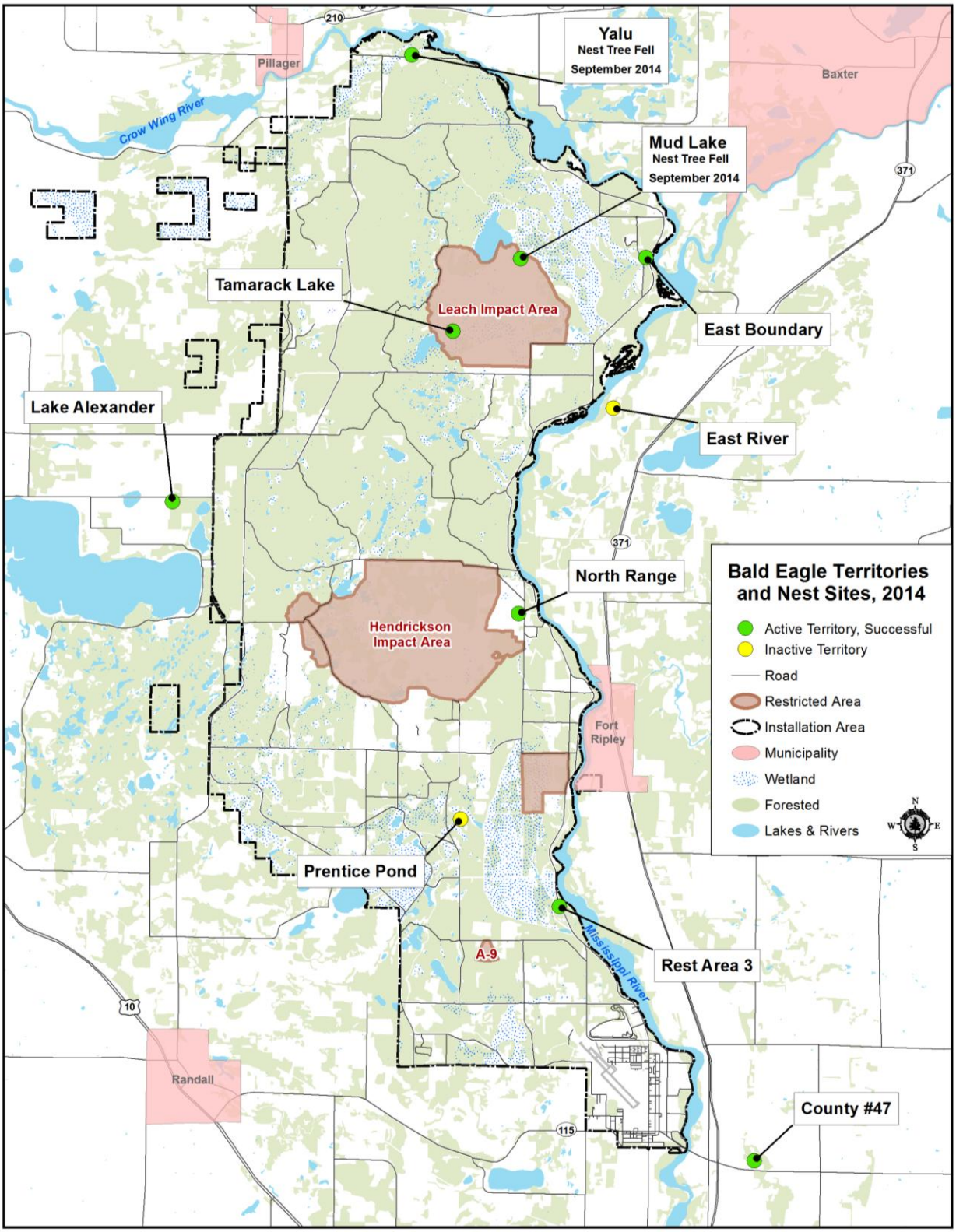
Bald eagles are closely monitored at Camp Ripley (Dirks et al. 2010). Since 1991, two to eight territories have been monitored within Camp Ripley, fledging from one to nine young annually (Table 14). Territory size is variable but are spaced apart to ensure sufficient food resources for chicks and to raise young with minimal disturbance from other eagles. Eagle pairs can have more than one nest within a territory. In April 2014, bald eagles occupied six of seven territories throughout Camp Ripley (Figure 12). The Prentice Pond nest was inactive. The Rest Area 3, Tamarack Lake, Mud Lake, and Yalu territories each fledged one young, East Boundary fledged two young, and North Range pair had chicks but it is not known how many fledged. The Yalu and Mud Lake nest trees blew down in September 2014 during a major wind event with many trees blown down on the north end of Camp.

Table 14. Bald eagle nests and fledglings, Camp Ripley Training Center, 1991-2014.

Year	Number of Active Territories	Number of Young Fledged
1991-1992	4	?
1993	2	4
1994	3	5
1995	3	4
1996	3	4
1997	3	6
1998	2	4
1999	3	3
2000	4	8
2001	4	8
2002	2	1
2003	3	4
2004	3	4
2005	5	5
2006	6	1*
2007	5	9
2008	5	5
2009	4	2*
2010	6	3
2011	7	4
2012	6	5
2013	7	6
2014	**6**	**6***

* Active nests not checked for nest success due to military training.

Figure 12. Bald eagle territories and nest status at and near Camp Ripley Training Center, Minnesota, 2014.



Four eagle territories within one mile of the Camp Ripley boundary were also monitored. Two of the four territories were active in 2014, and one young was fledged each on County Road #47 and Lake Alexander territories. The East River territory was not active. The Hammernick nest blew down during the winter of 2012-2013, and was rebuilt within its territory during the fall 2014.

Black Tern (*Chlidonias niger*)

Black terns, a SGCN (MNDNR 2014), were observed on Mud Lake (n=3) in early June 2014. Black terns are a high priority in all Bird Conservation Region's waterbird plans. The North American Breeding Bird Survey (BBS) provides population trends for 1966-1989 (NatureServe 2009a), and during this time the North American population of black terns decreased at an annual rate of 5.6% per year, for an overall population decline of 71.8%. The population decline (84.8%) has been greater in the United States than in Canada. Minnesota is one of twelve states with sufficient sample size to determine population trends from the BBS and it also shows significant population declines.

Owl Surveys

Owl surveys at Camp Ripley began in 1994, and continued annually until 1999. These surveys were placed on a four-year rotation in 2000, but with the threat of West Nile Virus occurring in owl populations, the survey is now conducted every year. Data from these surveys is also used to monitor state and regional owl population trends.

In the past, owls were surveyed at 26 points along one designated route (Route #1) in the spring to determine presence and abundance of owl species (Figure 13). The survey was conducted four times during specified survey periods (March 12-March 24, March 25-April 6, April 7-April 19, April 20-May 2). A three minute passive listening period was used at each point. An additional survey route (Route #2) was added in 2004, which covers the interior portion of Camp Ripley. This route was surveyed with similar survey protocol as Route #1.

In 2009, Camp Ripley's survey protocol was changed to reflect protocol designed by the Western Great Lakes Region (WGLR) owl monitoring survey (Grosshuesch 2008). This project is a collaborative effort between Hawk Ridge Bird Observatory, Natural Resources Research Institute, Minnesota Department of Natural Resources, and Wisconsin Department of Natural Resources. This survey was developed as a large scale, long-term owl survey to monitor owl populations in the WGLR. It was designed to increase understanding of the distribution and abundance of owl species in the region since few species of owls are adequately monitored using traditional avian survey methods such as breeding bird surveys, songbird point counts, or Christmas Bird Counts. Survey protocol uses existing survey routes, of 10 stops per route, to conduct roadside surveys in Minnesota and Wisconsin. In 2008, the number of survey periods was reduced from three to one period (April 1 to April 15) with a five minute passive listening period. The survey window was extended to April 28 due to poor weather conditions. The (WGLR) survey analysis of seasonal calling activity data suggested one survey period in April is adequate to detect all species of interest for monitoring purposes. For comparison purposes with the WGLR owl survey, the number of routes at Camp Ripley is based upon 10 stops per route.

In 2014, the owl survey for Route #1 (Figure 13) was conducted on April 8 (2.6 routes). The Route #2 (Figure 13) survey was conducted on April 15 (points #1-#7) and April 16 (points #8-#14) (1.4 routes).

A total of 18 owls were detected during 2014 surveys (4 routes). The mean for barred owls (*Strix varia*) was 4.0 owls/route, a three-fold increase from 2013 (Figure 14). The mean for great horned owls (*Bubo virginianus*) was 0.50 owls/route, the largest number since 2006 (Figure 14). No northern saw-whet owls (*Aegolius acadicus*) were heard. The 2014 overall mean of 4.5 owls/route (Figure 15) is the fourth highest mean during the 17 year history of the survey. And, it is above the Camp Ripley long-term survey mean of 3.82 owls/route.

Figure 13. Owl survey routes, Camp Ripley Training Center, route #1 since 1993

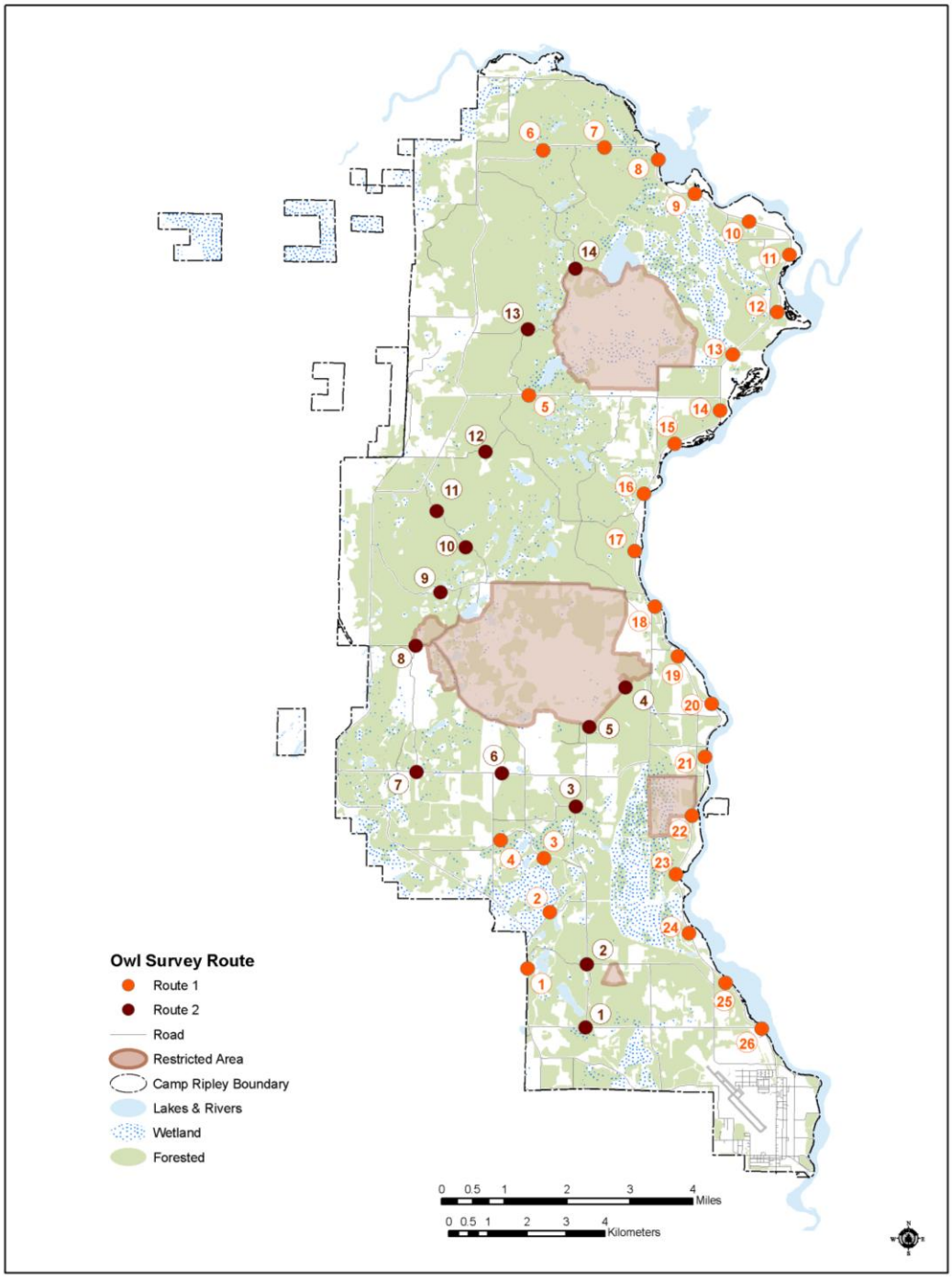
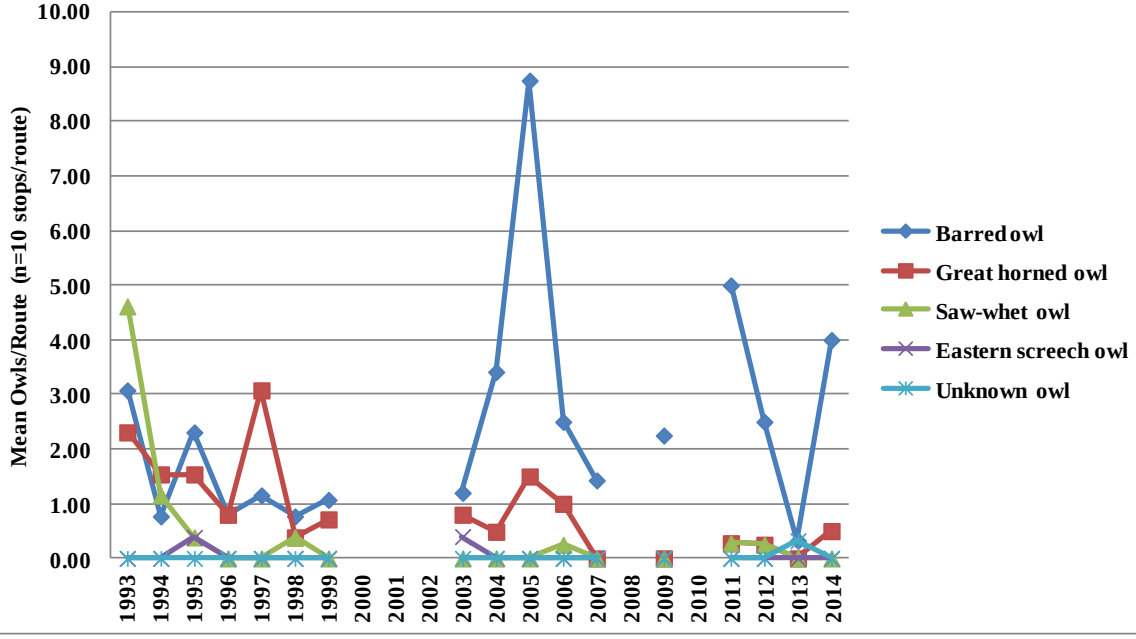
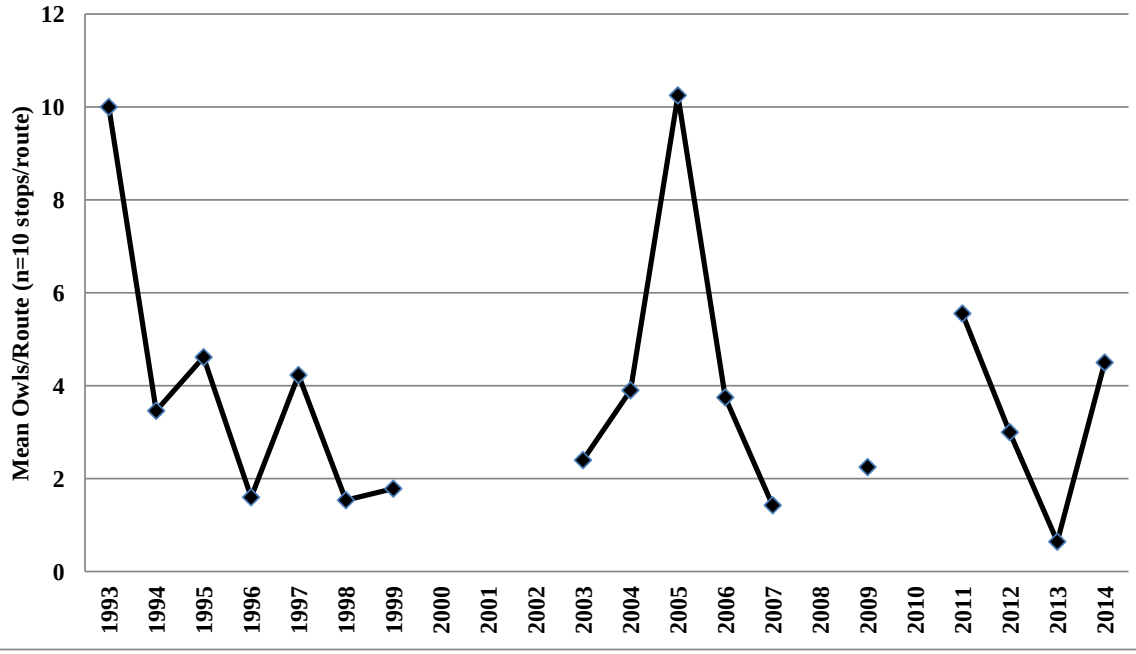


Figure 14. Mean number of owls per route, Camp Ripley Training Center, 1993-2014[a].



[a] Survey data presented with a three minute passive listening period. No surveys were conducted in 2000-2002 and 2007, 2008, and 2010.

Figure 15. Overall mean number of owls per route, Camp Ripley Training Center, 1993-2014[a].



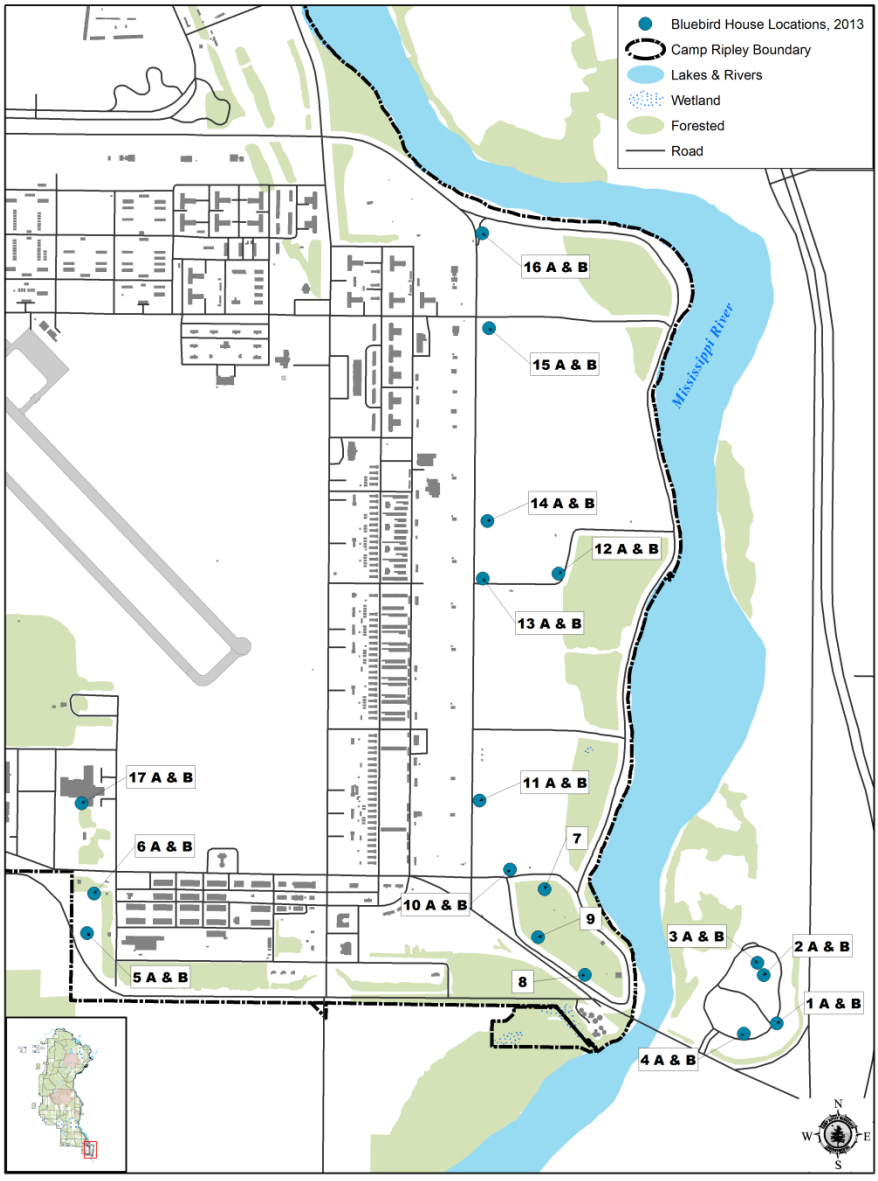
[a] Survey data presented with a three minute passive listening period. No surveys were conducted in 2008 and 2010.

In 2013, Camp Ripley had 200% fewer mean owls/route (0.65) compared to Minnesota's WGLR survey's mean of 2.0 owls/route (Grosshuesch and Brady 2014). However, neighboring routes in southern Cass and Crow Wing counties and northern Morrison County barred owl counts (n=4 routes) ranged from 0-5 owls/route in 2013, similar to Camp Ripley's survey (Figure 15). Camp Ripley's mean owls per route has been either similar to Minnesota's WGLR survey number or has exceeded it since 2005 (Grossheusch and Brady 2014). Minnesota's WGLR owl survey results are pending for 2014.

Eastern Bluebird (*Sialia sialis*) Nest Boxes

Eastern bluebird populations declined significantly from the 1930s to 1960s due to loss of habitat and competition from other cavity nesting birds particularly non-native European starlings (*Sturnus vulgaris)* and house sparrows (*Passer domesticus*) (MNDNR 2012a). Because of this population decline, nationwide bluebird recovery efforts began with the North American Bluebird Society in 1977 (North American Bluebird Society 2008a) and in 1979 statewide recovery efforts were initiated by the Audubon Chapter of Minneapolis Bluebird Recovery Program of Minnesota (Bluebird Recovery Program of Minnesota 2008) in cooperation with the Nongame Program of the DNR. These recovery efforts provided artificial nest boxes for eastern bluebirds. Camp Ripley established artificial nest

Figure 16. Location of eastern bluebird houses, Minnesota State Veterans Cemetery and Camp Ripley Training Center cantonment area, since 2013.



boxes in 1994 at the Minnesota State Veterans Cemetery and along the Camp Ripley cantonment fence in 2007 to aid in the eastern bluebird recovery. In addition, the nest boxes at the Minnesota State Veterans Cemetery provide visitors viewing enjoyment.

In August 2008, the coordinator of the Bluebird Recovery Program of Minnesota evaluated the past nest boxes and locations for their benefit to bluebird use and production. Based on his recommendations, the nest boxes were replaced with Gilbertson PVC artificial nest boxes (North American Bluebird Society 2008b) and moved to different locations (Figure 16). Bluebird nest box pairs were located in open areas close to scattered trees, at least 300 feet from brush, and more than 500 feet apart. Placing boxes away from brush areas minimizes nest box use by house wrens (*Troglodytes aedon*). These new locations have been effective and eliminated use by house wrens from 2009 to 2013.

During 2014, 29 Gilbertson PVC bluebird nest boxes were monitored regularly during the breeding season (April to August) by Mike Ratzloff, Camp Ripley volunteer. The nest box pair (#17A & B) was removed during the early spring due to construction activity; they will be reinstalled in 2015. Sixteen boxes were occupied by bluebirds, three by tree swallows (*Tachycineta bicolor*) (Table 15), and

Table 15. Bluebird and tree swallow fledging production, Camp Ripley Training Center, since 2009.

Year	Veterans Cemetery			Cantonment		
	# Nest Boxes	**# Bluebirds Fledged**	**# Tree Swallows Fledged**	**# nest boxes**	**# Bluebirds Fledged**	**# Tree Swallows Fledged**
2009	8	17 (5 boxes)	10 (3 boxes)	21	79 (12 boxes)	6 (1 box)
2010	8	17 (5 boxes)	11 (2 boxes)	23	79 (16 boxes)	13 (4 boxes)
2011	8	13 (3 boxes)	19 (4 boxes)	23	53 (11 boxes)	10 (4 boxes)
2012	8	7 (3 boxes)	18 (5 boxes)	23	82 (13 boxes)	1 (2 boxes)
2013	8	16 (4 boxes)	10 (2 boxes)	23	53 (14 boxes)	10 (3 boxes)
2014	**8**	**16 (3 boxes)**	**9 (2 boxes)**	**21**	**79 (13 boxes)**	**6 (1 box)**

none by house wrens. No nesting attempts were made by invasive house sparrows. Sixteen bluebirds fledged from the nest boxes at the Minnesota State Veterans Cemetery and 79 fledged from nest boxes within the cantonment area. Bluebird fledgling production has been excellent. This can be attributed to regular maintenance and monitoring which greatly improves the success of bluebird houses. Additionally, 15 tree swallows successfully fledged.

In the fall of 2014, four bluebird nest box pairs (#12, #13, #14 and #15) were removed and were relocated due to future construction of a solar field adjacent to the boxes.

Mammals

Gray Wolf (*Canis lupus*)

Federal Court Decision

Through federal action and by encouraging the establishment of state programs, the 1973 Endangered Species Act provided for the conservation of ecosystems upon which threatened and endangered species of fish, wildlife, and plants depend (USFWS 2008b). The first federal Endangered Species Preservation Act was passed in 1966, and in 1967 gray wolves were classified as endangered and provided limited protection. In 1974, gray wolves were afforded full protection under the federal Endangered Species Act (ESA) of 1973 (MNDNR 2011b). During the mid- to late-1970's the DNR estimated the wolf population at about 1,000 to 1,200; based on 2003-2004 and 2007-2008 surveys, the population had grown and stabilized at approximately 3,000 animals. The 2013-2014 survey estimated that the current population was stable at 2,423 wolves (MNDNR 2015a).

In a proposed rule issued on May 5, 2011, the U.S. Fish and Wildlife Service proposed to remove gray wolves in the Western Great Lakes Distinct Population Segment — which includes Minnesota, Michigan, Wisconsin, and portions of adjoining states — from the Federal List of Endangered and Threatened Wildlife because wolves have recovered in this area and no longer require the protection of the Endangered Species Act (USFWS 2011a). The Final Rule to remove Endangered Species Act protection for gray wolves in this area took effect January 27, 2012 (USFWS 2011b). However, due to a Federal court decision, wolves in the western Great Lakes area were relisted under the Endangered Species Act, effective December 19, 2014 (USFWS 2015a). Wolves now revert to the federal protection status they had prior to being removed from the endangered species list in the Great Lakes region. This means wolves now are federally classified as threatened in Minnesota and endangered elsewhere in the Great Lakes region (MNDNR 2015b).

Wolf Monitoring Background

Besides serving as a National Guard training center, Camp Ripley is also a Minnesota Statutory Game Refuge. Wolves were first documented on Camp Ripley in 1993. Camp Ripley provides good quality habitat for wolves on the southern edge of the Minnesota gray wolf range. In the past nineteen years, forty-three wolves have been captured and radio-collared on Camp Ripley to determine pack size, movements, causes of mortality, and possible effects of military training (Table 16).

Since 2001, Camp Ripley has supported two or three wolf packs; although for the short time that three packs used Camp, the south pack spent most of its time in areas off Camp. Comparing survival rates of wolves on and off Camp Ripley may provide additional insight into the effects of delisting and now relisting wolves. Research has demonstrated that military training activities on Camp do not negatively affect wolves and the presence of wolves on Camp has not resulted in any loss of training capabilities. In fact, evidence obtained from this study confirmed that wolves that move off Camp are moving into a more hostile environment where they are exposed to illegal, accidental, and hunting/trapping caused mortality.

Since gray wolves were delisted in 2012, wolf packs on Camp Ripley have been monitored following guidance from Section 4(g) of the Endangered Species Act, which requires the federal government (through the U.S. Fish and Wildlife Service) to monitor, for a minimum of five years, any species that is delisted due to its recovery. In addition, the Minnesota Wolf Management Plan encourages area-specific telemetry monitoring of wolves be continued after delisting. Considering the recent court decision placing wolves back on the endangered species list, it will be important to continue to have radio-collared wolves on Camp to provide data for statewide research and population monitoring.

Radio-collared Wolves

At the beginning of 2014 the only radio-collared wolf remaining on Camp Ripley was an older female (#40) in the North Pack (Figure 17). The alpha female of the North Pack for at least four years, wolf #40 was first captured via helicopter in February 2010. In January, 2014, four wolves were observed while aerial radio-tracking wolf #40 south of Cassino Road in Training Area 56. In December 2014, six wolves, including #40, came in to a baited remote camera station in Training Area 68. Several of the wolves appeared to be this year's pups.

Two wolves that were originally radio-collared on Camp were also monitored throughout the year. Wolf #41 is a male that was collared as a pup in September 2011. As part of the Miller Lake Pack, he stayed on or near Camp through late August 2012 (Figure 31 in MNDNR and MNARNG 2013). In late September 2012, he was located near Long Prairie, Minnesota approximately 20 miles southwest of Camp. In late October 2012, he moved again and since that time has been located north of Amor, Minnesota approximately 70 miles from Camp. Remote camera pictures taken by area residents show an uncollared wolf with a pup in the same area. In July 2012, wolf #36 also moved off Camp to an area southwest of Lake Alexander. In early 2013, he was observed with another wolf, probably the start of another pack. In February 2014, wolf #36 was shot illegally and found north of Cushing, Minnesota (Figure 18).

Although no radio-collared wolves remained in the Miller Lake pack in 2014, a track survey in February revealed at least 6 wolves remained in this pack. In the fall 2014, one uncollared wolf, probably part of the Miller Lake Pack, was legally trapped south west of Camp. A helicopter capture crew will be brought to Camp Ripley to capture wolves in early 2015. The goal is to capture and collar three to four uncollared wolves in each of the Miller Lake and North packs and deploy two GPS/satellite collars on young wolves that might disperse.

Table 16. Gray wolves captured, Camp Ripley Training Center, since 1996.

Wolf#	Sex	# of Captures	Age at 1st Capture	Date of 1st Capture	Date of Last Capture	Weight (lbs) at Last Capture	Ear Tag Color & Number (Left/ Right)	Fate	Comments
1	F	1	Yearling	9/10/1996	9/10/1996	57		dead	Illegally trapped/shot in Cass County (8/1997)
2	F	2	Pup	9/19/1996	8/29/1997	42		dead	Illegally shot-poacher
3	F	1	Yearling	9/20/1996	9/20/1996	80		dead	Poisoned
4	M	2	Yearling	9/23/1996	1/31/1998	79		dead	Hit by car
5	F	1	Yearling	2/21/1997	2/21/1997	55		unknown	Dropped collar for data retrieval
6	F	3	4-5 years	2/21/1997	7/24/1998	90		dead	Hit by car
7	M	3	10 month	2/21/1997	2/1/1998	55		dead	Illegally shot-poacher
8	F	1	10 month	2/21/1997	2/21/1997	50		unknown	Dropped collar for data retrieval
9	M	2	3-4 years	2/21/1997	2/3/1998	90		unknown	Pillsbury State Forest
10	M	1	Pup	8/29/1997	8/29/1997	20		dead	Starved? (9/23/2007)
11	F	4	Pup	10/31/1997	2/4/1999	59		dead	Illegally shot in Hillman area? Collar found in swamp
12	M	2	Yearling	11/4/1997	2/3/1998	60		dead	Killed by ADC in Pine County (7/26/1999)
13	M	1	Yearling	2/3/1998	2/3/1998	88		unknown	Dropped collar for data retrieval
14	F	3	Yearling	9/14/1998	1/30/2002	76		unknown	Collar failed -2003
15	M	3	>3 yrs	2/2/1999	1/17/2001	107		dead	Found dead on Camp (7/2001)
16	F	1	1-2 years	1/18/2001	1/18/2001	65		dead	Found dead in Michigan- Illegally shot (9/2002) (Sue)
17	M	2	1-2 years	9/26/2001	2/4/2004	88		unknown	Missing
18	M	3	3-4 years	11/15/2001	2/25/2003	95		dead	Struck by car on Hwy 371 (Lucky)
19	F	2	1-2 years	1/30/2002	12/13/2002	76		dead	Illegally shot south of Camp
20	F	2	>3 years	1/30/2002	1/30/2006	79		dead	Found dead west of Camp Unk. (8/2007) (Lady)
21	F	1	1-2 years	2/25/2003	2/25/2003	68		dead	Found dead in cornfield (Shot?)
22	M	1	2-3 years	2/4/2004	2/4/2004	100		dead	Killed by ADC 4/24/2004 in Cass County
23	M	2	1-2 years	2/4/2004	1/30/2006	72		dead	Illegally shot during firearms deer season (11/2007) (Smokey)
24	M	1	1-2 years	2/4/2004	2/4/2004	78		unknown	Collar failed
25	M	1	1-2 years	2/4/2004	2/4/2004	83		unknown	Collar chewed off
26	M	1	3-4 years	1/30/2006	1/30/2006	85		dead	Illegally shot during firearms deer season (11/2008) (Sly)
27	M	1	2 years	1/30/2006	1/30/2006	85		dead	Struck by car on Hwy 371
28	M	1	4-5 years	1/30/2006	1/30/2006	103		dead	Illegally shot - was North Pack alpha male (Big Foot)
29	F	1	2 years	1/30/2006	1/30/2006	67	Orange 1/Blue 11	unknown	Collar chewed off -11/2009 North Pack
30	F	1	3 years	1/31/2006	1/31/2006	85		dead	Found during helicopter capture (2/08) killed by wolves (Shep)
31	M	1	4-5 years	3/22/2008	3/22/2008	75		dead	Illegally shot (11/2011) South Pack

Table 16. Gray wolves captured, Camp Ripley Training Center, since 1996.

Wolf#	Sex	# of Captures	Age at 1st Capture	Date of 1st Capture	Date of Last Capture	Weight (lbs) at Last Capture	Ear Tag Color & Number (Left/ Right)	Fate	Comments
32	F	2	2-3 years	3/22/2008	9/13/2011	76		dead	Illegally killed (arrow) south of Camp Ripley (October 9, 2012)
33	F	1	2 years	3/22/2008	3/22/2008	76		dead	Killed by depredation trapper in Manitoba, Canada (7/2008)
34	M	1	4-5 years	3/22/2008	3/22/2008	92		dead	Illegally shot near Staples, MN on 11/12/2009 (Techno)
35	M	1	Pup	10/6/2009	10/6/2009	55	Metal 2117/2466	unknown	North Pack; VHF collar (Trickster); Collar chewed off Jan. 2010
36	**M**	**1**	**3 years**	**2/2/2010**	**2/2/2010**	**63**	**Yellow 34/Yellow 46**	**DEAD**	**Lake Alexander Pack – illegally shot in February 2014 near Cushing, MN**
37	M	1	4-5 years	2/3/2010	2/3/2010	77		dead	Killed by wolves in adjacent pack in February 2012
38	F	1	Pup	2/3/2010	2/3/2010	56	Blue 21/Orange 15	unknown	South Pack – satellite collared, failed May 2010
39	M	1	8-10 years	2/3/2010	2/3/2010	97		dead	Died of natural causes February 2012
40	**F**	**1**	**4-6 years**	**2/3/2010**	**5/20/2011**	**69**	**Orange 24/Yellow 29**	**ALIVE**	**North Pack – alpha female**
41	**M**	**1**	**Pup**	**9/25/2011**	**9/25/2011**	**50**	**Blue 16/Blue 25**	**ALIVE**	**Moved to Fergus Fall, MN area from Miller Lake Pack**
42	M	1	Pup	9/26/2011	9/26/2011	40	Yellow 50/Blue 17	unknown	North Pack – not radio-collared
43	F	1	Pup	9/26/2011	9/26/2011	39	Orange 23/Blue 23	unknown	North Pack – not radio-collared
44	M	1	3 years	2-14-2013	2-14-2013	87	Yellow 35/Blue 7	dead	Unknown Pack - illegally shot in early November 2013 near Little Elk WMA
45	F	1	3-4 years	2-14-2013	2-14-2013	77	Orange 8/Orange 20	dead	Unknown Pack - legally harvested during wolf season NE of Rice, MN

Figure 17. Locations of wolf #40, North Pack, Camp Ripley Training Center, 2014.

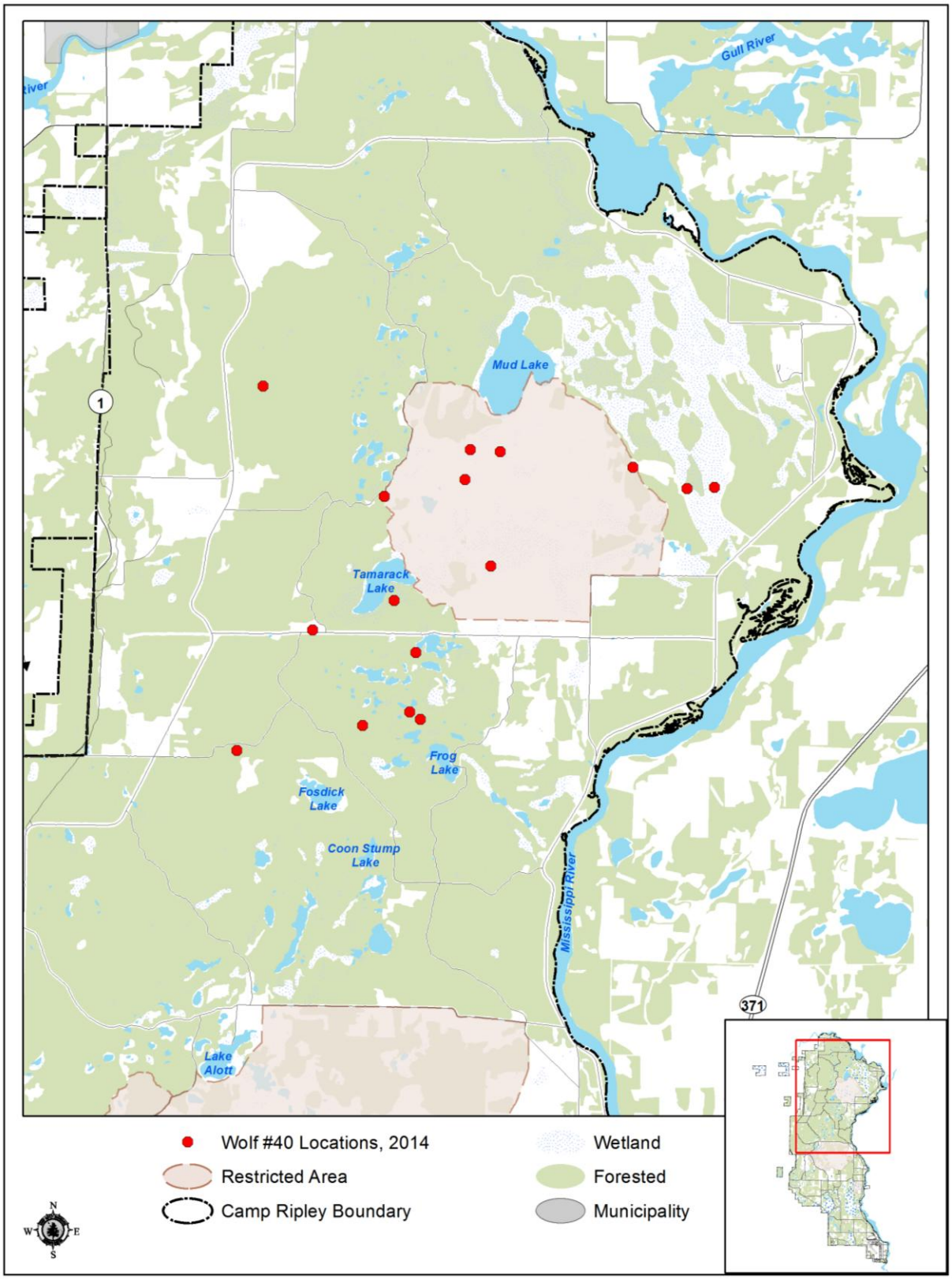
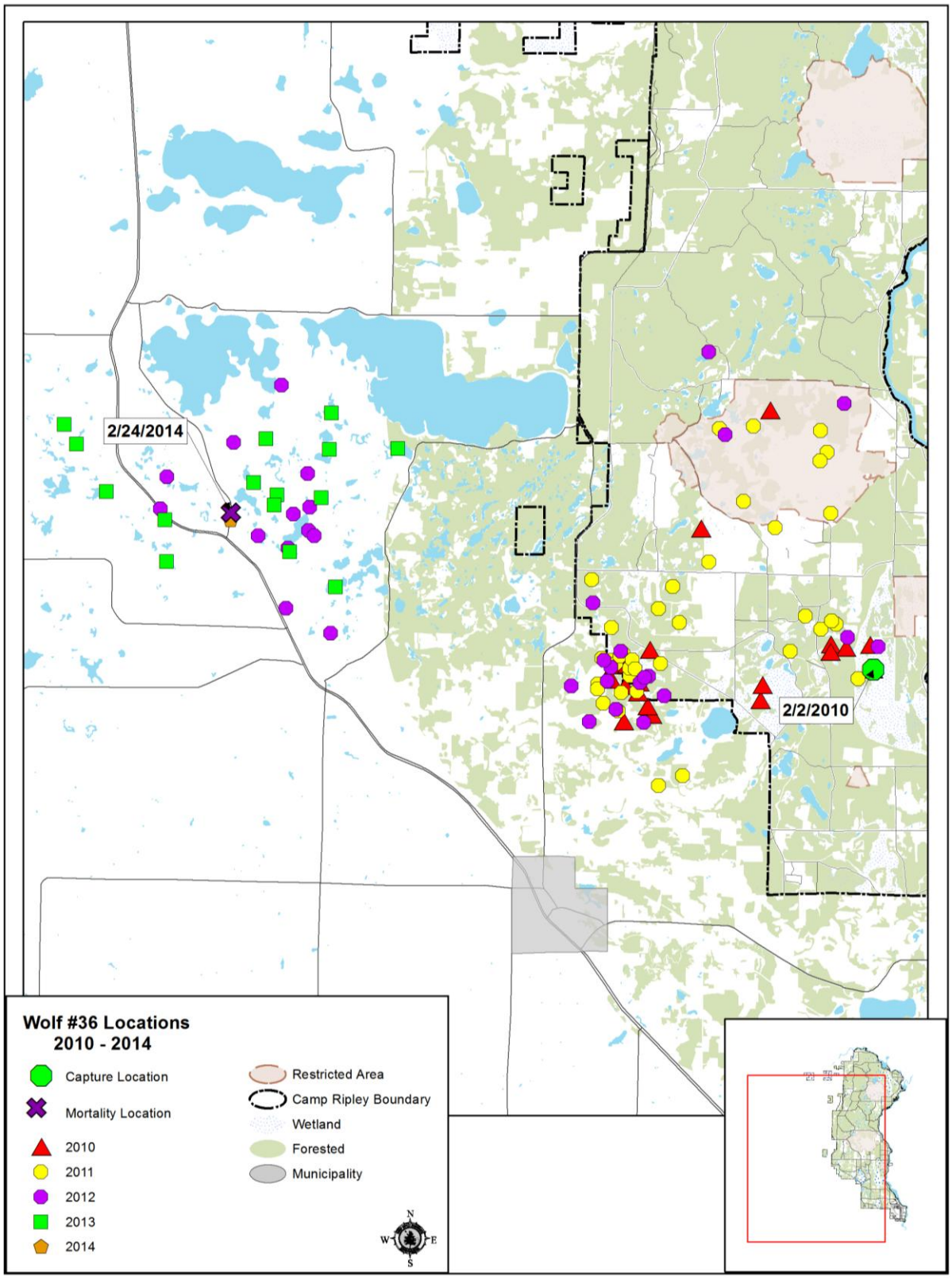


Figure 18. Locations of wolf #36, Miller Lake and Lake Alexander packs, Camp Ripley Training Center, 2010-2014.



Black Bear (*Ursus americanus*)

Research

A telemetry-based study of black bears was initiated at Camp Ripley in 1991. The current study is part of a statewide research project conducted by the MNDNR designed to monitor the body condition, movements, and reproductive success of bears in the northern, central, and southern parts of Minnesota's bear range. Camp Ripley lies along the southern edge of bear range in Minnesota. The principal objectives of this study include: 1) continued monitoring of reproduction and cub survival, 2) additional (improved) measurements of body condition, heart function, and wound healing, 3) examination of habitat use and movements with GPS telemetry, 4) investigation of female dispersal near the southern fringe of the expanding bear range (Garshelis et al. 2004), and 5) monitoring the incidence of nuisance bears and in particular any conflicts with soldiers and military training.

Mortalities and Reproduction

Ground and aerial tracking were used to monitor reproductive success, movements and survival of eight radio collared black bears through 2014 (Table 17). Researchers are now focusing more on reproductive success and survival than movements and habitat use; therefore bears on Camp Ripley were located less frequently in 2012-14 than in the past. Bear 2063 (12 years old in 2014) is usually located in the northeastern part of Camp Ripley but occasionally crosses the Mississippi River. In the fall of 2013, she denned in a road culvert in Crow Wing State Park, neither of her yearling cubs survived to March den visits. Bear 2123 and 2124 are bear 2063's five year old offspring; both of these bears have taken up residence within 2063's home range. Bear 2123 had her first cubs in 2013, all three survived to March 2014 den visits. However, bear 2123 was shot south of Pillager during the 2014 bear season (Figure 19). Bear 2124 again denned in a road culvert under Cassino Road in Training Area 59. She had cubs in January, 2014 but the cubs did not survive until spring. Bear 2124 was inaccessible in the culvert, so she was not handled during March den visits; however, she was trapped in July 2014 to replace her radio collar.

Bear 2079 (12 years old in 2014) was again fit with a GPS collar in March, 2014. The hundreds of locations obtained from her GPS collars provide additional information on her home range and confirms that bear 2079 is continuing to move her home range further south of Camp (Figure 20). Bear 2092 (nine years old in 2014), is one of bear 2079's offspring and her territory is in the northern portion of her mother's old home range. Bear 2092 had two cubs in 2013, both survived to March 2014 den visits. Bear 2092's 2014-15 den has not been located because she lost her collar in the fall of 2014. Bear 2107 (seven years old in 2014), is also one of 2079's offspring; although she is no longer collared, bear 2107 and two cubs were recorded on a remote camera southwest of Camp in July 2014.

Bear 2081 (15 years old in 2014) had two cubs in 2013; however, in March 2013 an orphaned cub was placed at the opening of the den, which she readily accepted. All three yearlings were in the den with her in March 2014. Bear 2081 also wore a GPS collar in 2014, which confirmed that she is usually located in the south central part of Camp (Figure 20). Bear 2130 was first collared during den visits in February 2012; she had three cubs in 2013, all survived to March 2014 den visits. In the fall

Figure 19. Locations for black bear #2123, Camp Ripley Training Center, 2010-2014.

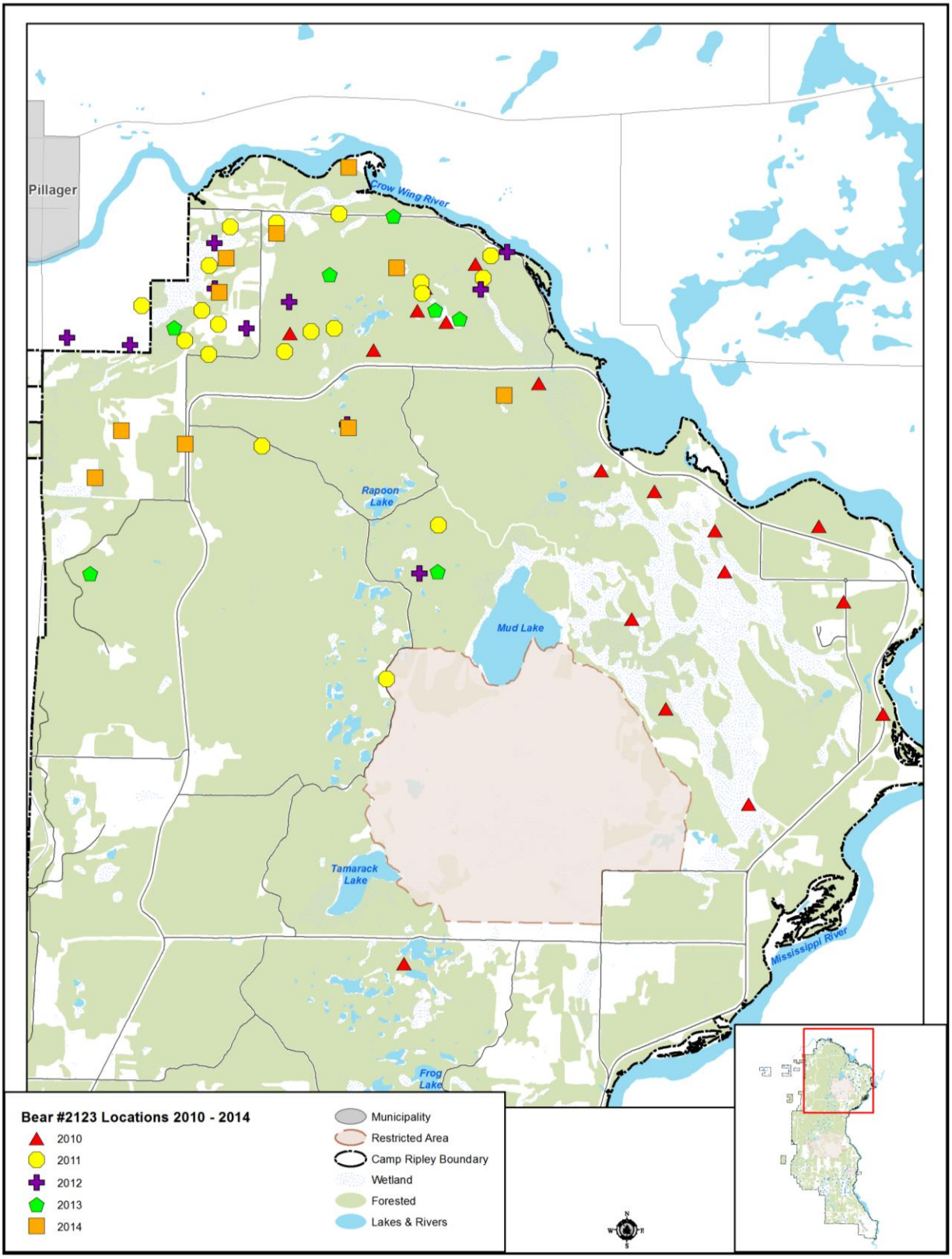
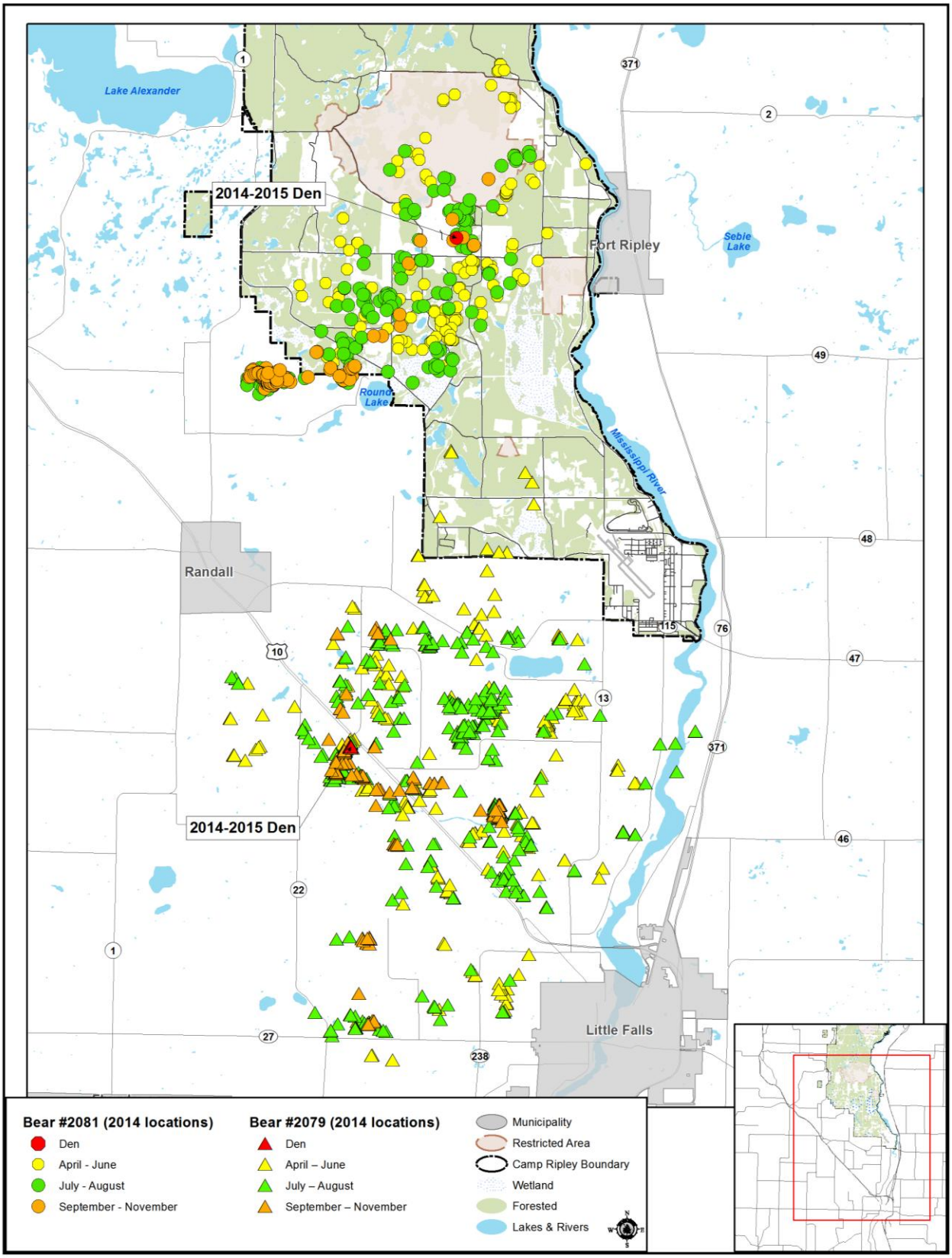


Figure 20. Locations for black bears #2079 and #2081, Camp Ripley Training Center, 2014.



of 2013, a bear den was located 20 yards east of Bizerte Road in TA 29. In March 2014, a new female bear (2154) was radio-collared in that den; she had two yearlings with her.

Table 17. Black bears monitored, Camp Ripley Training Center, 2013.

Bear ID	Sex	Age as of Jan. 2014	Date of First Capture	Age at First Capture	Weight at Last Capture (lbs)	Ear Tag Color & Number (Front/Back Left//Front/Back/Right)*	Status
2063	F	12	2002	Cub	157 (3/2014)	B-B 281 / Y-Y 202	**ALIVE**
2079	F	12	2004	2 yrs	235 (3/2014)	P-P 301 / Y-Y 218	**ALIVE**
2081	F	15	2004	5 yrs	190 (3/2014)	O-W 44 / O-W 42	**ALIVE**
2092	F	9	2005	Cub	235 (3/2014)	B-B 295 / O-O 231	**ALIVE collar recovered 11/2014 (2079's cub)**
2107	F	7	2007	Cub	137 (2/2013)	Orange 245 / Orange 26	**ALIVE, collar recovered 12/2013 (2079's cub)**
2123	F	5	2009	Cub	155 (3/2014)	Blue / Orange 379	**DEAD (2063's cub)**
2124	F	5	2009	Cub	159 (7/2014)	Blue / Yellow 19	**ALIVE (2063's cub)**
2130	F	Unk.	2012	Unk.	203 (3/2014)	Missing / Blue 293	**ALIVE**
2154	F	Unk.	2014	Unk.	165 (2/2014)	Blue 351 / Blue 298	**ALIVE**

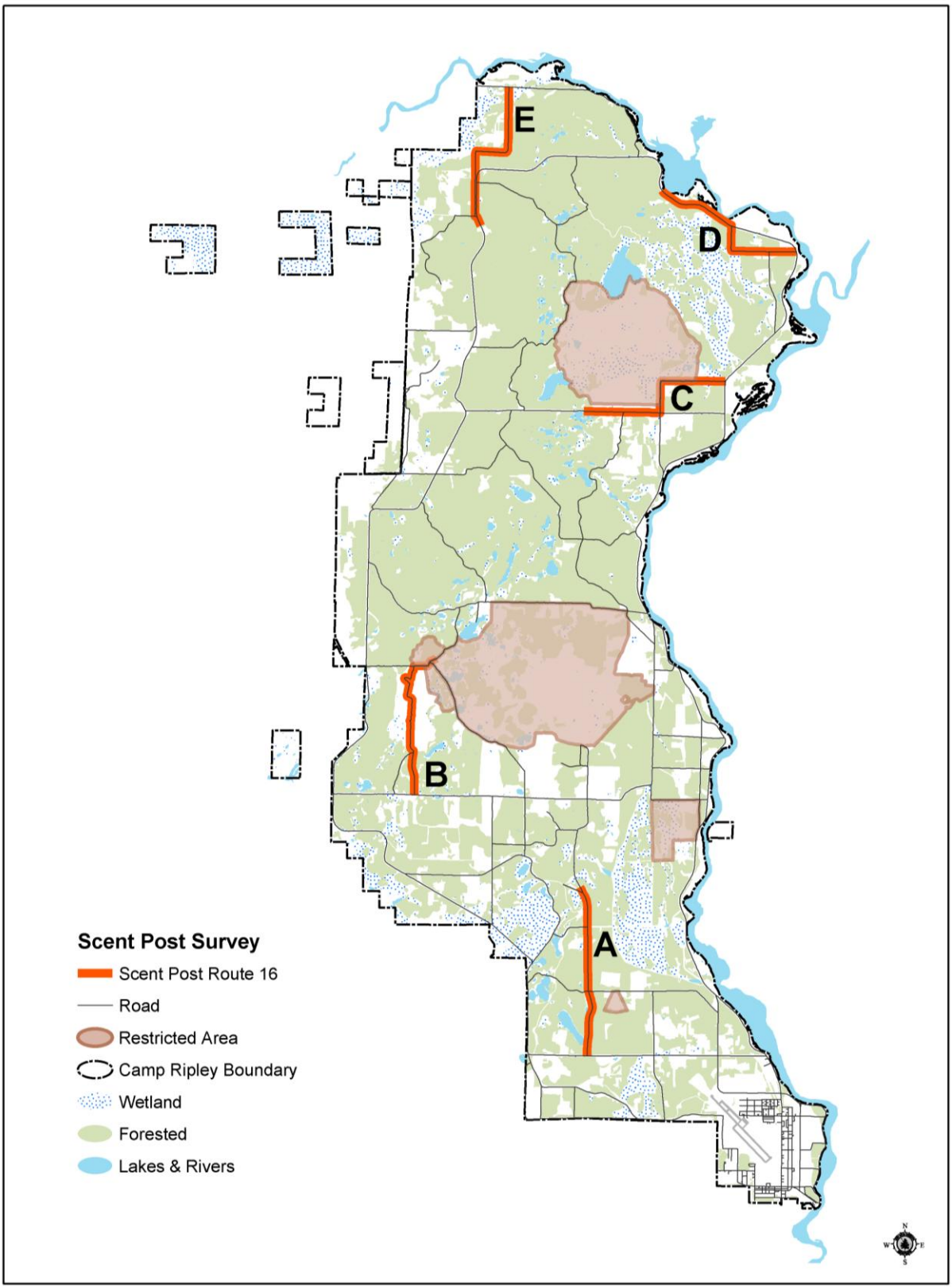
*Y=Yellow; W=White; O=Orange; R=Red; P=Pink

Carnivore Scent Station Survey

The DNR has conducted carnivore scent station surveys throughout the state for the past 38 years to monitor population trends of major furbearer-predator species. As part of this effort, surveys have been conducted at Camp Ripley since 1985. Camp Ripley contains one route, #16, which consists of five segments (Figure 21). Each segment is 2.7 miles long, with a scent station every 0.3 miles. A scent station consists of a 0.9 meter diameter circle of sifted soil with a fatty-acid scent tab placed in the middle. Each station is checked for tracks the morning after installation. Segments A and B were not surveyed, segment C was checked on September 26, and segments D was checked on September 22, and E was checked on September 26.

The most common animals to leave tracks on survey plots during 2014 were gray wolf, coyote (*Canis latrans*), raccoon (*Procyon lotor*), domestic cat, and red fox (*Vulpes vulpes*). During 2012, the last time the survey was conducted on Camp, gray wolf, gray fox, fisher, and skunk were the most frequent visitors to scent stations.

Figure 21. Carnivore scent station survey routes, Camp Ripley Training Center, since 1985.



In 2013, the most recent statewide data available, route visitation rates (% of routes with detection) were highest for red fox (35%), followed by raccoon (30%), skunks (28%), domestic cat (26%), coyote (25%), and dog (19%). Camp Ripley routes are located in the survey's forest zone and at the boundary of the transition zone. The coyote index in the forest zone was below the long-term average while in the transition zone the index is on an upward trend with the index at its highest level recorded. Red fox indices in the transition zone had increased to near the long-term average but in the last two years have dropped below the long-term average. Red fox indices in the forest zone are at or near their long-term average. Raccoon indices in the forest and transition zones remained at or near their long-term average. The forest zone gray wolf index declined, though not significantly, and has remained above the long-term average. This data must be considered carefully due to discrepancies such as weather, timing, and natural animal movements (Erb 2014).

Beaver (*Castor canadensis*)

Beaver are an important part of the natural ecosystems at Camp Ripley. This species can have a large effect on the environment in which it lives. In a natural system, beavers create or enlarge wetland areas which trap nutrients and help to reduce flooding by holding and slowly releasing water. However, problems occur in localized areas of Camp Ripley when beavers plug road culverts, flooding and damaging roads. When this occurs, a cooperative effort between the Environmental Office, DNR, and Camp Ripley Department of Public Works (DPW) is initiated to identify problem areas and implement solutions.

All problem areas are inspected by the Environmental Office, and possible solutions are provided to Camp Ripley's DPW. Some areas require the removal of beaver through trapping. Trapping permits are issued by a local DNR conservation officer. Camp Ripley beaver removal is conducted by DNR and nuisance beaver trappers at the direction of DNR staff. During the fall of 2014, nine beaver were removed from problem areas. Beaver removal occurred in the following areas: Cody Road (n=4), Training Area 13 along East Boundary (n=3), Luzon Road (culvert #366; n=1), and Armor Trail (culver #36; n=1). Beaver trapping will continue in the spring of 2015.

Many problem areas can be addressed through the use of damage control structures, such as Clemson levelers and beaver deceivers. These devices have been used successfully at Camp Ripley in the past, and additional sites are targeted for these devices each year. However, these devices do require maintenance and eventually fail and/or need to be replaced.

Beaver ponds throughout Camp Ripley provide habitat for Blanding's and other turtles and numerous reptiles and amphibians; as well as provide feeding areas for a variety of wildlife and habitat for waterfowl and other birds. Therefore, it is important that these wetlands not be permanently drawn down or drawn down in fall or winter in order to install these devices. Installation should occur after a temporary drawdown in spring or summer, or during natural low-water levels. Research in east-central Minnesota investigated the effects of a controlled drawdown on Blanding's turtle populations. The incidence of mortality was high after the drawdown due to predation, road mortality and winterkill (Dorff Hall and Cuthbert 2000).

Cougar (*Puma concolor*) and Canada Lynx (*Lynx canadensis*) Detection Survey

Historically, cougars, also known as mountain lions, were never common in Minnesota; however, they likely ranged throughout the state before European settlement (MNDNR 2012b). Camp Ripley staff receives several reports annually of cougar sightings on Camp. In the last four years, 14 verified cougar sightings have occurred throughout Minnesota. A male cougar was documented to have trekked from western South Dakota through Minnesota to southwestern Connecticut and recently a cougar was shot in Jackson County (MNDNR 2012b). Three likely, but unconfirmed observations were reported on Camp Ripley in 2008, another one adjacent to Camp in the fall of 2009, again in the fall of 2011, and in the summer of 2014.

Since March 2000, the Canada lynx has been listed as a federally threatened species under the Endangered Species Act. This is the only lynx species in North America. Numbers of lynx in Minnesota likely fluctuate with Canadian populations and with the abundance of their primary prey, the snowshoe hare (*Lepus americanus*) (MNDNR 2012c).

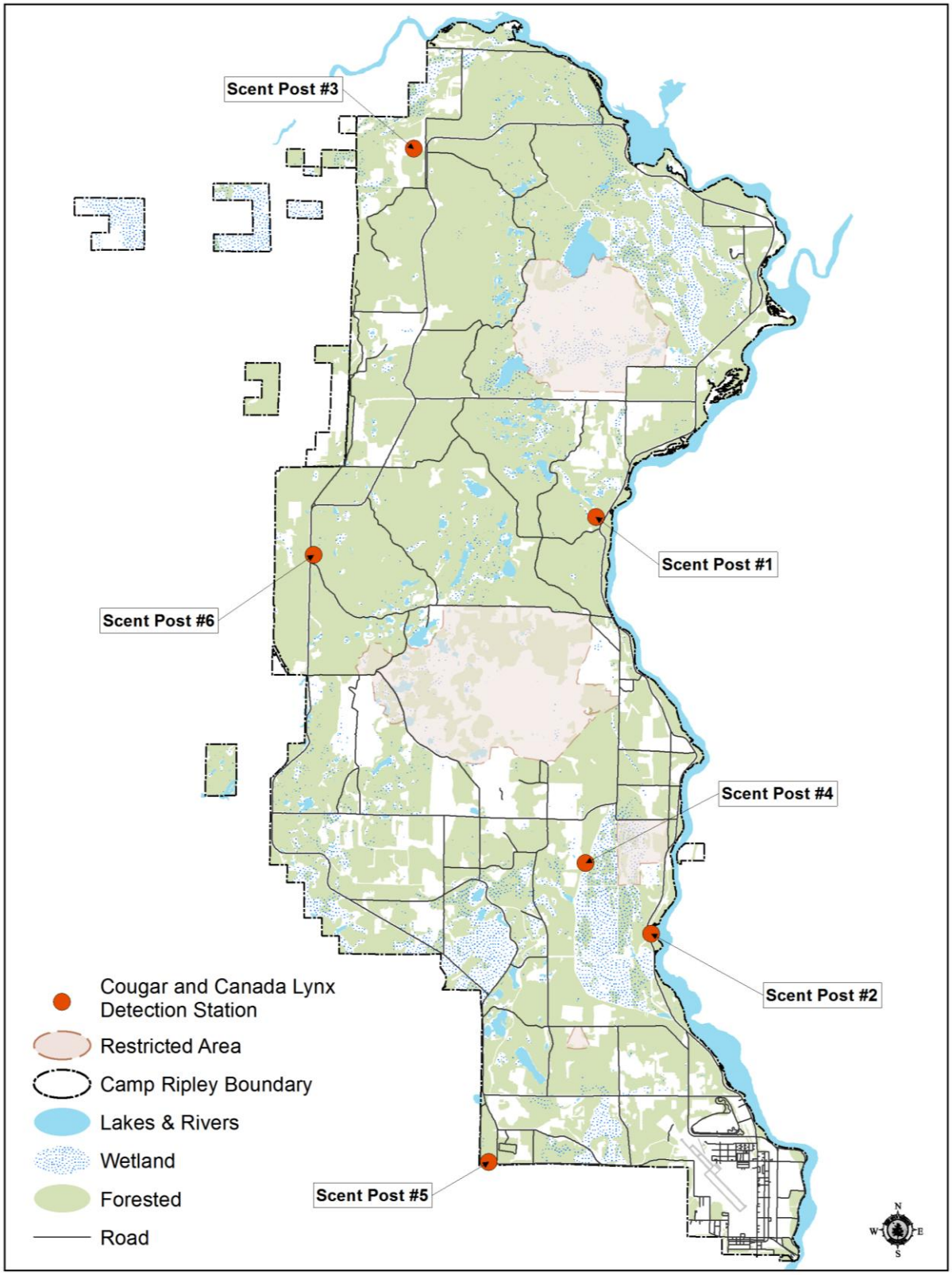
Minnesota historically supported the largest lynx population in the Great Lakes region. Studies are currently underway to understand their distribution, abundance, persistence, and habitat use in and near the Superior National Forest in northeastern Minnesota. This research indicates that Canada lynx may be more abundant in Minnesota than previously thought. In 1993, a lynx sighting was reported on Camp Ripley and more recent sightings in the state include Morrison County just west of Camp Ripley (Dirks and Dietz 2010)

Bobcats inhabit much of the same forested country as lynx, but are more common. Like the lynx, bobcat populations are affected by the abundance of food, mostly rabbits and mice. Evidence of bobcats and sightings are common on Camp Ripley and landowners along the Camp Ripley borders are known to hunt and trap bobcats.

To further assess the presence of large cats on Camp Ripley, scent stations were established that can be used to detect lynx, cougars, and bobcats. The detection system consists of a perforated plastic pipe installed over a 7-foot fence post. The plastic pipe has a 2-foot sheet of carpet glued to the base. A solid scent lure is placed under the plastic pipe cap, and the carpet is sprayed with liquid cougar lure (either cougar urine or catnip scent). In addition, wild catnip is used as a lure when available.

In 2014, scent stations were in operation from July to October. Black bears were the most commonly recorded animal attracted to the scent posts. Numerous white-tailed deer and smaller mammals were also recorded at the scent stations. Trail cameras prove to be the most effective in recording and positively identifying animals at the scent post. All mammals visiting the stations (Figure 22), during the growing season, will continue to be sampled by use of trail cameras in 2015.

Figure 22. Cougar and Canada lynx detection survey locations, Camp Ripley Training Center, since 2014.



Fisher (*Martes pennanti*)

Since 2007, Camp Ripley has participated in a statewide research project conducted by the MNDNR to examine fisher and marten ecology in Minnesota. The primary objectives of this study are to: 1) estimate survival rates and causes of mortality for fisher and marten, 2) describe and quantify features of natal den sites used by females, 3) directly estimate parturition rates and, if possible, litter sizes of radio-marked females, 4) evaluate how survival or reproduction varies as a function of forest attributes, prey abundance and weather conditions, and 5) to evaluate the design of winter track surveys (Erb et al. 2009). Camp Ripley is located on the southern edge of Minnesota's fisher range and is one of three study areas. Marten are not found in Camp Ripley.

In 2010, Camp Ripley and the Central Lakes College (CLC) natural resources program established a cooperative project to obtain assistance with trapping and monitoring fisher, using student volunteers. Under this cooperative project, fisher trapping on Camp Ripley commenced in early February 2014 continuing through March 10, 2014, resumed again on December 4, 2014 and continued until December 22, 2014. Since 2010, twenty-eight fishers have been captured, including six recaptures, during 6,941 trap nights (0.403 fisher/100 trap nights) (Table 18). Twenty-two fishers were monitored by CLC and Camp Ripley volunteers and interns resulting in 392 telemetry locations since September 2010 (Tables 18 and 19).

Table 18. Fisher capture data and total trap nights per month, Camp Ripley Training Center, 2008-2014.

Month	2008 Trap Nights	2008 Fisher Captured	2009 Trap Nights	2009 Fisher Captured	2010 Trap Nights	2010 Fisher Captured	2011 Trap Nights	2011 Fisher Captured	2012 Trap Nights	2012 Fisher Captured	2013 Trap Nights	2013 Fisher Captured	2014 Trap Nights	2014 Fisher Captured
January			209	0	0	0	0	0	209	0	58	0	0	0
February			444	1	0	0	228	1	568	3	575	4	321	1
March			474	1	0	0	241	2	117	0	149	2	190	0
August	16		0	0	0	0	0	0	0	0	0	0	0	0
September	442	1	147	0	12	0	13	0	0	0	0	0	0	0
October	176	0	29	0	220	0	323	0	35	0	0	1	0	0
November	483	0	169	1	462	3	489	0	425	0	425	0	0	0
December	342	0	137	1	411	2	484	2	458	1	199	0	329	6
Total	**1,459**	**1**	**1,609**	**4**	**1,105**	**5**	**1,778**	**5**	**1,812**	**4**	**1,406**	**7**	**840**	**7**

Table 19. Fisher monitored, Camp Ripley Training Center, since 2007.

Fisher ID	Sex	Estimated Age at Capture	Tooth Age (yrs) at Capture*[a]	Date of Capture	Weight at Capture (kgs)	Ear Tag Number (Right/Left)	Status
F07-326	F	Sub-adult	1.5**	11/14/2007	2.7	327/326	Unknown, radio-collar pulled off June 2008
F08-466	F	Sub-adult	NC	9/22/2008	3.0	488/466	Unknown, radio-collar pulled off Feb. 2009
F09-458	M	Adult 2+ yrs	4.5	2/27/2009	6.0	454/458	Found dead, unknown cause May 2009
F09-480	M	Sub-adult	NC	3/15/2009	4.6	487/480	Radio-collared, recaptured, collar removed
F09-480	M	Adult	SU	11/13/2009	5.3	481/480	Radio-collar removed due to injury, not fitted with new collar
F09-461	F	Adult	1.0	12/13/2009	2.9	460/461	Radio-collared, found dead unknown cause in September 2010
F10-463	M	Adult	0.5	11/10/2010	5.3	462/463	Unknown, radio-collar not recovered- suspected pulled - November 2010
F10-482	M	Juvenile	1.5	11/22/2010	3.65	483/482	Unknown, radio-collar had frequency interference unable to locate
F10-484	M	Adult	1.5	11/24/2010	5.22	485/484	Radio-collared, collar failed
F10-484	M	Adult	1.5	2/16/2011	5.9	Missing/484	Recaptured, radio-collar replaced; incidental trap mortality 2/20/2011
F10-464	M	Sub-adult	SU	12/4/2010	4.6	486/464	Unknown, collar pulled off April 2011 southeast of Motley
F10-472	M	Adult	0.5	12/15/2010	4.6	473/472	Radio-collar pulled off January 2011
F10-472	M	Adult	0.5	3/2/2011	5.2	473/Missing	Unknown, recaptured, radio-collared – lost animal
F11-467	F	Adult	1.5**	3/3/2011	2.8	465/467	Radio-collared, unknown – lost animal
F11-563	M	Adult	SU	12/7/2011	5.2	564/563	Radio-collared, radio collar strap broke in January 2013
F11-563	**M**	**Adult**	**NC**	**2/24/2013**	**6.4**	**564/1479**	**Recaptured, radio-collar replaced**
F11-468	M	Adult	1.7	12/8/2011	6.0	469/468	Found dead 7/12/2012, not predation
F12-566	M	Adult	NA	2/7/2012	4.9	565/566	Radio-collared, unknown – lost animal
F12-566	M	Adult	NC	2/28/2012	Unknown	565/566	Recaptured, radio-collar excellent condition, unknown – lost animal
F12-572	F	Sub-adult	NC	2/23/2012	2.7	573/572	Incidental trap mortality near Amor, Ottertail County, MN November 2013
F12-571	**F**	**Adult**	**2.7**	**12/20/2012**	**2.95**	**567/571**	**Found dead on 5/6/2014, likely predation**
F13-568	**M**	**Sub-Adult**	**0.8**	**2/9/2013**	**4.5**	**569/568**	**Radio-collared, unknown – lost animal**

Table 19. Fisher monitored, Camp Ripley Training Center, since 2007.

Fisher ID	Sex	Estimated Age at Capture	Tooth Age (yrs) at Capture*[a]	Date of Capture	Weight at Capture (kgs)	Ear Tag Number (Right/Left)	Status
F13-1476	**F**	**Sub-Adult**	**0.8**	**2/9/2013**	**2.7**	**570/1476**	**Radio-collared, failed radio-collar, alive - trail camera observations – Fall 2014**
F13-1477	**F**	**Adult**	**SU**	**2/9/2013**	**2.8**	**1482/1477**	**Radio-collared – unknown radio collar failed (Sept. 2014)**
F13-1452	F	Juvenile	NC	3/1/2013	2.4	1480/1452	Unknown, radio-collar pulled off March 2013
F13-1451	M	Adult	2.9	3/4/2013	6.3	1478/1451	Radio-collared, collar recovered 8/5/2013
F13-1484	M	Adult	3.5	10/30/2013	5.65	1481/1484	Incidental trap mortality12-28-2013
F14-1454	**F**	**Adult**	**6.5**	**2/20/2014**	**2.4**	**1454/1453**	**Found dead on 5/6/2014, likely predation**
F14-1456	**M**	**Adult**	**NA**	**12/6/2014**	**5.4**	**1455/1456**	**Radio-collared – collar pulled off – Dec. 2014**
F14-1456	**M**	**Adult**	**NC**	**12/14/2014**	**5.4**	**1455/1456**	**Recaptured, radio-collared again**
F14-1475	**M**	**Adult**	**NA**	**12/14/2014**	**5.1**	**1474/1475**	**Radio-collared, Died**
F14-1458	**M**	**Adult**	**NA**	**12/17/2014**	**5.9**	**1457/1458**	**Radio-collared**
F13-568	**M**	**Adult**	**2.7**	**12/21/2014**	**5.5**	**1500/1499**	**Recaptured, radio-collared again**
F14-1473	**M**	**Adult**	**NA**	**12/22/2014**	**6.2**	**1472/1473**	**Radio-collared**

[a] years of age at capture *NC – tooth not collected, NA-Data currently not available, SU-sample unusable, **-age uncertain as to 1.5 to 2.5 years old

Ground and aerial radio-tracking continued to be used to monitor movements and survival of radio-collared fisher (Table 20). In 2014, assistance with radio-tracking was obtained through volunteer Nathan Wesenberg, summer interns Adam Maleski and John Sipe, and CLC student volunteers. Natal and maternal den sites were identified for fishers #571, #1477, and #1454. Fisher #571 had kits, but kit numbers were hard to determine as the kits were under the leaf litter, the number was estimated at 2 to 3. Because she was found numerous times in the same den tree and displayed defensive behavior, it was determined that female #1477 had kit/s, but kits were not verified due to den tree cavity height. Fisher #1454 also had kits but we were not able to verify the number. Female fisher #1476's radio-collar failed in January 2014, and reproduction was not verified; however, in September she was observed at a bait station in south Baxter with another fisher, probably a kit. Resting den sites (n=25) were identified for fishers #1454 (n=8), #1477 (n=6), #571(n=4), #568 (n=3), #563 (n=1), and #1456 (n=3), during 2014.

Table 20. Total number of fisher locations, Camp Ripley Training Center, since 2007.

Fisher	Sex	Number of Locations	Period Collared
F08-326	F	18	November 2007-June 2009
F08-466	F	6	January – February 2009
F09-458	M	3	February-May 2009
F09-480	M	12	March-November 2009
F09-461	F	36	December 2009-August 2010
F10-463	M	2	November 2010
F10-482	M	1	November 2010
F10-484	M	8	November 2010 – February 2011
F10-464	M	11	December 2010 – April 2011
F10-472	M	7	December 2010 – January 2011; March 2011 – April 2011
F11-467	F	2	March 2011
F11-563	M	88	December 2011 to January 2013; February 2013 to present
F11-468	M	23	December 2011 to July 2012
F12-566	M	7	February 2012 to March 2012
F12-572	F	3	February 2012 to November 2013
F12-571	F	86	December 2012 to March 2014
F13-568	M	54	February 2013 to January 2014 December 2014 to present
F13-1476	F	45	February 2013 to January 2014
F13-1477	F	91	February 2013 to September 2014
F13-1452	F	5	March 2013
F13-1451	M	12	March 2013-August 2013
F13-1484	M	5	October 2013 to December 2013
F14-1454	F	27	February 2014 to May 2014
F14-1456	M	7	December 2014 to present
F14-1458	M	2	December 2014 to present
F14-1475	M	1	December 2014
F14-1473	M	1	December 2014 to present

Adult male fisher #563 (Figure 23) has been radio-collared for three years, since December 2011; his territory is the central portion of Camp between Mud Lake and Lake Alott Road. He has been radio-collared for the greatest length of time for the Camp Ripley study area. Adult female fisher #571's radio-collar failed in late March 2014. Her carcass was discovered by a turkey hunter in May 2014. She died from an unknown cause, and a necropsy confirmed three recent placental scars. Her territory was at the east end of Cassino Road (Figure 24) and she had been radio-collared for 17 months. Fisher #568 had been radio-collared about one year and used the south one-third of Camp (Figure 27 in MNDNR and MNARNG 2014) as his territory but transmitter contact was lost in February 2014; he was recaptured and radio-collared in December 2014. Adult female fisher #1454 also died in May 2014 from unknown causes, and a necropsy confirmed two recent placental scars. Adult female fisher #1477's radio-collar failed in September 2014 her territory was between Yalu and Pusan roads (Figure 24). Adult female fisher #1476 is believed to be alive as multiple private trail camera images showed a radio-collared fisher within her territory during the fall of 2014. No female fishers had active radio-collars at the end of 2014 (Figures 24).

The cooperative project with the CLC natural resources program to obtain assistance with trapping fisher and gathering fisher telemetry locations has been highly successful. Student volunteers have logged 1,719 hours of time, and twenty-eight fishers have been captured and radio-collared since

Figure 23. Locations of fisher #563 (♂), #1454 (♂), #1456 (♂), #1458 (♂), and #1473(♂), Camp Ripley Training Center, 2014.

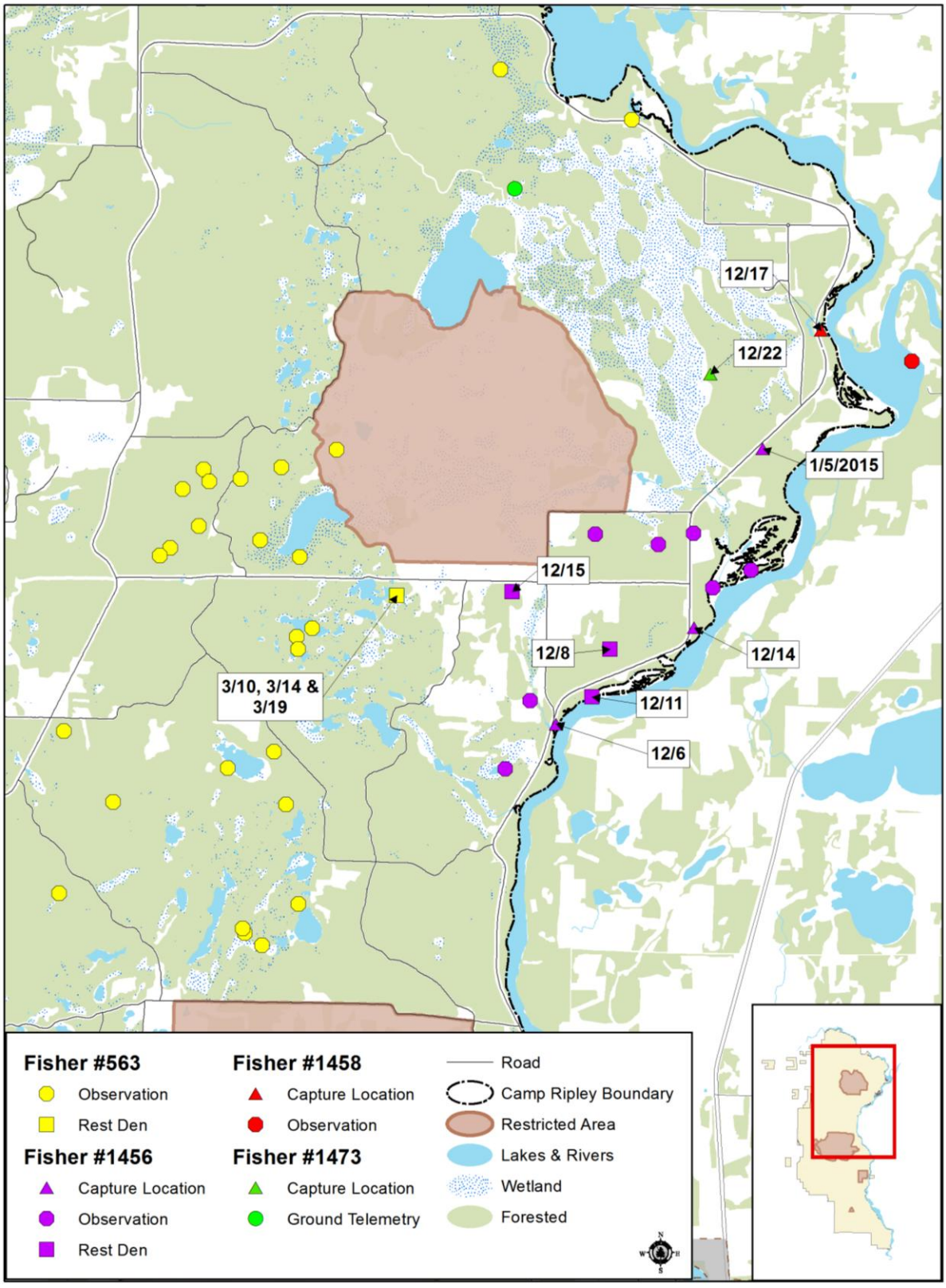
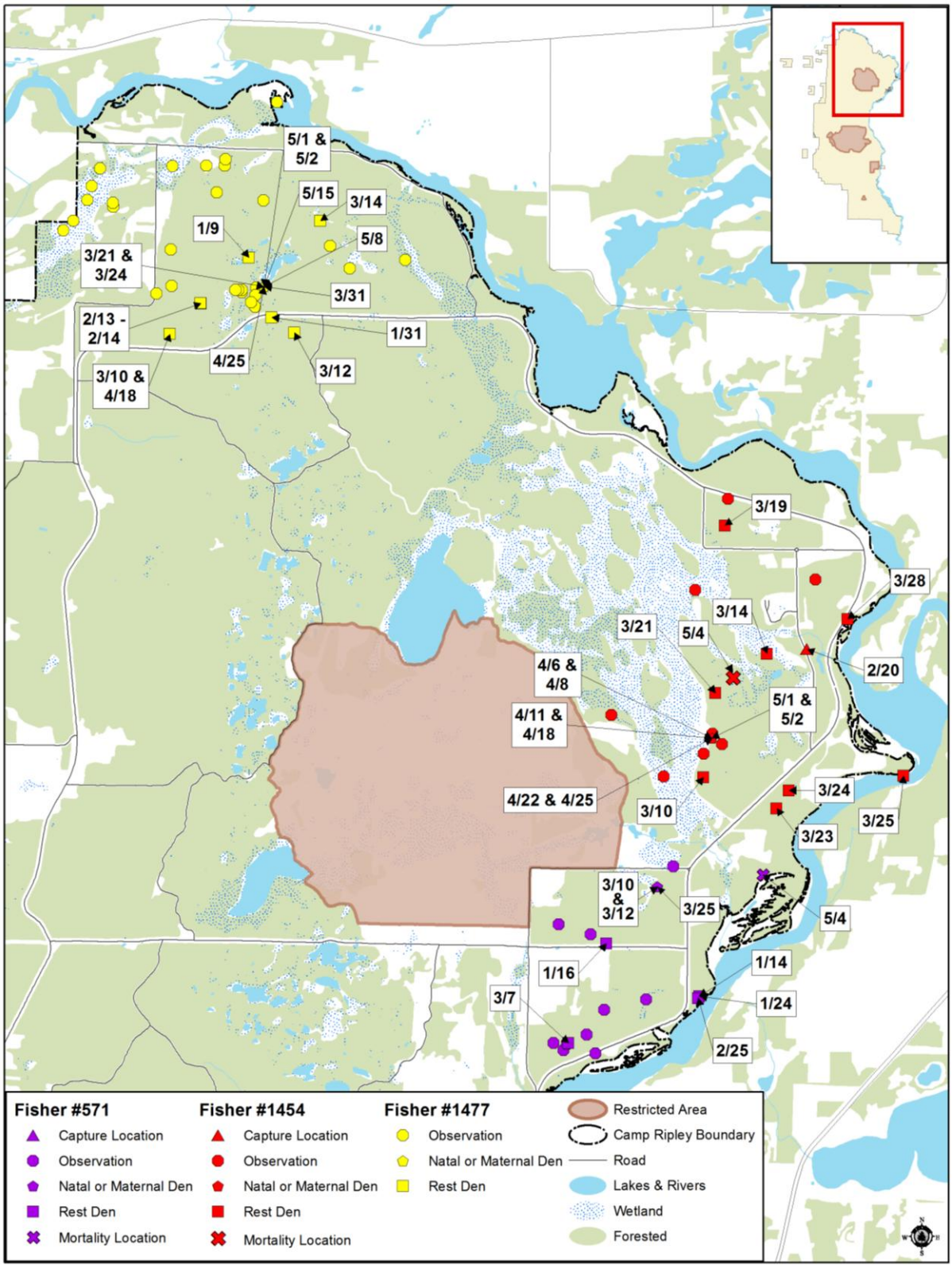


Figure 24. Locations of fisher #1477 (♀), #571 (♀), and #1454 (♀), Camp Ripley Training Center, 2014.



September 2010. In addition, Dr. Bill Faber, CLC, Natural Resources Program has purchased field gear for the fisher project, which was greatly appreciated.

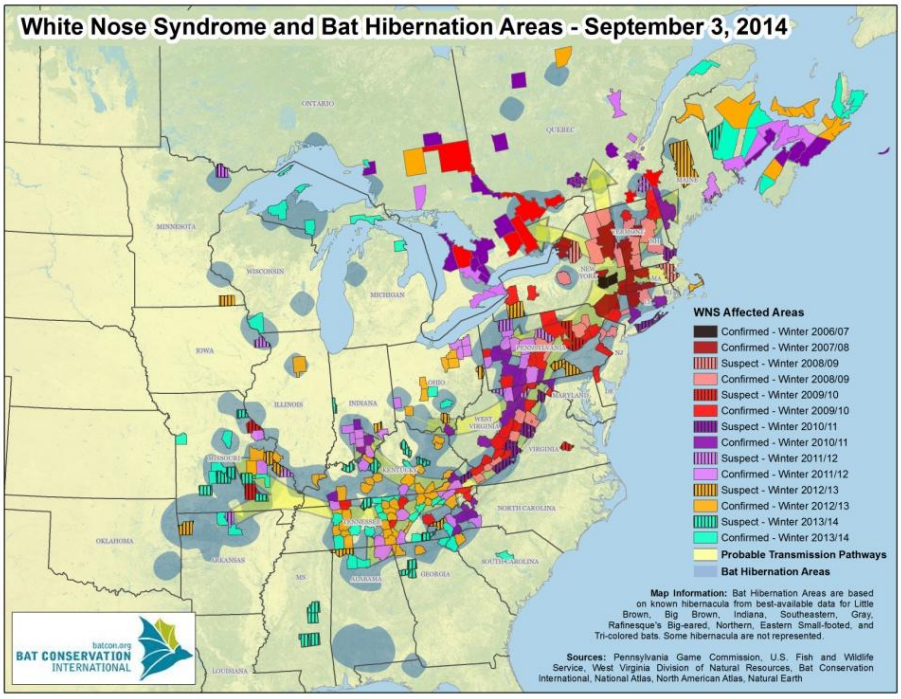
Bats

Camp Ripley is home to three bats that are designated state special concern species and SGCN, northern long-eared bat (*Myotis septentrionalis*), little brown myotis (*Myotis lucifugus*), and big brown bat (*Eptesicus fuscus*). And, three additional bats that are SGCN only, silver-haired bat, eastern red bat, and hoary bat. Past stationary acoustic bat surveys have identified all of these bat species occurring on Camp Ripley (Dirks and Dietz 2010).

Proposed Northern Long-eared Bat Listing

In January 2010, the U.S. Fish and Wildlife Service (USFWS) received a petition from the Center for Biological Diversity requesting that the northern long-eared bat be listed as threatened or endangered under the Endangered Species Act and to designate critical habitat. The USFWS announced on October 2, 2013, that listing the northern long-eared bat is warranted and proposes to list it as endangered throughout its range which includes Minnesota. An endangered species is one that is in danger of extinction throughout all or a significant portion of its range. At this time, it was determined that designating critical habitat was not determinable (USNARA 2013). After a comment period, the next step in the process is for the USFWS to either publish a final listing rule, withdraw the proposal, or extend the proposal if there is substantial disagreement within the scientific community regarding the appropriateness of listing the species. It is anticipated that the final listing rule will be published in April 2015. However, Section 7 of the Endangered Species Act requires that any activity with a federal nexus consider impacts to not only federally listed species, but also species proposed for federal listing; therefore, the regulatory effect of the proposed listing is already present.

Figure 25. White-nose syndrome occurrence in the eastern United States, by county, as of September 2014 (Bat Conservation International 2014).



The northern long-eared bat is known to occur on Camp Ripley (Dirks and DeJong 2007) and has been designated as a state special concern species since 1984. While no winter habitat is known to occur on Camp Ripley, summer and migratory habitat is available. Northern long-eared bats are associated with forested habitats, especially around wetlands (MNDNR 2013b) and roost singly or in colonies underneath bark, in cavities or in crevices of both live and dead trees. Northern long-eared bats begin feeding at dusk by flying through the understory along forested hillsides and ridges feeding on insects that they catch in flight using echolocation. The primary threat to northern long-eared bats is white-nose syndrome (WNS). Other threats are loss and degradation of summer habitat, human disturbance of hibernacula, wind turbine operations, timber harvest and forest management (USFWS 2013).

WNS is threatening bat populations in the eastern United States. Since 2006, WNS has spread from a single central New York cave southward into Alabama and northwestward into Wisconsin and likely will move into Iowa and Minnesota (Figure 25). WNS is a fungus that has killed more than 5.7 million hibernating bats (Bat Conservation International 2014) since 2006 in North America. Due to WNS threats to Minnesota's bat populations, including SGCN, DNR staff developed a mobile acoustic monitoring protocol to examine possible bat population changes.

Mobile Acoustic Bat Transect Survey

A mobile acoustic bat transect survey protocol was established in 2010 (Figure 26). The purpose of the mobile survey is to obtain quantitative data about bat populations and to monitor multiple species simultaneously in advance of WNS outbreaks in Minnesota and neighboring states. However, the mobile acoustic transect methodology has several limitations; one of which is it does not work well for all species of bats, including northern long-eared bats, as the route does not travel within forest understory habitats. Therefore, in 2014, survey work also included use of stationary acoustic surveys in habitats suited for northern long-eared bats to better identify locations where they occur (Appendix A). The project's goal is to assess the impacts of WNS on summer distribution of bats by examining changes in bat distribution and activity over successive years.

DNR staff established a 30 mile mobile transect on Camp Ripley (Figure 26) that passes through common habitat types and could be easily sampled in successive years. Survey protocol (Britzke and Herzog 2009) requires that the acoustic survey be conducted while bats are on maternity range, generally between June 1 and July 15. Monitoring is conducted on nights with low wind, no rain or fog, and suitable temperatures for bat activity. The Camp Ripley survey was conducted using an ANABAT II (2010, 2012-2013) bat detector mounted on the top of the vehicle, with the microphone pointing straight up, and an ANABAT SD2 with mobile microphone (2014) to record bat echolocations. Surveys were conducted on July 8, 2010, June 26, 2012, July 11, 2013, and July 9, 2014, and the echolocations recorded were analyzed by Christi Spak, DNR Biological Survey.

In 2014, the fewest total echolocations were recorded since the survey began (n=58), less than 55% of what was recorded in 2010 (n=130) (Figure 27). Overall, there were 41% fewer bat echolocation recordings in 2014 than in 2013 (n=98) and a 26% decline from 2012 (n=79) (Figure 27). Of the total bat calls recorded in 2014, the proportion of big brown (*Eptesicus fuscus*)/silver-haired (*Lasionycteris noctivagans*) bat echolocations were less than in 2010 but greater than in 2012 and

Figure 26. Mobile acoustic bat transect survey, Camp Ripley Training Center, since 2010.

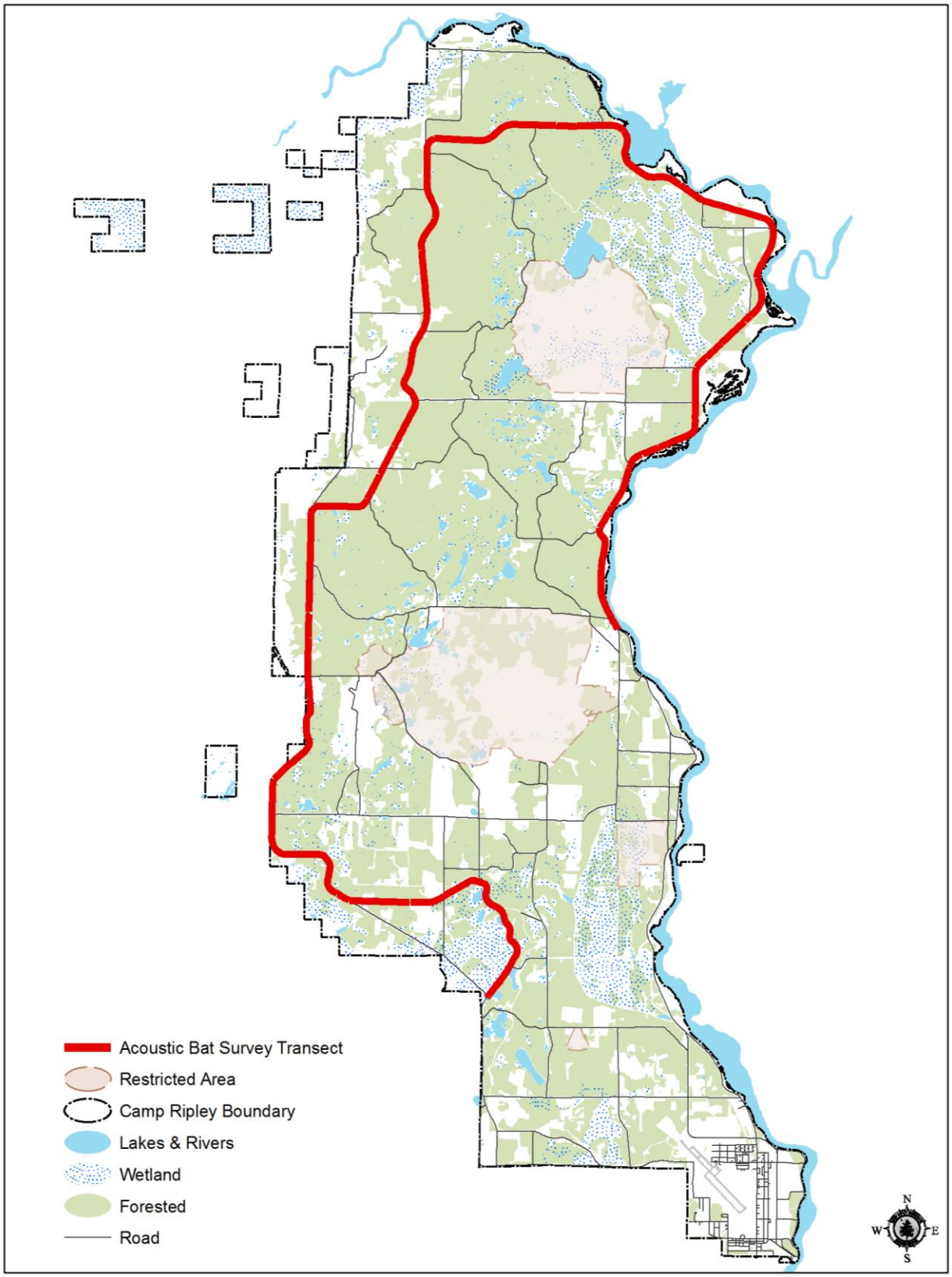


Figure 27. Mobile transect survey number of acoustic bat echolocations recorded, Camp Ripley Training Center, 2010, 2012-2014.

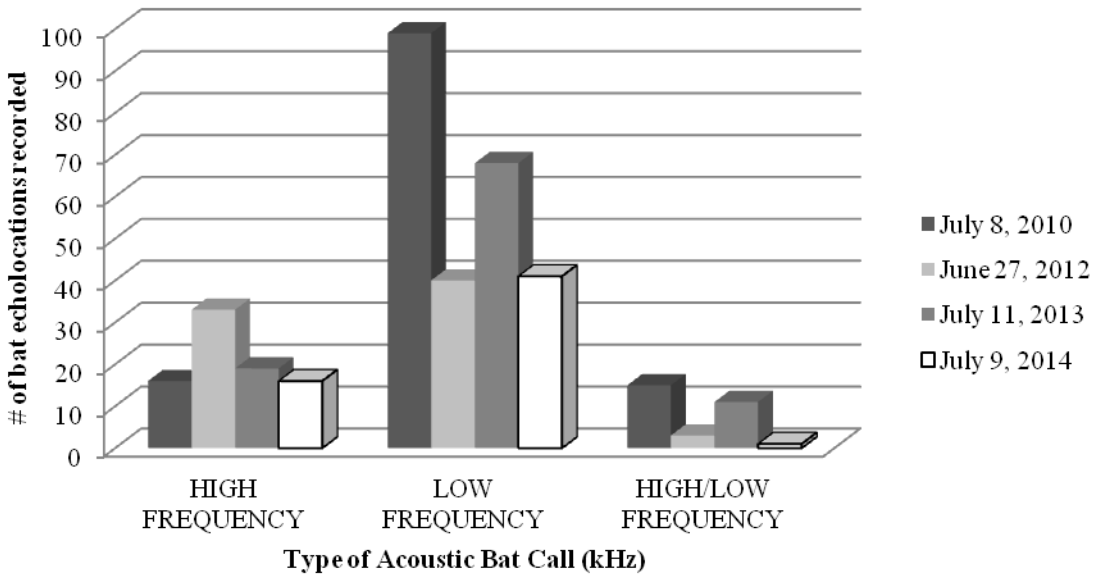
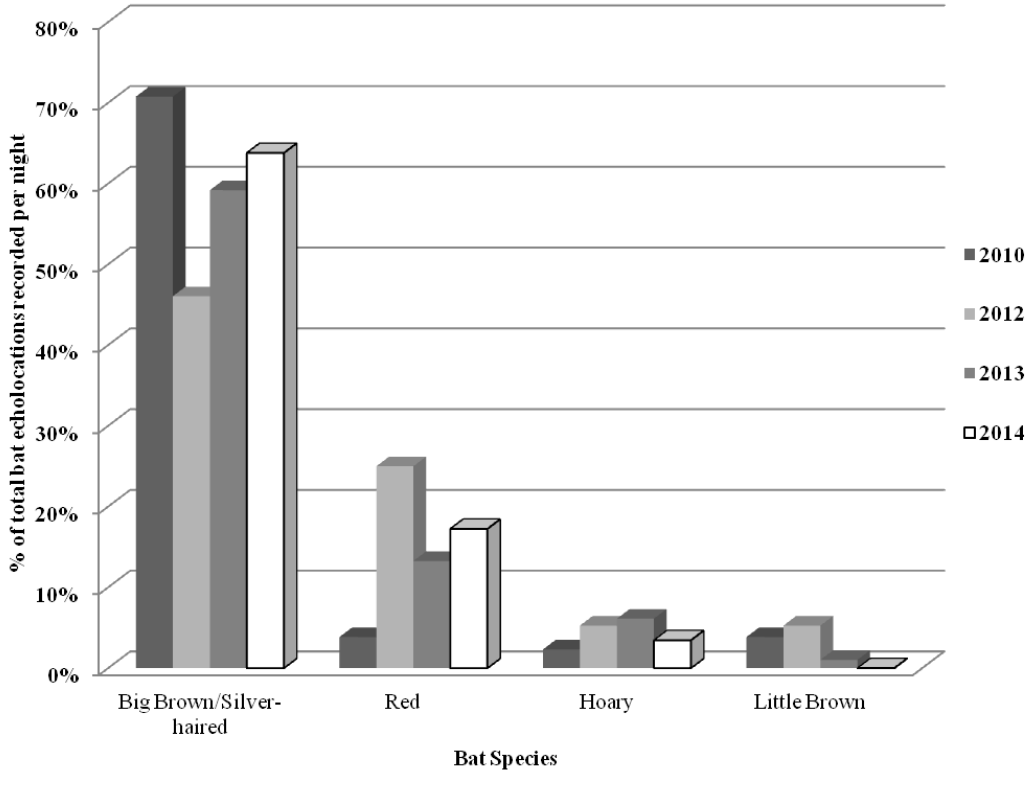


Figure 28. Mobile transect survey proportion of acoustic bat species echolocations recorded, Camp Ripley Training Center, 2010, 2012-2014.



2013. And, the proportion of red bat (*Lasiurus borealis*) echolocations increased from 2010 and 2013 but decreased from 2012 (Figure 28). The reduction in total survey echolocation calls and the proportion of big brown/silver-haired bat calls from 2010 are inconclusive regarding any possible population declines, at this time. DNR staff plan to continue to sample the mobile transect one to three times annually to monitor bat population trends and to measure any impacts of WNS and additionally set up stationary locations.

Stationary Acoustic Bat Survey

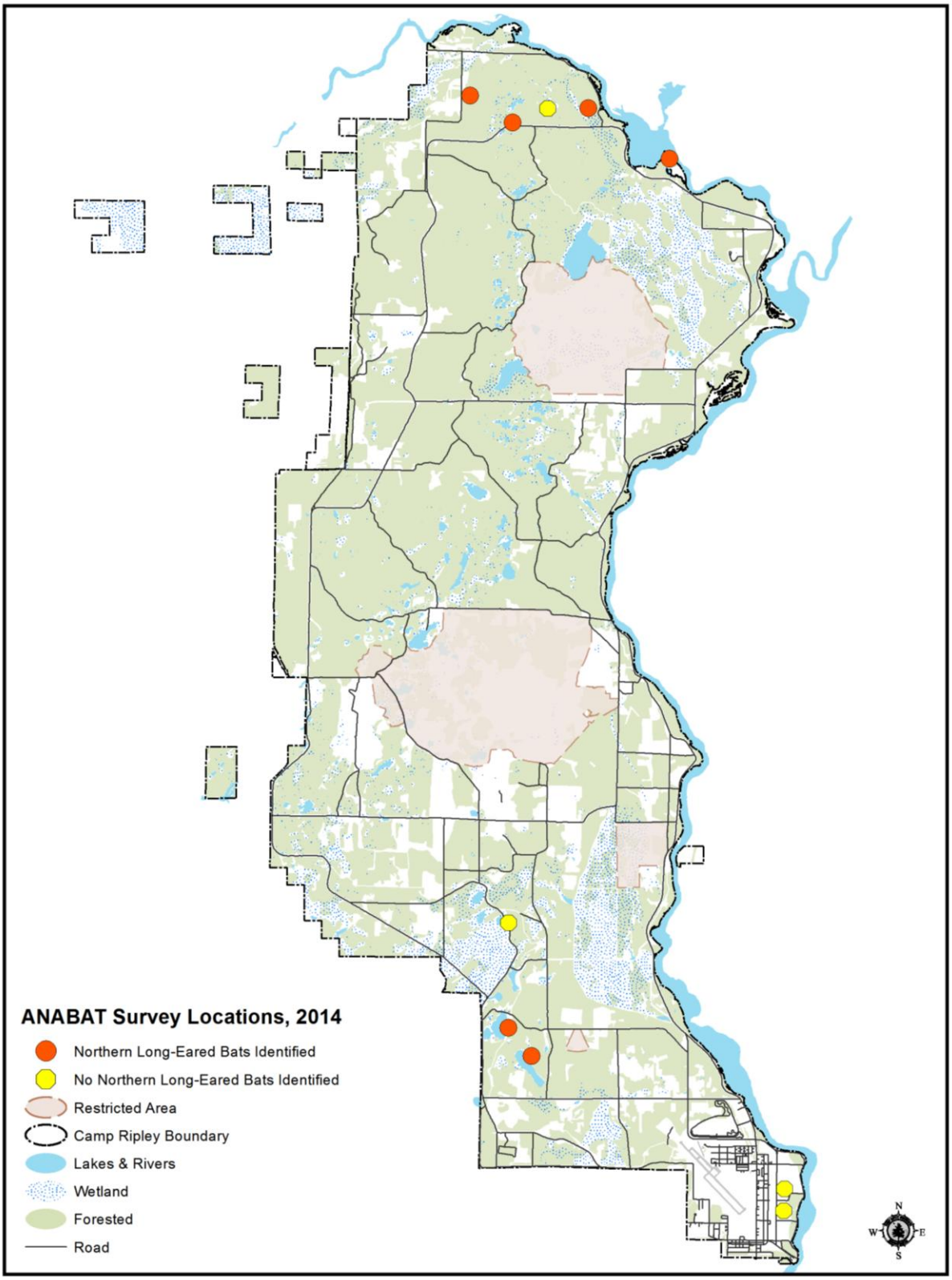
Recording bat echolocation "calls" is the most efficient and least intrusive way of identifying different species of bats in a given area (USGS 2014). However, acoustic bat surveys have many variables that contribute to the quantity and quality of echolocation recordings. Bats can be characterized by the 'volume' of their echolocation calls, some bats are 'shouting' bats and others are 'whispering' bats. For example, big brown bats and little brown bats are shouters, and emit sounds at 110 decibels (if we could hear them) similar to the loudness of a smoke alarm. However, northern long-eared myotis produce sounds of 60 decibels, similar to the level of human conversation. Therefore, shouting bats can be heard by the detector at greater distances than whispering bats. Shouting bats can overpower the calls of the whispering bats, such as northern long-eared myotis, when they are near the detector together. Northern long-eared myotis therefore are more difficult to detect than other bats.

How sound attenuates in the atmosphere can also influence the quantity and quality of calls recorded and the zone of reception, the physical space where the bat can be detected. Weather conditions such as temperature, wind, humidity and air pressure affect bat activity and call quantity and quality. Also, structural clutter, such as vegetation, can block the path of the calls. In addition, calls recorded can be partial or parts of two species of bats, making bat identification difficult.

The objective for the 2014 stationary acoustic bat survey was to place detectors in habitats suited for northern long-eared bats and to identify locations where they occur. Bat surveys were conducted using ANABAT SD2 detectors during the summer of 2014 at various locations throughout Camp Ripley (Figure 29). In addition, an acoustic bat survey was conducted for a proposed solar field project in Cantonment. Bat call data was recorded for three to four nights at each site. Calls were reviewed and analyzed by Christi Spak, DNR staff, who has seven years of experience with identification of ANABAT recordings.

Northern long-eared bats were positively identified at four of the ten locations surveyed, they are: Sylvan Dam, Ferrell Lake, Goose Pond, west and central portions of Training Area 78. And, a suspected northern long-eared bat at the Training Area 77 location on the north end of Camp.

Figure 29. Stationary acoustic bat survey locations, Camp Ripley Training Center, 2014.



Northern Long-eared Bat Summer Habitat Use Study

By Timothy J. Catton – USDA Forest Service, Superior National Forest

In spring 2014 the Superior National Forest and the Minnesota Department of Natural Resources, with additional funding from USDI Fish and Wildlife Service, combined resources to conduct a pilot project to describe summer habitat use by northern long-eared bats (*Myotis septentrionalis*, MYSE) in Minnesota. This project included mist-netting, banding, transmitter deployment, radio-telemetry, acoustic recording, roost structure identification and characterization, and emergence surveys. In addition, more extensive analysis of habitat characteristics around identified roost structures may be conducted. A second goal of this project was to develop and test methodologies to be used in future work of this type, and to expand expertise in these methodologies in Minnesota. To these ends there were 31 people from federal and state agencies, academia, and volunteers from 3 states and 1 province of Canada that both brought experience to and gained experience from this project. Prior to project initiation, a detailed project protocol was developed to insure that all participants used standardized methodology.

Netting

Mist-netting efforts were conducted on 12 nights between June 9th and July 3rd. There were 7 netting sites on the Camp Ripley Training Center in Morrison County (Figure 30), and 5 netting sites on the Superior NF in Lake and St. Louis Counties. Sites were selected that provided a corridor, typically a road or trail, which would be used by bats for foraging or travel to and from roosting and foraging areas. The number of nets at any site ranged from 3 to 6 each night. Nets used were 2.6 meter, 6m or 9m in length depending on the width of the flyway, and 3 nets were stacked for a total height of 7.3m using the Forest Filter™ system. Nets were "opened" at approximately 30 minutes after sunset to reduce incidental capture of birds and remained open for a period of approximately 2 hours to just over 7 hours depending on capture success and desired objectives for the night. Net checks were conducted approximately every 15 minutes.

A total of 130 bats were captured (Figure 31). Six of the seven species of bat known to occur in Minnesota were handled with only the tri-colored bat not captured. Overall little brown bats made up a majority of the bats captured (45.4%, *n*= 59) followed by 21.5% northern long-eared (*n*= 28), 19.2% big brown (*n*= 25), 10.8% eastern red (*n*= 14), 2.3% silver-haired (*n*= 3) and 0.8% hoary bats (*n*= 1). Males made up 46.9% of the bats captured (*n*= 61), females 53.1% (*n*= 69).

At Camp Ripley (CRTC), 46.5% of the bats captured were little brown (*n*= 40), 4.6% were northern long-eared (*n*= 4), 29.1% were big brown (*n*= 25), 16.3% were eastern red (*n*= 14), 3.5% were silver-haired (*n*= 3), and no hoary bats were caught (Figure 32). On the Superior (SUNF), 43.2% were little brown (*n*=19), 54.5% were northern long-eared (*n*= 24) and 2.3% were hoary bats (*n*= 1). No big brown, eastern red or silver-haired bats were captured on the Superior (Figure 31).

Figure 30. Bat netting locations, Camp Ripley Training Center, 2014.

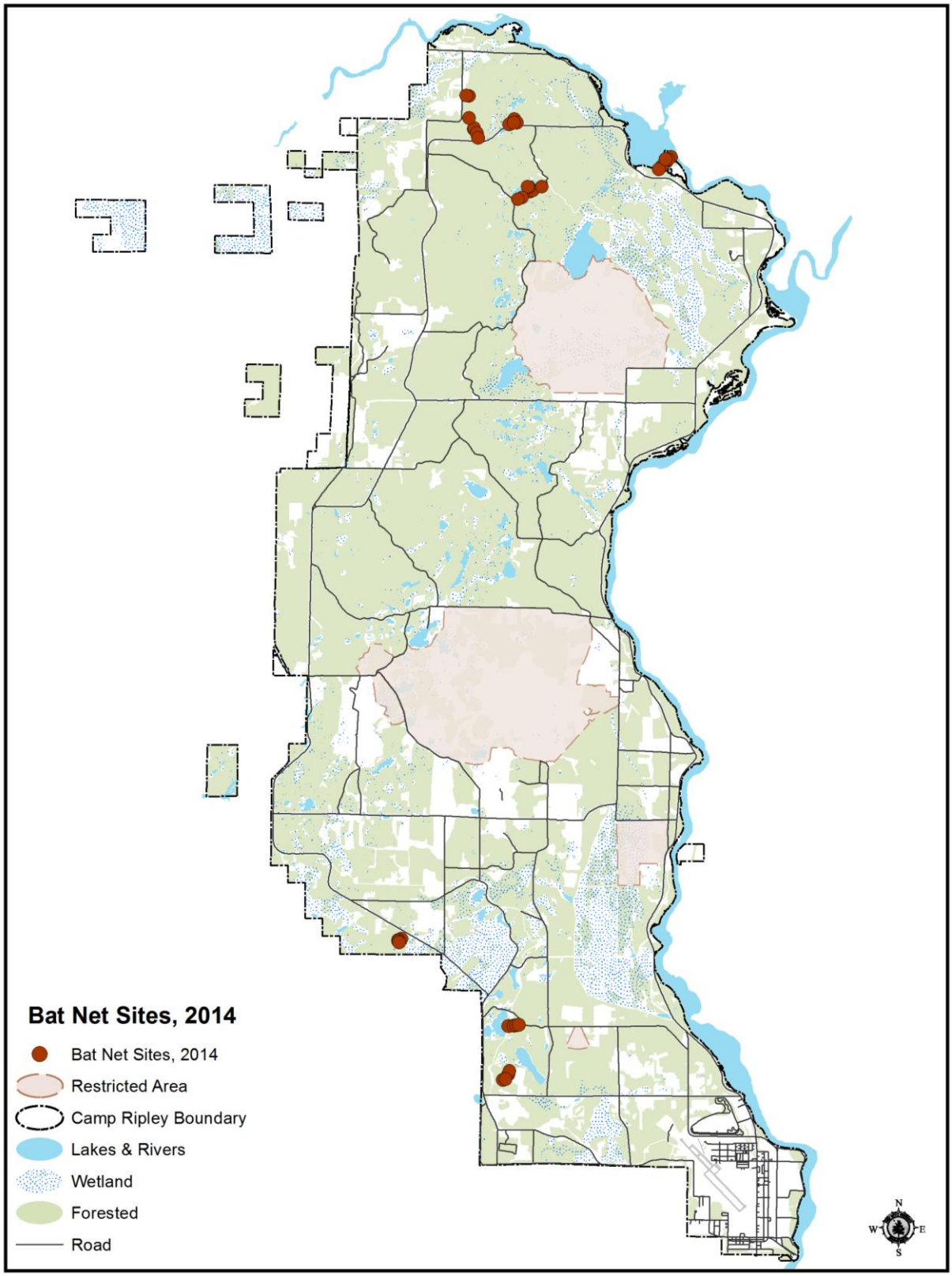


Figure 31. All bats captured by species and sex (n=130), 2014.

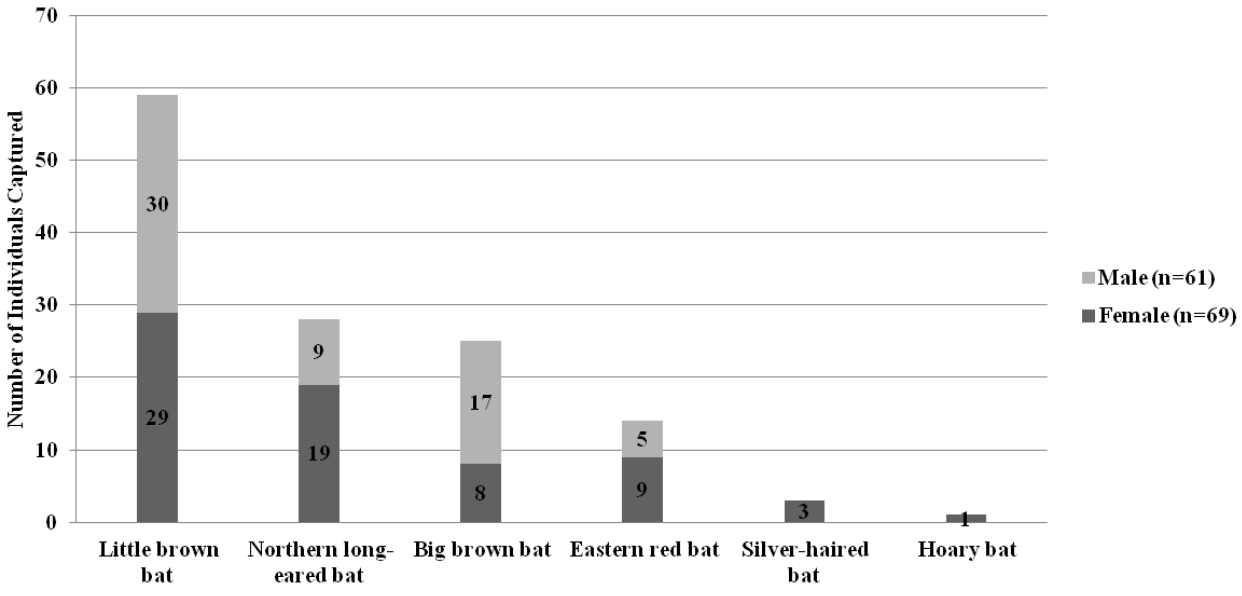
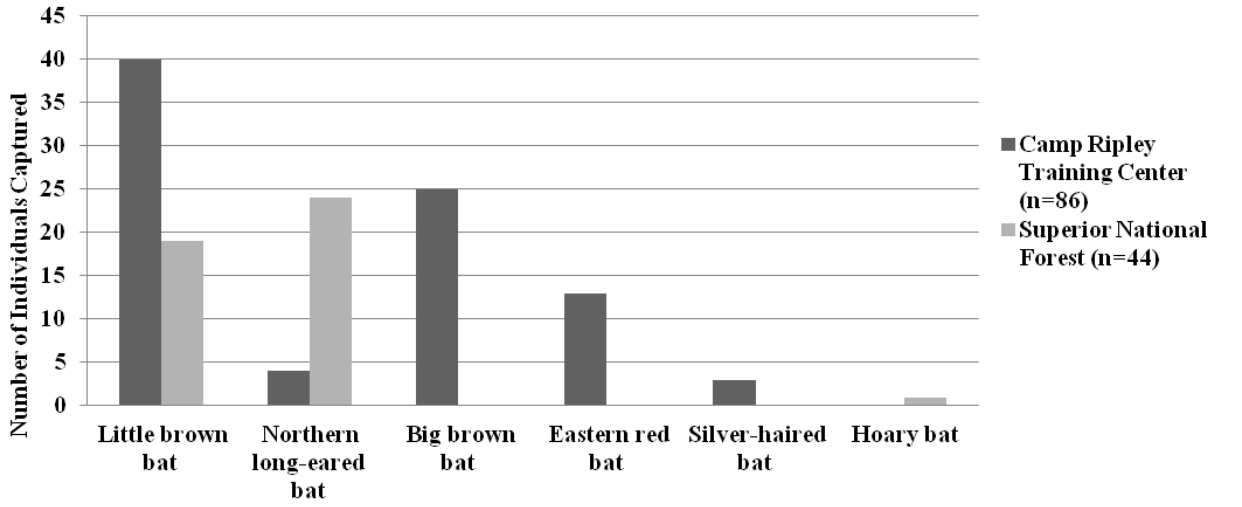


Figure 32. All bats captured by species and location (*n*=130), 2014.



Acoustics

Anabat acoustic bat detectors were set out at each netting site. This was done to identify additional bat species using the area that were not documented by capture in the mist-nets. Typical placement was along a flyway in which at least one of the mist-nets was located. Additional detectors were placed in adjacent areas that would likely be used by foraging bats such as along the edges of field or along other flyways. Calls were recorded during the night's mist-netting activities and then downloaded and archived for future analysis. Numerous call files were recorded and analyses will be

conducted as time and personnel allow. Preliminary analysis indicates that more species were detected acoustically than were captured during a particular netting session.

Banding

Wing bands were placed on bats for the purpose of recapture identification during winter hibernacula surveys and/or future mist-netting surveys. Fifty Porzana bands were obtained from USDI Geological Survey (USGS) sized for marking *Myotid* bats. DNR possessed additional bands for marking of larger bats and *Myotid* bats when the Porzana bands had all been used. Bands were attached to the forearm of individuals in accordance with locally established protocols for marking sexes (males banded on the right forearm, females on the left). Porzana bands were attached using the manufacturer supplied banding pliers. Other bands were attached by hand, squeezing the bands so as to not pierce the wing membrane but tight enough to prevent the band from slipping off.

Numbered bands were affixed to the wings of 103 of the 130 bats captured (79.2%). Some bats received transmitters along with bands; while some received transmitters only (Table 21). Due to the limited quantity of bands and transmitters, not all bats were marked. Banding information will be entered in to the Bat Population Database maintained by the USGS to assist in documenting any future recaptures of banded individuals.

Table 21. Banding and marking of captured bats, 2014.

	Little brown bat	Northern long-eared bat	Big brown bat	Eastern red bat	Silver-haired bat	Hoary bat	Total
Band Only	49	7	20	13	3	1	**93**
Transmitter Only		5					**5**
Band & Transmitter	3	7					**10**
Unmarked Bats	7	9	5	1			**22**

Telemetry

Transmitters (Holohil LB-2N and LB-2X) were attached primarily to reproductive female (pregnant or lactating) *Myotid* bats (see report cover page). We attempted to re-locate bats fitted with radio transmitters each day that the transmitter was assumed to be active by walking in to locate the individual roost structures. Due to access issues there were two triangulated locations where the roost structures were not identified. Several searches by fixed-wing aircraft fitted with antennas were conducted in an attempt to locate bats that were presumed to have moved from the ground search area.

A total of 15 transmitters were deployed on *Myotid* bats, 12 on female northern long-eared bats, and 3 on little brown bats, 2 female and 1 male. There were 5 bats transmittered on Camp Ripley and 10 on the Superior NF. Bats were relocated 77 times identifying 33 different roost structures. On 4 occasions 2 transmittered bats were located in the same tree; these were bats that had received transmitters on the same night at the same netting site. In one location 3 transmittered bats alternated roosting with each other over a period of 4 days. Table 22 below summarizes locations of individual bats identifying days they were able to be located, number of trees used during that time, range of

distances from capture site (foraging area) to roost trees and the average distance from capture site to roost trees identified.

Table 22. Bat telemetry location summary, 2014.

	F01	F02	F03	F04	F05	F06	F07	F08	F10	F11	F12	F13	F14	M15
No. of days	9	8	8	7	5	4	4	2	4	1	10	5	5	6
No. of trees used	3	5	1*	3	4	3	2	1	3	1	5	3	2	2
Distances from capture site (miles)														
Range	1.5	.2-.5	0.7	.3-.4	.3-.4	.4-.8	0.4	0.4	.2-.6	0.5	.1-.6	.4-.7	.2-.3	0.1
Avg	1.5	0.3	0.7	0.4	0.4	0.5	0.4	0.4	0.4	0.5	0.3	0.5	0.3	0.1
			*Roost structure was a building											
	CRTC bats		SUNF bats											

Roost Structures

Roost structures were identified by "walk in" locations of transmittered bats during the day. One additional roost structure was identified during an emergence survey when surveyors noted bats also emerging from a tree adjacent to the identified roost tree. Roost trees were visited at a later date to record characteristics of the trees used and associated habitat types (see "Habitat Work").

Of the 34 roost structures identified 97.1% (n= 33) were trees (Table 23). Trees were predominantly aspen (51.5%, *n*= 17) followed by 21.2% red oak (*n*= 7), 9.1% red maple (*n*= 3), 6.1% basswood (*n*= 2), 3.0% black ash (*n*= 1) and 3.0% jack pine (*n*= 1). Two snags could not be identified to species. The non-tree roost structure was in the roof area of a seldom used resort cabin. This site was used by a female little brown bat that travelled approximately .75 miles from her capture site to this location. She used this roost site for a period of 10 days until the transmitter failed.

Table 23. All roost trees by species, 2014.

	Trembling aspen	Red oak	Red maple	Basswood	Black ash	Jack pine	Unknown	Total
Live	15	4	3	2	1	1	0	26
Dead	2	3	0	0	0	0	2	7
Total	**17**	**7**	**3**	**2**	**1**	**1**	**2**	**33**

Roost trees identified to species on Camp Ripley (Table 24 and Figure 33 and 34) were predominantly red oak (50.0%, *n*= 7) followed by 21.4% trembling aspen (*n*= 3), 14.2% basswood (*n*= 2), 7.1% red maple (*n*= 1) and 7.0% jack pine (*n*= 1). Red oak diameters (dbh) ranged from 5"-24" ($\bar{x}$ =15.6", σ= 5.8"), aspen diameters ranged from 16"-22.5" ($\bar{x}$ =18.2", σ= 2.9") (Table 24).

Table 24. Bat roost tree data, Camp Ripley Training Center, 2014.

Camp Ripley	Trembling aspen	Red oak	Red maple	Basswood	Black ash	Jack pine
n	3	7	1	2	0	1
dbh range	16.0-22.2	5.0-24.0	13.5	13.0-15.0		7.5
Mean	18.2	15.6	13.5	14		7.5
Standard Deviation	2.9	5.8	N/A	N/A		N/A

Figure 33. Locations of female northern long-eared bat roost trees, Camp Ripley Training Center, 2014.

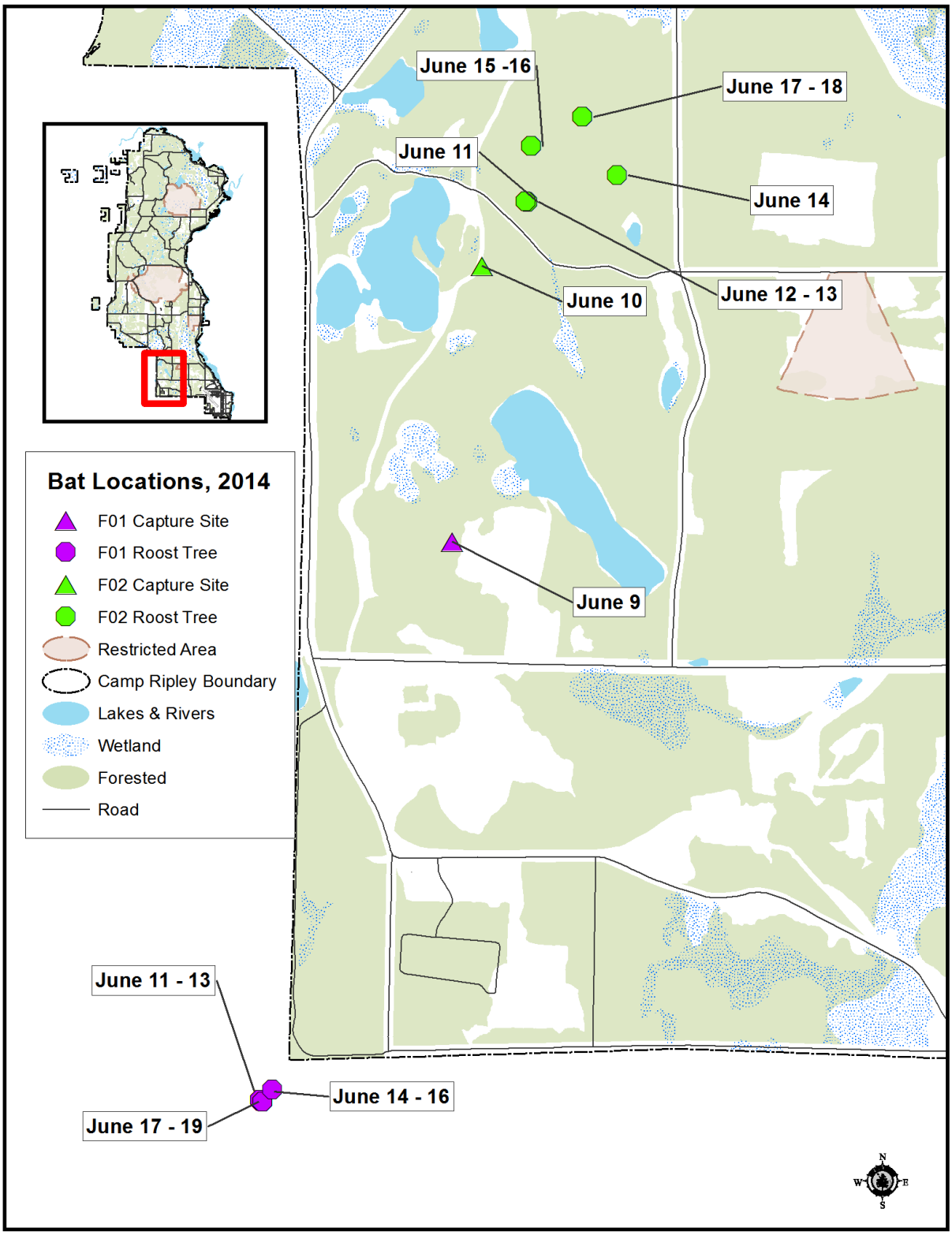
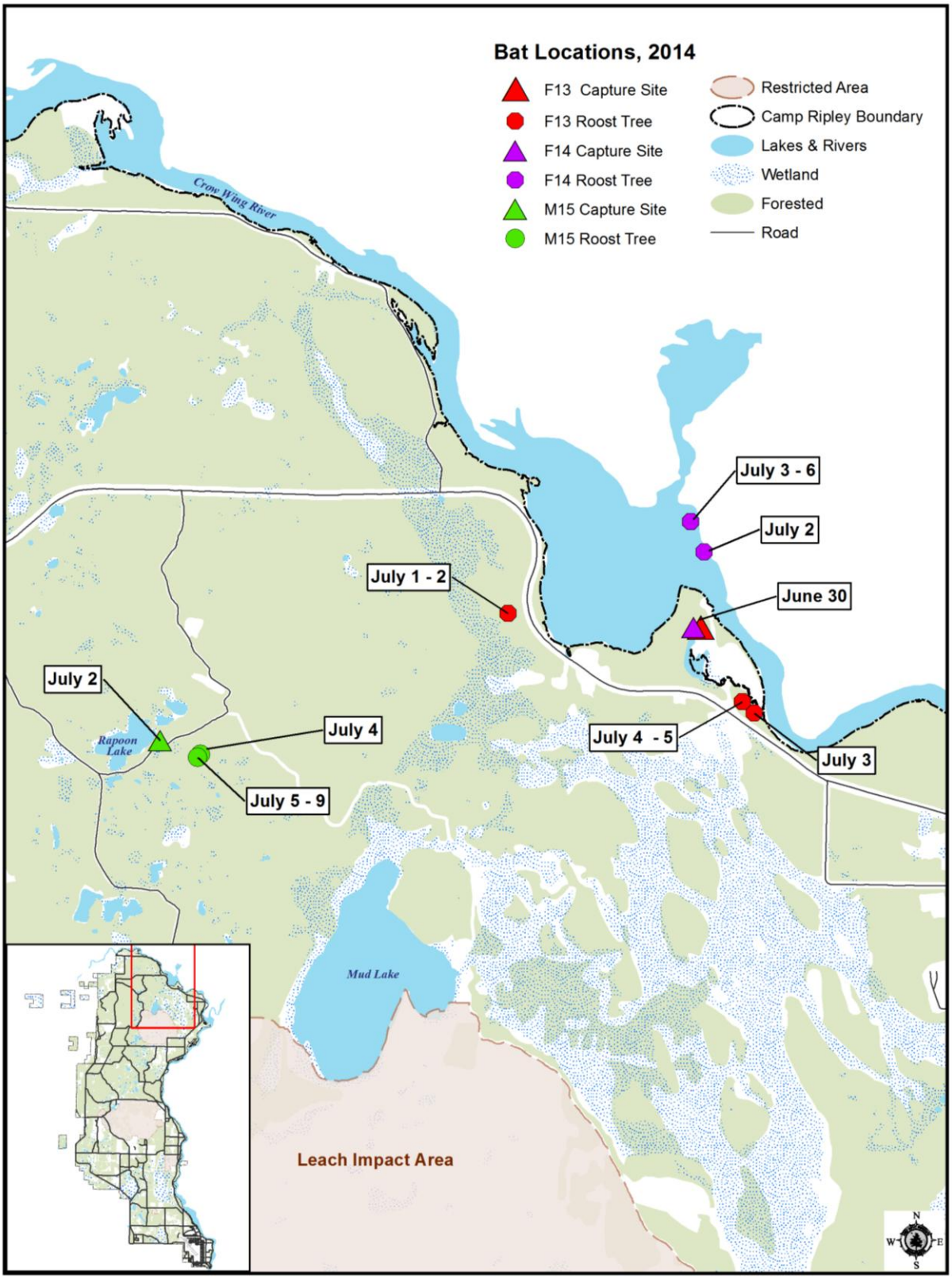


Figure 34. Locations of female northern long-eared bat (F13 and F14) and male little brown bat (M15) roost trees, Camp Ripley Training Center, 2014.



Roost trees identified to species on Superior NF were predominantly trembling aspen (82.3%, *n*= 14) followed by 11.8% red maple (*n*= 2) and 5.8% black ash (*n*= 1). Aspen diameters ranged from 9.1"-18.0" ($\bar{x}$ =12.9", σ=2.4") (Table 25).

Table 25. Bat roost tree data, Superior National Forest, 2014.

Superior Nat'l Forest	Trembling aspen	Red oak	Red maple	Basswood	Black ash	Jack pine
n	14	0	2	0	1	0
dbh range	9.1-18.0		8.25-12.7		8.8	
Mean	13.3		10.48		8.8	
Standard Deviation	2.4		N/A		N/A	

Emergence Surveys

When possible, emergence surveys were conducted on identified roost trees. Surveyors would position themselves at least half an hour before sunset with a clear view to observe the cavity entrance (if known) or the most likely area of the tree that would be used by bats. The number of bats seen emerging from the tree was recorded until the surveyor was no longer able to see due to darkness. Where possible, telemetry receivers and acoustic detectors were also used during the surveys. Surveyors at Camp Ripley used night vision goggles (NVG's) during their surveys.

Emergence survey counts noted from 1 bat to as many 33 using the same roost tree on a particular night (Table 26). Higher counts were typically recorded at Camp Ripley likely due to the availability of NVG's for the surveys.

Table 26. Number of roosts surveyed by number of bats observed emerging, 2014.

	Number of bats seen emerging				
	1-5	**5-10**	**10-20**	**20-30**	**30+**
Camp Ripley Training Center	3	1	1	2	2
Superior National Forest	7	3	2	0	0

Analysis of emergence observations combined with telemetry and acoustical data is pending.

Additional Research

In addition to data collection for this project we also cooperated with the USDA Forest Service's Northern Research Station lab in Rhinelander, WI in collecting wing punches and swabs from *Myotid* bats to support their ongoing research on white-nose syndrome, microbiome, and population genetic analyses. Forty sets of wing punches and swabs (20 each from the Camp Ripley and Superior NF sites) were collected using individual sterile punches and swabs. Wing punches and swabs were not obtained from bats that received transmitters.

For their pilot work on mercury levels in insectivorous bats as a bio-indicator, hair that was clipped from 14 of the 15 bats that were fitted with radio transmitters was collected in individual Whirl-Paks™, frozen and sent to the UW-LaCrosse Department of Chemistry and Biochemistry. All analyses and results on these additional research projects are pending and will be reported by the respective researchers.

Porcupine (*Erethizon dorsatum*)

Porcupines are the second largest member of the rodent family. While most rodents have a high rate of reproduction along with a high rate of mortality, porcupines have neither. Female porcupines have one litter per year, with usually only one pup. Their winter diet consists of the inner bark of conifer trees and their summer diet consists of a variety of woody and herbaceous vegetation, primarily at ground level (Hazard 1982). Fishers are effective predators of porcupines.

Porcupines can also be a nuisance when they gnaw on wooden objects, tires, and plastic tubing. Camp Ripley has obtained a porcupine nuisance permit from the DNR since 2008. Porcupines are taken only on problem areas identified by Range Control. Thirty nuisance porcupines were taken under the DNR permit in 2014.

Reptiles and Amphibians

Blanding's Turtle (*Emys blandingii*)

The Blanding's turtle is listed as a state threatened species and a SGCN by the DNR. A species is considered threatened if it is likely to become endangered within the foreseeable future throughout all or a significant portion of its range within Minnesota. Camp Ripley is part of three DNR Blanding's turtle priority areas (Figures 35 and 36). Priority areas are the most important areas in the state for management, protection, and research of Minnesota's Blanding's turtle population. In July 2012, the USFWS was petitioned to include Blanding's turtles as threatened or endangered. The USFWS had not filed findings of this petition as of the date of this publication and notes it is under review (USFWS 2015b). This species depends upon a variety of wetland types and sizes, and uses sandy upland areas and roadways for nesting.

Surveys of Blanding's turtles have occurred at Camp Ripley since 1992. In 2014, two turtles were observed incidentally, a marked female (BCJ) on August 1 and an unmarked male on September 3. Historically, nesting turtles have been observed between June 2 and July 2. During the 2014 nesting survey season, the first Blanding's turtle was observed on June 12.

Congdon et al. (1983) recorded predation on Blanding's turtle nests at 93% in Michigan. Practically all unprotected Blanding's turtle nests on Camp Ripley are depredated, usually by the next morning. In several cases skunks have been observed disturbing nesting Blanding's or common snapping (*Chelydra serpentine*) turtles or digging out the nest while the female turtle was laying her

Figure 35. Observations, nest locations, and DNR priority areas for Blanding's turtles in the north portion of Camp Ripley Training Center, 2014.

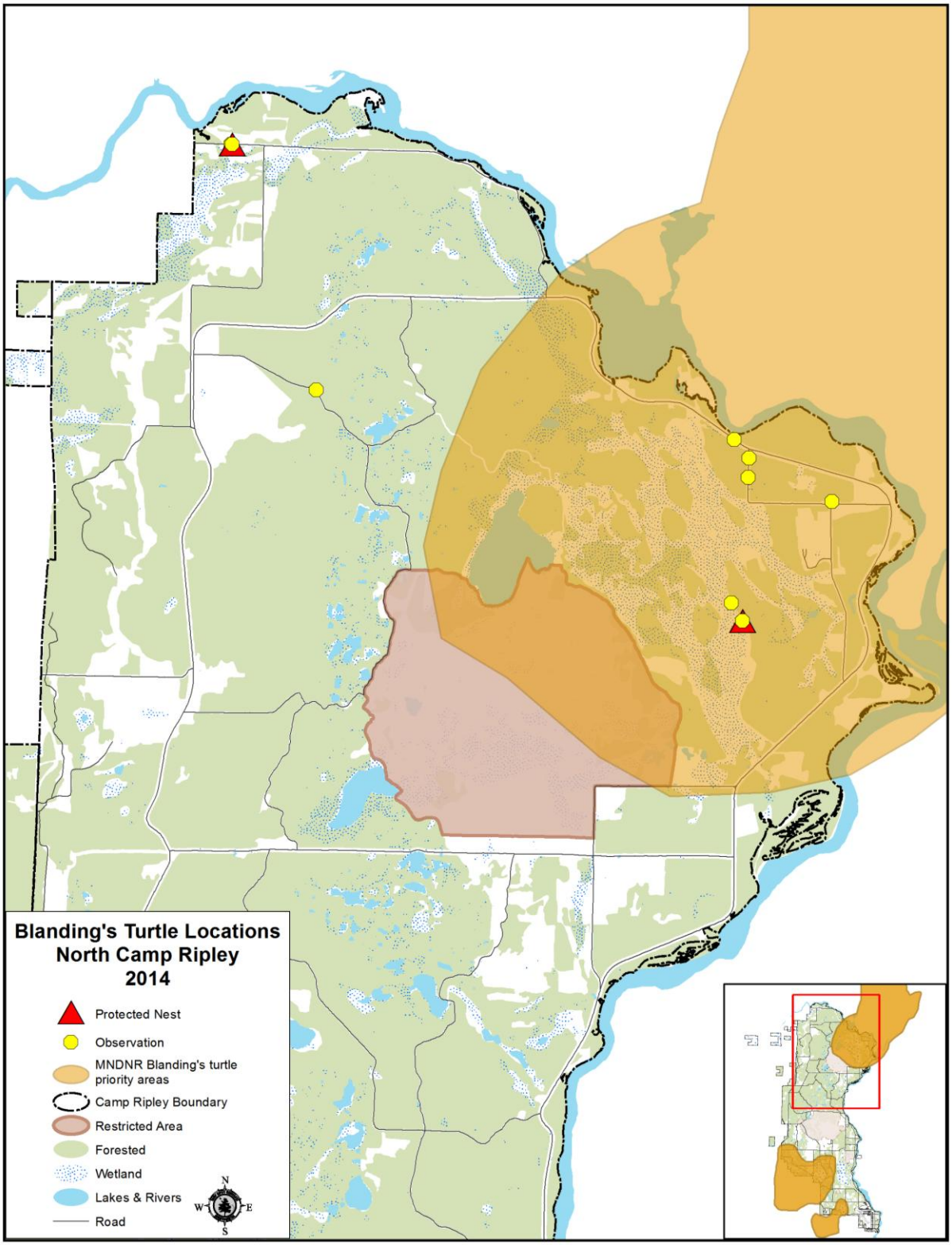
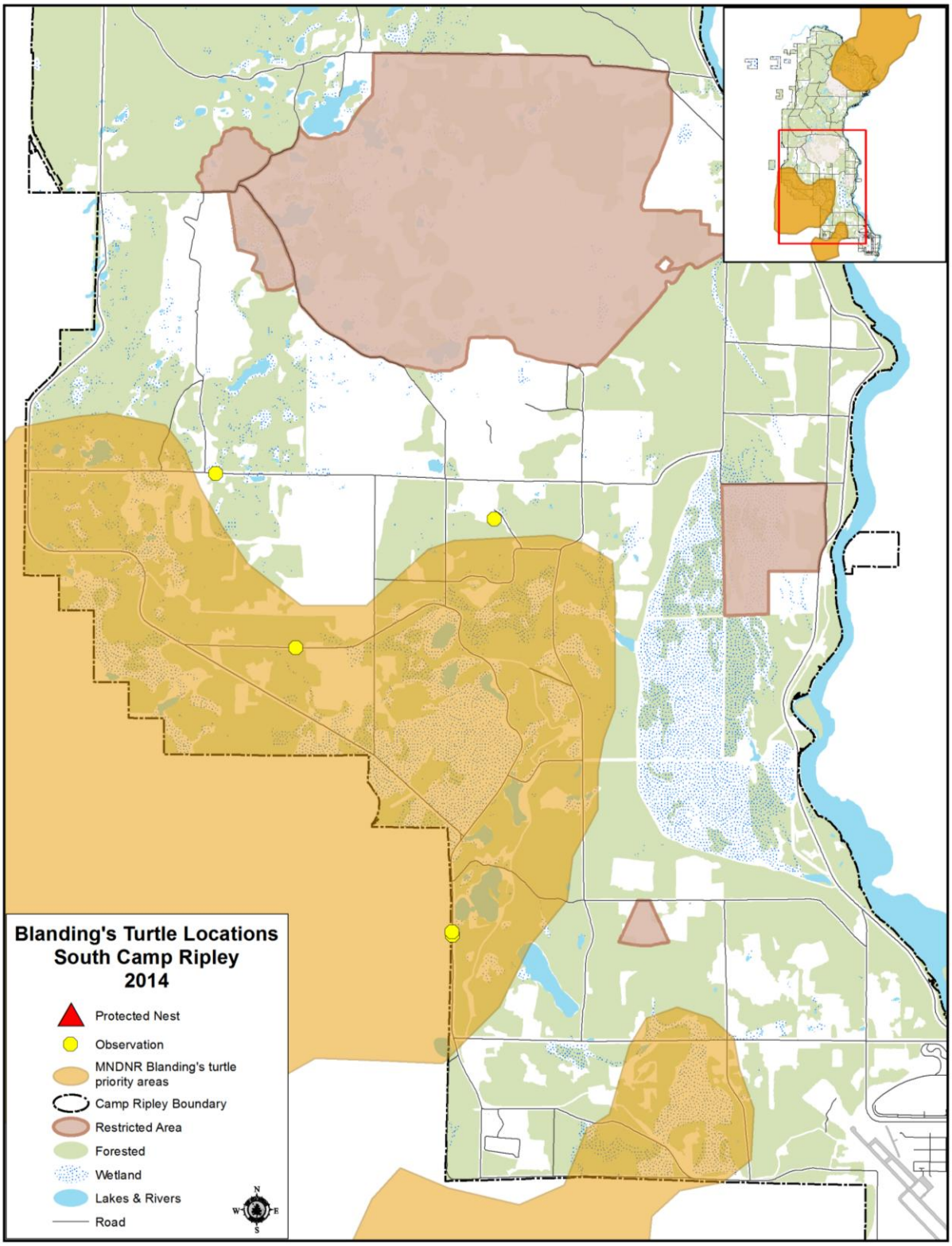


Figure 36. Observations, nest locations, and DNR priority areas for Blanding's turtles in the south portion of Camp Ripley Training Center, 2014.



eggs. Because nest predation is extremely high, road surveys are conducted annually throughout known Blanding's habitat to find and protect nests. On Camp Ripley, surveyors spent 113 hours on traditional and exploratory routes from June 11 through June 22, 2014 (Table 27). The peak Blanding's nesting season occurred late in June due to the cool spring (Table 27). Surveyors recorded twelve Blanding's turtle observations (Figures 35 and 36). To aid in future identification, notches are filed into turtle carapace scutes and each turtle is given a unique alpha code. Nine turtles had been previously marked, none were newly marked this year, and three were of unknown identity or unmarked. Turtles which were not marked or had unknown markings were intentionally left undisturbed so nesting would not be hindered. Unfortunately, these turtles were not observed again. Standard protocol is to watch a turtle, determine if it is attempting to nest, wait until it completes nesting, then capture and identify it. No newly marked turtles found were juvenile.

Table 27. Summary of Blanding's turtle nest search surveys, Camp Ripley Training Center, 2000-2014.

Year	*Survey Period*	*First Female Blanding's Observed*	*First Blanding's Nest Found*	*Last Blanding's Observed*	*Number of Survey Hours*	*Number of Turtles Observed*	*Average Temperature (°F) during Survey Period**	*Average Temperature (°F)during March to May**
2000	May 31-June 23	June 5	No nests	June 14	91.5	11	60	56
2001	June 6-?	June 15	No nests	June 27	79	9	66	41
2002	June 7-25	June 11	June 11	June 22	75	19	67	36
2003	June 6-22	June 9	June 11	June 17	129.5	10	65	41
2004	June 2-July 2	June 14	June 14	July 2	225	12	61	42
2005	June 6-23	June 10	June 12	June 17	225	18	68	44
2006	June 2-30	June 2	June 8	June 20	158	10	66	47
2007	June 1-21	June 3	June 7	June 20	189	19	68	45
2008	June 4-July 1	June 14	June 18	June 27	243	33	64	39
2009	June 11-June 28	June 11	June 13	June 27	205	17	68	41
2010	June 2- June 24	June 8	June 16	June 19	203	10	64	48
2011	June 3-June 29	June 6	June 13	June 29	208	44	64	40
2012	May 31-June 18	June 2	June 3	June 17	155	46	65	49
2013	June17-July 5	June 19	June 25	July 5	198	37	71	37
2014	**June 9 – June**	**June 11**	**June 20**	**June 22**	**113**	**12**	**69**	**41**

*Weather Underground online – Brainerd Airport- at <http://www.wunderground.com/history/airport/KBRD/>

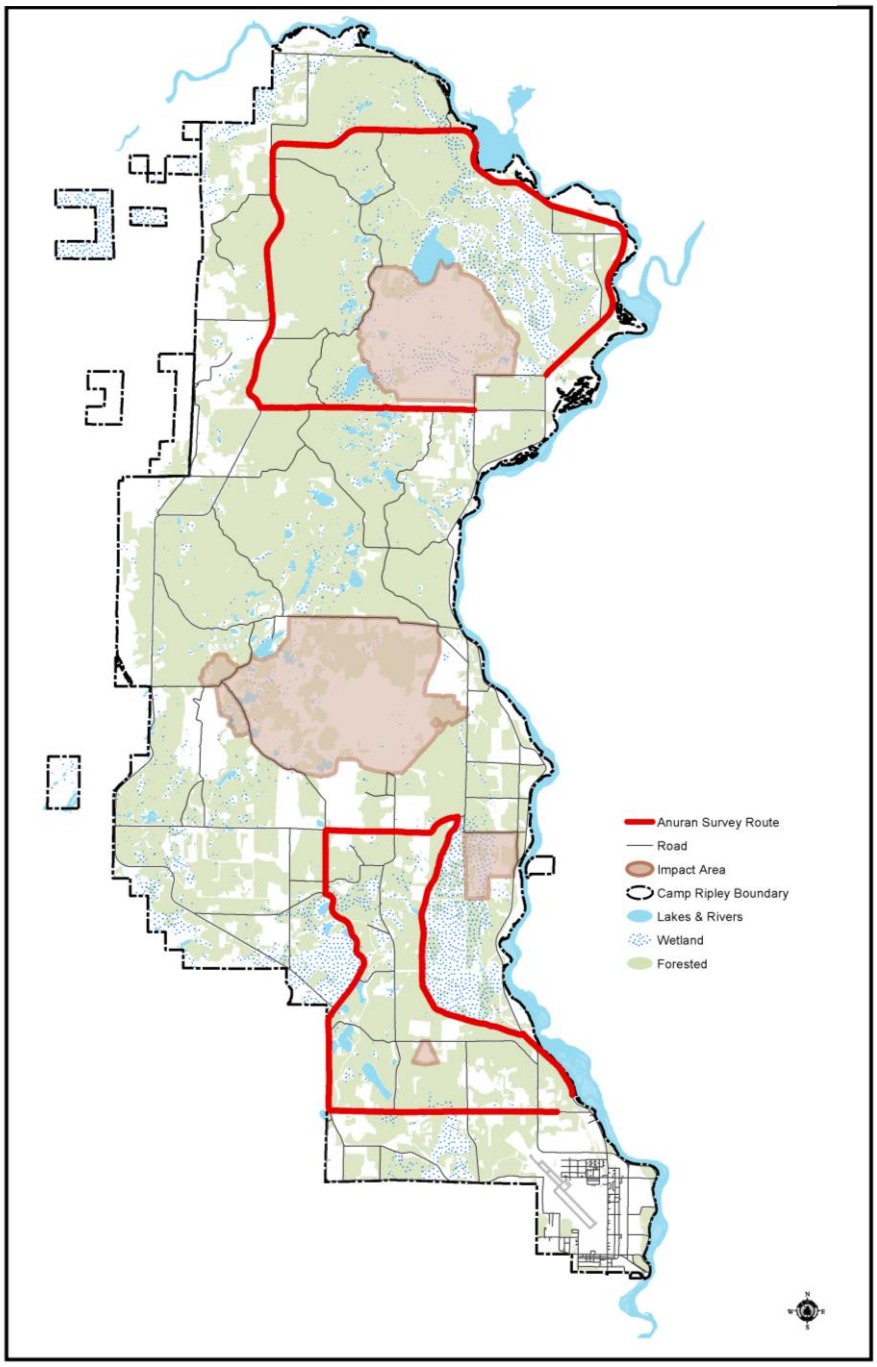
Two Blanding's turtle (Identification codes: BCO and JL) nests were protected (Figures 35 and 36) and monitored through late-October 2014. Nests were monitored for hatching success and where no evidence of hatching was observed nests were excavated in early-November 2014. One of the protected nests hatched, while the other nest was excavated and will be left to overwinter. Seventeen hatchlings were produced based upon observed hatchlings, and nest incubation was 89 days.

In 2013, the last nest protected (July 3 – BCD), hatched only one hatchling on October 25, 2013 the nest was partially excavated and no additional hatchlings were observed. This protected nest

was recovered and was left to overwinter. In June 2014, the nest had not hatched and was excavated. Nine eggs with fully developed, dead turtles inside were found that did not survive the winter.

Research has shown that few Blanding's turtle hatchlings actually arrive at a wetland (MNDNR 2011b). Hatchlings often need to make a long overland journey (up to 1.6 miles) to a wetland making them susceptible to predators, automobiles, and desiccation (Congdon et al. 1983; Piepgras and Lang 2000). Therefore, protective square cages were built and the bases lined on the inside with corrugated plastic, which facilitated capturing hatchlings and escorting them to nearby shrub wetlands. Escorting hatchings should increase their chance of survival; however, once hatchlings arrive at the wetland they continue to be prey for birds, mammals, and fish.

Figure 37. Anuran survey routes, Camp Ripley Training Center, 1993-2014.



Anuran Surveys

Frog and toad calling surveys are conducted as part of a larger statewide survey, and have been conducted at Camp Ripley since 1993. The statewide survey began due to growing concern over declining amphibian populations worldwide. In addition, statewide data is contributed to the U.S. Geological Survey's North American Amphibian Monitoring Program. Frog and toad abundance estimates are documented by the index level of their chorus, following Minnesota Herpetological Society guidelines

(Moriarty, unpublished). If individual songs can be counted and there is no overlap of calls, the species is assigned an index value of 1. If there is overlap in calls the index value is 2, and a full chorus is designated a 3. Anuran surveys are performed at ten stops along two separate routes at Camp Ripley. The routes are surveyed three times from April through July (Figure 37).

Both routes were surveyed in 2014, during all three time periods. However, due to the cold spring, all survey time periods were delayed across the state. Surveys were conducted by DNR staff on the south (route #50195) on April 22, May 27, and July 9 and on the north (route #50295) on May 4, May 28, and July 10. During the first survey period (April 15 – 30), spring peepers (*Pseudacris crucifer*) had an index similar to 2006. A few northern leopard frogs (*Rana pipiens*) were heard (Figure 38, Table 28). Boreal chorus frog (*Pseudacris maculata*) and wood frog (*Rana sylvatica*) index values were the second and third highest recorded, respectively, since 1994. During the second survey period (May 15-June 5), spring peeper's index value was the fourth highest since 1995. Gray treefrogs (*Hyla versicolor*) were at an all time high similar to 2012. Cope's gray treefrogs (*Hyla chrysoscelis*) and American toads (*Anaxyrus americanus*) had index values similar to 2006 and 2009 (Figure 39, Table 28), respectively. Statewide results, between 1998 and 2009, indicate a detectable decrease in the proportion of routes where gray treefrogs and spring peepers were heard (Larson 2010), while Camp Ripley's appears to be relatively stable.

Figure 38. Average anuran index value during the first survey period, Camp Ripley Training Center, 1994-2014. Surveys were not conducted during 2008.

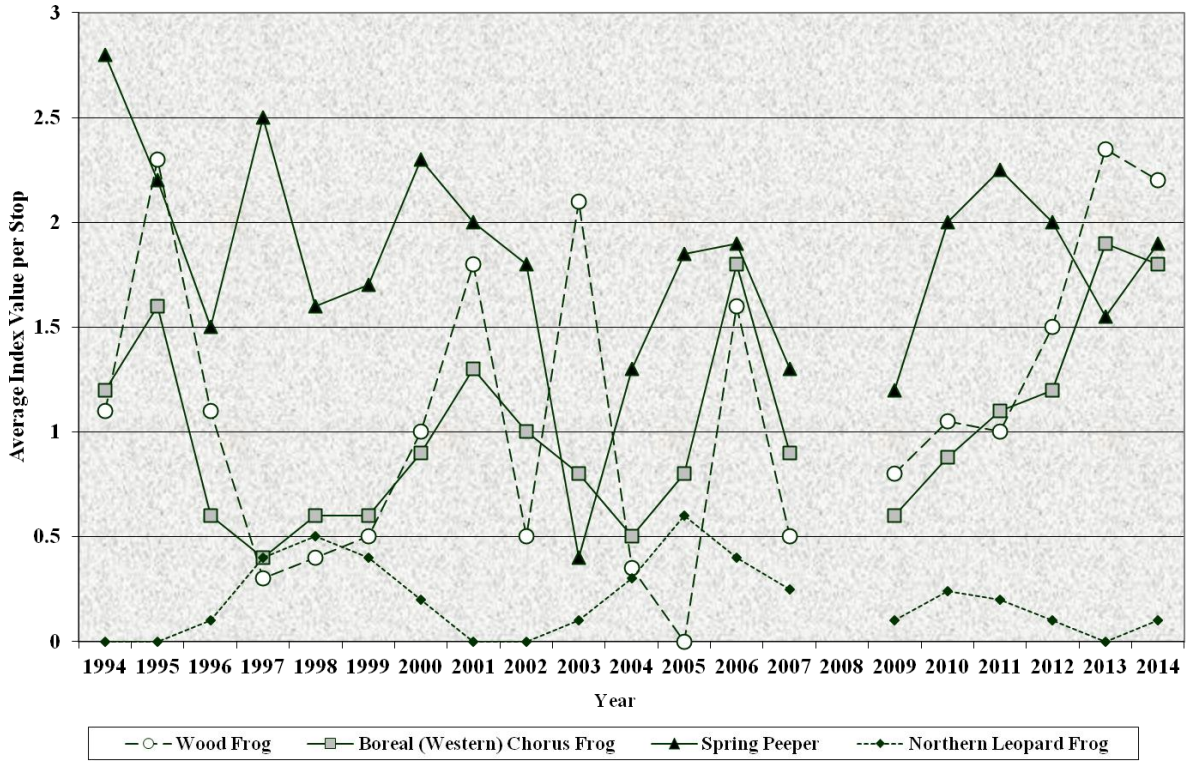
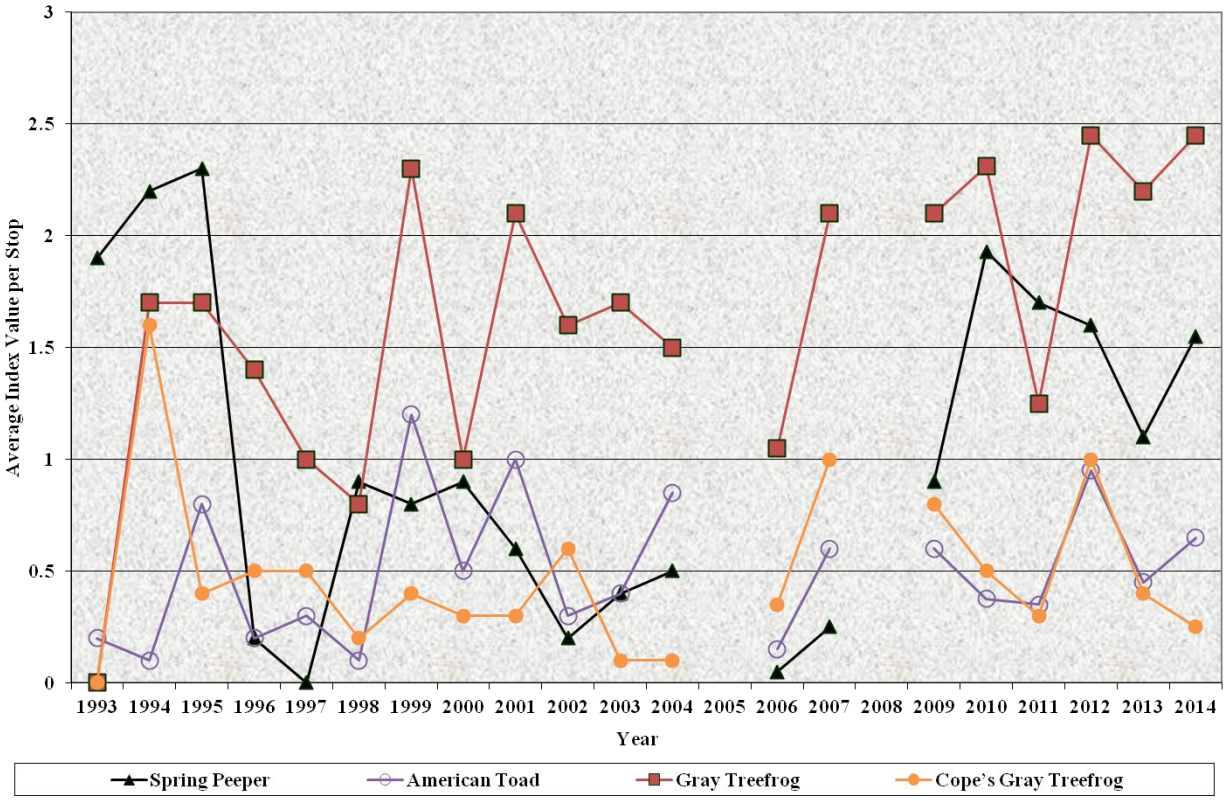


Figure 39. Average anuran index value during the second survey period, Camp Ripley Training Center, 1993-2014. Surveys were not conducted during the second survey period in 2005 and 2008.



Amphibian Chytridiomycosis Study

Natural resources on military lands support a large percentage of America's endangered habitats and species. As a result, the Department of Defense (DoD) has implemented an ecosystem management approach to maintain and/or restore biological diversity and sustain use of land and water resources on its properties to ensure sustainability of military readiness. As a result of this management strategy, military natural resource biologists focus on the military mission, think regionally, rely on the best available science and form partnerships to balance the impacts of training with biodiversity conservation.

Amphibians play essential roles, both as predators and prey, in the ecosystems of DoD lands. In addition, these species serve as excellent indicators of the health of an ecosystem due to their sensitivity to changes or disturbances in the environment. For many years, scientists have observed precipitous population declines and die-offs of entire amphibian species worldwide. Emerging diseases such as chytridiomycosis, caused by the fungus *Batrachochytrium dendrobatidis* [*Bd*], are a major cause of many amphibian population declines and extinctions. While the origin and spread of

Table 28. Anuran survey index data, Camp Ripley Training Center, 1993-2014.

Survey Period 1	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
Wood frog	*	1.1	2.3	1.1	0.3	0.4	0.5	1	1.8	0.5	2.1	0.35	0	1.6	0.5	*	0.8	1.05	1.0	1.5	2.35	**2.2**
Boreal (Western) chorus frog	*	1.2	1.6	0.6	0.4	0.6	0.6	0.9	1.3	1	0.8	0.5	0.8	1.8	0.9	*	0.6	0.88	1.1	1.2	1.9	**1.8**
Spring peeper	*	2.8	2.2	1.5	2.5	1.6	1.7	2.3	2	1.8	0.4	1.3	1.85	1.9	1.3	*	1.2	2.0	2.25	2.0	1.55	**1.9**
Northern leopard frog	*	0	0	0.1	0.4	0.5	0.4	0.2	0	0	0.1	0.3	0.6	0.4	0.25	*	0.1	0.24	0.2	0.1	0	**0.1**
American toad	*	0	0	0	0	0	0	0	0	0	0	0	0.8	0	0	*	0	0	0	0	0	**0**
Gray treefrog	*	0	0	0	0	0	0	0	0	0	0	0	1.35	0	0	*	0	0	0	0	0	**0**
Cope's gray treefrog	*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	0	0	0	0	0	**0**
Mink frog	*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	0	0	0	0	0	**0**
Green frog	*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	0	0	0	0	0	**0.05**
Survey period 2	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
Wood frog	2.4	0.1	0	0	0	0	0	0	0	0	0	0	*	0	0	*	0	0	0	0	0	**0**
Boreal (Western) chorus frog	0.4	0.1	0.2	0	0	0	0.1	0.2	0.2	0	0.2	0.2	*	0	0.05	*	0.3	0.56	0.5	0.9	0.7	**0.8**
Spring peeper	1.9	2.2	2.3	0.2	0	0.9	0.8	0.9	0.6	0.2	0.4	0.5	*	0.05	0.25	*	0.9	1.93	1.7	1.6	1.1	**1.55**
Northern leopard frog	0	0	0	0	0	0.1	0.1	0.3	0.1	0	0.1	0.1	*	0.1	0.05	*	0	0.06	0.1	0.05	0.15	**0.05**
American toad	0.2	0.1	0.8	0.2	0.3	0.1	1.2	0.5	1	0.3	0.4	0.85	*	0.15	0.6	*	0.6	0.37	0.35	0.95	0.45	**0.65**
Gray treefrog	0	1.7	1.7	1.4	1	0.8	2.3	1	2.1	1.6	1.7	1.5	*	1.05	2.1	*	2.1	2.31	1.25	2.45	2.2	**2.45**
Cope's gray treefrog	0	1.6	0.4	0.5	0.5	0.2	0.4	0.3	0.3	0.6	0.1	0.1	*	0.35	1	*	0.8	0.5	0.3	1.0	0.4	**0.25**
Mink frog	0	0	0	0.2	0.1	0.1	0	0	0	0	0	0	*	0	0	*	0	0	0	0	0.1	**0**
Green frog	0	0	0	0.1	0.1	0	0	0	0	0	0	0	*	0	0	*	0.1	0	.05	0	0	**0**
Survey period 3	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
Wood frog	*	*	0	0	*	*	*	*	0	0	*	*	0	*	0	*	0	0	0	0	0	**0**
Boreal (Western) chorus frog	*	*	0.1	0	*	*	*	*	0	0	*	*	0	*	0	*	0	0	0	0	0	**0**
Spring peeper	*	*	0	0	*	*	*	*	0	0	*	*	0	*	0	*	0	0	0	0	0	**0**
Northern leopard frog	*	*	0	0	*	*	*	*	0	0	*	*	0	*	0	*	0.3	0	0	0	0	**0**
American toad	*	*	0	0	*	*	*	*	0	0	*	*	0	*	0	*	0	0	0.1	0	0	**0**
Gray treefrog	*	*	0.2	0	*	*	*	*	0.2	0.3	*	*	0.25	*	0.4	*	0.5	0.05	1.8	1.05	0.6	**0.15**
Cope's gray treefrog	*	*	0	0	*	*	*	*	0	0.3	*	*	0.1	*	0.12	*	0.3	0	0.45	0.2	0.2	**0.05**
Mink frog	*	*	0.3	0.4	*	*	*	*	0	0.1	*	*	0.05	*	0.06	*	0	0.1	0.15	0.05	0.2	**0.2**
Green frog	*	*	0	0.3	*	*	*	*	0.3	0.1	*	*	0.25	*	0.06	*	0.7	0.25	0.55	0.5	0.25	**0.35**

this disease is being studied, the distribution and the species that are most vulnerable are not well understood.

Partners in Amphibian and Reptile Conservation (PARC) members met in an international conference in November 2007 to share their efforts in research and management related to emerging diseases including chytridiomycosis. As a result of this conference, a worldwide mapping effort is underway. PARC is a partnership of federal, state, university, industry, and non-government representatives that work towards conserving amphibians, reptiles and their habitats as integral parts of our ecosystem and culture through proactive and coordinated public/private partnerships.

In 2009, DoD and PARC joined forces to conduct an emerging disease survey for *Bd* on 15 DoD installations located along historic Route 66 and 64 (funded by the DoD Legacy Resource Management Program). To date, over 1,000 amphibian samples have been collected and 217 (16.6%) have tested positive for *Bd*.

The objective of this follow-on work is to conduct an emerging disease survey for *Bd* on an additional 15 DoD sites located along three north-south transects within the U.S. The project will provide unrivaled and unmatched spatial and temporal analysis of *Bd* occurrence, the scale of which is uncommon but absolutely necessary. The three transects are:

- East Coast: (Maine to Florida along Interstate 95)
- Mid-U.S: (Minnesota to Alabama along Interstate 65)
- West Coast: (Washington to California along Interstate 5)

These transects were selected for this study because they bisect 20 states and 18 ecoregions (including a wide diversity of habitat types). Furthermore, it is estimated that approximately 40 species of frogs, toads, and salamanders are found along these routes. This study will provide important baseline health data for amphibians on DoD sites and provide a better understanding of the detection, distribution, and frequency of the disease.

Camp Ripley is the northernmost site of the Mid-U.S. transect. In June 2011, two of 25 (8.0%) Camp Ripley frogs, both wood frog (*Lithobates sylvaticus*) tadpoles, tested positive for *Bd*. In September 2011, 17 of 25 (68.0 %) samples tested positive for *Bd*, these amphibians included wood frogs, leopard frog tadpole, and mink frog adults. In May and June 2013, one American toad adult (collected on Fort Ripley Road), four northern leopard frogs (*Lithobates pipiens*) (collected at Yalu Creek at the intersection with Yalu Road), and 14 wood frog tadpoles (collected from along west end of Normandy Road, Hole in Day marsh, and Yalu Creek) were swabbed at Camp Ripley.

Sixty-one percent of 2013 samples tested positive for *Bd* zoospores. Of the 50 installations nationwide that were sampled for *Bd*, Camp Ripley was one of six with more than 50% of its samples testing positive. The average zoospore equivalent for positive samples nationwide was 11, but for the infection to be considered the disease chytridiomycosis, zoospore equivalents must be greater than 10,000. While *Bd* is present on a majority of military sites nationwide, at this time the fungus does not appear to have a negative impact on amphibian species. The study demonstrates that currently *Bd* is endemic rather than an epidemic (Lannoo et al. 2014).

Limited steps can be implemented to prevent the introduction and spread of *Bd* on the installation, they are: 1) Equipment used off the installation or in infected locations may be contributing to the spread of the disease. Equipment should be sterilized with a solution of diluted bleach prior to being moved to other wetlands. 2) Monitor wetland sites in the spring for dead/dying frogs. High mortality rates may indicate a *Bd* infection. 3) Do not allow collection or translocation of amphibian species on or off the installation. 4) Prevent the release of exotic amphibian pets on installations. 5) Increase the awareness of military personnel about the disease (Lannoo et al. 2014).

Insects

Tiger Beetle Surveys
By Christopher Smith, DNR, Region 3 Nongame Program

Minnesota has approximately 20 species of tiger beetle, nine of which are listed on the state's list of Endangered, Threatened, and Special Concern species. Habitat loss through development and succession, as well as habitat degradation by recreational activities such as the use of off-highway vehicles (OHVs), are perceived to be significant contributors to tiger beetle declines.

Camp Ripley is a large (approximately 52,750 acres) military training center located in central Minnesota, and occurs along the boundaries of three ecological subsections (Anoka Sand Plain, Hardwood Hills, and Pine Moraines & Outwash Plains). At Camp Ripley, we targeted two species of state listed tiger beetles during surveys - the Northern Barrens Tiger Beetle and the Ghost Tiger Beetle (Table 29). Both of these species had been documented at Camp Ripley in the past (Steffens 2005, Hanson 1997).

Common Name	Scientific Name	State Status
Ghost Tiger Beetle	*Cicindela lepida*	Threatened
Northern Barrens Tiger Beetle	*Cicindela patruela*	Special Concern

Northern barrens and ghost tiger beetles were targeted between 29 June 2014 and 2 July 2014. The northern barrens tiger beetle is a spring/fall species, however it is usually much more abundant during its spring flight period in Minnesota (C. Smith, pers. obs.). Ghost Tiger Beetle is typically considered a summer species that emerges in June or July, but many Minnesota observations occur in August and September (MNDNR, unpublished data). Surveys consisted of haphazard visual encounter surveys in sandy areas during the day. Surveys conducted between 29 June and 2 July were tangential to other fieldwork being conducted on Camp, and were therefore relatively low effort. The existing Ghost Tiger Beetle location on Camp was surveyed at least once daily, and was surveyed at varying times of the day (morning, mid-day, late afternoon, and evening). And, this location was again targeted in August-September 2014. Locational data were collected using a Garmin 62stc handheld GPS using the WGS84 datum and/or a Google Nexus tablet using the Mobile Mapper application.

Five species of tiger beetle were encountered during these Camp Ripley tiger beetle surveys (Table 30). The only state listed species of tiger beetle found during surveys was the northern barrens tiger beetle. The ghost tiger beetle was not encountered during these surveys. A single common claybank tiger beetle (*Cicindela limbalis*) was observed along an infrequently used access road.

These surveys detected four of the nine tiger beetle species previously reported from Camp Ripley (Hansen 1997). In addition, the common claybank tiger beetle was detected, a species not previously reported from Camp (Hansen 1997). Even though survey effort was relatively low, tiger beetles were noticeably absent from many areas where one might expect to find them. This could perhaps be a result of the unusually cool and rainy weather experienced in late May and early June – a time when many spring/fall species are most active.

The absence of the ghost tiger beetle two years in a row is a bit concerning, as Camp Ripley may harbor one of the only remaining populations in the state. Additional surveys are recommended, as is the creation of additional open-sand habitat in the grassy area immediately southeast of the known locality.

American Burying Beetle (*Nicrophorus americanus*) Surveys
By Christopher Smith, DNR, Region 3 Nongame Program

The American Burying Beetle (*Nicrophorus americanus*), hereafter "ABB," is listed as a federally endangered species under the U.S. Endangered Species Act, and listed as critically endangered by the international Union for Conservation of Nature and Natural Resources (IUCN) – Red List (World Conservation Monitoring Centre 1996). It is easily distinguished from other Minnesota *Nicrophorus* spp. by its reddish-orange pronotum (Figure 40). While extant populations of this species in Minnesota are unknown, this species was collected across portions of central and southern Minnesota through 1969 (University of Minnesota Insect Collection, unpublished data). Despite these relatively recent observations, very few targeted surveys for ABB have been conducted in Minnesota prior to the onset of this project.

Figure 40. American Burying Beetle (*Nicrophorus americanus*) collected in Minnesota circa 1940. Note the reddish-orange pronotum. Access to specimen courtesy of the University of Minnesota Insect Collection (UMSP). Image by MNDNR, Christopher E. Smith.

Table 30. Tiger beetle survey locations and observations at Camp Ripley, Morrison County, Minnesota. All species observed were recorded but surveyors targeted *Cicindela patruela* and *C. lepida*.

Survey Date	Location		Common Name	Scientific Name	Comments
	Latitude (N)	Longitude (W)			
June 29, 2014	46.312483	94.443126	Northern Barrens Tiger Beetle	*Cicindela patruela*	Single individual observed.
June 30, 2014	46.111462	94.360812	Big Sand Tiger Beetle	*Cicindela formosa*	
	46.111462	94.360812	Oblique-lined Tiger Beetle	*Cicindela tranquebarica*	
	46.28081	94.394718	Common Claybank Tiger Beetle	*Cicindela limbalis*	Single individual observed.
	46.292881	94.399301	Six-spotted Tiger Beetle	*Cicindela sexguttata*	
July 1, 2014	46.280867	94.394354	Six-spotted Tiger Beetle	*Cicindela sexguttata*	
July 2, 2014	46.233425	94.391723	Six-spotted Tiger Beetle	*Cicindela sexguttata*	Many.
	46.25217	94.456632	Oblique-lined Tiger Beetle	*Cicindela tranquebarica*	

In 2014, ABB surveys were conducted at the Camp Ripley Training Center between June 29 and July 3. Survey timing, preceding the 4th of July holiday, allowed access to areas usually off-limits because of live-fire military training. Surveys consisted of pitfall traps (19 L buckets) baited with large rats aged during warm weather for two to four days prior to their use. A small piece of 2.5 cm hardware cloth was placed over the pitfall to exclude small mammals, and a plywood lid raised approximately 5-8 cm above the bucket rim was used to shelter the pitfall from direct sun and precipitation. These lids were weighted down with 5-8 kg paver stones to reduce the likelihood of bait theft by larger scavengers. Pitfall traps were left open for four consecutive nights, with each bucket on each night representing a "trap night". Pitfall traps were placed on high-ground at eight locations, two near the Hendrickson Impact Area, four near the Leach Impact Area, and one just northwest of Range Control (Figure 41).

Figure 41. American burying beetle pitfall trap locations, Camp Ripley Training Center, 2014.

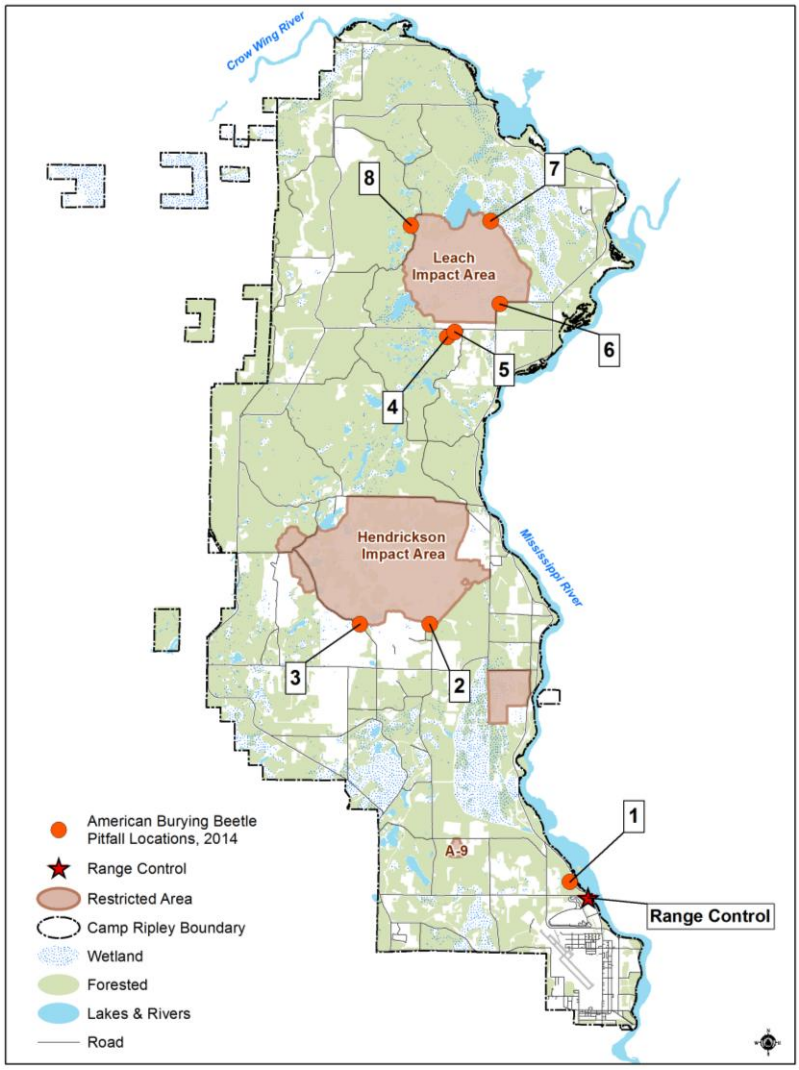


Figure 42. Photograph of the Yellow-bellied Burying Beetle (Nicrophorus guttula) specimen collected at Camp Ripley Training Center, 2014. Image shows antennal club in lower right-hand corner. Image by MNDNR, Christopher E. Smith.

To the best of our ability, survey methods followed the *American Burying Beetle Nicrophorus americanus Range Wide Presence / Absence Live-trapping Survey Guidance* (USFWS 2014). Species of carrion beetle and burying beetle were identified to species in the field, and a small subsample of specimens were collected.

In total, 257 carrion and burying beetles (Family Silphidae) were captured during 32 trap-nights of survey (Table 31). ABB surveys were also conducted on Camp in 2013. In 2013 seven species of burying beetle were captured, in 2014 four of these species were captured again. Also in 2013, five species of carrion beetle were captured on Camp with four being captured again in 2014. (Minnesota Department of Natural Resources and Minnesota Army National Guard 2014). No ABB were encountered in either 2013 or 2014. However, a single Yellow-bellied burying beetle (*Nicrophorus guttula*) was captured in 2014 (identification confirmed by Dr. Derek Sikes; Figure 42). This individual represents only the second specimen reported from Minnesota and will be deposited at the University of Minnesota Insect Collection (UMSP).

Table 31. Beetle pitfall captures per trap night, Camp Ripley Training Center, 2014. Includes negative data for species encountered during 2013 surveys.

Species		Family	Camp Ripley	
Scientific Name	**Common Name**		**Spring**	**Fall**
Carrion and Burying Beetles				
Heterosilpha ramosa	Prairie Carrion Beetle	Silphidae	2.41	--
Necrophila americana	American Carrion Beetle	Silphidae	3.50	--
Necrodes surinamensis	Red-lined Carrion Beetle	Silphidae	0.00	--
Nicrophorus defodiens	No Common Name	Silphidae	0.00	--
Nicrophorus guttula	Yellow-bellied Burying Beetle	Silphidae	0.03	--
Nicrophorus marginatus	Margined Burying Beetle	Silphidae	0.00	--
Nicrophorus orbicollis	Round-necked Burying Beetle	Silphidae	1.38	--
Nicrophorus pustulatus	No Common Name	Silphidae	0.00	--
Nicrophorus sayi	No Common Name	Silphidae	0.03	--
Nicrophorus tomentosus	Gold-necked Burying Beetle	Silphidae	0.19	--
Nicrophorus vespilloides	Boreal Burying Beetle	Silphidae	0.03	--
Oiceoptoma noveboracense	Margined Carrion Beetle	Silphidae	0.25	--
Thanatophilus lapponicus	Northern Carrion Beetle	Silphidae	0.22	--
Non-target Tiger Beetles				
Cicindela formosa	Big Sand Tiger Beetle	Cicindelidae	0.03	--
Cicindela sexguttata	Six-spotted Tiger Beetle	Cicindelidae	0.03	--

There are 12 species of burying beetle (*Nicrophorus* spp.) documented in Minnesota (Carroll and Gundersen 1996, Haarstad 1985, Hatch 1927). Little is known about the current distribution or population trends for many of these species in Minnesota. However, four species stand out as needing additional survey effort because of non-detection or low rates of detection during 2013 and 2014 surveys (Table 32).

Table 32. Current list of burying beetle species (Family Silphidae, Subfamily Nicrophorinae) documented in Minnesota with additional comments.

Species	Captured at Camp Ripley	Perceived Minnesota Distribution	Comments
Nicrophorus americanus Olivier 1790	No	Formally occupied southern 2/3 of state. ***Additional surveys recommended.***	Federally endangered. Presumed to be extirpated from MN.
Nicrophorus defodiens Mannerheim 1846	Yes	East-central and northern.	
Nicrophorus guttula Motschulsky 1845	Yes	Morrison and St. Louis counties? ***Additional surveys recommended.***	Two specimens. One at UMSP and one at LACM.
Nicrophorus hybridus Hatch & Angell 1925	No*	Northern 2/3.	
Nicrophorus investigator Zetterstedt 1824	No	Cook County. ***Additional surveys recommended.***	Single specimen.
Nicrophorus marginatus Fabricius 1801	Yes	Statewide, except Northeast.	
Nicrophorus obscurus Kirby 1837	No*	Statewide? ***Additional surveys recommended.***	None captured during 2013-2014 surveys.
Nicrophorus orbicollis Say 1825	Yes	Statewide.	Very common.
Nicrophorus pustulatus Herschel 1807	Yes	Statewide.	Uncommon in pitfalls.
Nicrophorus sayi LaPorte 1840	Yes	Statewide.	
Nicrophorus tomentosus Weber 1801	Yes	Statewide.	Common.
Nicrophorus vespilloides Herbst 1783	Yes	Northern 2/3.	

* Likely to be present.

Capture rates during 2014 spring surveys were well below those of the 2013 fall surveys, however this is likely due to natural differences in seasonal abundance. In Minnesota, most of our burying beetles appear to exhibit univoltine life histories (i.e., one generation per year), with many species believed to overwinter as adult beetles (Ratcliffe 1996). Overwinter survivorship for *Nicrophorus* spp. appears to be highly variable, and in some instances has been estimated to be < 50% (Schnell et al. 2008, Smith 2002). This in turn may result in much lower abundance during the spring because the only beetles available for capture are adults that have successfully overwintered, whereas captures in the fall represent both remaining year-old adult beetles and recently eclosed "young-of-year" beetles.

Additional surveys spread-out temporally are recommended, as surveys conducted to-date have had relatively low effort due to time and funding constraints. In addition to targeting the

endangered ABB, surveys on Camp should also target *N. guttula* to elucidate whether or not a reproducing population occurs on-site (vs. an occasional stray from further west). The fact that *N. guttula* was detected during 2014 surveys, but not detected during more intensive 2013 surveys leaves some hope for a yet undetected population of ABB on Camp.

Lastly, the lack of detection of *N. obscurus* is of interest. This species is reported in Morrison County (albeit east of the Mississippi River) post 1940 by Carroll and Gundersen (1996), but has not be detected during the 2013 or 2014 surveys.

Fisheries

By John Maile, Minnesota Department of Military Affairs

In 2014, fisheries management continued within Camp Ripley; however, no fish rearing took place as a result of other lakes outside of Camp Ripley being available for rearing walleye (*Stizostedion vitreum*) and muskellunge (*Esox masquinongy*). From April 30 to May 2, 2014 Environmental staff conducted a lake survey on Ferrell Lake.

Ferrell Lake is a 52 acre lake located within Camp Ripley and has with a maximum depth of approximately 12 feet. The lake has very little military development along its shore and the watershed is dominated by northern hardwood forest. Current development is two cable concrete accesses, one on the southwest side and the other on the northeast side. A dock is located at the southwest access along with a couple row boats for recreational use for soldiers and visitors to the military reservation; personal boats are allowed but must be clear of any invasive species. Water clarity is excellent allowing for good aquatic vegetation to grow to a depth of about 10 feet. The southeastern portion of the lake is a large bay that will produce a dense mat of lily pads and other aquatic plants. There is very little structure within the lake other than the natural weed line, a couple beaver lodges and sunken wood debris. The lake supports a variety of fish to include pumpkinseed, bluegill, crappie, largemouth bass, walleye and even a few bullheads. The primary species management for Ferrell Lake is walleye and panfish. Stocking has helped establish a good panfish population. For the first time, in September of 2011, 296 crappies were stocked into Ferrell Lake ranging in sizes ranging from 4-9 inches. Once panfish such as bluegill and crappie are established, natural reproduction usual supports natural lakes. Walleye management is dependent on stocking. The most recent stocking effort occurred in April 2012, where 408 yearlings and 7 adult walleyes were stocked. A recent survey was conducted on Ferrell Lake from April 30 to May 2, 2014. Ten hoop nets were set throughout the lake shortly after ice out which occurred on April 24. The nets were set on the afternoon of April 30 and pulled the afternoon of May 2. Conditions were good for surveying and a good sample of fish were caught (Table 33). Ferrell Lake has an abundance of both small and large bluegill sunfish (Table 33), varying in size from 1 inch yearling fish to adults reaching 10 inches. The crappie stocking has proven successful; there are good numbers of crappies in the 9 to 11 inch bracket with some large healthy adults reaching the 12+ inch mark. Walleye numbers remain good with the survey data showing well distributed size classes of fish. Fishing pressure on Ferrell Lake is low, however on a small lake like this fish can be susceptible to over harvest especially panfish. Large bluegills and crappies can

become vulnerable and easy to catch during spawning, so keeping a mix of large to small fish will help maintain a balanced panfish fishery.

Table 33. Fisheries survey, Ferrell Lake, Camp Ripley Training Center, May 2, 2014.

Fish Species	0"-5"	6"-8"	9"-11"	12"-14"	15"-19"	20"-24"	25"-29"	30"+
Pumpkinseed	1	9	5					
Bluegill	53	44	7					
Crappie	1	4	1	4				
Largemouth Bass	1			3	1			
Walleye	1			11	18	6	1	
Bullhead	1							

Pest Management

By Jay Brezinka, Minnesota Department of Military Affairs

Tick Borne Diseases

Tick borne diseases are a significant cause of human morbidity in Minnesota, with over 1,000 cases reported to Minnesota Department of Health (MDH) annually in recent years. The primary vector for tick borne diseases in Minnesota is the blacklegged tick (also known as the deer tick, *Ixodes scapularis*). Small mammals play an important role in the tick borne disease cycle; both as hosts for the vectors and by maintaining and transmitting infections to ticks, which do not transmit infections vertically (passing a disease from parent to offspring) between generations. Prevention and control of zoonotic diseases requires a clear understanding of each of the components involved in the natural transmission cycle in order to understand their net effect on human disease risk.

During 2014, the Vector-borne Disease Unit with the MDH completed three site visits to Camp Ripley on May 9, June 12 and 23, 2014. The ticks that were collected were tested for a variety of tick-borne diseases to better understand how many blacklegged ticks are infected with human pathogens and how the infection prevalence changes over time and location. Half of the ticks will be tested for the agents that cause Lyme disease (*Borrelia burgdorferi)*, Anaplasmosis (*Anaplasma phagocytophilum)*, Babesiosis (*Babesia microti)*, Ehrlichiosis (*Ehrlichia muris*-like agent), as well as two other Borrelia organisms. As an expansion to previous work at Camp Ripley, the other half of ticks were tested for Heartland virus and Powassan virus, and tested separately due to differences in testing methods.

During visits to three different sites at Camp Ripley, 763 adult ticks and 20 nymphs were collected. Of these ticks, 252 were randomly selected and tested for the previously mentioned pathogens. Overall, approximately 51.2% of adult ticks were infected with *B. burgdorferi* (Table 34). Of the 123 adult ticks tested for *B. burgdorferi* and the other five pathogens, 80 (65.0%) ticks were

infected with at least one disease agent while 38 (30.9%) were co-infected with at least two disease agents.

Table 34. *Ixodes scapularis* infection prevalence by disease, Camp Ripley Training Center, 2014.

Disease Agent	Adults # Positive/# Tested (%)	Nymphs # Positive/# Tested (%)	All Ticks # Positive/ # Tested (%)
B. burgdorferi	63/123 (51.2%)	0/0 (0%)	63/123 (51.2%)
A. phagocytophilum	24/123 (19.5%)	0/0 (0%)	24/123 (19.5%)
E. muris-like agent	18/123 (14.6%)	0/0 (0%)	18/123 (14.6%)
B. microti	19/123 (15.4%)	0/0 (0%)	19/123 (15.4%)
Borrelia miyamotoi	7/123 (5.7%)	0/0 (0%)	7/123 (5.7%)
Novel *Borrelia* species	1/123 (0.8%)	0/0 (0%)	1/123 (0.8%)
Heartland virus	0/109 (0%)	0/20 (0%)	0/129 (0%)
Powassan virus	3/109 (2.8%)	0/20 (0%)	3/129 (2.3%)

In 2014, MDH found evidence of seven tick-transmitted disease agents in *I. scapularis* collected from Camp Ripley. As suspected, infection prevalence was substantial for most agents with Lyme disease bacteria being more commonly detected than other agents. Overall, these findings are consistent with other Minnesota tick sampling locations studied in recent years. One notable finding, the unusually low number of nymphs collected, may be due to the extremely cold and long winter that Minnesota endured in 2013-2014.

LAND USE MANAGEMENT

Army Compatible Use Buffer (ACUB)

By Jay Brezinka, Minnesota Department of Military Affairs

Introduction

Section 2811 of the Fiscal Year Department of Defense Authorization Act, passed December 2, 2002, created 10 United States Code (U.S.C.) section mark (§) 2684a, which authorizes a military installation to enter into an agreement with state, local government, or private conservation organizations to limit encroachment on lands neighboring the installation. Subsequently, the Headquarters Department of the Army, Director of Training, issued guidance pursuant to a

memorandum dated May19, 2003, subject: Army Range and Training Land Acquisitions and Army Compatible Use Buffers. The memorandum defines the requirements of an Army Compatible Use Buffer (ACUB) proposal in order for an installation to execute any land acquisition.

Intent

The effects of population encroachment have been felt by military installations across the country. Each installation has had to find creative ways to deal with these issues. The most common solution has been restrictions placed on units training, which degrades training realism. Since encroachment has yet to become critical, Camp Ripley has not limited commanders in the field from meeting their training objectives. However, this could change quickly. Acquiring the interest in lands around Camp Ripley will ensure unrestricted training to its users far into the future. It's the unrestricted, quality training and facilities at Camp Ripley that keeps military units coming back. Of the 53,000 acres that comprise Camp Ripley, about 50,000 acres are available for maneuver training space. This allows units that require large amounts of training space to become proficient on their weapon systems.

Purpose

The purpose of the Camp Ripley Army Compatible Use Buffer (ACUB) program, known locally as "*Central Minnesota Prairie to Pines Partnership…preserving our heritage"*, is to create and enhance a natural undeveloped buffer around Camp Ripley by taking advantage of available opportunities to prevent encroachment and enhance conservation and land management. By securing a buffer, Camp Ripley can continue to offer and provide critically important, high quality military training and operations to ensure combat readiness, as well as mitigate community development encroachment around the Training Center. Through implementation of Camp Ripley's proposal, Camp Ripley will also be contributing to preserving the local heritage and enhancing a regional conservation corridor.

Update

Because encroachment is a priority issue for the Minnesota Army National Guard (MNARNG), an ACUB proposal was prepared for Camp Ripley and subsequently approved by the Army and National Guard Bureau (NGB) in May 2004. Since then, the following accomplishments have occurred:

- Given the complimentary relationship that ACUB offers from a land management perspective and the long-standing partnerships that MNARNG has enjoyed with the Minnesota Department of Natural Resources (DNR) and the Minnesota Board of Water and Soil Resources (BWSR), both agencies graciously accepted an invitation to assist in implementing ACUB through a Cooperative Agreement with NGB.
- In addition to the DNR and BWSR, 20 partners have expressed a willingness to assist in implementing ACUB including, in some cases, committing their own funds.

- To date, 372 willing landowners have expressed interest in ACUB. These landowners represent about 46,000 acres of land. Over 95 percent of the interested landowners desire permanent conservation easements rather than acquisition. Federal funding in the amount of $23,099,000 has been awarded to the Camp Ripley ACUB since 2004.
- In addition to federal funding, DNR and BWSR secured $3,973,000 in state funding in support of ACUB through the Lessard-Sams Outdoor Heritage Council.
- Funding decisions relative to specific parcels is based on ranking criteria that are weighted for military considerations (77%) and ecological considerations (23%).
  Complete details regarding the ACUB accomplishments from fiscal year (FY) 2004 (start) to 2014 are provided in the FY2014 annual report that was presented to NGB. A summary of actions taken by DNR and BWSR are presented below.

Minnesota Department of Natural Resources (DNR) Summary

Upon receiving Assistant Chief of Staff for Installation Management approval of the Camp Ripley ACUB on May 3, 2004, the MNARNG designated DNR to serve as its primary partner. NGB and the State of Minnesota, acting by and through DNR, entered into a Cooperative Agreement to implement the Camp Ripley ACUB. The cooperative agreement identified as Agreement No. W9133L-04-2-3052, establishes the terms and conditions applicable to the contribution of federal funds to assist DNR's acquisition of long-term interest in or title to parcels of land adjacent to Camp Ripley in accordance with the approved ACUB proposal.

The initial cooperative agreement, which became effective on August 16, 2004, included $500,000 from NGB to execute the first year of the Camp Ripley ACUB. The cooperative agreement has subsequently been modified eight times to accommodate $1,954,000 from Department of Defense (DOD) and $2,100,000 from NGB for a total of $4,054,000 (Table 35).

Table 35. Minnesota Department of Natural Resources federal funding allocation, since FY2004.

		DOD	Army	NGB
FY2004	Original CA	N/A	N/A	$500,000
FY2005	Mod No. 1	$500,000	N/A	$500,000
FY2006	Mod No. 2	$500,000	N/A	N/A
FY2007	Mod No. 3	N/A	N/A	N/A
FY2007	Mod No. 4	$749,000	N/A	N/A
FY2007	Mod No. 5	N/A	N/A	$600,000
FY2008	N/A	N/A	N/A	N/A
FY2009	N/A	N/A	N/A	N/A
FY2010	Mod No. 6	$205,000	N/A	NA
FY2010	Mod No. 7	N/A	N/A	$500,000
FY2011	N/A	N/A	N/A	N/A
FY2012	N/A	N/A	N/A	N/A
FY2013	N/A	N/A	N/A	N/A
FY2014	Mod No. 8	N/A	N/A	N/A(language update to CA)
TOTAL		**$1,954,000**	**+**	**$2,100,000 = $4,054,000**

Minnesota Department of Natural Resources Past Actions/Monitoring

From fiscal year 2004 to 2013, DNR has completed 19 land transactions totaling 1,920.35 acres. As such, the DNR is forever responsible for monitoring the parcels of land that are associated with these transactions. All parcels were inspected by DNR personnel during FY2014 to ensure that the land use complies with the intent of the easements or fee simple acquisition that justified the expenditure of ACUB funds. The DNR's annual monitoring plan calls for site visits every three years. Reports of site visits are filed for each land parcel and are available through the DNR. All parcels were found to be in compliance based on the monitoring inspections.

Minnesota Department of Natural Resources Fiscal Year 2014 Accomplishments

DNR did not complete any land transactions in FY2014.

Minnesota Board of Water and Soil Resources (BWSR) Summary

Realizing the capability and mutual goals of BWSR, the MNARNG also designated BWSR to serve as partner to work in conjunction with the DNR. NGB and the State of Minnesota, acting by and through BWSR, entered into a cooperative agreement to implement the Camp Ripley ACUB. The cooperative agreement identified as Agreement No. W9133N-06-2-3056, establishes the terms and conditions applicable to the contribution of Federal funds to assist BWSR's acquisition of long-term interest in or title to parcels of land adjacent to Camp Ripley in accordance with the approved ACUB proposal.

The initial cooperative agreement with BWSR, which became effective on June 30, 2006, included $500,000 from the DOD. The cooperative agreement has subsequently been modified 23 times to accommodate $8,650,000 from DOD and $10,395,000 from NGB for a total of $19,045,000 (Table 36).

Table 36. Minnesota Board of Water and Soil Resources federal funding allocation, since FY2006.

		DOD	Army	NGB
FY2006	Original CA	$500,000	N/A	N/A
FY2007	Mod No. 1	$1,000,000	N/A	N/A
FY2007	Mod No. 2	N/A	N/A	$500,000
FY2007	Mod No. 3	N/A	N/A	$1,000,000
FY2007	Mod No. 4	N/A	N/A	$807,000
FY2008	Mod No. 5	$840,000	N/A	N/A
FY2008	Mod No. 6	N/A	N/A	$1,235,500
FY2008	Mod No. 7	N/A	N/A	$1,500,000
FY2009	Mod No. 8	$750,000	N/A	N/A
FY2009	Mod No. 9	N/A	N/A	$1,500,000
FY2010	Mod No. 10	$460,000	N/A	NA
FY2010	Mod No. 11	$100,000	N/A	NA
FY2010	Mod No. 12	N/A	N/A	$700,000
FY2011	Mod No. 13	$1,500,000	N/A	NA
FY2011	Mod No. 14	$1,000,000	N/A	NA
FY2011	Mod No. 15	N/A	N/A	NA (language update to CA)
FY2012	Mod No. 16	$250,000	N/A	NA
FY2012	Mod No. 17	N/A	N/A	$314,500
FY2013	Mod No. 18	N/A	N/A	$5,000
FY2013	Mod No. 19	N/A	N/A	$1,000,000
FY2013	Mod No. 20	N/A	N/A	$833,000
FY2013	Mod No. 21	N/A	N/A	$1,000,000
FY2014	Mod No. 22	$1,250,000	N/A	NA
FY2014	Mod No. 23	$1,000,000	N/A	NA
TOTAL		**$8,650,000**	**+**	**$10,395,000 = $19,045,000**

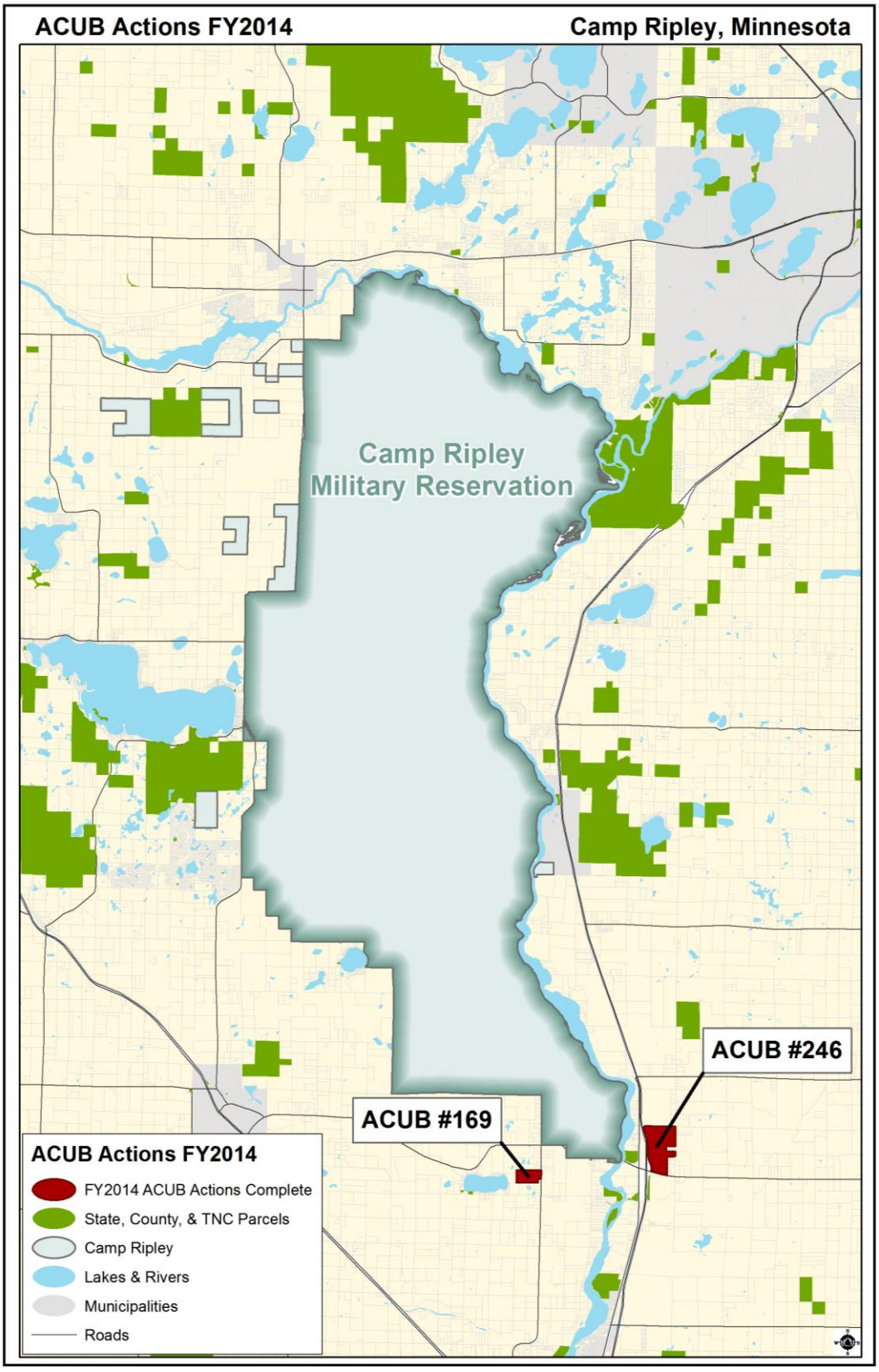
Minnesota Board of Water and Soil Resources Past Actions/Monitoring

From FY2006 to FY2013, BWSR completed 86 land transactions totaling 11,886.5 acres. As such, BWSR is forever responsible for monitoring the parcels of land that are associated with these transactions. During FY2014, all parcels were inspected by Morrison Soil and Water Conservation District personnel on behalf of BWSR. The inspections are intended to ensure that the land use complies with the intent of the easements that justified the expenditure of ACUB funds. BWSR's annual monitoring plan calls for site visits in the summer of each year. Reports of site visits are filed for each land parcel and are available through BWSR. All parcels were found to be in compliance based on the monitoring inspections in FY2014.

Minnesota Board of Water and Soil Resources Fiscal Year 2014 Accomplishments

BWSR completed and recorded 2 land transactions in FY2014 totaling 285 acres. In order to be considered complete for the purposes of this annual report, the land transactions must be recorded and documented in MNARNG's Real Property Database. Figure 43 depicts the location of all FY14 BWSR transactions that have been completed in FY2014.

Figure 43. ACUB accomplishments for BWSR, Camp Ripley Training Center, fiscal year 2014.



Integrated Training Area Management (ITAM)

By Jason Linkert, Timothy Notch, Brian Sanoski, and Adam Thompson, DMA

Program Overview

The increased technology of military weapons and equipment along with the increased operational tempo caused by the Global War on Terrorism has placed more pressure on training lands. Past and continued degradation of natural resources can have a negative effect on the realism of future training exercises. To meet all environmental laws and regulations the U.S. Army Construction Engineering Research Laboratory has developed the Integrated Training Area Management (ITAM) program. A report or overview of the ITAM program is documented annually to include all assessments, accomplishments and products purchased or produced from the preceding year. This plan is reviewed annually and revised as mission, accomplishments or environmental changes warrant. Major revisions are formally reviewed every five years to include changes to the introduction, ITAM program, goals and objectives, funding equipment, back log requirements and projected budget.

The ITAM program is a comprehensive tool that consists of five components necessary to maintain and improve the condition of natural resources. Funding requirements to implement the five components identified in the ITAM Workplan are submitted to National Guard Bureau annually for validation. The five components are as follows:

1. Range and Training Land Assessment (RTLA)
2. Land Rehabilitation and Maintenance (LRAM)
3. Training Requirements Integration (TRI)
4. Sustainable Range Awareness (SRA)
5. Geographic Information System (GIS)

Range and Training Land Assessment (RTLA) Program

RTLA is the component of the ITAM program that provides for the collecting, inventorying, monitoring, managing, and analyzing of tabular and spatial data concerning land conditions on an installation. RTLA provides data needed to evaluate the capability of training lands to meet multiple use demands on a sustainable basis. It incorporates a relational database and Geographic Information System (GIS) to support land use planning decision processes. This data is intended to provide information to effectively manage land use, natural and cultural resources.

The mission requirements of the military units training on Camp Ripley determine the focus of the RTLA program. RTLA analyzes the training requirements and conducts assessments that evaluate the training lands ability to support those requirements. The results of the RTLA assessments provide treatment prescriptions that are forwarded on to the LRAM component for execution. The training requirements of Camp Ripley customers are determined using a multi-step process.

1. Review of Range Facility Management Scheduling System and the Army Range Requirements Model to determine types of units utilizing Camp Ripley.

2. Review of current tactics, techniques, and procedures being used in theater for which areas soldiers utilize during training.
3. Coordinate with units, range control, and operations to refine and prioritize assessments.

The process developed six major types of training conducted on Camp Ripley. While each type of training has its own unique requirements, they do share common characteristics that help form the mission-scape for each training type. The six training types are:

1. Field Artillery
2. Mechanized Maneuver
3. Engineer
4. Patrolling/Convoy Operations
5. Assembly Area/Bivouac
6. Light/Dismounted Infantry

Since the start of the Global War on Terrorism, added emphasis has been placed on patrol and convoy training by all units that utilize Camp Ripley while bivouac and assembly area operations have decreased due to the increased reliance on forward operating bases in the theaters of operation and tactical training bases on the installation. As operations overseas are reduced, a return to the 'traditional' training seen before the Global War on Terrorism will increase the importance of assembly area and bivouac operations.

To support the mission-scape requirements, the following is a list of the RTLA assessments currently being conducted (Table 37):

1. Annually assess Camp Ripley's maneuver trails to ensure safe travel by all vehicles (also known as LRAM assessment).
2. Assess the quality and sustainability of artillery firing points.
3. Assess woody vegetation and safety hazards in open maneuver and helipads.
4. Assess forest structure and condition for maneuver corridors in Maneuver Area K1.
5. Assess hazardous, restricted, and off-limit areas for cultural and safety concerns.
6. Monitor the maneuverability of Camp Ripley's land navigation courses.
7. Assess maneuver training areas for potential hazards.
8. Assess visibility through the forest understory for land navigation purposes.

RTLA Assessment Results

Maneuver Trails. In 2014, the north half of Camp Ripley was assessed for maneuver training damage. A total of 142 sites have been identified for repair.

Table 37. Range and training land assessments, Camp Ripley Training Center, 2014.

Project Name	2014
Assessment 1 (Maneuver Trail Condition)	North Half
Assessment 2 (Artillery Firing Points)	23 sites (Set B)
Assessment 3 (Open Maneuver and Helipads)	Open Maneuver
Assessment 4 (Maneuver Corridors)	Trail 5
Assessment 5 (Restricted Use Areas)	Camp Ripley
Assessment 6 (Land Navigation Courses)	B-7
Assessment 7 (Hazardous Artifacts)	Maneuver Area C
Assessment 8 (Forest Understory)	Training Areas 68, 69, 72, 75, 76

Artillery Points. A total of 23 (Set B) field artillery firing points were assessed in 2014. Sites were graded on ten pre-selected attributes such as encroachment, maximum slope, and surface-danger zone training conflicts. Each site was given a red, amber, or green rating with green being the most suitable land condition for field artillery. Three firing points scored red and need immediate treatment in order to be functional as firing points. A total of 179 acres of available grassland was lost due to forest encroachment and pine plantations between 1985 and 2012. To avoid future loss of available lands for artillery training it is recommended that a more frequent prescribed fire regime be implemented and fire treatments be allowed to burn into the forest edge to discourage future encroachment.

Open Maneuver and Helipads. Assessment details and attributes have been designed to conduct the open maneuver and helipad assessment starting in fall 2015.

Maneuver Corridor. Continued maintenance of maneuver corridors A, B, and C was performed by Camp Ripley staff in 2014. The native prairie grass that was seeded in the fall of 2012 was clipped in July of 2013 to establish the cover crop and treated with a foliar herbicide application in September to restrict any woody vegetation growth. In spring of 2014 the maneuver corridor was maintained with prescribed fire, to reduce invasive species while favoring fire tolerant native plants. Additional maintenance is anticipated in 2015 to clean up an extensive area damaged from high winds and storms.

The 2014 planned maneuver corridor expansion consists of one additional lane in training area 71 and one additional lane with three fingers in Training Area 70. Eagle Construction completed these two lanes, which will connect to the existing corridors and provide additional training land for mechanized maneuvers. A dormant seeding was installed late into October with additional maintenance anticipated in 2015.

Land Navigation. Land Navigation Course B-7 was assessed for snag density and traversibility. Movement throughout the course was graded easy (flat, with little brush density). Snags were tallied throughout the course as well. Two areas are in need of hazard snag removal. This is an annual task done by the ITAM crew.

Hazardous Artifacts. Maneuver Area C (5,289 Acres) was assessed for historical training and farm artifacts in late 2014. Fifteen sites were identified, none of which posed an immediate hazard.

Forest Understory. Training Areas 68, 69, 72, 75, and 76 were assessed using 185 random points. A Visual Signal-17 panel was emplaced at the assessment points and a photograph taken 50 meters away. Each photograph was rated on a 0-5 scale with 0 indicating the panel was completely obscured and 5 denoting that the panel was fully visible.

Land Rehabilitation and Maintenance (LRAM) Program

Land Rehabilitation and Maintenance is an ongoing program whereby erosion control measures and good vegetation management practices are employed to maintain and stabilize the soil. LRAM is the component of the ITAM program that provides a preventive and corrective land

rehabilitation and maintenance procedure to reduce the long-term impacts of training on Camp Ripley. LRAM uses technologies such as re-vegetation and erosion control techniques to maintain soils and vegetation required to support Camp Ripley's mission. These specifically designed efforts help to maintain Camp Ripley as a quality military training site and subsequently minimize long-term costs associated with land rehabilitation. LRAM includes programming, planning, designing, and executing land rehabilitation, maintenance, and reconfiguration projects based on requirements and priorities identified in the Training Requirements Integration and RTLA components of the ITAM program. A key component of the LRAM program is an annual assessment that is conducted to document LRAM needs attributable to past years activities.

2014 LRAM Work

The LRAM Program completed work in the following areas:

1. Repaired all 151 sites identified in the 2013 maneuver trail assessment.
2. Continued management on prior year firing point improvements consisted of stump and brush removal on 59.6 acres in Training Area 70, 71 and 79. Herbicide application treatment was applied to 44.1 acres of quaking aspen (*Populus tremloides*) and American hazel (*Corylus americana*) to maintain maneuver corridors. Herbicide application treatment was also applied to 58 acres of firing points to curtail growth of common tansy (*Tanacetum vulgare*), buckthorn (Rhamnus cathartica) and baby's breath (*Gypsophila paniculata*).
3. Hydroseeded 8.2 acres of highly erodible lands with native grass seed.
4. Repaired approximately 107 acres of maneuver damage during the summer annual training period.
5. Hand seeded 10 acres of repaired maneuver damage with native grass seed.

Major equipment purchased this year for the LRAM program included:

1. 2015 Ford F-550 4x4 Crew Cab with Aluminum Flatbed
2. Finn T-90 Hydroseeder
3. 12' Flail-Vac Native Seed Harvester
4. John Deere Loader Attachment

Training Requirements Integration (TRI)

Training Requirements Integration is a program developed to integrate the training mission with the natural resource requirements. TRI is the component of the ITAM Program that provides a decision support procedure that integrates training requirements with land management, training management, and natural and cultural resources management. The integration of all requirements occurs through continuous consultation between operations, range control, natural and cultural resources managers, and other environmental staff members, as appropriate. The INRMP and ITAM work plan are documents that require TRI input. As of 2012, the ITAM work plan is a web-based program.

Sustainable Range Awareness (SRA)

Sustainable Range Awareness is the component of the ITAM Program that provides a means to develop and distribute educational materials to land users. Materials relate procedures for sound environmental stewardship of natural and cultural resources and reduce the potential for inflicting avoidable impacts. The SRA intent is to inform land users of restrictions and activities, to avoid and prevent damage to natural and cultural resources. The SRA component applies to soldiers, installation staff, and other land users.

The SRA component purchased 9,125 laminated maps of Camp Ripley in 2012. The maps have proven to be very popular with the installations' customers and include information on the back side that supports sustainable land use. Additional brochures, pamphlets and maps are produced and distributed annually for further educational uses and per solider request.

Geographic Information System (GIS)

By Craig Erickson and Lee Anderson, Minnesota Department of Military Affairs

As a component of the Environmental and ITAM programs, GIS is used to support management of those programs and is subsequently used to implement related resource management plans such as the Integrated Natural Resources Management Plan (MNARNG 2003, MNARNG 2007), Integrated Cultural Resource Management Plan (Camp Ripley Environmental Office 2009), Forestry Management Plan (MNARNG 2002), Integrated Wildland Fire Management Plan (MNARNG 2009b), Protected Species Management Plan (Dirks et al. 2010), Lake Management Plan (Dirks and Dietz 2009), Range Complex Master Plan, and the Camp Ripley and Arden Hills Army Training Site Development Plan.

Whether used for data development, maintenance, analysis, display, or cartographic production this decision support tool is maintained to adapt with end user needs. Continuous coordination with program support personnel, other directorates, departments and external entities are required to ensure the most accurate and complete geospatial data is available.

Program coordination both within MNARNG and ARNG are facilitated through working groups. The MNARNG GIS Working Group meets monthly and consists of GIS and CAD staff from Camp Ripley Command (CRC) and the Facilities Management Office (FMO) with occasional participation from Range Control, Dept of Public Works (DPW), and the Joint Operations Center (JOC). At the Federal level the Environmental Advisory Committee (EAC) sponsors a Work Group to address GIS and automation related issues. This group is made up of 10 state GIS representatives, to include a representative from MN, the ARNG-ILE GIS Manager and an EAC representative who functions as the working group chair.

Environmental, ITAM, Facilities Management, Information Technology (J6), and Operations (J3) are the core program areas supporting GIS within the MNARNG. The established coordination between these areas has led to an expanded use of GIS in support of other program areas as well.

These areas include family assistance, recruiting and retention, Personnel (J1), logistics, and public safety. Although not specific to this document it should be noted that GIS personnel also support those efforts outside primary program areas.

The use of consistent datasets and products across common geographic areas (i.e., Camp Ripley and AHATS) as well as the required integration between range management and environmental sustainability initiatives has inherently lead to shared efforts regarding GIS support for the Environmental and ITAM programs. As a result, designating specific efforts between these two program areas is not always clear cut. Therefore, for the sake of simplified reporting, GIS accomplishments and management efforts listed in this section include support beyond the ITAM program.

Data Management

Several MNARNG GIS goals and objectives are defined by Federal, Army, and NGB regulations that govern management of GIS. These regulations pertain to data standardization and conceptual design of the system. The goal is to coordinate data and GIS structure within the states as well as nationally. This coordination and standardization is necessary to keep state and federal efforts synchronized. In accordance with these regulations, Environmental related data layers within the MNARNG GIS repository are compliant with the Spatial Data Structure for Facilities, Installations, and Environment (SDSFIE) version 2.6 as well as Federal Geographic Data Committee metadata standards.

To support visibility and analysis efforts, standardized geospatial data layers are submitted annually to the Department of the Army and Army National Guard. Specific to ARNG-ILE (Army National Guard-Installations Logistics Environment) are the Common Installation Picture (CIP) layers. The Army Sustainable Range Program (SRP) also has requirements for annual data submissions. These requirements initiate a review of current data layers and coordination with subject matter experts to ensure spatial and attribute data is current, accurate, properly documented, and compliant with CIP and SRP Quality Assurance Plans (QAP). In addition to those submissions there is continued development and maintenance of geospatial data layers based upon MNARNG business needs.

This year a set of fields were added to each feature class within our production geodatabases to track feature level metadata. These additions to the SDSFIE schema are considered as extended compliance. They are used to record feature source, method to create or add a feature, last date feature geometry was verified, and the last date feature attributes were verified. The intension is to continue maintaining these attributes until metadata capabilities within ArcGIS are able to support feature level metadata.

End User Support

- Major efforts in 2014:
    - Army Compatible Use Buffer
    - Camp Ripley Site Development Plan
    - Range Complex Master Plan
    - Solar Field site suitability analysis
    - Range reconciliation between Planning Resource Infrastructure Development and Evaluation, Range Facility Management Scheduling System, and GIS
    - Range Firing Management Support System Graphic Fire Desk (GFD) setup
    - Explosive Safety Siting
    - Cultural Resource geospatial data reorganization
    - Coordination of Camp Ripley military installation map revision
    - Camp Ripley and AHATS events (hunts, fishing, races, and other outreach)
    - Plans and reports (Annual Report, Prescribed Fire Plan, Landscape Plan, Norwegian Soldier Exchange)

- Custom maps (hard copy and digital) continue to be the primary GIS product for non-GIS staff.
    - Total maps: 1,395
    - Approximately 476 map projects created or modified

- The Map Library on the MNARNG Sharepoint site continues to provide wider dissemination of commonly requested maps.
    - Total page views: 8226
    - Average daily unique visitors: 4.9

- All production data has been maintained to SDSFIE and QAP (CIP and SRP) standards.

- Submitted SRP QAP compliant data layers to ARNG to fulfill annual data requirements.

- Participated in the pilot migration to SDSFIE 3.1 Army Adaptation.

Information Technology Coordination

The J6 (Information Technology) directorate is responsible for hardware, software and network support for the MNARNG. All of which are essential components of a GIS. With improved network security the ability for general users to manage these components has become increasingly limited. In order to obtain the necessary permissions and priority to maintain core components of the GIS a member of the Environmental GIS staff has been functioning as a liaison with the J6 Directorate.

Through this relationship the approval of GIS related software for use on the NGMN domain has been expedited. This has also allowed for more timely installs of newly approved software as well as a J6 point of contact for resolving GIS related software issues.

The five production GIS databases (gER, gINST, gIMG, gMN, and gSRP) reside on J6 production servers. In addition, network storage space has been designated as GIS workspace to better organize GIS project files across multiple functional areas and allow for simplified sharing of projects and project specific data. The integration of GIS data and applications onto J6 systems also allows us to take advantage of in-place continuity of operations and fail over procedures. In addition it reduces the overhead of hardware costs and maintenance for Environmental and ITAM as well as the other program areas using the system.

GIS staff with privileged level permissions is critical for supporting web based applications. The ability to disseminate a web based interface to interact with data from multiple program areas and sources is a powerful capability of this technology and it will continue to expand within the MNARNG. Understanding data sources and limitations are essential for reliable analysis and information sharing through web applications; as are application development capabilities for improvement of tools and interfaces to present data for specific user needs. This will require continued integration and support between J6 and GIS personnel.

OUTREACH AND RECREATION

By John Maile, Minnesota Department of Military Affairs

One of Camp Ripley's missions is to add value to the community. The environmental team does this by being active in many special events. Camp Ripley is a valuable asset to the local community and the state of Minnesota. It is important that Camp Ripley, in particular the environmental team, be interactive with the citizens of our community and the state of Minnesota. Over the past year, the environmental team has helped implement activities such as the Morrison County Water Festival, Earth Day and National Public Lands Day.

The Environmental Office has been a long-term partner with various educational institutions within the state. Camp Ripley's environmental team is also involved in local high school job shadow programs. The shadow program provides an out-of-classroom experience for those students interested in the natural resources field. The environmental team provides about ten different natural resource options including large mammal radio telemetry, fisheries, forest inventory and bird surveys to name a few. Our desire is to ensure that each student realizes a valuable learning experience while shadowing with Camp Ripley environmental personnel. Partnering with local colleges has not only been beneficial to the students but the environmental program as well. Central Lakes College has been a valuable partner with the fisher research project.

Camp Ripley is also available for environmental presentations and tours. Using the Martin J. Skoglund environmental classroom has been a great way to introduce students to conservation and hands-on science. In 2014, the environmental team gave 85 presentations, tours, and briefs to 4,500 people entailing more than 300 staff hours.

Hunting Programs

Disabled American Veterans Firearms Wild Turkey Hunt

Camp Ripley hosted the tenth annual Disabled American Veterans (DAV) turkey hunt on May 4-6, 2014. Beautiful mid-spring conditions welcomed the hunters this year. The hunt was again organized and conducted by the Veterans Administration and Minnesota Chapter of the National Wild Turkey Federation with support from Camp Ripley staff and DNR. Thirty-six hunters participated in this year's turkey hunt, harvesting five birds (Table 38).

Table 38. Disabled American Veterans spring wild turkey hunts, Camp Ripley Training Center, 2005-2014.

Year	Turkeys Harvested	Hunter Success	Permits Issued	Number of Hunters	Dates	Largest Turkey (lbs)
2005	11	58%	22	19	May 3-4	24
2006	12	48%	27	25	April 25-26	22.5
2007	15	52%	31	29	April 25-26	23.5
2008	27	75%	39	36	April 23-24	23.8
2009	23	66%	40	35	April 22-23	23.6
2010	15	40%	40	37	April 21-22	24.6
2011	16	46%	40	35	April 20-21	Unk.
2012	19	50%	40	38	April 25-26	Unk.
2013	12	38%	40	32	April 24-26	Unk
2014	**5**	**14%**	**40**	**36**	**May 4-6**	**23.5**
Total	**155**		**359**	**322**		
Avg.	**15**	**48%**				

Deployed Soldiers Firearms Wild Turkey Hunt

Camp Ripley hosted its sixth annual deployed soldiers turkey hunt on May 1-2, 2014. The hunt was organized and conducted by the Environmental Office. This hunt was organized into one, 2-day hunt period (Table 39).

Table 39. Deployed soldiers spring wild turkey hunt, Camp Ripley, 2009-2014.

Year	Turkeys Harvested	Hunter Success	Permits Issued	Number of Hunters	Dates	Largest Turkey (lbs)
2009	18	64%	45	28	April 27-29	23.8
2010	25	53%	60	47	April 26-28	25.5
2011	27	46%	86	58	April 25-26 April 28-29	23.4
2012	27	53%	86	53	April 30- May 1 May 3-4	23.5
2013	30	57%	92	52	April 29-30 May 2-3	24.86
2014	**29**	**47%**	**70**	**62**	**May 1-2**	**24.3**
Total	**156**		**348**	**300**		
Avg.	**26**	**53%**				

Disabled American Veterans Firearms Deer Hunt

The twenty-third annual Disabled American Veterans (DAV) firearms deer hunt on Camp Ripley was held October 7-8, 2014. This year 54 hunters participated. Unseasonably warm weather greeted the hunters on the first day followed by heavy rains the second day. However, the hunters made the best of it and harvested seven deer (Table 40).

Table 40. Disabled American Veterans firearms white-tailed deer hunt, Camp Ripley Training Center, 1992-2014.

Year	Deer Harvested	Hunter Success	Bucks	Does	Fawns	Permits Issued	Number of Hunters	Dates	Largest Deer (lbs)
1992	7	37%	4	2	1	19	19	Oct. 14-15	152
1993	11	35%	5	4	2	31	31	Oct. 13-14	132
1994	14	35%	3	3	8	42	40	Oct. 12-13	185
1995	6	15%	1	5	0	40	39	Oct. 11-12	142
1996	9	23%	3	4	2	40	39	Oct. 9-10	132
1997	9	23%	2	2	5	40	38	Oct. 8-9	152
1998	11	30%	2	5	4	39	37	Oct. 7-8	129
1999	8	23%	4	3	1	38	35	Oct. 6-7	137
2000	14	37%	5	5	4	40	38	Oct. 4-5	181
2001	4	11%	1	1	2	45	38	Oct. 10-11	123
2002	12	26%	3	8	1	46	46	Oct. 9-10	144
2003	10	20%	4	6	0	50	48	Oct. 8-9	160
2004	15	33%	6	7	2	48	45	Oct. 6-7	184
2005	12	24.5%	3	7	2	52	49	Oct. 5-6	152
2006	9	19.5%	2	6	1	50	46	Oct. 4-5	146
2007	18	31%	7	8	3	59	59	Oct. 3-4	168
2008	9	16%	2	6	1	58	53	Oct 8-9	180
2009	13	25%	5	4	4	55	52	Oct 7-8	174
2010	8	12%	2	5	0	60	55	Oct 6-7	123
2011	12	20%	3	9	0	60	59	Oct. 5-6	170
2012	9	14%	4	3	1	60	56	Oct. 3-4	10 pts, 200
2013	7	13%	1	5	1	60	54	Oct. 1-2	130
2014	**7**	**15%**	**2**	**5**	**0**	**55**	**47**	**Oct 7-8**	**4pts, 117lbs**
Total	**234**		**75**	**112**	**48**		**1023**		
Avg.	**10**	**24%**	**3**	**4.8**	**2**		**42**		

Deployed Soldiers Muzzleloader Deer Hunt

The fourth annual deployed soldiers muzzleloader deer hunt at Camp Ripley was held December 1-3, 2014. Soldiers that had most recently returned from a deployment were given priority for hunt permits. Forty-seven of the 71 soldiers selected attended the hunt. Weather conditions were near perfect during the hunt, cold and snow cover allowed the hunters to find the active deer. The hunt was a huge success, bagging 29 with some very impressive bucks being taken (Table 41).

Table 41. Deployed soldiers muzzleloader white-tailed deer hunt, Camp Ripley Training Center, 2014.

Year	Deer Harvested	Hunter Success	Bucks	Does	Fawns	Permits Issued	Number of Hunters	Dates	Largest Deer (antler points/lbs)
2011	14	28%	3	7	4	64	49	Nov. 28-30	8 pts, 150
2012	49	86%	15	25	9	73	57	Nov. 26-28	8 pts, 166
2013	34	85%	17	12	5	61	40	Dec. 2-4	11 pts, 178
2014	**29**	**61%**	**11**	**14**	**4**	**71**	**47**	**Dec. 1-3**	**10 pts, 175**
Total	**126**		**46**	**58**	**22**	**269**	**193**		
Avg.	**31.5**	**65%**	**11.5**	**14.5**	**5.5**		**48.25**		

Soldiers Archery Deer Hunt

The ninth annual soldiers archery deer hunt was held on October 7-8 in conjunction with the DAV firearm hunt on Camp Ripley. Soldiers were allowed to hunt in any non-restricted areas north of Cassino Road. One hundred and seventy-five permits were available, 151 hunters applied and all granted a permit to hunt. A total of 88 hunters participated in this year's hunt (Table 42).

Table 42. Soldiers archery deer hunt, Camp Ripley Training Center, 2006-2014.

Year*	Deer Harvested	Hunter Success	Bucks	Does	Fawns	Permits Issued	Number of Hunters	Dates	Largest Deer (lbs)
2006	6	15%	3	3	0	100	39	Oct 4-5	92
2007	10	17%	1	6	3	123	59	Oct 3-4	175
2008	14	25%	6	6	2	123	56	Oct 8-9	141
2009	11	22%	3	7	1	126	51	Oct 7-8	198
2010	12	13%	5	7	0	135	90	Oct 6-7	214
2011	2	3%	0	2	0	89	53	Oct 5-6	Unk.
2012	23	23%	5	12	6	132	96	Oct 3-4	182
2013	7	6%	2	5	0	150	109	Oct 1-2	150
2014	**8**	**9%**	**3**	**4**	**1**	**151**	**88**	**Oct 7-8**	**10pts/148**
Total	**94**		**26**	**49**	**18**		**639**		
Avg.	**10**	**15%**	**2.8**	**5.4**	**2**				

*****2006-2012 permitted hunters were soldiers who had been mobilized to support the Global War on Terrorism since September 11, 2001.

Youth Archery Deer Hunt

The thirteenth annual youth archery deer hunt was held October 10-12, 2014. Like past years the participants were allowed to hunt in any non-restricted areas north of Cassino Road. The hunt was coordinated by the Minnesota Deer Hunters Association, the Minnesota State Archery Association, Camp Ripley, and the DNR. In 2014, a total of 175 permits were issued with 134 hunters participating, harvesting five deer (Table 43).

Table 43. Youth archery white-tailed deer hunt, Camp Ripley Training Center, 2002-2014.

Year	Deer Harvested	Hunter Success	Bucks	Does	Fawns	Permits Issued	Number of Applicants	Number of Hunters	Dates	Largest Deer (lbs)
2002	13	14.9%	5	3	5	100	267	87	Oct 12-13	168
2003	10	7.7%	4	5	1	150	216	132	Oct 11-12	118
2004	9	7.1%	1	7	1	150	217	127	Oct 9-10	126
2005	20	15%	8	12	0	152	219	133	Oct 8-9	196
2006	13	9.7%	5	6	2	150	259	133	Oct 7-8	127
2007	19	14%	6	5	8	150	234	136	Oct 6-7	141
2008	10	8.1%	3	5	2	150	220	124	Oct 11-12	114
2009	12	7.5%	2	7	3	150	240	130	Oct 10-11	120
2010	7	5%	2	5	0	150	250	136	Oct 9-10	132
2011	9	6%	3	4	2	175	229	153	Oct 8-9	Unknown
2012	10	7.2%	5	3	2	175	252	139	Oct 6-7	Unknown
2013	10	7.3%	4	3	3	175	273	137	Oct 12-13	131
2014	**5**	**3%**	**2**	**2**	**1**	**175**	**196**	**134**	**Oct 11-12**	**120**
Total	**147**		**50**	**67**	**30**	**2,002**		**1,695**		
Avg.	**11.3**	**8.6%**	**3.8**	**5.1**	**2.3**			**130**		

General Public Archery Deer Hunt

The annual general public archery deer hunt at Camp Ripley continues to be known as one of the largest and most anticipated archery hunts in the nation since its establishment in 1954. This hunt is administered by the DNR. Hunters are allowed to apply for one of two, 2-day seasons. This year, the hunts were held on October 15-16 and 25-26. For the eleventh year, hunters were permitted to use a bonus tag, allowing them to tag an antlerless deer without having to use their regular archery tag. In 2014, the number of permitted hunters was 3,805. A total of 2,966 hunters participated in the 2014 archery hunts (Table 44). There were 145 deer harvested during the two hunts.

Disabled Veterans and Deployed Soldiers Fishing Event

In 2014, Camp Ripley environmental staff with the help of other organizations put together the fourth annual Trolling for the Troops fishing event. Again, professional fishing guides, disabled

Table 44. General public archery white-tailed deer hunts, Camp Ripley Training Center, 1983-2014 (*Years when bonus tags were allowed).

Year	Deer Harvested	Adult Bucks	%	Adult Does	%	Fawns	%	Permits Issued	# of Hunters	Hunter Success	1st Season	2nd Season	Largest Deer (lbs)
1983	237	89	38	94	40	54	22	3,500	2,831	8.4%	OCT. 8-9	OCT. 15-16	253
1984	387	162	42	151	39	74	19	4,500	3,815	10.1%	OCT. 6-7	OCT. 27-28	238
1985	278	118	42	113	41	47	17	5,000	3,996	7.0%	OCT. 12-13	OCT. 27-28	257
1986	257	106	41	83	32	68	26	5,000	3,940	6.5%	OCT. 11-12	OCT. 25-26	243
1987	284	122	43	91	32	71	25	5,000	4,112	6.9%	OCT. 10-11	OCT. 24-25	250
1988	241	91	38	101	42	49	20	5,000	4,090	5.9%	OCT. 8-9	OCT. 22-23	262
1989	215	95	44	75	35	45	21	4,000	3,136	6.9%	OCT. 17-18	OCT. 28-29	226
1990	301	137	46	115	38	49	16	3,500	2,585	11.6%	OCT. 27-28	NOV. 17-18	225
1991	219	87	40	90	41	42	19	4,000	2,217	9.9%	OCT. 19-20	NOV. 30-DEC. 1	232
1992	406	228	56	140	35	38	9	4,500	3,156	12.9%	OCT. 31-NOV. 1	NOV. 21-22	224
1993	287	147	51	82	29	58	20	5,000	4,127	7.0%	OCT. 21-21	OCT. 30-31	237
1994	267	136	51	95	36	36	13	4,000	3,158	8.5%	OCT. 20-21	OCT. 29-30	237
1995	247	102	41	100	41	45	18	4,500	3,564	6.9%	OCT. 19-20	OCT. 28-29	256
1996	160	78	49	55	34	27	17	4,000	3,154	5.1%	OCT. 17-18	OCT. 26-27	248
1997	142	67	47	57	40	18	13	3,000	2,316	6.1%	OCT. 16-17	OCT. 25-26	243
1998	189	116	61	50	26	23	12	3,000	2,291	8.2%	OCT. 15-16	OCT.31- NOV. 1	249
1999	203	100	49	83	41	20	10	3,000	2,335	8.7%	OCT. 21-22	OCT. 30-31	251
2000	375	228	61	109	29	38	10	4,000	3,128	12.0%	OCT. 19-20	OCT. 28-29	247
2001	350	192	55	126	36	32	9	4,500	3,729	9.4%	OCT. 18-19	OCT. 27-28	272
2002	324	186	57	102	31	36	11	4,500	3,772	8.6%	OCT. 17-18	OCT. 26-27	235
2003	318	161	51	120	38	37	11	4,500	3,810	8.3%	OCT. 16-17	OCT. 25-26	247
***2004**	484	218	45	206	43	60	12	4,521	3,836	12.4%	OCT. 21-22	OCT. 30-31	235
***2005**	477	186	39	218	46	73	15	4,522	3,813	12.5%	OCT.20-21	OCT.29-30	245
***2006**	514	165	32	241	47	108	21	5,009	4,351	11.8%	OCT. 19-20	OCT. 28-29	244
***2007**	476	150	32	228	48	98	20	5,014	4,294	11.1%	OCT. 18-19	OCT. 27-28	255
***2008**	516	183	35	220	43	113	22	5,005	4,167	11.9%	OCT. 19-20	OCT. 26-27	234
***2009**	477	190	40	202	42	85	18	5,005	4,126	11.4%	OCT 15-16	OCT 31-NOV 1	265
***2010**	507	187	37	228	45	92	18	5,002	4,293	11.8%	OCT 20-21	OCT 30-31	253
***2011**	422	153	18	185	32	84	20	5,000	4,305	10.2%	OCT 20-21	OCT 29-30	215
***2012**	429	176	41	169	39	84	20	5,003	4,205	9.8%	OCT 18-19	OCT 27-28	215
***2013**	308	116	37	130	42	65	21	5,002	4,488	6.8%	OCT 26-27	NOV 2-3	223
***2014**	**145**	**55**	**38**	**65**	**45**	**25**	**17**	**3,805**	**2,966**	**4.8%**	**OCT 15-16**	**OCT 25-26**	**207**

veterans and deployed, currently serving or retired soldiers were combined into teams for a day of fishing. The event was held on June 5 and 6, 2014. The event continues to be supported by the American Legion, Veterans of Foreign Wars, DAV, Minnesota National Guard, and Upper Mississippi River Smallie Club. The event continues to be a huge success and a 2015 event is being planned.

ARDEN HILLS ARMY TRAINING SITE

The Twin Cities Army Ammunition Plant was one of six Government Owned-Contractor Operated plants built to produce small arms ammunition during World War II. The MNARNG began leasing its current facility in 1972 and the Organizational Maintenance Shop vehicle maintenance buildings were constructed in 1973. In September 2000, MNARNG acquired accountability for a portion of the 2,347-acre installation. That portion of the Twin Cities Army Ammunition Plant is now known as the Arden Hills Army Training Site (AHATS) (Figure 3). Presently, AHATS consists of 1,500 acres, which is available for military training and consequently, environmental management. AHATS is located in the northern portion of the city of Arden Hills, approximately eight miles north of the St. Paul city limits and six miles northeast of the Minneapolis city limits. Other surrounding municipalities include New Brighton, Mounds View, and Shoreview.

Population and monitoring studies along with management of the flora and fauna is an ongoing part of the installation's Integrated Natural Resources Management Plan (INRMP), which was completed in November of 2001 and updated in 2007 (Dirks et al. 2008), 2008 (Dirks and Dietz 2009), 2009 (Dirks and Dietz 2010), 2010 (Dirks and Dietz 2011), 2011 (MNDNR and MNARNG 2012), 2012 (MNDNR and MNARNG 2013), and 2013 (Appendix B). The data obtained will be used to help manage the natural resources on AHATS. Thirty-one mammal species, 147 bird species and 298 plant species have been identified at the training site.

CULTURAL RESOURCES

By Patrick Neumann, Minnesota Department of Military Affairs

Arden Hills Army Training Site (AHATS) is a federally owned property leased to the MNARNG. As a federal property overseen by the MNARNG and funded by federal dollars, all of the same laws and regulations exist for managing cultural resources within the boundaries of AHATS that apply for all other MNARNG controlled properties.

AHATS has been surveyed for cultural resources in its entirety and no eligible resources are present at this time. There are also Advisory Council for Historic Preservation program comments regarding existing structures which completes the section 106 process regarding historic structures for the MNARNG at AHATS. Any future construction at AHATS will be submitted to the Minnesota State Historical Preservation Office for review and will comply with all laws regarding cultural resources. Should any unknown cultural materials be encountered during construction, all construction activities in the vicinity will cease until a cultural survey can be completed.

LAND USE MANAGEMENT

Land Use Control and Remedial Design

By Mary Lee, Minnesota Army National Guard (MNARNG)

The Operable Unit 2 (OU2) Land Use Control Remedial Design (LUCRD) New Brighton/Arden Hills Superfund Site passed the Consistency Test and was signed on September 27, 2010. Land Use Controls (LUC) are required as part of the remedies for soil, sediment, and groundwater at specific areas within OU2. LUC are needed because the current concentrations of various contaminants within these areas are above levels that allow for unlimited use or unrestricted exposure. There are no LUC for military training; however some soil caps and digging restrictions are present on AHATS.

The MNARNG, as part of its community responsibility, wants to make AHATS available for nonmilitary users, including those under age 18. The exposure levels for those under 18 are more restrictive. In order to reach the exposure levels the LUCRD must be amended. OU2 LUCRD Revision 2 passed final consistency on 28 June 2011. This revision changed the Wildlife Viewing Area and twenty acres at site F to 'unrestricted' and a selected portion of the cantonment area to 'restricted commercial'. A request for revision has been submitted to the Minnesota Pollution Control Agency by the Army to amend the balance of the cantonment area and portions of the training areas and is moving forward with favorable outcomes expected in 2015.

As a result, the conditions of the LUCRD must be honored by the MNARNG relative to their long-range planning, land use, and land management practices on AHATS. To ensure compliance with the conditions of the LUCRD, MNARNG is hereby referencing the LUCRD and inserting a copy as an appendix to the AHATS Master Plan/Site Development Plan (MNARNG 2009a) and the AHATS INRMP (MNARNG 2007 and Appendix B), or by updating this annual report. It is understood that any future revisions to the LUCRD will automatically supersede any earlier editions.

NATURAL RESOURCES

Natural resource planning is an integral part of the Conservation Program for the MNARNG. The MNARNG uses the INRMP as the guidance document for implementing the Conservation Program. The planning process used in developing the INRMP focuses on using key stakeholders from the MNARNG, DNR, the U.S. Fish and Wildlife Service, and other organizations that have an interest in the MNARNG's Conservation Program. Together, these stakeholders represent the Integrated Natural Resources Management Planning Committee. The primary responsibility of the Planning Committee is to ensure that the INRMP not only satisfies the military mission but also provides a foundation for sound stewardship principles that adequately address the issues and concerns that are raised by all stakeholders. Annually, stakeholders discuss and review the INRMP for

AHATS, and present their annual accomplishments and work plans for the next year. Please refer to Appendix D for the 2013 AHATS annual meeting minutes.

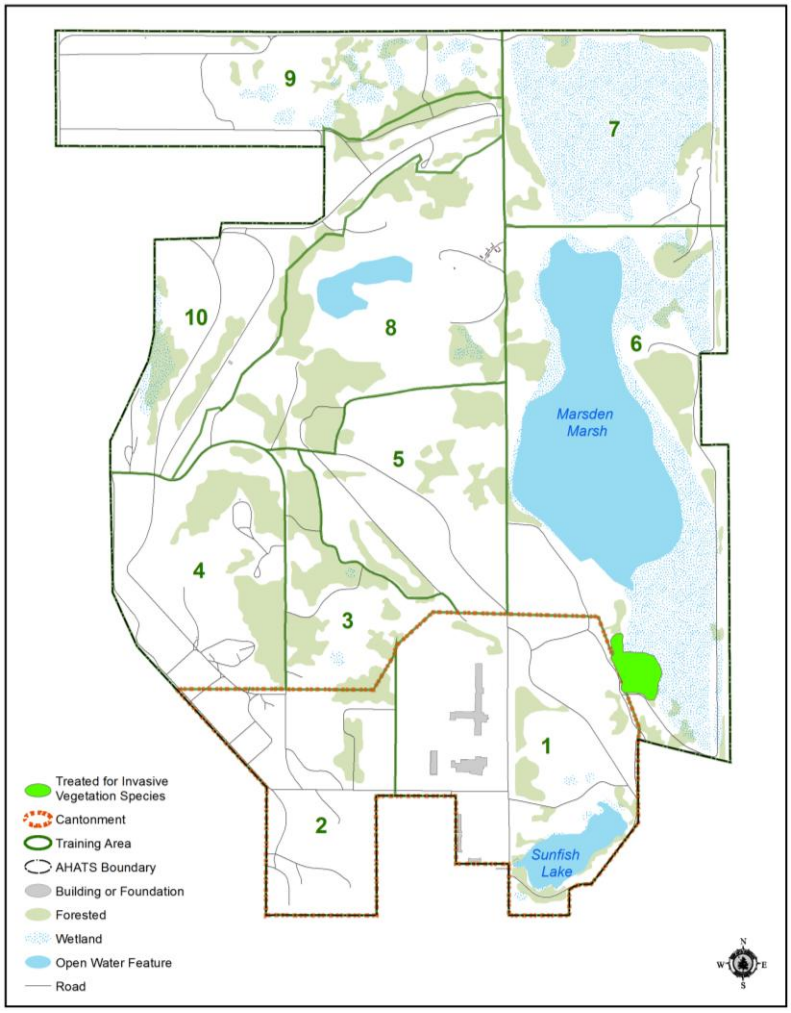
Vegetation Management

Terrestrial Invasive Species Control

By Jason Linkert, Minnesota Department of Military Affairs

Common buckthorn (*Rhamnus cathartica*) and glossy buckthorn (*Rhamnus frangula*) are prolific forest invaders in Minnesota that outcompete and prevent the regeneration of native species in the forest understory. In 2014, Environmental staff from Camp Ripley and AHATS lead a buckthorn removal project with assistance from St. Cloud State University and Central Lakes College interns. Over five acres of buckthorn was treated in Training Area 6 during the week long project (Figure 44). Small buckthorn trees were mechanically removed with power brush saws and larger trees up to 12" in diameter breast height were felled with chain saws. The logs and brush were stacked in numerous piles for removal this winter and the stumps were cut-stump treated with triclopyr to prevent any future stump sprouting. The site will require numerous chemical and mechanical treatments over the next few years to prevent stump sprouting. An additional herbicide treating was completed on an adjacent area of buckthorn infestation that was cut in 2012.

Figure 44. Terrestrial invasive plant treatment location, Arden Hills Army Training Site, 2014.



Wildlife

By Nancy J. Dietz and Brian J. Dirks, Minnesota Department of Natural Resources

Species in Greatest Conservation Need

Species in greatest conservation need (SGCN) are defined as native animals whose populations are rare, declining, or vulnerable to decline and are below levels desirable to ensure their long-term health and stability. One of the federal requirements of the Comprehensive Wildlife Conservation Strategy to manage species in greatest conservation need is that all states and territories develop a wildlife action plan. "Tomorrow's Habitat for the Wild and Rare" is Minnesota's response to this congressional mandate. It provides direction and focus for sustaining SGCN into the future (MNDNR 2006).

The goal of the wildlife action plan is to 1) stabilize and increase populations of SGCN, 2) improve knowledge about SGCN, and 3) enhance people's appreciation and enjoyment of SGCN. Additional research will be directed toward identifying other SGCN species on AHATS, and management or conservation actions that could be implemented to benefit these species.

In Minnesota, 292 species meet the definition of species in greatest conservation need (MNDNR 2006). All listed species (federal and state) are included on the SGCN list. This set of SGCN includes mammals, birds, reptiles, amphibians, fish, insects, and mollusks, and represents about one-quarter of the nearly 1,200 animal species in Minnesota that were assessed for this project (MNDNR 2006). AHATS provides habitat for 39 SGCN, including 36 bird species of which 22 are songbirds, two mammals, and a reptile (Appendix D in MNDNR and MNARNG 2013).

The DNR is currently updating its wildlife action plan with targeted completion in 2015. In August 2013, DNR amended its list of state endangered, threatened, and species of concern by changing the status of 302 species of mammals, birds, reptiles and amphibians, fish, mollusks, insects, vascular plants, lichens, mosses and liverworts, and fungi. These amendments to the state listed species will cause many species to be added as species in greatest conservation need and these changes will be reflected in the updated wildlife action plan in 2015.

Birds

Christmas Bird Count

The Christmas Bird Count (CBC) has been coordinated by the National Audubon Society since 1900, and has become the oldest continuous nationwide wildlife survey in North America (Sauer et al. 2008). Counts occur within predetermined 15-mile diameter circles located across North America, Mexico, and South America. All of AHATS is found within the St. Paul, north (CBC census code: MNSP) census circle. Each count is conducted during a single calendar day within two weeks of Christmas (December 14 to January 5). The St. Paul, north census was started in 1967, and the census

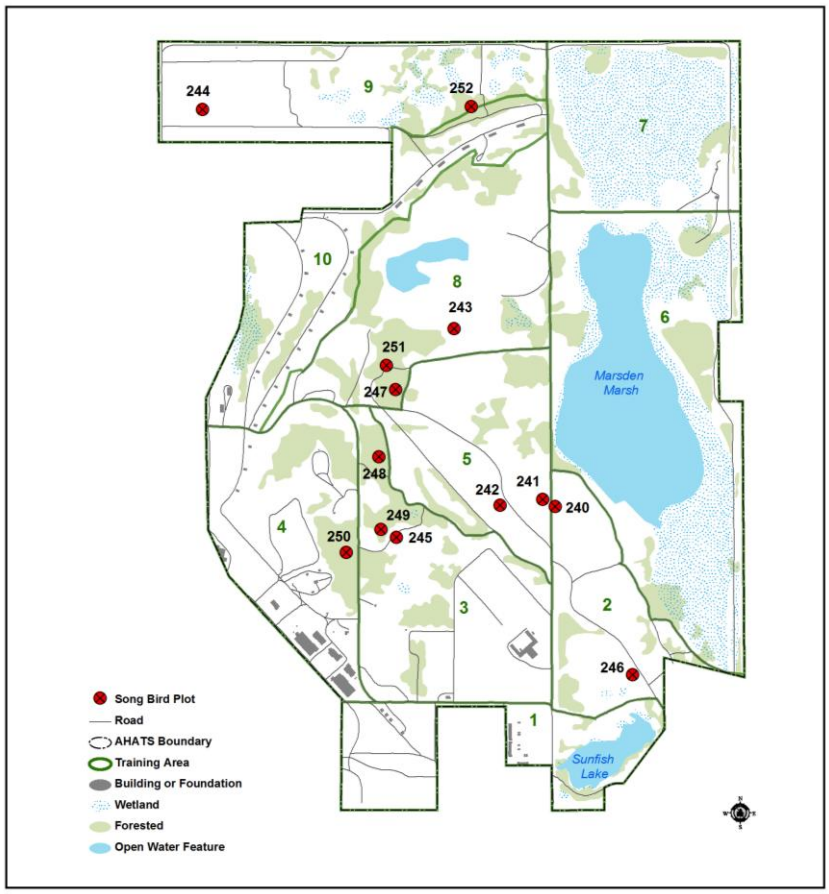
Table 45. Christmas bird count data, Arden Hill Army Training Site, winter of 2009-2014.

Species	Scientific Name	Dec. 18, 2009	Dec. 18, 2010	Dec. 17, 2011	Dec. 15, 2012	Dec. 14, 2013	Dec. 20, 2014
Canada goose	*Branta canadensis*	28	20	2	25		
Trumpeter swan	*Cygnus buccinator*	7	2		2		
Mallard	*Anas platyrhynchos*	~1500	~1300	~800	300	625	205
Canvasback	*Aythya valisineria*		1				
Common goldeneye	*Bucephala clangula*		6			1	
Common merganser	*Mergus merganser*					1	
Bald eagle	*Haliaeetus leucocephalus*	1		4	4	1	3
Red-tailed hawk	*Buteo jamaicensis*	6	5	4	4	3	1
Rough-legged hawk	*Buteo lagopus*	1			1		5
Wild turkey	*Meleagris gallopavo*	13	9	22	17	10	
Ring-billed gull	*Larus delawarensis*				1		
Rock pigeon	*Columba livia*		1	7			
Mourning dove	*Zenaida macroura*			13	8	3	5
Great horned owl	*Bubo virginianus*	1		3	3		3
Red-bellied woodpecker	*Melanerpes carolinus*	1		1		2	1
Downy woodpecker	*Picoides pubescens*	1	4	6		6	10
Hairy woodpecker	*Picoides villosus*	1		2	1	3	2
Pileated woodpecker	*Dryocopus pileatus*				1		
Northern shrike	*Lanius excubitor*		5	1	3	2	1
Blue jay	*Cyanocitta cristata*		2	6		50	5
American crow	*Corvus brachyrhynchos*	25	39	16	45	71	100
Black-capped chickadee	*Parus atricaillus*	9	10	62	11	48	47
White-breasted nuthatch	*Sitta corolinensis*		2	8	4	5	6
American tree sparrow	*Spizella arborea*	3		52	50	6	3
Dark-eyed junco	*Junco hyemalis*				15	2	6
Northern cardinal	*Cardinalis cardinalis*				4	5	
American goldfinch	*Carduelis tristis*		1	20		2	
House sparrow	*Passer domesticus*				20	1	
# Observers		**Unk.**	**Unk.**	**5**	**3**	**4**	**6**
TOTAL # INDIVIDUALS		**1,597**	**1,406**	**1,029**	**521**	**847**	**401**
TOTAL # SPECIES		**14**	**15**	**18**	**20**	**20**	**16**

has occurred 47 times (Minnesota Ornithologists' Union 2014). CBC data is primarily used to track winter distribution patterns and population trends of various bird species.

The 2014-2015 CBC at AHATS occurred on Saturday, December 20, 2014, and was conducted by Craig Mullenbach, Tom McCarthy, Amber Burnette, Bob Holtz, and Jerry Hogeboom, St. Paul Audubon Society volunteers, and Mary Lee, AHATS staff. The temperature was 30 degrees Fahrenheit, with winds of 6 miles per hour, and overcast with no precipitation (Wunderground 2014b). Four hundred and one birds of 16 species were counted at AHATS during the annual CBC (Table 45).

Figure 45. Permanent songbird survey plots, Arden Hills Army Training Site, 2001-2014.



Breeding Bird Monitoring

As a natural oasis in a mostly metropolitan area, AHATS provides important breeding and migratory habitat for bird species in greatest conservation need (SGCN). Thirty-six SGCN birds have been identified on AHATS, including both breeding and migratory species (Appendix D in DNR and MNARNG 2013). Nineteen SGCN birds including waterbirds, raptors, and songbirds are known to breed on AHATS; four were recorded during songbird point count surveys this year.

Songbird surveys were conducted on 10 permanent plots (Figure 45) on June 6, 2014. Two grassland plots, #241 and #242, and one woodland plot, #249, were not surveyed in 2014. Surveys have been conducted on these plots since 2001. A total of 90 birds consisting of 33 different species were recorded. Overall, the average number of birds per plot was 9.0 and the average number of species per plot was 8.0 (Table 46 and Figure 46). Trends of three SGCN grassland songbirds are presented in Figure 47.

Grassland plots (*n*=5) contained 25 bird species and 28 total birds. The average number of birds found on grassland plots was 5.6 and the average number of species per plot was 5.0 (Table 46 and Figure 46). Grasshopper sparrows (*Ammodramus savannarum*), a SGCN, had been increasing in abundance since 2009, and were the most abundant grassland plot bird in 2011 but dropped to none in 2012 and to one in 2013 and 2014. Eight of the past twelve years, clay-colored sparrows (*Spizella pallida*) were the most abundant species recorded on grassland plots (Table 47). Grassland management at AHATS in recent years has involved prescribed burning and tree and invasive shrub removal, which limits encroachment of trees and brush into grasslands. Grassland birds benefit from the absence of trees due to the lack of perches for predators and brown-headed cowbirds (*Molothrus ater*), a brood parasite. Brushy grasslands are more suitable for edge species, such as the American goldfinch (*Carduelis tristis)*.

Woodland plots (*n*=5) contained 28 species and 62 total birds. The average number of birds found on woodland plots was 12.4 and the average number of species per plot was 11.0 (Table 46 and Figure 46). The most abundant birds on woodland plots in 2014 were common yellowthroat (*Geothlypis trichas*), eastern wood-pewee (*Contopus virens*), and American goldfinch (*Carduelis tristis*) (Table 47).

Figure 46. Average number of songbird species per plot, Arden Hills Army Training Site , Minnesota, 2001 to 2014.

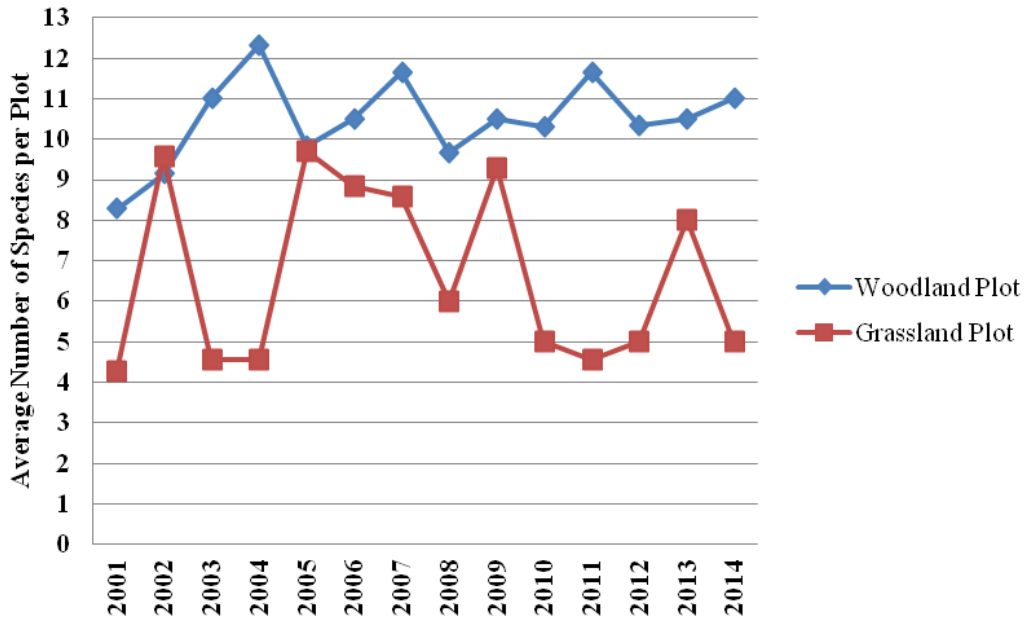


Figure 47. Selected grassland songbird species in greatest conservation need, Arden Hills Army Training Site, Minnesota, 2001 to 2014.

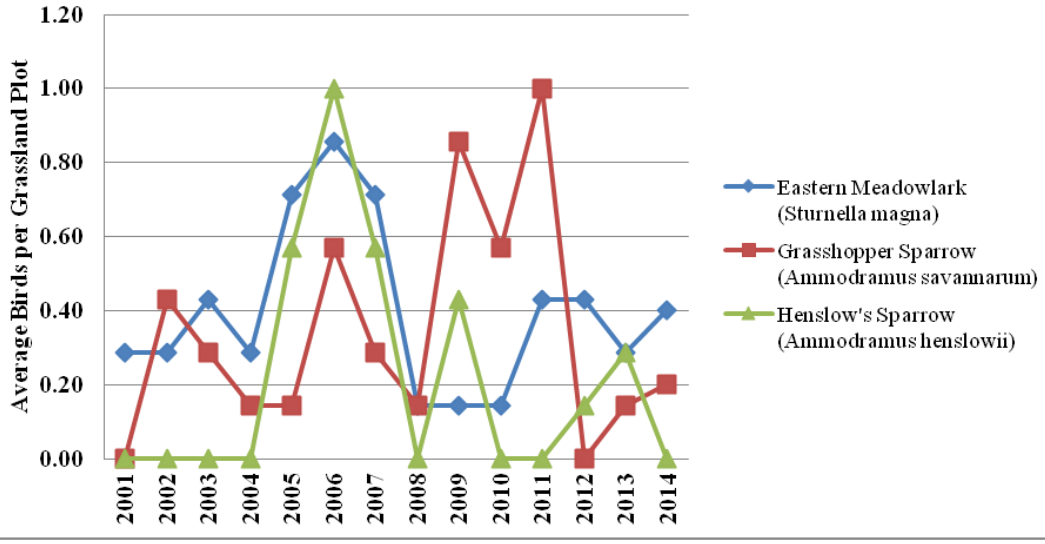


Table 46. Summary of songbird surveys, Arden Hills Army Training Site, Minnesota, 2001-2014.

Woodland Plots						
Year	**Field Surveyors**	**# of Plots Surveyed**	**Total # of Birds Documented**	**Total # of Species Documented**	**Average # of Birds per Plot**	**Average # of Species per Plot**
2001	Dirks	7	81	25	11.57	8.28
2002	Dirks	7	78	28	11.14	9.14
2003	Dirks	6	84	31	14.00	11.0
2004	Dirks	6	88	36	14.66	12.33
2005	Dirks	6	73	28	12.12	9.83
2006	Dirks	6	74	32	12.13	10.5
2007	Dirks	6	90	34	15.00	11.66
2008	Dirks	6	64	25	10.66	9.66
2009	Dirks	6	73	25	12.16	10.5
2010	Dirks	6	67	26	11.2	10.3
2011	Dirks	6	79	29	13.2	11.66
2012	Dirks	6	71	36	11.8	10.33
2013	Dirks	6	69	27	11.5	10.5
2014	**Dirks**	**5**	**62**	**28**	**12.4**	**11.0**

Grassland Plots						
Year	**Field Surveyors**	**# of Plots Surveyed**	**Total # of Birds Documented**	**Total # of Species Documented**	**Average # of Birds per Plot**	**Average # of Species per Plot**
2001	DeJong	7	37	18	5.28	4.28
2002	DeJong	7	62	22	8.86	9.57
2003	DeJong	7	39	17	5.57	4.57
2004	Burggraff	7	41	19	5.86	4.57
2005	DeJong	7	67	23	9.57	9.71
2006	DeJong	7	75	20	10.71	8.85
2007	DeJong	7	66	21	9.43	8.57
2008	Dirks	7	45	26	6.42	6.0
2009	Dirks	7	46	20	6.71	9.28
2010	Dirks	7	45	16	6.43	5.0
2011	Dirks	7	40	19	5.71	4.57
2012	Dirks	7	39	20	5.57	5.0

Grassland Plots (Continued)						
Year	**Field Surveyors**	**# of Plots Surveyed**	**Total # of Birds Documented**	**Total # of Species Documented**	**Average # of Birds per Plot**	**Average # of Species per Plot**
2013	Dirks	7	62	25	8.86	8.0
2014	**Dirks**	**5**	**28**	**15**	**5.6**	**5.0**

Henslow's Sparrow (*Ammodramus henslowii*)

Henslow's sparrows, a SGCN, were observed for six of the past ten years at AHATS during breeding bird surveys. None were observed during 2008, 2011, and 2014. However, this could be due to the timing of 2008 surveys which were later than the previous five years, or could indicate that 2006 was the peak of a local eruption of the species. Henslow's sparrow sightings increased in the Minnesota region during the summer of 2005, the year they were first observed at AHATS. Possible causes for increased sightings may be due to a temporary population increase, a temporary population shift from another area, or a true population increase. Annual monitoring will provide information regarding their continued presence on AHATS (Dirks et al. 2010).

Henslow's sparrows are listed as endangered by the DNR and six other states, but are not listed by the U.S. Fish and Wildlife Service. This species usually breeds in grasslands south and east of Minnesota. The nationwide population of this grassland bird species has declined nearly 80 percent since 1966, due to habitat destruction and/or reforestation (National Audubon Society 2007).

Management for this species should provide for large areas of suitable habitat, prevention of disturbance during the breeding season, and the control of succession (Herkert 2003). Suitable habitat is usually tall, dense grass with a deep litter layer and scattered tall forbs for perching. Periodic disturbance, such as prescribed fire, may be essential to maintaining suitable habitat; even though it will likely reduce the suitability of the grassland during the treatment year. Trees and shrubs should be eliminated in the center and along the edges of grassland areas to discourage predators and nest parasites such as the brown-headed cowbird. The grassland areas where Henslow's sparrows were located should not all be burned or mowed in the same year, allowing some habitat to remain each year. These grasslands should be burned or mowed on a four or five year rotation, since it may take several years for the habitat to regain suitable structure for nesting Henslow's sparrows (Dirks et al. 2010). Habitat requirements and management for Henslow's sparrows will be included in the development of future habitat restoration plans.

Table 47. Most abundant songbirds observed on plots, Arden Hills Army Training Site, 2003-2014. The number of birds documented is indicated in columns.

Grassland Plots (*n*=7)													
Common Name	**Scientific Name**	**June 17, 2003**	**June 29, 2004**	**June 1, 2005**	**June 2, 2006**	**June 5, 2007**	**July 9, 2008**	**May 29, 2009**	**May 27, 2010**	**June 3&14, 2011**	**June 6, 2012**	**June 7, 2013**	**June 6, 2014[a]**
Mourning dove	*Zenaida macroura*						2						
Eastern kingbird	*Tyrannus tyrannus*		6			5	2	4				4	**2**
American crow	*Corvus brachyrhynchos*			10									
Tree swallow	*Tachycineta bicolor*				5			4	5	3		4	
Black-capped chickadee	*Poecile atricapillus*		3										
House wren	*Troglodytes aedon*						4				3		
Sedge wren	*Cistothorus platensis*			6							3		
Eastern bluebird	*Sialia sialis*					5	4	4		3			**2**
Gray catbird	*Dumetella carolinensis*						2				2		
Clay-colored sparrow	*Spizella pallida*	7		5	8	11	6	6	11	4	4	10	**4**
Field sparrow	*Spizella pusilla*		5				4		4	3	5	6	**2**
Vesper sparrow	*Pooecetes gramineus*					4							
Song sparrow	*Melospiza melodia*	6											
Henslow's sparrow	*Ammodramus henslowii*				7	4		3					
Grasshopper sparrow	*Ammodramus savannarum*							6	4	7			
Common yellowthroat	*Geothlypis trichas*										3		**4**
Red-winged blackbird	*Agelaius phoeniceus*	4		5									
Eastern meadowlark	*Sturnella magna*	3		5	6	5				3	3		**2**
Brewer's blackbird	*Euphagus cyanocephalus*												
American goldfinch	*Carduelis tristis*		7	7			2		5	3	3	7	**3**

Woodland Plots (*n*=6)													
Common Name	**Scientific Name**	**June 17, 2003**	**June 29, 2004**	**June 1, 2005**	**June 2, 2006**	**June 5, 2007**	**July 9, 2008**	**May 29, 2009**	**May 27, 2010**	**June 3&14, 2011**	**June 6, 2012**	**June 7, 2013**	**June 6, 2014[a]**
Mourning dove	*Zenaida macroura*				4								
Tree swallow	*Tachycineta bicolor*							4					
Eastern wood-pewee	*Contopus virens*		7	6	6	4	3	5		5	4	6	**3**
Great crested flycatcher	*Myiarchus crinitus*					4	3			6		4	**5**
Red-eyed vireo	*Vireo olivaceus*			6				5	5			5	
Blue jay	*Cyanocitta cristata*						6	6	6	6		4	
Black-capped chickadee	*Poecile atricapillus*	6				7		3		7	4		
White-breasted nuthatch	*Sitta carolinensis*						5		5		6	4	
House wren	*Troglodytes aedon*	7	5	8	5	11		3	6	6	6		
Blue-gray gnatcatcher	*Polioptila caerulea*												**3**
American robin	*Turdus migratorius*	7	6	5	7		5	6					
Gray catbird	*Dumetella carolinensis*						3						
Eastern towhee	*Pipilo erythrophthalmus*						3						
Common yellowthroat	*Geothlypis trichas*							5		5	5		**6**
Yellow warbler	*Dendroica petechia*							3					
Chipping sparrow	*Spizella passerina*												**3**
Song sparrow	*Melospiza melodia*						5						
Northern cardinal	*Cardinalis cardinalis*				4	4	3	3					
Indigo bunting	*Passerina cyanea*						3			4		4	
Red-winged blackbird	*Agelaius phoeniceus*				4	5	4	3					**3**
Brown-headed cowbird	*Molothrus ater*						3		5		4		
Baltimore oriole	*Icterus galbula*							4	5		5	4	**3**
American goldfinch	*Carduelis tristis*	6	9			4		4	4	4	4	5	**4**

[a] Only five grassland and five woodland songbird plots were survey in 2014.

Osprey (*Pandion haleaetus*)

During the 2014 nesting season, an osprey pair was observed on the nesting platform at North Hamline Gate (Figure 48), and fledged two chicks. On August 5, 2014, two osprey chicks were banded at the Hamline nest (Table 48). The osprey chick banding was conducted in cooperation with Audubon Minnesota and Excel Energy, who provided the bucket truck for access to the platform.

Neither the Marsden Marsh nor the two new artificial osprey platforms in Training Areas 4 and 10 (Figure 48), both installed in 2013, were used.

Table 48. Osprey chicks raised, Arden Hills Army Training Site, since 2001.

Year	Osprey Raised
2001	3
2002	4
2009	2
2010	2
2011	2
2012	2
2013	3
2014	**2**
Total	**20**

Artificial Bird Nest Boxes

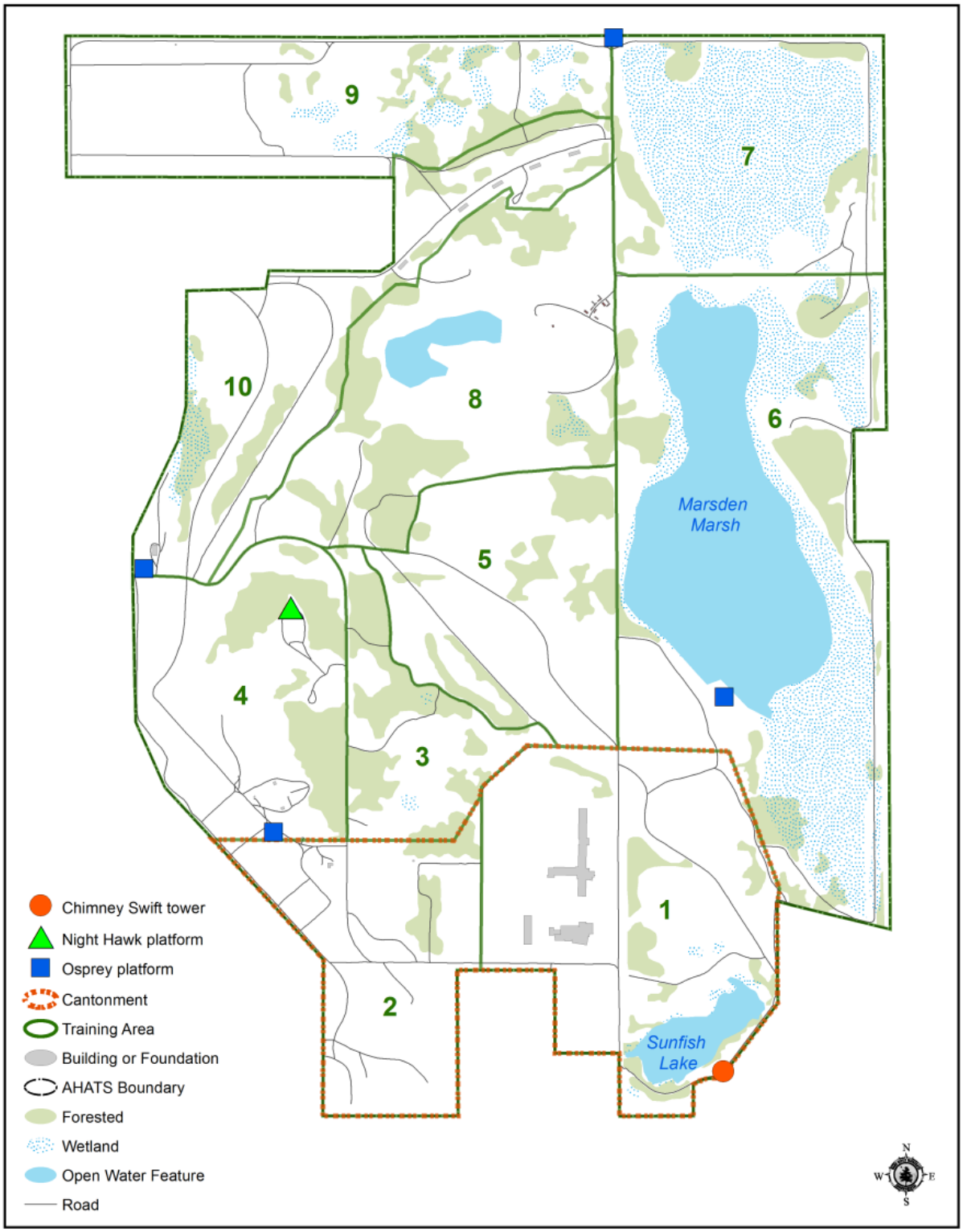
Artificial nest boxes have been installed at AHATS in previous years by the Audubon Society and other local groups for a variety of bird species (e.g., wood duck, kestrel, and bluebird). These nest boxes are monitored by Craig Andresen and Chase Davies, volunteers with the St. Paul Audubon Society. During late summer of 2010, Camp Ripley interns began to assess the condition of AHATS artificial nest boxes, gather GPS locations for boxes, and develop a location map. Each box was uniquely identified by using the existing metal tag numbering system attached to each box and a description of box type (e.g., Peterson or Gilbertson bluebird box). The maps continue to be updated, as time allows. In 2014, a revised set of location maps were created and their accuracy will be verified in the future.

Common Loon (*Gavia immer*)

Although listed as a SGCN, Minnesota has more loons (roughly 12,000) than any other state except Alaska. Threats to loons include human disturbance and pollutants such as lead and mercury. The DNR monitors loon populations with the help of volunteers to improve understanding of what our state bird needs to maintain a strong, healthy presence here (MNDNR 2011c).

Common loons have nested on AHATS wetlands and lakes in the past; however, no effort was made to document if any of those nesting attempts were successful. In 2014, no common loons were observed on AHATS.

Figure 48. Osprey, chimney swift, and common nighthawk nest structures, Arden Hills Army Training Site, since 2013.



Sandhill Crane (*Grus canadensis*)

Sandhill cranes are monitored through a project of the International Crane Foundation. The annual Midwest Crane Count has been conducted since 1976. The purpose of the count is to monitor the abundance and distribution of cranes in the upper Midwest (International Crane Foundation 2010). Two pairs of sandhill cranes occurred at AHATS during the spring of 2014, and two colts fledged with one additional probable colt fledging.

Trumpeter Swan (*Cygnus buccinator*)

The DNR introduced a pair of wing-clipped trumpeter swans to the Marsden Lake wetland in 1993, and again in 1994. Seven young free-flying wild swans were observed at the wetland during the summer of 1994, presumably after observing the presence of the introduced pair. A wild pair nested at AHATS in 1995, and subsequently raised two cygnets in the wetland. This made AHATS the first site in Ramsey County in approximately 150 years to support the production of cygnets from wild swans.

One pair of trumpeter swans was observed on Marsden Marsh and five cygnets were observed on October 14, 2014 and fledged. Trumpeter swans had been listed as threatened in Minnesota but where reclassified in 2013 as a special concern species. Each year Marsden Lake is monitored for trumpeter swan presence and reproduction (Dirks et al. 2010) (Table 49).

Table 49. Trumpeter swans raised, Arden Hills Army Training Site, since 1995.

Year	Cygnets Fledged
1995	2
1996	3
1997	1
1998	5
1999	6
2000	0
2001	1
2002	0
2003	2
2004	3
2005	2
2006	7
2007	5
2008	6
2009	1
2010	1
2011	1
2012	0
2013	0
2014	**5**
Total	**51**

Common Nighthawk (*Chordeiles minor*)

The common nighthawk is a SGCN in Minnesota. Nighthawks are not well monitored by breeding bird surveys and their populations have been declining. The cause of population decline in unknown but is believed to be related to loss of breeding habitat, pesticide use, and nest predation. A wide variety of habitats are used but nesting occurs on the ground on a bare site in an open area (NatureServe 2009b). Due to population declines, an artificial common nighthawk structure was constructed and installed in July 2011 (Figure 48). The artificial structure was not used in 2012-2014.

Chimney Swift (*Chaetura pelagica*)

Chimney swifts are avian neotropical migrants that are exhibiting a decrease in population. They inhabit rural and urban habitats where suitable roosting and nesting sites are available along with abundant insect populations. These swifts nest primarily in chimneys but will also use the interior walls of silos, barns, and uninhabited homes. Natural nest sites include the interior of hollow tree trunks and branches. Recently, populations have become vulnerable as chimney screening and demolition of buildings historically used for nesting/roosting reduces important habitat. In addition, newly constructed chimneys are lined with metal flue pipe which is too smooth for swifts to cling to and may potentially result in entrapment and cause bird deaths (NatureServe 2011). To help reduce population declines artificial nest/roost structures have been developed. A chimney swift tower was installed at AHATS in May 2011 (Figure 48). The artificial tower was not used in 2012-2014.

Mammals

White-tailed Deer (*Odocoileus virginianus*) Aerial Survey

Historically, winter white-tailed deer populations at the AHATS and Twin Cities Army Ammunition Plant (TCAAP) properties have fluctuated from an estimated high of 400 in the late 1960s (Jordan et al. 1997) to 30 in 2001 and 2003. Overpopulation of deer may negatively impact vegetation and efforts to restore oak savannah, impact the vegetative structure required for military training, and cause hazards due to vehicle collisions along perimeter roadways. Aerial deer surveys are conducted annually to track population changes. The number of deer counted during winter deer surveys had increased to a high of 124 in 2007, but has recently declined (Table 50).

Table 50. Aerial surveys of white-tailed deer, Twin Cities Army Ammunition Plant and Arden Hills Army Training Site, 1999-2014.

Year	1999	2000	2001	2002[a]	2003	2004	2005[a]	2006	2007	2008	2009	2010	2011	2012[a]	2013	2014
Deer Counted	41	47	30	--	30	47	--	84	124	87	104	72	61	--	41	**64**

[a] No count conducted

Although the properties are fenced, deer are not completely restricted from moving in and out of AHATS and TCAAP. Since control of the deer population at AHATS and the surrounding area occurs primarily on the training site, management of this population will rely primarily on hunting pressure. As the number of deer had increased since 2003, the number of hunts and total number of deer harvested have also increased to keep the deer herd from becoming too large (See Hunting Programs section in this document for hunt data summaries). This year's survey was conducted at AHATS and TCAAP in late January with excellent snow conditions by Michael Goodnature, Ramsey County Parks and Recreation Department. Sixty-four deer were counted during the survey (Table 50). The reduction in deer numbers is partially due to the harvest of deer in the fall of 2009, 2010, and 2012 when 66, 52, and 53 deer were harvested, respectively. These are the largest total number of deer harvested since hunts began in 2003. This indicates that hunting

pressure has aided reduction in deer numbers and is necessary to reduce and/or maintain the deer population.

Beaver (*Castor canadensis*)

Beaver are an important part of the natural ecosystems at AHATS. This species can have a large effect on the environment in which it lives. In a natural system, beavers create or enlarge wetland areas which trap nutrients and help to reduce flooding by holding and slowly releasing water. However, problems occur in localized areas when beavers plug road culverts, flooding and damaging roads. When this occurs, a cooperative effort between the Environmental Office, DNR, and Camp Ripley Department of Public Works (DPW) is initiated to identify problem areas and implement solutions.

All problem areas are inspected by the Environmental Office, and possible solutions are provided to Camp Ripley's DPW. Some areas require the removal of beaver through trapping. Trapping permits are issued by a local DNR conservation officer. AHATS beaver removal was conducted by a nuisance beaver trapper at the direction of DNR staff. During the spring and fall of 2014, seven beaver were removed from a problem area adjacent to East Patrol Road.

Many problem areas can be addressed through the use of damage control structures, such as Clemson levelers and beaver deceivers. These devices have been used successfully at Camp Ripley in the past, when installed correctly. However, these devices do require maintenance and eventually fail and/or need to be replaced.

Beaver ponds and wetlands throughout AHATS provide habitat for Blanding's and other turtles and numerous reptiles and amphibians; as well as provide feeding areas for a variety of wildlife and habitat for waterfowl and other birds. Therefore, it is important that these wetlands not be permanently drawn down or drawn down in fall or winter in order to install these devices. Installation should occur after a temporary drawdown in spring or summer, or during natural low-water levels. Research in east-central Minnesota investigated the effects of a controlled drawdown on Blanding's turtle populations. The incidence of mortality was high after the drawdown due to predation, road mortality and winterkill (Dorff Hall and Cuthbert 2000).

Reptiles and Amphibians

Blanding's Turtle (*Emys blandingii*)

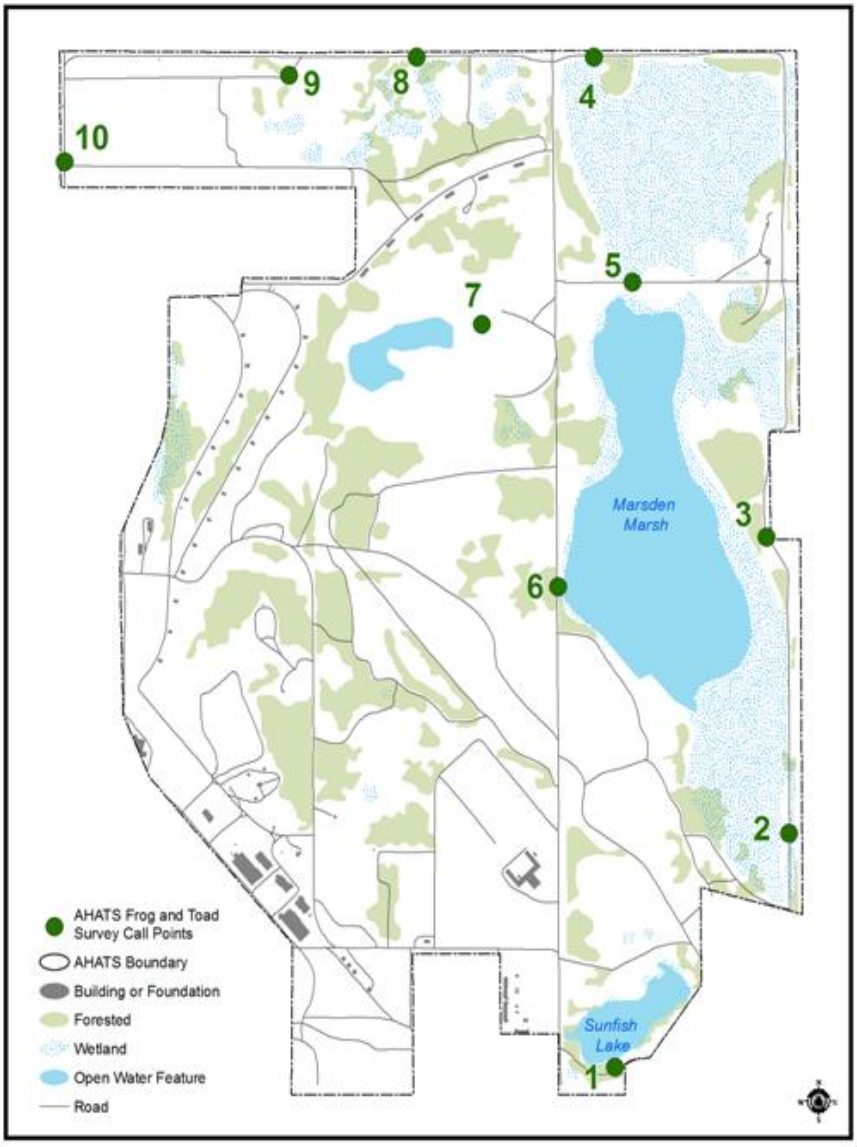
The Blanding's turtle is listed as a state threatened species by the DNR. AHATS is part of a DNR designated Blanding's turtle priority area (Figure 58 in DNR and MNARNG 2013). Priority areas are the most important areas in the state for management, protection, and research of Minnesota's Blanding's turtle population. This species depends upon a variety of wetland types and

sizes, and uses sandy upland areas for nesting. Surveys of Blanding's turtles have occasionally occurred at AHATS. Because nest predation is extremely high, road surveys are conducted in known Blanding's habitats to find and protect nests.

A Blanding's turtle road survey was conducted by DNR staff on June 5, 2014 (total of 2 vehicle hours). Survey areas focused on the gravel pit area and Training Areas 6, 7, 8 and 9. No Blanding's turtles were observed during the survey nor incidentally during the summer.

Anuran Surveys

Figure 48. Anuran survey stops, Arden Hills Army Training Site, since 2003.

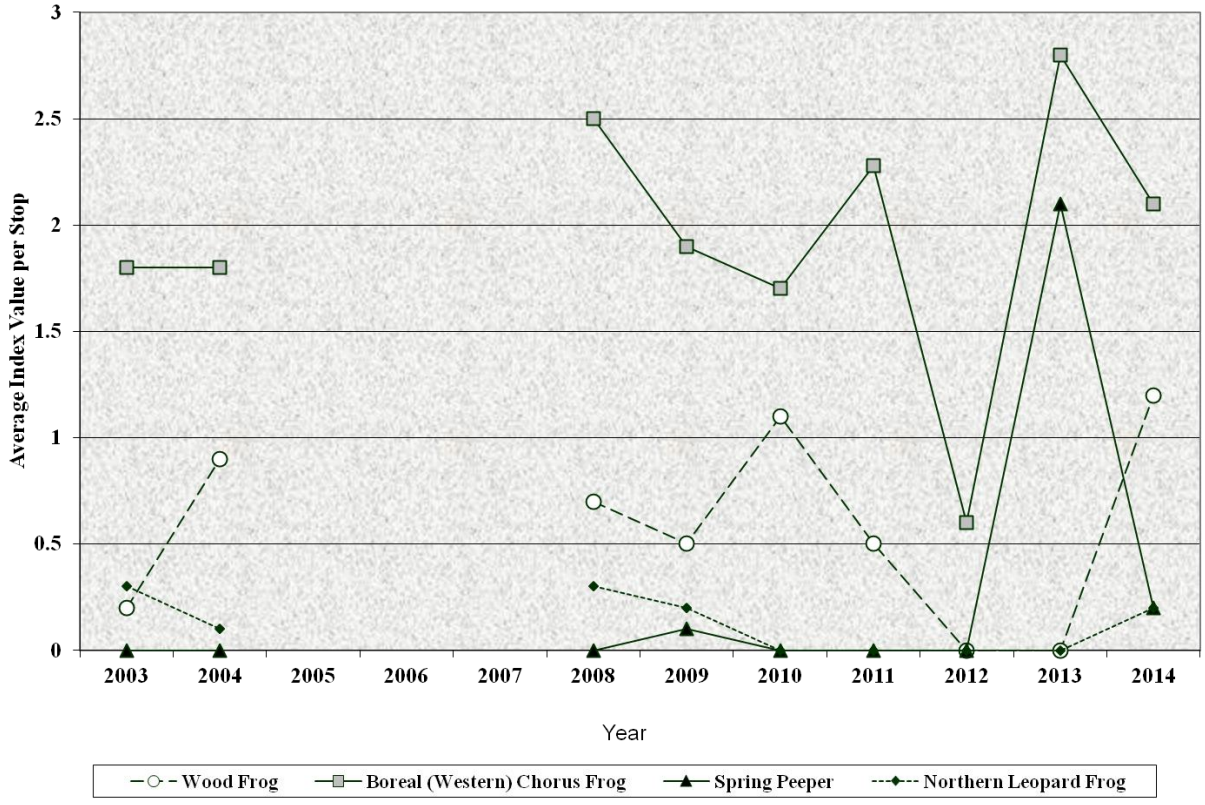


Frog and toad calling surveys are conducted as part of a larger statewide survey, and have been conducted at AHATS since 1993. The statewide survey began due to growing concern, for the past two decades, over declining amphibian populations worldwide. In addition, statewide data is contributed to the U.S. Geological Survey's North American Amphibian Monitoring Program. Frog and toad abundance estimates are documented by the index level of their chorus, following Minnesota Herpetological Society guidelines (Moriarty, unpublished). If individual songs can be counted and there is no overlap of calls, the species is assigned an index value of 1. If there is overlap in calls the index value is 2, and

a full chorus is designated a 3. Anuran surveys are performed at ten stops. The routes are surveyed three times from April through July (Figure 49).

Surveys were conducted by Jessica Richard, DNR volunteer, during the three survey time periods on April 25, May 20, and July 10, 2014. Due to the unseasonably cold spring, all survey time periods were delayed across the state. Boreal chorus frogs (*Pseudacris maculata*), spring peepers (*Pseudacris crucifer*), and northern leopard frog (*Lithobates pipiens*) were all detected during the first time period, and wood frogs (*Lithobates sylvaticus*) were at the average highest index recorded (Figure 49). During the second time period, boreal chorus frogs, gray treefrogs (*Hyla versicolor*), Cope's gray treefrogs (*Hyla chrysoscelis*), and American toads (*Bufo americanus*) were detected. Gray treefrogs, Cope's gray treefrogs (*Hyla chrysoscelis*), and green frogs (*Lithobates clamitans*) were detected during the third time period. Interpretation of AHATS results is difficult due to years when the anuran survey was not conducted, particularly during the second and third survey periods.

Figure 49. Average anuran index value during the first survey period, Arden Hills Army Training Site, 2003, 2004, 2008-2014. Surveys were not conducted from 2005 to 2007.



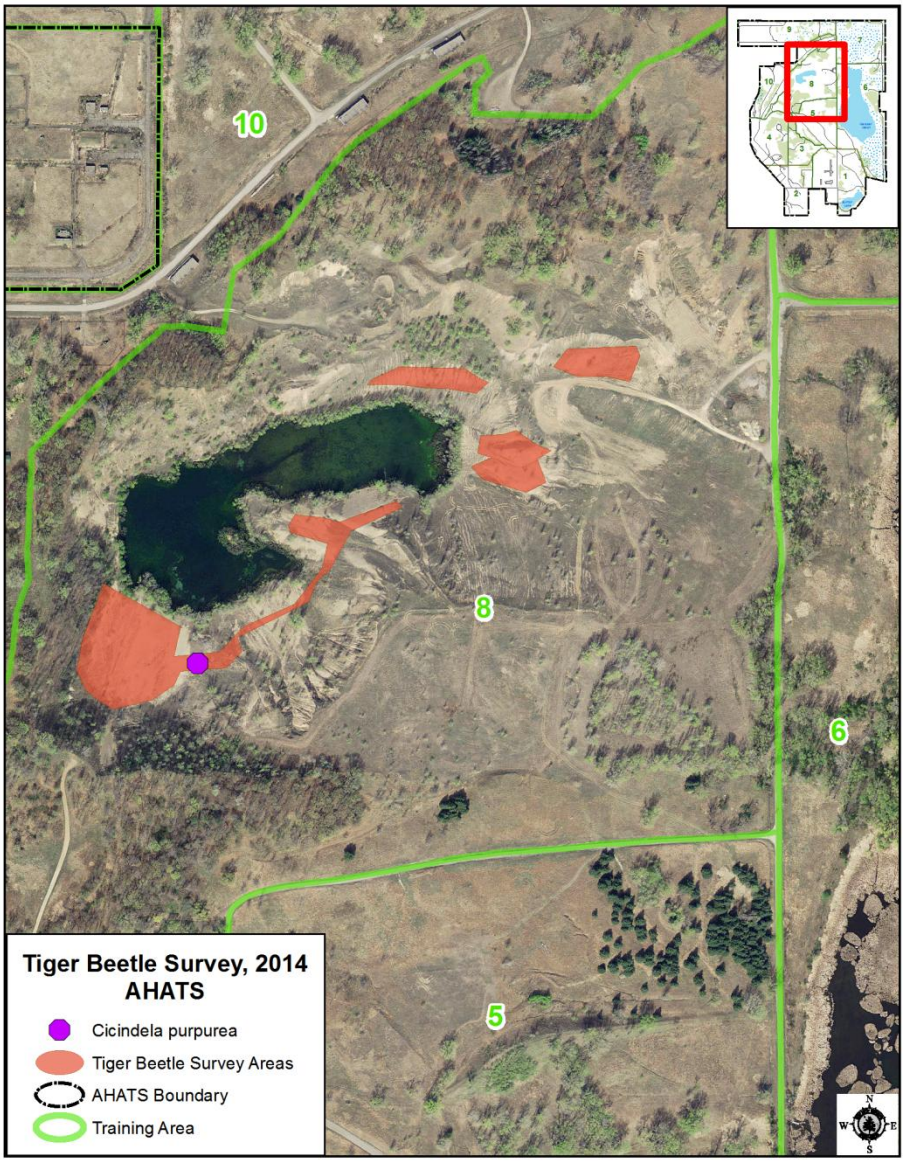
Insects

Tiger Beetle Survey

By Christopher Smith, DNR, Region 3 Nongame Program

Minnesota has approximately 20 species of tiger beetle, nine of which are listed on the state's list of Endangered, Threatened, and Special Concern species. Habitat loss through development and succession, as well as habitat degradation by recreational activities such as the use of off-highway vehicles (OHVs), are perceived to be significant contributors to tiger beetle declines.

Figure 50. Locations of tiger beetle survey areas and the location for the *Cicindela purpurea* observation, Arden Hills Army Training Site, 2014.



Arden Hills Army Training Site (AHATS), formerly referred to as the Twin Cities Army Ammunition Plant (TCAAP), is a relatively large (approximately 1,500 acres) military training center located in east-central Minnesota. At AHATS, we targeted a single species of state-listed tiger beetle during surveys - the ghost tiger beetle (*Cicindela lepida*). This species was first documented on the property in 1997 (Hansen 2001, Hansen 1997). Surveys consisted of visual encounter surveys in sandy areas (Figure 50), following the confirmation that adults were flying at a location in Wisconsin (Lester Doyle, personal communication). Ghost tiger beetles are believed to be more active later in the day and overnight (Ron Huber, personal communication), so surveys were conducted in late afternoon. Surveys were conducted by one to two DNR – Nongame Wildlife Program staff, as well as the Environmental Protection Specialist at

AHATS. Locational data were collected using a Garmin 62stc handheld GPS using the WGS84 datum and/or a Google Nexus tablet using the Mobile Mapper application.

During two visits to AHATS (September 4th and 17th), three species of tiger beetle were observed. Two of the more common species (*Cicindela formosa* and *Cicindela scutellaris*) were observed in areas of open sand, though neither were abundant during these surveys. The third species encountered, a single cow path tiger beetle (*Cicindela purpurea*), represents a first of AHATS as well as a Ramsey County record (Ron Huber, personal communication; Figure 50). No state-listed tiger beetles were observed during these surveys.

Open-sand habitat at AHATS seems suitable for the ghost tiger beetle. The relatively large and flat sandy area just west of the observed cow path tiger beetle (Figure 50) seems especially promising. This area looks similar to a site in Wisconsin that ghost tiger beetles currently occupy (personal observation).

If extant, AHATS may harbor one of the last populations of the state-threatened ghost tiger beetle in Minnesota. Areas of sand should be protected from OHVs use, but occasional light foot traffic is probably safe. There are a couple areas of woody shrub and tree encroachment on areas of open sand. These shrubs and trees should be removed, preferably during frozen ground conditions.

Butterfly Survey

The St. Paul Audubon Society conducted their annual survey for butterflies at AHATS on July 3, 2014. Fifteen species were recorded for a total of 76 individuals. The diversity of species observed was similar to previous years; however, the number of individuals was significantly lower than the past 10 years. Significantly fewer European skippers (*Thymelicus lineola*) were observed the past several years than in the previous 4 years but numbers were similar to last year. Common wood nymphs (*Cercyonis pegala*) were observed this year but were not observed in 2013, which is significant since this species had been the most common species observed on the count in since 2001. The variety of different species observed is similar to 2004, 2008, 2011, and 2013 (Table 50). The low count number can be partially attributed to the cold spring.

Table 51. Number of butterflies, Arden Hills Army Training Site, St. Paul Audubon Society, 2001-2014.

Common Name	Scientific Name	July 6, 2001	July 14, 2002	July 6, 2003	July 10, 2004	July 9, 2005	July 8, 2006	June 30, 2007	June 29, 2008	June 27, 2009	June 26, 2010	June 26, 2011	June 30, 2012	June 30, 2013	July 3, 2014
Black swallowtail	*Papilio polyxenes*	1				1	1	1							
Eastern tiger swallowtail	*Papilio glaucus*	4				2			2	1		1	2		**1**
Swallowtail species	*species undetermined*	1		1								2			
Checkered white	*Pontia protodica*	3													
Cabbage white	*Pieris rapae*		5			1		5	5	2	2	5			
"Whites"	*Pieris species*					1						1			
Clouded sulphur	*Colias philodice*	?	2	8		2	6	42			10		6		
Orange sulphur	*Colias eurytheme*	100s	35	1	1	1		30			6		20	1	**4**
Dainty sulphur	*Nathalis iole*	1													
Sulphur species	*species undetermined*										15		3	2	
American copper	*Lycaena phlaeas*		3				2	2	2						
Gray copper	*Lycaena dione*	9	1	8											
Bronze copper	*Lycaena hyllus*														
Edward's hairstreak	*Satyrium edwardsii*			1											
Coral hairstreak	*Satyrium titus*	2	1	1	1										
Banded hairstreak	*Satyrium calanus*			1						1				2	**2**
Striped hairstreak	*Satyrium liparops*	1						1							
Hairstreak species	*species undetermined*			2						1				3	**1**
Eastern tailed-blue	*Everes comyntas*	5	100's	4		6	32	34			2	1	5	11	**1**
Western tailed-blue	*Cupido amyntula*													1	
Spring azure	*Celastrina ladon*									8	6				
'Summer' spring azure	*Celastrina ladon neglecta*	4	1	3						8	1			1	
Variegated fritillary	*Euptoieta claudia*	1		1											
Great spangled fritillary	*Speyeria cybele*	12	11	40	9	16	5	13	2	4	17		15	2	**2**
Aphrodite fritillary	*Speyeria aphrodite*	4	4	dozen	19	10	14	2	2	4			5		**2**
Regal fritillary	*Speyeria idalia*														
Silver-bordered fritillary	*Boloria selene*														
Fritillary species	*species undetermined*	32	10	14	14+		14	28		14	10		10		
Silvery checkerspot	*Chlosyne nycteis*				1										
Pearl crescent	*Phyciodes tharos*	11			1										
Northern crescent	*Phyciodes selenis*			7	2		1			1					**10**
Northern pearl crescent	*Phyciodes selenis/tharos*					1	1	7	2						
Crescent species	*species undetermined*		2	4						6	1	16	2	1	
Baltimore checkerspot	*Euphydryas phaeton*	15		6	13	5	4	10	1	3	1				
Question mark	*Polygonia interrogationis*		1				2						1		
Silvery checkerspot	*Chlosyne nycteis*				1										
Eastern comma	*Polygonia comma*			1			3		2		5		1		

Table 51. Number of butterflies, Arden Hills Army Training Site, St. Paul Audubon Society, 2001-2014.

Common Name	Scientific Name	July 6, 2001	July 14, 2002	July 6, 2003	July 10, 2004	July 9, 2005	July 8, 2006	June 30, 2007	June 29, 2008	June 27, 2009	June 26, 2010	June 26, 2011	June 30, 2012	June 30, 2013	July 3, 2014
Gray comma	*Polygonia progne*										2				
Mourning cloak	*Nymphalis antiopa*	2	2	5	2	5		3	2	1	2	2			**3**
American lady	*Vanessa virginiensis*	6	2	1		1		4							
Painted lady	*Vanessa cardui*	5									1				
Vanessa species	*species undetermined*		1												
Red admiral	*Vanessa atalanta*	12+		3			2	11			3		3	1	
Common buckeye	*Junonia coenia*	7	1			1		6						3	
White admiral	*Limenitis arthemis arthemis*								3						
Red-spotted purple	*(Limenitis a . astyanax)*								1	1					
Viceroy	*Limenitis archippus*	1	2	5		1			2			1		4	
Hackberry emperor	*Asterocampa celtis*							2							
Northern pearly-eye	*Enodia anthedon*	2	4	7	1	5	9	5			2		1		**2**
Eyed brown	*Satyrodes eurydice*	46	15-20	22	3	5	32	26	1		4				**1**
Little wood satyr	*Megisto cymela*								2	7	2	7	1		**3**
Common ringlet	*Coenonympha tullia*	4							6	11				6	
Common wood nymph	*Cercyonis pegala*	dozen	dozen	100-	100+	36	104	173		44	57	7	26		**22**
Monarch	*Danaus plexippus*	11	10	11	1	17	64	38	4	10	3	3	7	2	**11**
Silver-spotted skipper	*Epargyeus clarus*	2	2	1	1	1	2	2		2		1	8	7	**7**
Northern Cloudywing Skipper	*Thorybes pylades*									1					
Least skipperling	*Ancyloxypha numitor*									1			1		
European skipper	*Thymelicus lineola*	6		dozen	2	1		5	23	32	17	74	2	1	**2**
Peck's skipper	*Polites peckiums (=coras)*								2			1			
Northern cloudy skipper	*Thorybes pylades*														
Tawny-edged skipper	*Polites themistocles*	4						1					1		
Long dash	*Polites mystic*							1							
Delaware skipper	*Atrytone logan*	4	7	11	1	4	7	2							
Northern broken -dash	*Wallengrenia egeremet*	1		2			3	15					3		
Mulberry wing	*Poanes massasoit*	1	1	1	3	1	6	1					1	1	
Hobomok skipper	*Poanes hobomok*											1			
Dion skipper	*Euphyes dion*							1							
Black dash	*Euphyes conspicua*							3							
Dun skipper	*Euphyes vestris*	1		3			8	4			2				
Skipper species	*species undetermined*				1		4	2	2	1	3	2	2		**1**
Grass skipper species	*species undetermined*														**1**
	Total Species*	35	26	32	17	23	20	32	18	22	23	13	20	17	**15**
	Total Individuals**				176	124	329	480	66	156	173	125	127	49	**76**

*a species of butterfly and all its subspecies are counted as a single species **total individuals may not be available due to estimates

OUTREACH AND RECREATION

By Mary Lee, MNARNG, and John Maile, DMA

Hunting Programs

Deployed Soldiers Archery Wild Turkey Hunt

AHATS hosted its sixth annual Deployed Soldiers archery turkey hunt on May 8-10 and May 11-13, 2014. The hunt was organized and conducted by the Environmental Office. Twenty hunters participated in two three day turkey hunts. Six hunters were successful, for a 30 percent success rate (Table 52).

Table 52. Deployed Soldiers wild turkey hunt, Arden Hills Army Training Site, 2009-2014.

Year	Turkeys Harvested	Hunter Success	Permits Issued	Number of Hunters	Dates	Largest Turkey (lbs)
2009	2	25%	8	8	April 15-17	20.9
2010	5 2	100% 33%	10 10	5 6	April 14-16 April 21-23	Unknown
2011	2 1	33% 25%	10 10	6 4	April 15-17 April 18-20	22 lbs
2012	2 3	33% 50%	10 10	6 6	April 21-22 April 28-29	23 lbs
2013	1 4	25% 40%	20 17	4 10	April 20-21 April 27-28	Unknown
2014	**5** **1**	**29%** **33%**	**20** **20**	**17** **3**	**May 8-10** **May 11-13**	**Unknown**

Soldiers Archery Deer Hunt

In 2014, the ninth annual deployed soldiers' archery deer hunt was held on October 24-26, November 3-5, November 21-23, and December 12-14. Forty permits per hunt were issued to current military members and Minnesota veterans. (Table 53).

Table 53. Deployed soldiers archery white-tailed deer hunt, Arden Hills Army Training Site, 2006-2014.

Year	Deer Harvested	Bucks	Does	Fawns	Number of Hunters
2006	7	2	5	0	33
2007	13	4	5	4	55
2008	21	7	10	4	102
2009	30	8	6	16	104
2010	35	13	20	2	110
2011	24	8	12	4	79
2012	43	18	23	2	101
2013	19	10	8	1	70
2014	**29**	**15**	**7**	**7**	**78**

Volunteer Archery Deer Hunt

Volunteers that support either the deployed soldier hunts or the youth hunt are allowed an opportunity to hunt at AHATS during the last deployed soldiers hunt on December 12-14, 2014. Thirteen deer were harvested during the combined soldier/volunteer hunt (Table 54).

Table 54. Volunteer archery white-tailed deer hunt, Arden Hills Army Training Site, 2003-2013.

Year	Deer Harvested	Bucks	Does	Fawns	Number of Hunters	Dates
2003	13	6	6	1	18	Nov. 28-30
2004	6	4	2	0	19	Nov. 26-28
2005	9	6	2	1	26	Nov. 25-27
2006	19	9	6	4	26	Nov. 24-26
2007	30	10	15	5	35	Nov. 23-25
2008	22	3	17	2	33	Nov. 28-30
2009	28	11	8	9	31	Nov. 27-29
2010	17	3	6	8	20	Nov. 26-28
2011	11	5	3	2	24	Dec. 2-4
2012	10	5	5	0	26	Nov. 30-Dec. 2
2013	8	5	3	0	33	Dec. 6-8
2014	**13**	**6**	**5**	**2**	**31**	**Dec 12-14**

STATEWIDE ARMORIES

CULTURAL RESOURCES

By Patrick Neumann, Minnesota Department of Military Affairs

The MNARNG operates 63 armories and maintenance facilities statewide. These facilities include properties totaling 397.4 acres of land. These facilities are subject to all of the cultural resources laws and regulations described in the Cultural Resources Management section of this report.

The majority of this land has been disturbed by long use of limited space around the armories. Much of that space is also utilized as parking and storage areas. There is an ongoing effort to survey the armory properties to determine if there are any intact areas that would be in need of an archaeological study prior to any future construction. As of the printing of this report there are twenty-five sites that still need to be documented to determine the need for further survey work. This project is anticipated to be completed in the next year.

All of the armories have been surveyed for eligibility on the National Register of Historic Places. The Madison, Mankato, and Northfield armories are recommended as eligible for the register though not yet nominated for the register. The New Ulm armory is on the National Register.

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APPENDIX A. CAMP RIPLEY TRAINING CENTER INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN UPDATED GOALS AND OBJECTIVES

CAMP RIPLEYADMINISTRATION						
Section / Year Created	**INRMP Goal**	**2014 Objective**	**Objective Originally Created**	**2014 Objective Status**	**2015 Update**	**2015 Update Created**
INRMP **1/1/2003**	**Ensure adequate funding and resources to implement Camp Ripley's Conservation programs and ITAM.**	**Maintain five MNARNG staff to support the implementation of the Conservation Program and five staff to implement Integrated Training Area Management (ITAM) programs at Camp Ripley.**	**1/1/2003**	**Completed**	**Maintain five MNARNG staff to support the implementation of the Conservation Program and five staff to implement Integrated Training Area Management (ITAM) programs at Camp Ripley.**	**11/4/2014**
		Update and execute a Cooperative Agreement between MNARNG and the MNDNR for the management and protection of Camp Ripley's natural and cultural resources and enforcement of applicable laws and regulations.	**1/1/2003**	**Completed**	**Update and execute a Cooperative Agreement between MNARNG and the DNR for the management and protection of Camp Ripley's natural and cultural resources and enforcement of applicable laws and regulations.**	**11/4/2014**
		Conduct an annual meeting of the Natural Resources Planning Committee to review the annual work plans and for presenting an annual update of INRMP accomplishments from the preceding year.	**1/1/2003**	**Completed**	**Conduct an annual meeting of the Natural Resources Planning Committee to review the annual work plans and for presenting an annual update of INRMP accomplishments from the preceding year.**	**11/4/2014**
		Annually integrate long-range natural resources planning with site development planning for the military mission.	**1/1/2003**	**Completed**	**Annually integrate long-range natural resources planning with site development planning for the military mission.**	**11/4/2014**

CAMP RIPLEYADMINISTRATION

Section / Year Created	INRMP Goal	2014 Objective	Objective Originally Created	2014 Objective Status	2015 Update	2015 Update Created
		In 2014, maintain current contracts for services in conducting special natural resources projects at Camp Ripley whenever internal resources are not adequate to meet objectives (e.g., MNDNR, SCSU, CLC).	1/1/2003	Completed	In 2015, maintain current contracts for services in conducting special natural resources projects at Camp Ripley whenever internal resources are not adequate to meet objectives (e.g., MNDNR, SCSU, and CLC).	11/4/2014
		Maintain administration of the INRMP development, implementation, and updates through the Camp Ripley Environmental Office.	1/1/2003	Completed	Maintain administration of the INRMP development, implementation, and updates through the Camp Ripley Environmental Office.	11/4/2014
		Completed an annual Conservation-INRMP update report. Update, review and obtain signatures with MNDNR and USFWS.	12/10/2008	Completed	Complete an annual Conservation-INRMP update report. Update, review and obtain signatures with MNDNR and USFWS.	11/4/2014
		In 2014, continue to implement land fund projects.	12/10/2008	Completed	In 2015, continue to implement land fund projects.	11/4/2014
		Develop and maintain a work plan of ITAM projects in the ITAM plan that supports the INRMP implementation.	2010	Completed	Develop and maintain a work plan of ITAM projects in the ITAM plan that supports the INRMP implementation.	10/27/2014
		Develop and maintain a work plan of environmental projects in the STEP that support the INRMP implementation.	2010	Completed	Develop and maintain a work plan of environmental projects in the STEP that support the INRMP implementation.	11/4/2014

CAMP RIPLEYADMINISTRATION						
Section / Year Created	**INRMP Goal**	**2014 Objective**	**Objective Originally Created**	**2014 Objective Status**	**2015 Update**	**2015 Update Created**
		Develop and maintain a work plan of wildland fire projects in the Fire and Emergency Services Program that support the INRMP implementation.	**2010**	**Completed**	**Develop and maintain a work plan of wildland fire projects in the Fire and Emergency Services Program that support the INRMP implementation.**	**11/4/2014**

CAMP RIPLEY CULTURAL RESOURCES						
Section/ Goal Created	**ICRMP Goal**	**2014 Objectives**	**Objective Originally Created**	**2014 Objective Status**	**2015 Update**	**2015 Update Created**
		Revise and review the MNARNG Integrated Cultural Resources Management Plan to retain regulatory compliance.	**11/20/2013**	**In Process**	**Continue with update and complete**	**11/18/2014**
		Complete Surveys of maneuver areas C and K2.	**11/20/2013**	**Completed**	**Complete Surveys of Maneuver Areas J and G**	**11/18/2014**
7/16/2009	**Continue consultation with Tribes in order to further the partnership that will permit the protection of irreplaceable cultural resources.**	**Conduct Tribal consultations between MNARNG and all interested Tribal representatives.**	**10/2012**	**Completed**	**Conduct Tribal consultations between MNARNG and all interested Tribal representatives.**	**11/18/2014**

CAMP RIPLEY CULTURAL RESOURCES						
Section/ Goal Created	**ICRMP Goal**	**2014 Objectives**	**Objective Originally Created**	**2014 Objective Status**	**2015 Update**	**2015 Update Created**
7/16/2009	**Enhance MNARNG personnel awareness of and appreciation for cultural resources preservation and improve the effectiveness of their decision making by engaging MNARNG personnel in the development of standard operation procedures, real estate transactions, and on any specific project that might affect cultural resources**	**Produce an in-house training presentation to be updated yearly for personnel involved in activities that require involvement of the Cultural Resources Manager.**	**11/20/2013**	**Completed**	**Refine in house training for individuals that will directly deal with potential for cultural resources impacts and separate the training from archaeology day.**	**11/18/2014**
7/16/2009	**Ensure that scientific and historical data recovered from cultural resources at MNARNG installations are made available with due respect to confidentiality and security to researchers, Tribes and other interested parties.**	**Invite local universities to conduct phase II surveys for field school teaching purposes or as thesis projects for graduate students.**	**11/20/2013**	**Completed**	**Engage with students directly and begin planning projects that are mutually beneficial for MNARNG and student interns.** **Work with professors and students to procure grant funding from various sources.**	**11/18/2014**
7/16/2009	**Promote outreach with interested stakeholders in natural and cultural resources and ensure their access to these resources, when possible**	**Create a cultural and history portion of the environmental classroom brief.** **Partner with the Minnesota Office of the State Archaeologist to develop a presentation at Camp Ripley for Minnesota Archaeology week.**	**11/20/2013**	**Completed**	**Expand on archeology day and include St Cloud State University. Pair archaeology day with the Camp Ripley open house to improve visibility and attendance.** **Integrate cultural resources management information into classroom presentation.**	**11/18/2014**
		Digitize the archaeological and architectural reports held in the Environmental office.	**11/20/2013**	**In Progress**	**Complete digitization tasks**	**11/18/2014**
		Integrate digitized archaeological and architectural reports into a GIS based database.	**11/20/2013**	**In Progress**	**Complete integration tasks**	**11/18/2014**

CAMP RIPLEY FORESTRY

Section / Year Created	INRMP Goal	2014 Objectives	Objective Originally Created	2014 Objective Status	2015 Update	2015 Update Created
Forestry 12/8/2009	Update the Camp Ripley forest management plan to include progress/action since initial plan dated 2002.	Update the Camp Ripley Forest Management plan, to be completed in 2015.	10/26/2012	In Progress	In 2015, update the Camp Ripley Forest Management plan.	11/4/2014
		Review years 2014-2015 of 10-year land fund plan, coordinate with military staff to ensure consensus.	10/26/2012	In Progress	Review years 2014-2015 of 10-year land fund plan, coordinate with military staff to ensure consensus.	11/4/2014
Forestry 1/1/2003	Maintain Forest Vegetation Inventory for land management planning, and for monitoring changes	New Objective			In 2016, maintain forest vegetation inventory for land management planning, and for monitoring changes.	11/4/2014
		In 2014, Little Falls MNDNR Forestry will verify, measure, and evaluate changes to the forest landscape attributed to annual alterations and update the FIM data.	12/10/2008	Completed	In 2015, Little Falls DNR-Forestry will verify, measure, and evaluate changes to the forest landscape attributed to annual alterations and update the FIM data. Begin updating forest inventory in areas of natural disturbances and land conversions to cover approximately 10% Camp Ripley's forested land. (Revised Objective)	11/4/2014
		In 2014, include off post parcels in the upcoming forest re-inventory of Camp Ripley.	12/8/2011	Completed		
		Meet to discuss beginning a 10% re-inventory of Camp Ripley.	12/8/2011	Not completed	Meet to discuss beginning a 10% re-inventory of Camp Ripley.	11/4/2014

CAMP RIPLEY FORESTRY

Section / Year Created	INRMP Goal	2014 Objectives	Objective Originally Created	2014 Objective Status	2015 Update	2015 Update Created
Forestry 1/1/2003	Provide and maintain a mature forest base with sufficient opportunity for diverse military training exercises that challenge soldiers and leaders to operate in the restrictive terrain of a heavily forested northern landscape	Encourage clear cutting on aspen stands identified through DFC determination to be part of installation's aspen base.	12/10/2008	Completed	Encourage clear cutting on aspen stands identified through DFC determination to be part of installation's aspen base.	11/4/2014
		In 2014, continue to develop and implement management recommendations for each site and continue to develop mission-scape to characterize the landscape as it supports the military mission of Camp Ripley.	12/10/2008	Ongoing	In 2015, continue to develop and implement management recommendations for each site and continue to develop mission-scape to characterize the landscape as it supports the military mission of Camp Ripley.	11/4/2014
		In 2014, complete additions of maneuver lanes in K1.	12/8/2011	Completed		
		Ensure that range or corridor development includes stump removal and vegetation control.	12/8/2011	Ongoing	Ensure that range or corridor development includes stump removal and vegetation control.	11/4/2014
		Develop a tree planting plan in areas that are compatible with military training.	12/22/2008	In Progress	Plant trees in areas that are compatible with Camp Ripley's mission.	11/4/2014
Forestry 1/1/2003	Balance forest diversity on the Training Site by maintaining the integrity of the historic representation of forest composition	In 2014, indentify additional opportunities to encourage white-pine release.	12/10/2008	In Progress	In 2015, indentify additional opportunities to encourage white-pine release.	11/4/2014

CAMP RIPLEY FORESTRY

Section / Year Created	INRMP Goal	2014 Objectives	Objective Originally Created	2014 Objective Status	2015 Update	2015 Update Created
		Review military training activities within the jack pine stands located in the northwest corner of Camp Ripley and see if management for jack pine is compatible.		In Progress	Continue reviewing military training activities within the jack pine stands located in the northwest corner of Camp Ripley and see if management for jack pine is compatible.	11/4/2014
		In 2014, implement adaptive forest management strategies to protect and regenerate the oak stands within desired areas.	12/10/2008	In Progress	In 2015, implement adaptive forest management strategies to protect and regenerate the oak stands within desired areas.	11/4/2014
		In 2014, arrange an agreement between Camp Ripley and MNDNR forestry/nursery to collect native tree seed in exchange for tree seedlings in return.	12/8/2011	Not completed/ Discontinue		
		In 2014, remove existing fence and allow for natural regeneration on site and maintain the black fence for an additional 2 years.	12/8/2011	In progress/ revised	In 2015, remove existing fence and allow for natural regeneration on site.	11/4/2014
Forestry 1/1/2003	Clearly communicate the administrative procedures and constraints for commercial timber sales, SDP work projects, and firewood permits as controlled by Camp Ripley, administered by the MNDNR-Forestry Office.	In March 2014, review a 2-year harvest plan for Camp Ripley.	12/8/2009	Completed	In March 2015, review a 2-year harvest plan for Camp Ripley	11/4/2014

CAMP RIPLEY FORESTRY

Section / Year Created	INRMP Goal	2014 Objectives	Objective Originally Created	2014 Objective Status	2015 Update	2015 Update Created
		Maintain a single point of contact as the MNDNR forester for all timber sales, firewood permits, or stand treatment contracts. Internal communications should be through the Training Area Coordinator.	12/10/2008	Completed - Ongoing	Maintain a point of contact as the MNDNR forester for all timber sales, firewood permits, or stand treatment contracts. Internal communications should be through Camp Ripley Forester.	11/4/2014
		Maintain thorough communications with DPW-Roads and Grounds supervisor for all standards to achieve for forestry treatments or timber access road work being completed by CRC-FMO is in compliance with Voluntary Site-level Forest Management Guidelines.	12/10/2008	Completed - Ongoing	Maintain thorough communications with DPW-Roads and Grounds supervisor for all standards to achieve for forestry treatments or timber access road work being completed by CRC-FMO is in compliance with Voluntary Site-level Forest Management Guidelines.	11/4/2014
		Respond to Site Development Plan proposals as first priority for planning and execution with commercial timber sales given first option for work projects for MNDOC, Sentence-to-Serve, and MNDNR-MCC.	12/10/2008	Completed - Ongoing	Respond to Site Development Plan proposals as first priority for planning and execution with commercial timber sales given first option for work projects for MNDOC, Sentence-to-Serve, and MNDNR-MCC.	11/4/2014
		Participate in planning initiative for landscape planning as part of forest stewardship grant sponsored by Minnesota Forest Resources Council.	11/17/2010	Completed - Ongoing	Participate in planning initiative for landscape planning as part of forest stewardship grant sponsored by Minnesota Forest Resources Council.	11/4/2014

CAMP RIPLEY FORESTRY						
Section / Year Created	**INRMP Goal**	**2014 Objectives**	**Objective Originally Created**	**2014 Objective Status**	**2015 Update**	**2015 Update Created**
Forestry **1/1/2003**	**Monitor fire danger levels and control wildfires**	**Implement the new changes to the wildfire management plan.**	**12/10/2008**	**Not Completed**	**Implement the new changes to the wildfire management plan.**	**11/4/2014**

CAMP RIPLEY GRASSLANDS						
Section/ Goal Created	**INRMP Goal**	**2014 Objectives**	**Objective Originally Created**	**2014 Objective Status**	**2015 Update**	**2015 Update Created**
Grasslands **1/1/2003**	**Restore and manage the grassland communities for the purposes of military training, protection of species, native prairie restoration, and soil stabilization**	**In 2014, evaluate designated grasslands and prioritize these units for management needs based on previous year assessments.**	**12/11/2008**	**Completed, assessed 23 grassland areas in 2014.**	**In 2015, evaluate designated firing point locations and prioritize these units for management needs based on previous year RTLA assessments.**	**11/3/2014**
		In 2014, implement the BMP practices for controlling invasive plants (Hanson and Malone 2011) within Camp Ripley.	**12/2010**	**Objective completed.**	**In 2015, implement the BMP practices for controlling invasive plants (Hanson and Malone 2011) within Camp Ripley.**	**11/5/2014**
		In 2014, update distribution maps of target invasive plant species' populations (common tansy, spotted knapweed, leafy spurge, purple loosestrife, Queen Anne's lace, and baby's breath).	**12/11/2010**	**Completed, ongoing**	**In 2015, update distribution maps of target invasive plant species' populations (common tansy, spotted knapweed, leafy spurge, purple loosestrife, Queen Anne's lace, and baby's breath).**	**11/5/2014**

CAMP RIPLEY GRASSLANDS						
Section/ Goal Created	**INRMP Goal**	**2014 Objectives**	**Objective Originally Created**	**2014 Objective Status**	**2015 Update**	**2015 Update Created**
		In 2014, continue mechanical and chemical removal of target invasive species.	12/11/2010	Completed chemical treatment of 32 acres of Baby's breath and 20 acres of common tansy. Objective is ongoing.	In 2015, continue mechanical and chemical removal of target invasive species.	11/5/2014
		Continue to treat large scale invasive populations in 2014 with herbicide application and re-seed heavily disturbed soils in Training Area 22 and 23. Implement prescribed fire in Training Area 23 prior re-seeding.	11/14/2011	Objective was deemed unnecessary due to range construction.		
		During 2014, large scale chemical treatments of invasive plants will be concentrated within high prioritization areas.	11/14/2011	Completed, treated 20 acres of common tansy (*Tanacetum vulgare*) and 32 acres of baby's breath (Gypsophilia paniculata) in 2014.	During 2015, large scale chemical treatments of invasive plants will be concentrated within high prioritization areas.	11/5/2014
		In 2014, locate, cut, and treat the areas where buckthorn is present.	11/14/2011	Completed and continue to update.	In 2015, locate, cut, and treat the areas where buckthorn is present.	11/5/2014
		Identify areas where soldiers and staff are often coming in contact with poison ivy and treat by chemical means.	11/14/2011	Completed, treated heavily infested areas per request from soldiers.	Identify areas where soldiers and staff are often coming in contact with poison ivy and treat by chemical means.	11/5/2014
		In 2014 use prescribed fire to maintain the grassland compartments to meet training capability needs, native prairie restoration and to control invasive - exotic species.	12/11/2008	Completed and ongoing, 623.5 acres of grassland mission enhancement prescribed burns completed.	In 2015, use prescribed fire to maintain the grassland compartments to meet training capability needs, native prairie restoration and to control invasive -exotic species.	11/5/2014
		New Objective	11/17/2014		Develop and implement an early detection rapid response plan for potential serious invaders giant hogweed and garlic mustard.	11/17/2014

CAMP RIPLEY GRASSLANDS						
Section/ Goal Created	**INRMP Goal**	**2014 Objectives**	**Objective Originally Created**	**2014 Objective Status**	**2015 Update**	**2015 Update Created**
		New Objective	**11/17/2014**			**11/17/2014**
		New Objective	**11/17/2014**		**Maintain biological control methods for treatment in areas where accessibility is restricted**	**11/17/2014**
		In 2014, based on RTLA assessments, burn the following units: B-11-1, B-4-21, C-12-1, C-28-4, D-23-14, D-20-18, D-23-17, D-25-13, F-44-56, F-50-1, F-44-55, F-45-54, K1-54-63, K1-70-81, I-64-74, I-64-79, I-64-80, and I-64-85.	**11/14/2011**	**Completed 15 enhancement burns in 2014.**	**In 2015, based on RTLA assessments, burn the following units:B-1-2,B-1-3, B-1-4, B-1-6, B-8-13, B-8-15, B-10-14, D-20-45, D-21-19, D-31-3, D-32-6,D-32-8, D-33-10, I-58-49, I-58-51, I-61-52, I-64-77, I-64-78, K2-78-69, and K1-80-67.**	**11/5/2014**
Grasslands 12/11/2008	**Minimize troop training interruptions due to accidental impact area and ranges wild fires caused by training activities.**	**In 2014, implement the use of prescribed fire on all impact areas and ranges to reduce fuel hazards (about 13,500 acres).**	**11/14/2011**	**Completed**	**In 2015, implement the use of prescribed fire on all impact areas and ranges to reduce fuel hazards (about 13,500 acres).**	**11/5/2014**

CAMP RIPLEY IMPROVED GROUNDS

Section / Goal Created	INRMP Goal	2014 Objectives	Objective Originally Created	2014 Objective Status	2015 Update	2015 Update Created
Improved Grounds **1/1/2003**	**Protect and develop improved grounds for functional and aesthetic qualities in the Cantonment Area of Camp Ripley.**	**In 2014 complete the proposed tree replacement plan approved for Nelson Hall and Bettenberg avenue.**	**3/26/2008**	**Completed**		**11/17/2014**
		Annually inspect cantonment trees for dead, dying or high-risk trees and have them removed.	**3/26/2008**	**Completed**	**Annually inspect cantonment trees for dead, dying or high-risk trees and have them removed.**	**11/17/2014**
		Reference cantonment landscape plan regarding location and need of nursery to supply landscaping needs.	**3/26/2008**	**Completed**	**Reference cantonment landscape plan regarding location and need of nursery to supply landscaping needs.**	**11/17/2014**
		Develop an educational hiking trail starting at the Martin J. Skoglund Environmental Classroom, showcasing forestry, wildlife, plants and other conservation projects.	**11/14/2011**	**Completed**	**Maintain the educational trail with signs and educational material.**	**11/17/2014**

CAMP RIPLEY LAND USE

Section / Goal Created	INRMP Goal	2014 Objectives	Objective Originally Created	2014 Objective Status	2015 Update	2015 Update Created
Land Use 1/1/2003	Identify and develop land use opportunities for the public	In 2014, conduct two, two-day general public bow hunts for white-tailed deer in cooperation with MNDNR, Section of Wildlife.	11/14/2011	Completed	In 2015, conduct two, two-day general public bow hunts for white-tailed deer in cooperation with the DNR, Section of Wildlife.	11/17/2014
		In 2014, conduct a two-day youth archery white-tailed deer hunt.	11/14/2011	Completed	In 2015, conduct a two-day youth archery white-tailed deer hunt.	11/17/2014
		In 2014, conduct a two-day Disabled American Veterans white-tailed deer hunt.	11/14/2011	Completed	In 2015, conduct a two-day Disabled American Veterans white-tailed deer hunt.	11/17/2014
		In 2014, conduct a two-day deployed soldier archery white-tailed deer hunt.	11/14/2011	Completed	In 2015, conduct a two-day soldier archery white-tailed deer hunt.	11/17/2014
		New Objective	11/17/2014		In 2015, participate in MNDNR central Minnesota deer population goal setting process.	11/17/2014
		In 2014, implement a three-day deployed soldier muzzleloader white-tailed deer hunt.	11/14/2011	Completed	In 2015, conduct a three-day deployed soldier muzzleloader white-tailed deer hunt.	11/17/2014
		In 2014, conduct a two-day, Disabled American Veterans wild turkey hunt.	11/14/2011	Completed	In 2015, conduct a two-day, Disabled American Veterans wild turkey hunt.	11/17/2014
		In 2014, conduct two, 2-day deployed soldier wild turkey hunts.	11/14/2011	Completed	In 2015, conduct two, 2-day soldier wild turkey hunts.	11/17/2014

CAMP RIPLEY LAND USE

Section / Goal Created	INRMP Goal	2014 Objectives	Objective Originally Created	2014 Objective Status	2015 Update	2015 Update Created
		In 2014, hold a National Guard Fishing event, Trolling for the Troops.	11/14/2011	Completed	In 2015, hold a National Guard Fishing event, Trolling for the Troops.	11/17/2014
		In 2014, continue to conduct other non-motorized public recreation events such as skiing, nature hikes, or touring as opportunities arise.	11/14/2011	Completed	In 2015, continue to conduct other non-motorized public recreation events such as skiing, nature hikes, or touring as opportunities arise.	11/17/2014
		Maintain the following six recreation areas for picnicking, fishing or both: Area #1 DeParcq Woods Picnic Area, Area #2 Mississippi River Picnic Area, Area #3 Mississippi River Picnic Area, Area #4 Lake Alott Fishing Access, Area #5 Sylvan Dam Picnic Area, and Area #6 Round Lake Picnic Area.	11/14/2011	Completed	Maintain the following six recreation areas for picnicking, fishing or both: Area #1 DeParcq Woods Picnic Area, Area #2 Mississippi River Picnic Area, Area #3 Mississippi River Picnic Area, Area #4 Lake Alott Fishing Access, Area #5 Sylvan Dam Picnic Area, and Area #6 Round Lake Picnic Area.	11/17/2014
		In 2014, maintain approximately 21.5 miles of cross-country ski trails.	11/14/2011	Completed	In 2015, maintain approximately 21.5 miles of cross-country ski trails.	11/17/2014
		Conduct a biathlon race biennially.	11/14/2011	Completed	Conduct a biathlon race biennially.	11/17/2014
		In 2014, continue communication with Minnesota Power regarding the use and management of the Minnesota Power land located on the northern edge of Camp Ripley adjacent to the Crow Wing River.	11/14/2011	Ongoing	In 2015, continue communication with Minnesota Power regarding the use and management of the Minnesota Power land located on the northern edge of Camp Ripley adjacent to the Crow Wing River.	11/17/2014

CAMP RIPLEY LAND USE

Section / Goal Created	INRMP Goal	2014 Objectives	Objective Originally Created	2014 Objective Status	2015 Update	2015 Update Created
Land Use 3/26/2008	Minimize land use conflicts on and off the installation	Annually enroll 5-10 landowners in the ACUB Program.	11/14/2011	Completed	Annually enroll 5-10 landowners in the ACUB Program.	11/17/2014
		Continue to partner with MNDNR and MNBWSR to implement ACUB.	12/5/2011	In Progress	Continue to partner with DNR, BWSR, SWCD, and TNC to implement ACUB.	11/17/2014
		In 2012, continue to secure funding to implement ACUB and annually enroll about 1,000 acres of land in the program.	12/5/2011	In Progress	In 2015, continue to secure funding to implement ACUB and annually enroll about 1,000 acres of land in the program.	11/17/2014
		Continue to develop partnerships to protect natural resources around Camp Ripley.	12/5/2011	Ongoing	Continue to develop partnerships to protect natural resources around Camp Ripley.	11/17/2014
		In 2012, continue to pursue other state funding in support of ACUB including the Lessard-Sams Outdoor Heritage Fund.	12/5/2011	Ongoing	In 2015, continue to pursue other state funding in support of ACUB including the Lessard-Sams Outdoor Heritage Council Fund.	11/17/2014
12/12/2011	Ensure adequate funding and resources to implement the Noise Management Plan.	Maintain administration of the Noise Management Plan development, implementation and updates through the Camp Ripley Environmental Office.	12/12/2011	Ongoing	Maintain administration of the Noise Management Plan development, implementation and updates through the Camp Ripley Environmental Office.	11/17/2014

CAMP RIPLEY WILDLIFE-MAMMALS

Section / Goal Created	INRMP Goal	2014 Objectives	Objective Originally Created	2014 Objective Status	2015 Update	2015 Update Created
Wildlife 1/1/2003	Maintain white-tailed deer population levels consistent with biological diversity, carrying capacity, and military training needs	In 2014, harvest at least 400 white-tailed deer.	12/9/2008	Camp Ripley combined hunts harvested 194 white-tailed deer in 2014. See Camp Ripley outreach and recreation section.	In 2015, initiate a DNR and DMA goal setting team that will determine white-tailed deer harvest.	12/16/2014
		New Objective	12/16/2014		In 2015, conduct an aerial white-tailed deer survey in cooperation with the DNR.	12/16/2014
		New Objective	12/16/2014		Annually maintain a weather station and measure snow depth as a means to track winter severity on Camp Ripley.	12/16/2014
Wildlife 3/26/2008	Continue to monitor the reproductive success, movements, and mortality of black bears on Camp Ripley	In 2014, monitor the eight bears that are currently collared and collar additional bears as determined by MNDNR researchers.	3/26/2008	Ongoing project, see 2014 black bear section.	In 2015, monitor the six bears that are currently collared and collar additional bears as determined by DNR researchers.	12/16/2014
		In 2014, continue to monitor nuisance bear activity in accordance with the range regulations.	1/1/2003	No nuisance bear activity reported in 2014.	In 2015, continue to monitor nuisance bear activity in accordance with the range regulations.	12/16/2014
Wildlife 1/1/2003	Monitor populations of furbearers for comparison with state and regional data	In 2014, conduct MNDNR carnivore scent station survey on Camp Ripley, as professional staff time allows.	1/1/2003	Completed, DNR volunteers conducted, see carnivore scent station survey section.	In 2015, conduct DNR carnivore scent station survey on Camp Ripley, as professional staff time allows.	12/16/2014

CAMP RIPLEY WILDLIFE-MAMMALS

Section / Goal Created	INRMP Goal	2014 Objectives	Objective Originally Created	2014 Objective Status	2015 Update	2015 Update Created
		In 2014, continue to participate in the statewide fisher study by capturing, radio-collaring and monitoring fishers.	3/26/2008	DNR student volunteer fisher trappers captured and radio-collared seven fishers in 2014 and monitored ten fisher via radio-telemetry. See 2014 fisher section.	In 2015, continue to participate in the statewide fisher study by monitoring radio-collared fisher.	12/16/2014
		In 2012-2014, use LiDAR to estimate vegetation structure within delineated fisher home ranges and around den sites to determine habitat use.	12/21/2009	Ongoing	In 2015, use LiDAR to estimate vegetation structure within delineated fisher home ranges and around den sites to determine habitat use.	12/16/2014
Wildlife 1/1/2003	Manage beaver populations on Camp Ripley	In 2014, install beaver control structures in problem areas to prevent the washout of dikes and roads, replace broken levelers/deceivers, and submit DPW work orders, as needed.	11/27/2012	No beaver control structures needed replacing in 2014; therefore, no work orders submitted.	In 2015, install beaver control structures in problem areas to prevent the washout of dikes and roads, replace broken levelers/deceivers, and submit DPW work orders, as needed.	12/16/2014
		In 2014, obtain a permit to remove nuisance beaver, as needed.	1/12003	Completed, nine nuisance beaver removed in 2014.	In 2015, obtain a permit to remove nuisance beaver and remove beaver, as needed.	12/16/2014
		In 2014, implement nuisance beaver management guidelines, as outlined in permit.	3/26/2008	Ongoing as outlined in current permit.	In 2015, implement nuisance beaver management guidelines, as outlined in permit.	12/16/2014
Wildlife 3-26-2008	Manage porcupine populations at Camp Ripley	In 2014, obtain a permit to target problem areas for porcupines and harvest nuisance porcupines.	3/26/2008	Completed, 30 nuisance porcupines were removed in 2014.	In 2015, obtain a permit to target problem areas for porcupines and remove nuisance porcupines.	12/16/2014

CAMP RIPLEY WILDLIFE-BIRDS

Section / Goal Created	INRMP Goal	2014 Objectives	Objective Originally Created	2014 Objective Status	2015 Update	2015 Update Created
Wildlife 1/1/2003	Monitor bird populations on Camp Ripley	In 2014, complete a selected subset of 80 point-count survey plots based upon LiDAR and/or bird population needs.	12/9/2008	Not completed, insufficient professional staffing levels, moved to 2016.	In 2016, complete a selected subset of 80 point-count survey plots based upon LiDAR and/or bird population needs.	12/16/2014
		In 2014, establish new bird point count plots and develop sampling technique to capture full range of vegetative structure of 12 focal bird species to improve predictive ability of songbird models.	12/9/2008	Not completed, insufficient professional staffing levels, moved to 2016.	In 2016, establish new bird point count plots and develop sampling technique to capture full range of vegetative structure of 12 focal bird species to improve predictive ability of songbird models.	12/16/2014
		In 2014, continue to analyze INRMP bird survey data, including population and species diversity trends, habitat comparisons and correlations with types and intensities of use, and management guidelines using LIDAR comparisons.	3/26/2008	Ongoing	In 2015, continue to analyze INRMP bird survey data, including population and species diversity trends, habitat comparisons and correlations with types and intensities of use, and management guidelines using LIDAR comparisons.	12/16/2014
		In 2014, continue to annually update species lists of birds found on Camp Ripley.	1/12003	Ongoing	In 2015, continue to annually update species lists of birds found on Camp Ripley.	12/16/2014
		In 2014, monitor grouse and greater sandhill crane populations on Camp Ripley via spring counts.	1/1/2003	Not completed, insufficient professional staffing levels, moved to 2015.	In 2015, monitor grouse and greater sandhill crane populations on Camp Ripley via spring counts.	12/16/2014
		In 2014, investigate potential causes of red-eyed vireo population decline on Camp Ripley and future research needs.	12/15/2010	Ongoing, see 2014 report	In 2015, continue to monitor the red-eyed vireo population on Camp Ripley to determine future research needs.	12/16/2014

CAMP RIPLEY WILDLIFE-BIRDS

Section / Goal Created	INRMP Goal	2014 Objectives	Objective Originally Created	2014 Objective Status	2015 Update	2015 Update Created
Wildlife 1/1/2003	Continue to make bluebird-nesting boxes available for cavity nesting songbird species at the Camp Ripley Cemetery	In 2014, monitor and maintain 31 bluebird nest structures.	1/1/2003	Volunteers monitored and maintained 29 nest boxes at Veterans Cemetery and Cantonment Area in 2014. See 2014 report	In 2015, monitor and maintain 31 bluebird nest structures.	12/16/2014
Wildlife 1/1/2003	Monitor raptor populations on Camp Ripley	In 2014, participate in the statewide survey for owls.	1/1/2003	Completed, see 2014 report	In 2015, participate in the statewide survey for owls.	12/16/2014
		In 2014, monitor nesting success of ospreys on Camp Ripley.	1/1/2003	Completed, see 2014 report	In 2015, monitor nesting success of ospreys on Camp Ripley.	12/16/2014
Wildlife 1/1/2003	Maintain species diversity, distribution of waterfowl populations within Camp Ripley	In 2014, recruit volunteer/s to monitor productivity and maintain 30 wood duck nest structures.	3/26/2008	Recruited DNR volunteer in 2014; however, results were not submitted.	In 2015, recruit volunteer/s to monitor productivity and maintain 30 wood duck nest structures.	12/16/2014
Wildlife 1/1/2003	To protect waterfowl from potential injury due to ingestion of white phosphorus munitions compounds in the impact areas.	Maintain the ban on the firing of white phosphorus munitions into wetlands located in the Leach and Hendrickson impact areas indefinitely.	1/1/2003	Ongoing	Maintain the ban on the firing of white phosphorus munitions into wetlands located in the Leach and Hendrickson impact areas indefinitely.	12/16/2014
		Improve the ability of forward artillery observers to distinguish wetlands in the impact areas by providing aerial photos with wetland delineations and grid coordinates at the observation points.	1/1/2003	Ongoing	Improve the ability of forward artillery observers to distinguish wetlands in the impact areas by providing aerial photos with wetland delineations and grid coordinates at the observation points.	12/16/2014

CAMP RIPLEY WILDLIFE-BIRDS

Section / Goal Created	INRMP Goal	2014 Objectives	Objective Originally Created	2014 Objective Status	2015 Update	2015 Update Created
Wildlife 1/1/2003	Control nuisance bird problems	In 2014, continue to monitor nuisance bird problems, and resolve problems as needed.	1/1/2003	No nuisance bird complaints in 2014.	In 2015, continue to monitor nuisance bird problems, and resolve problems as needed.	12/16/2014

CAMP RIPLEY REPTILES AND AMPHIBIANS-INVERTEBRATES-FISHERIES

Section / Goal Created	INRMP Goal	2014 Objectives	Objective Originally Created	2014 Objective Status	2015 Update	2015 Update Created
Reptiles & Amphibians 1/1/2003	Continue to monitor the presence and abundance of reptiles and amphibians	In 2014, with appropriate professional staffing, review alternative reptile and amphibian survey techniques.	1/1/2003	Not completed, insufficient professional staffing levels, moved to 2015.	In 2015, with appropriate professional staffing, review alternative reptile and amphibian survey techniques.	12/16/2014
		In 2014, participate in statewide annual anuran call surveys.	1/1/2003	Completed, see 2014 report.	In 2015, participate in statewide annual anuran call surveys.	12/16/2014
Invertebrates 1/1/2003	Continue to monitor the presence and abundance of terrestrial and aquatic invertebrates	In 2014, with appropriate professional staffing, determine need for additional invertebrate surveys and establish schedule.	1/1/2003	Ongoing, surveys for tiger beetles and American burying beetles, see 2014 report.	In 2015, with appropriate professional staffing, determine need for additional invertebrate surveys and establish schedule.	12/16/2014
Fisheries 1/1/2003	Protect, establish, manage and enhance the fisheries resources at Camp Ripley	In 2014, implement management recommendations for each lake management plan.	11/14/2011	Completed	In 2015, implement management recommendations for each lake.	11/17/2014

CAMP RIPLEY REPTILES AND AMPHIBIANS-INVERTEBRATES-FISHERIES

Section / Goal Created	INRMP Goal	2014 Objectives	Objective Originally Created	2014 Objective Status	2015 Update	2015 Update Created
		Annually, continue population enhancement through fish stocking as deemed by lake management plans.	12/9/2008	No walleyes were available to stock.	Annually, continue population enhancement through fish stocking.	11/17/2014
		Continue to allow fishing opportunities as training permits.	12/9/2008	Ongoing	Continue to allow fishing opportunities as training permits.	11/17/2014
		In 2014, complete a lake survey, by spring trapping of Lake Alott, Ferrell and Fosdick lakes.	12/9/2008	Completed on Ferrell	In 2015, complete a lake survey, by spring trapping of Lake Alott, and Fosdick lakes.	11/17/2014
Fisheries 1/1/2003	Continue to allow a rearing program by MNDNR fisheries in Camp Ripley	In 2014, coordinate fish rearing activities on lakes and ponds used at Camp Ripley.	12/9/2008	Ongoing	In 2015, coordinate fish rearing activities on lakes and ponds used at Camp Ripley.	11/17/2014
Fisheries 11/4/2013	Monitor aquatic invasive species in Camp Ripley	In 2014, conduct aquatic assessments for zebra mussels and other aquatic invasive species.		Ongoing	In 2015, conduct aquatic assessments for zebra mussels and other aquatic invasive species. Prioritize based on public accessibility, frequency of use, and seasonal variation in water levels.	11/17/2014

CAMP RIPLEY PROTECTED SPECIES
(includes Federal Threatened and Endangered, State Threatened and Endangered, Species in Greatest Conservation Need (SGCN))

Section / Goal Created	INRMP Goal	2014 Objectives	Objective Originally Created	2014 Objective Status	2015 Update	2015 Update Created
T & E Species 1/1/2003	Manage and protect species that are listed as threatened or endangered by the federal government or species listed by the State of Minnesota	In 2014, continue to monitor resident and transient threatened and endangered species that may be present at Camp Ripley and implement management recommendations as noted in the Protected Species Management Plan (Dirks et al. 2010), as funding allows.	1/1/2003	Ongoing, conducted American burying beetle surveys in 2014 in cooperation with MNDNR, Region 3 Nongame Program staff, see 2014 report.	In 2015, continue to monitor resident and transient threatened and endangered species that may be present at Camp Ripley and implement management recommendations as noted in the Protected Species Management Plan (Dirks et al. 2010), as funding allows.	12/16/2014
		In 2014, monitor gray wolf populations and movements via radio telemetry (Dirks et al. 2010).	1/1/2003	Completed - Ongoing, monitored three wolves, see 2014 report.	In 2015, capture and monitor gray wolf populations and movements via radio telemetry (Dirks et al. 2010).	12/16/2014
		In 2014, monitor wolf mortality incidences and conduct necropsies on dead wolves (Dirks et al. 2010).	12/21/2009	Completed – Ongoing see 2014 report	In 2015, monitor wolf mortality incidences and conduct necropsies on dead wolves (Dirks et al. 2010).	12/16/2014
		In 2014, monitor location/s and protect wolf rendezvous sites (Dirks et al. 2010).	12/21/2009	No wolf rendezvous site/s located in 2014.	In 2015, monitor location/s and protect wolf rendezvous sites (Dirks et al. 2010).	12/16/2014
		In 2014, protect any known wolf den site/s (Dirks et al. 2010).	12/21/2009	No wolf den site/s located in 2014.	In 2015, protect any known wolf den site/s (Dirks et al. 2010).	12/16/2014
		In 2014, continue to monitor bald eagle nests and provide protection to nests in accordance with the ARNG eagle policy guidance (Dirks et al. 2010).	1/1/2003	Completed - seven territories monitored on Camp Ripley, see 2014 report.	In 2015, continue to monitor bald eagle nests and provide protection to nests in accordance with the ARNG eagle policy guidance (Dirks et al. 2010).	12/16/2014

CAMP RIPLEY PROTECTED SPECIES
(includes Federal Threatened and Endangered, State Threatened and Endangered, Species in Greatest Conservation Need (SGCN))

Section / Goal Created	INRMP Goal	2014 Objectives	Objective Originally Created	2014 Objective Status	2015 Update	2015 Update Created
		In 2014, conduct monthly bald eagle breeding season aerial surveys (April – July) (Dirks et al. 2010).	12/21/2009	Completed, see 2014 report.	In 2015, conduct monthly bald eagle breeding season surveys (April – July) (Dirks et al. 2010).	12/16/2014
		New Objective	12/11/2013		In 2016-2020, monitor the North Range bald eagle nest territory per Federal Fish and Wildlife Permit.	12/16/2014
		In 2014, monitor bald eagle mortalities and determine cause (Dirks et al. 2010).	12/21/2009	Completed, no bald eagle mortalities occurred in 2014.	In 2015, monitor bald eagle mortalities and determine cause (Dirks et al. 2010).	12/16/2014
		In 2014, track application progress of a 5-year programmatic agreement (take permit) for bald eagles on Camp Ripley (Dirks et al. 2010).	12/9/2009	Investigated, awaiting response from USFWS.	In 2015, track application progress of a 5-year programmatic agreement (take permit) for bald eagles on Camp Ripley (Dirks et al. 2010).	12/16/2014
		New Objective	12/16/2014		In 2015, capture wintering golden eagle and attach satellite radio-transmitter in cooperation with Audubon Minnesota and National Eagle Center.	12/16/2014
		Educate users about the presence and importance of protected species.	1/1/2003	Completed - Ongoing, revised range regulations, range bulletins, and developed backdoor conservation flyer placed in portable toilets downrange.	Educate users about the presence and importance of protected species.	12/16/2014

CAMP RIPLEY PROTECTED SPECIES
(includes Federal Threatened and Endangered, State Threatened and Endangered, Species in Greatest Conservation Need (SGCN))

Section / Goal Created	INRMP Goal	2014 Objectives	Objective Originally Created	2014 Objective Status	2015 Update	2015 Update Created
		In 2014, develop sampling locations and monitor, via ANABAT detector, for presence of northern long-eared bat and other state special concern species.	12/16/2013	Northern long-eared bats were proposed to be listed as federally endangered under the Endangered and Threatened Species Act in April 2015. Completed see Bat section in the report.	In 2015, develop sampling locations and monitor, via ANABAT detector, for presence of northern long-eared bat and other state special concern species.	12/16/2014
		In 2014, begin to determine locations of northern long-eared bat maternity roosts.	12/16/2013	Completed - Ongoing	In 2015, begin to determine locations of northern long-eared bat maternity roosts.	12/16/2014
		In 2014, continue to monitor Camp Ripley bat population index using a mobile acoustic transect survey.	12/16/2013	Completed - Ongoing	In 2015, continue to monitor Camp Ripley bat population index using a mobile acoustic transect survey.	12/16/2014
		In 2014, continue to determine the presence/absence of Canada lynx (Dirks et al. 2010) using trail cameras.	12/9/2008	Ongoing, see 2014 report.	In 2015, continue to determine the presence/absence of Canada lynx (Dirks et al. 2010) using trail cameras.	12/16/2014
		In 2014, continue a monitoring program for state threatened Blanding's turtles (Dirks et al. 2010).	1/1/2003	Completed – Ongoing, see 2014 report	In 2015, continue a monitoring program for state threatened Blanding's turtles (Dirks et al. 2010).	12/16/2014
		In 2014, finalize locations of alternate Blanding's turtle nesting enhancement locations and complete habitat enhancement.	11/15/2011	Not completed, insufficient professional staffing levels, moved to 2015.	In 2015, finalize locations of alternate Blanding's turtle nesting enhancement locations and complete habitat enhancement.	12/16/2014

CAMP RIPLEY PROTECTED SPECIES
(includes Federal Threatened and Endangered, State Threatened and Endangered, Species in Greatest Conservation Need (SGCN))

Section / Goal Created	INRMP Goal	2014 Objectives	Objective Originally Created	2014 Objective Status	2015 Update	2015 Update Created
		In 2014, monitor red-shouldered hawks to provide additional data on population, nest locations, and provide management recommendations	3/26/2008	Completed play call-back survey in 2014. See 2014 report.	In 2015, monitor red-shouldered hawks in northwestern portion of Camp Ripley to provide additional data on population affects of range development in area.	12/16/2014
		In 2014, develop red-shouldered hawk trap methods and deploy one satellite transmitter.	12/21/2009	Completed – Ongoing. In 2014, made several trapping attempts but no red-shouldered hawk captured.	In 2015, develop red-shouldered hawk trap methods and deploy one satellite transmitter.	12/16/2014
T & E Species 1/1/2003	Protect populations and habitats of special concern and other rare nongame wildlife species and prevent their decline to threatened or endangered status	In 2014, identify SGCN species and complete the final Protected Species Management Plan for Camp Ripley and recommend management actions.	1/1/2003	Not completed, insufficient professional staffing levels, moved to 2016.	In 2016, identify SGCN species and complete the final Protected Species Management Plan for Camp Ripley and recommend management actions.	12/16/2014
		With available funding and staff select SGCN species and develop survey methods to monitor occurrence on Camp Ripley.	12/21/2009	Not completed, insufficient professional staffing levels.	With available funding and staff select SGCN species and develop survey methods to monitor occurrence on Camp Ripley.	12/16/2014
		In 2014, monitor occurrence and production of trumpeter swans (Dirks et al. 2010).	12/21/2009	Completed, see 2014 report.	In 2015, monitor occurrence and production of trumpeter swans (Dirks et al. 2010).	12/16/2014

CAMP RIPLEY PROTECTED SPECIES (includes Federal Threatened and Endangered, State Threatened and Endangered, Species in Greatest Conservation Need (SGCN))						
Section / Goal Created	**INRMP Goal**	**2014 Objectives**	**Objective Originally Created**	**2014 Objective Status**	**2015 Update**	**2015 Update Created**
		In 2014, continue to include annual accomplishments of the Protected Species Management Plan in the annual Conservation Program Report as part of the Camp Ripley and AHATS INRMP updates.	**12/21/2009**	**Completed, see 2014 report.**	**In 2015, continue to include annual accomplishments of the Protected Species Management Plan in the annual Conservation Program Report as part of the Camp Ripley and AHATS INRMP updates.**	**12/16/2014**

INTEGRATED TRAINING AREA MANAGEMENT (formerly RTLA, TRI-LRAM, SRA)						
Section / Goal Created	**Goal**	**2014 Objective**	**Objective Originally Created**	**2014 Objective Status**	**2015 Update**	**2015 Update Created**
ITAM **Oct. 2010**	**Provide multiple, inter-connected platoon-sized firing points for field artillery units.**	**Assess 23 artillery firing points in 2014.**	**Oct. 2010**	**Completed**	**In 2015, assess 17 artillery firing points.**	**10/27/2014**
		Complete LRAM Assessment #1 on north half of CRTC.	**Oct. 2010**	**Completed**	**Complete LRAM Assessment #1 on south half of CRTC.**	**10/27/2014**
		Maintain existing firing point boundaries to limit encroachment using chemical, mechanical, or biological treatments.	**Oct. 2010**	**Completed; treated 161.7 acres with mechanical and chemical treatments.**	**Treat and improve firing points as identified in 2014 firing point assessments.**	**10/27/2014**

INTEGRATED TRAINING AREA MANAGEMENT (formerly RTLA, TRI-LRAM, SRA)

Section / Goal Created	Goal	2014 Objective	Objective Originally Created	2014 Objective Status	2015 Update	2015 Update Created
Oct. 2010	Provide maneuver corridors that allow multiple training scenarios for platoon-sized mechanized maneuver.	Provide additional 59.6 acres to be grubbed, seeded, stabilized and maintained.	Oct. 2013	Completed	Provide survey and evaluate training responses on existing size of maneuver corridors to ensure they meet all training objectives and requirements.	10/27/2014
		Maintain existing maneuver corridor using chemical, mechanical or physical treatments to reduce woody encroachment and remove noxious and invasive vegetation.	Oct. 2014	Completed; treated 161 acres	Maintain existing maneuver corridor using chemical, mechanical or physical treatments to reduce woody encroachment and remove noxious and invasive vegetation.	10/27/2014
		Write burn plans for maneuver corridor	Oct. 2013	Ongoing	In 2015, review and evaluate Rx burn on maneuver corridor.	10/27/2014
Oct 2010	Provide areas to support engineer training.	In 2014, continue to provide engineer training support.	Oct. 2010	Ongoing	In 2015, continue to provide engineer training support.	10/27/2014
Oct 2010	Provide maneuver trails that support patrolling/convoy operations.	Include helipads and drop zones in LRAM survey.	Oct. 2010	Not completed	In 2015, include helipads and drop zones in LRAM survey.	10/27/2014
	Provide forested areas to accommodate company level assembly areas	Forest understory assessment in Training Areas 68, 69, 72, 75 and 76.	Oct. 2010	Completed	Forest understory assessment in Training Areas 42, 51, 52, 53, 54, and 55.	10/27/2014
	Provide training lands to support dismounted maneuver training	Conduct assessment in Training Area 11.	Oct. 2010	Completed	Conduct assessment in Training Area 35.	10/27/2014

INTEGRATED TRAINING AREA MANAGEMENT (formerly RTLA, TRI-LRAM, SRA)						
Section / Goal Created	**Goal**	**2014 Objective**	**Objective Originally Created**	**2014 Objective Status**	**2015 Update**	**2015 Update Created**
Oct. 2010		Assess and manage hazardous artifacts in Maneuver Area C.	Oct. 2010	Completed	Assess and manage hazardous artifacts in Maneuver Area K.	10/27/2014
	Facilitate a nationally recognized ITAM program	Submitted 2015 budget for $883 K.	Oct. 2010	Completed	Submit 2016 budget for approximately $786K	10/27/2014
		Create an annual accomplishments document that shows the results of all RTLA assessments and completion of LRAM projects.	Oct. 2010	In Progress	Create an annual accomplishments document that shows the results of all RTLA assessments and completion of LRAM projects.	10/27/2014
		Execute all funds NLT 30 Sep 14.	Oct. 2010	Completed	Execute all funds NLT 30 Sep 15.	10/27/2014

CAMP RIPLEY GIS						
Section/ Goal Created	**INRMP Goal**	**2014 Objectives**	**Objective Originally Created**	**2014 Objective Status**	**2015 Update**	**2015 Update Created**
GIS 1/1/2003	Achieve and maintain compliance with all mandated GIS requirements	Complete metadata for all new and updated layers in production GDBs.	Dec. 2009	Incomplete	Complete metadata for all new and updated layers in production GDBs.	11/13/2014
		Maintain compliance with SDSFIE.	Dec. 2009	Completed	Maintain compliance with SDSFIE.	11/13/2014

CAMP RIPLEY GIS

Section/ Goal Created	INRMP Goal	2014 Objectives	Objective Originally Created	2014 Objective Status	2015 Update	2015 Update Created
		Provide appropriate data and documentation in the required format for all Army and NGB data requests.	Dec. 2009	Completed	Provide appropriate data and documentation in the required format for all Army and NGB data requests.	11/13/2014
GIS 1/1/2003	Maintain the MNARNG geographic database with sufficient completeness, consistency and accuracy for reliable query, analysis and application development	Identify data requirements and procedures in support of environmental/INRMP initiatives. Capture status and update frequency for each required layer.	Dec. 2011	Completed	Identify data requirements and procedures in support of environmental/INRMP initiatives. Capture status and update frequency for each required layer.	11/13/2014
		House a current copy of the Camp Ripley forest inventory in the GDB. The source of this layer should be the MNDNR FIM.	Dec. 2009	Completed	Store a current copy of the Camp Ripley forest inventory in the GDB. The source of this layer should be the MNDNR FIM.	11/13/2014
		Maintain ACUB data layers.	Dec. 2009	Completed	Maintain ACUB related data layers.	11/13/2014
		House current copies of the Camp Ripley and AHATS aerial photos in the GDB.	Dec. 2009	Incomplete	House current copies of the Camp Ripley and AHATS aerial photos in the GDB.	11/13/2014
		Ensure copies of digital statewide aerial photos are available to environmental staff.	Dec. 2009	Completed	Ensure copies of digital statewide aerial photos are available to environmental staff.	11/13/2014
GIS 1/1/2003	Maintain hardware and software systems appropriate for the info management needs of Camp Ripley	Develop GIS management plan to include data, software, hardware, application and staffing requirements. Must correspond with STEP and ITAM Work Plan reporting requirements.	Dec. 2012	In Progress	Develop GIS management plan to include data, software, hardware, application and staffing requirements. Must correspond with STEP and ITAM Work Plan reporting requirements.	11/13/2014

CAMP RIPLEY GIS

Section/ Goal Created	INRMP Goal	2014 Objectives	Objective Originally Created	2014 Objective Status	2015 Update	2015 Update Created
		Identify hardware needs for sustainment of data requirements.	Dec. 2009	Completed	Identify hardware needs for sustainment of data requirements.	11/13/2014
GIS 1/1/2003	Develop, implement, and maintain applications to meet the info needs of the MNARNG user community	Maintain user-friendly web application(s) through ArcGIS Server to support data access needs to help achieve select INRMP goals and objectives.	Dec. 2011	In Progress	Maintain user-friendly web application(s) through ArcGIS Server to support data access needs to help achieve select INRMP goals and objectives.	11/13/2014
		Maintain up-to-date content on the digital map library.	Dec. 2009	Completed	Maintain up-to-date content on the digital map library.	11/13/2014
GIS 3/26/2008	Ensure geospatial data and applications support MNARNG enterprise GIS initiatives.	Conduct monthly MNARNG GIS Working Group meetings and participate in the NGB GIS subcommittee.	Dec. 2009	Completed	Conduct monthly MNARNG GIS Working Group meetings and participate in the NGB GIS subcommittee.	11/13/2014
		Coordinate development and acquisition of geospatial data and applications with other users through the MNARNG GIS Working Group.	Dec. 2009	Completed	Coordinate development and acquisition of geospatial data and applications with other users through the MNARNG GIS Working Group.	11/13/2014
		Make appropriate geospatial data available in a centralized location to reduce redundancy.	Dec. 2009	Completed	Make appropriate geospatial data available in a centralized location to reduce redundancy.	11/13/2014
		Store data in an organized structure allowing end users to more easily locate appropriate data layers.	Dec. 2009	Completed	Store data in an organized structure allowing end users to more easily locate appropriate data layers.	11/13/2014

APPENDIX B: ARDEN HILLS ARMY TRAINING SITE INTEGRATED NATURAL RESOURCES MANAGEMENT PLAN UPDATED GOALS AND OBJECTIVES

AHATS ADMINISTRATION

Section/ Goal Created	INRMP Goal	2014 Objectives	Objective Originally Created	2014 Objective Status	2015 Update	2015 Update Created
INRMP 8/1/2007	Ensure adequate funding and resources to implement AHATS's INRMP	Implement the Conservation and ITAM Programs at AHATS.	12/15/2011	Ongoing	Continue to implement the Conservation and ITAM Programs at AHATS.	11/18/2014
		Maintain a Cooperative Agreement between MNARNG and MNDNR for the management and protection of AHATS's natural resources and enforcement of applicable laws and regulations.	12/15/2011	Completed and ongoing	Maintain a Cooperative Agreement between MNARNG and MNDNR for the management and protection of AHATS's natural resources and enforcement of applicable laws and regulations.	11/17/2014
		Maintain administration of the INRMP development, implementation, and updating through the Camp Ripley Environmental Office, and to include the LUCRD.	12/15/2011	Ongoing	Maintain administration of the INRMP development, implementation, and updates through the Camp Ripley Environmental Office, and to include the LUCRD.	11/18/2014
		Create an annual Conservation-INRMP update report. Update review and obtain signatures at annual meeting with MNDNR and USFWS.	12/15/2011	Completed and ongoing	Create an annual Conservation-INRMP update report. Update review and obtain signatures at annual meeting with MNDNR and USFWS.	11/18/2014
		Participate in the Sustainable Range Program committee to annually integrate long-range natural resources planning with site development planning for the military mission.	12/15/2011	Completed and ongoing	Participate in the Sustainable Range Program committee to annually integrate long-range natural resources planning with site development planning for the military mission.	11/18/2014

AHATS ADMINISTRATION

Section/ Goal Created	INRMP Goal	2014 Objectives	Objective Originally Created	2014 Objective Status	2015 Update	2015 Update Created
		Facilitate potential funding through the Natural Resources Damage Assessment to supplement implementation of AHATS INRMP.	12/15/2011	Ongoing	Facilitate potential funding through the Natural Resources Damage Assessment (NRDA) to supplement implementation of AHATS INRMP.	11/18/2014
		Develop and maintain a work plan of environmental projects in the STEP that support the INRMP implementation.	12/15/2011	Ongoing	Develop and maintain a work plan of environmental projects in the STEP that support the INRMP implementation.	11/18/2014
		Develop and maintain a work plan of wild land fire projects in the Fire and Emergency Services Program that support the INRMP implementation.	12/15/2011	Incomplete lack of funding / ongoing	Develop and maintain a work plan of wildland fire projects in the Fire and Emergency Services Program that support the INRMP implementation.	11/18/2014

AHATS RTLA

(Range and Training Land Assessment)

Section/ Goal Created	INRMP Goal	2014 Objectives	Objective Originally Created	2014 Objective Status	2015 Update	2015 Update Created
RTLA 8/1/2007	Provide information to land managers about the status of natural and cultural resources on AHATS	Reassess RTLA monitoring protocol.	12/15/2011	Ongoing	Continue RTLA monitoring protocol.	12/16/2014

AHATS RTLA

(Range and Training Land Assessment)

Section/ Goal Created	INRMP Goal	2014 Objectives	Objective Originally Created	2014 Objective Status	2015 Update	2015 Update Created
		Create an Integrated Training Area Management (ITAM) annual report which documents the accomplishments for the preceding year.	12/15/2011	Ongoing	Create an ITAM annual report which documents the accomplishments for that preceding year.	12/16/2014
		Provide information to the AHATS SDP, INRMP, IPMP, ICRMP, and Range Regulations.	12/15/2011	Completed and Ongoing	Provide information to the AHATS SDP, INRMP, IPMP, ICRMP, SOP, and Range Regulations.	12/16/2014

AHATS TRI-LRAM

(Training Requirements Integration – Land Rehabilitation and Maintenance)

Section/ Goal Created	INRMP Goal	2014 Objectives	Objectives Originally Created	2014 Objective Status	2015 Update	2015 Objective Updated
TRI 8/1/2007	Provide military trainers and land managers with the necessary technical and analytical information for them to meet their requirements	SRP committee will prioritize projects based on RTLA and other studies. Balance LRAM, RTLA, TRI, and SRA prioritization based on requirements and anticipated funding guidance.	12/15/2011	Ongoing	SRP committee will prioritize projects based on RTLA and other studies. Balance LRAM, RTLA, TRI, and SRA prioritization based on requirements and anticipated funding guidance.	12/16/2014

AHATS TRI-LRAM

(Training Requirements Integration – Land Rehabilitation and Maintenance)

Section/ Goal Created	INRMP Goal	2014 Objectives	Objectives Originally Created	2014 Objective Status	2015 Update	2015 Objective Updated
		Accommodate secondary land uses such as forestry, hunting, fishing, and recreation while ensuring that land use is in support of and/or compatible with training requirements and the LUCRD.	12/15/2011	Ongoing	Accommodate secondary land uses such as forestry, hunting, and recreation while ensuring that land use is in support of and/or compatible with training requirements and the LUCRD.	12/16/2014
TRI 8/1/2007	Optimize training land management decisions by coordinating mission requirements and land maintenance activities	Advise on the allocation of land to support current and projected training mission requirements.	12/15/2011	Ongoing	Advise on the allocation of land to support current and projected training mission requirements.	12/16/2014
		Range Control will coordinate usage with external organizations, supporting agencies, tenant activities, and higher headquarters.	12/15/2011	Ongoing	Range Control will coordinate usage with external organizations, supporting agencies, tenant activities, and higher headquarters.	12/16/2014
		Support the development and/or revision of the INRMP and ICRMP by providing training requirements data from the military to ensure the INRMP and ICRMP support the installation training mission.	12/15/2011	Ongoing	Support the development and/or revision of the INRMP and ICRMP by providing training requirements data from the military to ensure the INRMP and ICRMP support the installation training mission.	12/16/2014
TRI 8/1/2007	Ensure adequate staffing and resources to manage and protect AHATS's natural resources	Maintain Environmental Specialist to provide full time support for Conservation and ITAM programs at AHATS.	12/15/2011	Ongoing	Maintain Environmental Specialist to provide full time support for Conservation and ITAM programs at AHATS.	12/16/2014

AHATS TRI-LRAM

(Training Requirements Integration – Land Rehabilitation and Maintenance)

Section/ Goal Created	INRMP Goal	2014 Objectives	Objectives Originally Created	2014 Objective Status	2015 Update	2015 Objective Updated
LRAM 8/1/2007	Sustain natural resources to ensure long-term military use	Employ a Site Assessment type methodology to identify areas for redesign, rehabilitation, and/or repair by implementing RTLA assessments.	12/15/2011	Ongoing	Continue to implement and support RTLA assessments.	12/16/2014
		Implement management recommendations for sites identified in RTLA Assessment.	12/15/2011	Ongoing	Implement management recommendations for sites identified in RTLA Assessments.	12/16/2014

AHATS SRA

(Sustainable Range Awareness)

Section/ Goal Created	INRMP Goal	2014 Objectives	Objectives Originally Created	2014 Objective Status	2015 Update	2015 Update Created
SRA 8/1/2007	Minimize natural resources damage by educating users in regards to activities negatively impacting the environment.	Continue to educate land users of their environmental stewardship responsibilities.	12/15/2011	Ongoing	Continue to educate land users of their environmental stewardship responsibilities.	12/16/2014
		Conduct Environmental Briefings (Pre-camp conferences, trainer workshops, Training Area Coordination Briefings, schools, and civilian organizations).	12/15/2011	Ongoing	Conduct Environmental Briefings (Pre-camp conferences, trainer workshops, Training Area Coordination Briefings, schools, and civilian organizations).	12/16/2014

AHATS SRA

(Sustainable Range Awareness)

Section/ Goal Created	INRMP Goal	2014 Objectives	Objectives Originally Created	2014 Objective Status	2015 Update	2015 Update Created
		Promote compliance with AHATS environmental regulations and land use controls (LUCRD).	12/15/2011	Ongoing	Promote compliance with AHATS environmental regulations and land use controls (LUCRD).	12/16/2014
SRA 8/1/2007	Instill a sense of pride and stewardship for those that use AHATS's natural and cultural resources	Improve public relations through SRA by communicating our success at sustaining mission activities.	12/15/2011	Ongoing	Improve public relations through SRA by communicating our success at sustaining mission activities.	12/16/2014
		Convey installation mission and training objectives to environmental professionals and the public.	12/15/2011	Ongoing	Convey installation mission and training objectives to environmental professionals and the public.	12/16/2014
		Continue to implement a public education program.	12/15/2011	Ongoing	Continue to implement a public education program.	12/16/2014

AHATS VEGETATION MANAGEMENT

Section/ Goal Created	INRMP Goal	2014 Objectives	Objectives Originally Created	2014 Objective Status	2015 Update	2015 Update Created
Wetlands 8/1/2007	Protect, restore, and manage wetland communities on AHATS for the protection of wetland-dependent species and intrinsic value in accordance with federal, state, and local laws and regulations	Obtain all necessary permits required by the "Federal" Clean Water Act (CWA) and "State" Wetland Conservation Act (WCA) before project implementation.	12/15/2011	Ongoing	Obtain all necessary permits required by the "Federal" Clean Water Act (CWA) and "State" Wetland Conservation Act (WCA) before project implementation.	11/17/2014

AHATS VEGETATION MANAGEMENT

Section/ Goal Created	INRMP Goal	2014 Objectives	Objectives Originally Created	2014 Objective Status	2015 Update	2015 Update Created
		Implement control measures identified in findings for the protection of the wetland ecosystem for the purpose of improving and sustaining training area lands and eradication of exotic species.	12/15/2011	Ongoing	Implement control measures identified in findings for the protection of the wetland ecosystem for the purpose of improving and sustaining training area lands and eradication of exotic species.	11/17/2014
		Document wetland banking in annual accomplishment report.	12/15/2011	Ongoing	Document wetland banking in annual accomplishment report.	11/17/2014
		Continue storm water pollution prevention plan and best management practices.	12/15/2011	Ongoing	Continue storm water pollution prevention plan and best management practices.	11/17/2014
Grasslands - Woodlands 8/1/2007	Restore and manage grassland and woodland communities for the purposes of military training, protection of native species, oak savannah restoration, and soil stabilization	Facilitate the process to implement restoration projects if funding becomes available. Initiate comprehensive landscape plan.	12/15/2011	Not completed, insufficient funding and professional staffing levels	Facilitate the process to implement restoration projects, if funding becomes available. Initiate comprehensive landscape plan for cantonment area and training area.	11/17/2014
		Evaluate and prioritize grassland compartments for management needs.	12/15/2011	Ongoing	Evaluate and prioritize grassland compartments for management needs as part of NRDA.	11/17/2014
		New Objective			In 2015, conduct prescribed burns in burn units #9, #10, #12, #37 and areas where cottonwood removal occurred in winter of 2015.	12/2/2014

AHATS VEGETATION MANAGEMENT

Section/ Goal Created	INRMP Goal	2014 Objectives	Objectives Originally Created	2014 Objective Status	2015 Update	2015 Update Created
		Implement control measures identified in findings for the protection of the grasslands for the purpose of improving and sustaining training area lands and eradication of exotic species.	12/15/2011	Ongoing	Implement control measures identified in findings for the protection of the grasslands for the purpose of improving and sustaining training area lands and eradication of exotic species.	11/17/2014
		Ensure adequate fire breaks, best management practices, and other safety procedures are in place.	12/15/2011	Ongoing	Ensure adequate fire breaks, best management practices, and other safety procedures are in place.	11/17/2014
		Maintain a Vegetation Management Committee, which will develop detailed management regimes for each training area at AHATS, and create a Vegetation Management Plan for AHATS.	12/13/2011	Not completed, insufficient professional staffing levels	Maintain a Vegetation Management Committee, which will develop detailed management regimes for each training area at AHATS, and create a Vegetation Management Plan for AHATS, as per Natural Resources Damage Assessment proposal.	11/17/2014
		In 2014, update distribution maps of target invasive plant species' populations (spotted knapweed, leafy spurge, and common buckthorn).	12/11/2010	Completed-ongoing	In 2015, update distribution maps of target invasive plant species' populations (spotted knapweed, leafy spurge, purple loosestrife, Queen Anne's lace, and bristly locust).	11/17/2014
		In 2014, continue mechanical and chemical removal of target invasive species.	12/11/2010	Completed-ongoing	In 2015, continue mechanical and chemical removal of target invasive species.	11/17/2014
Floral 8/1/2007	Monitor floral resources on AHATS	Monitor, catalog, and create reference document for AHATS flora.	12/15/2011	Ongoing	Monitor, catalog, and create reference document for AHATS flora.	11/17/2014

AHATS PLANTED OR CULTIVATED VEGETATION NEAR BUILDINGS and BORDERS

Section	INRMP Goal	2014 Objectives	Objectives Originally Created	2014 Objective Status	2015 Update	2015 Update Created
Cantonment 8/1/2007	Protect and develop landscaped grounds for functional and aesthetic qualities in the AHATS Cantonment area	Maintain a tree nursery to supply future landscaping needs.	12/13/2011	Ongoing	Maintain a tree nursery to supply future landscaping needs.	11/17/2014
		Complete SCSU study and implement control measures identified in findings for the protection of the cantonment area for the purpose of improving and sustaining training area lands and eradication of exotic species.	12/13/2011	Ongoing	Continue control measures identified in findings for the protection of the cantonment and training area for the purpose of improving and sustaining training area lands and eradication of exotic species.	11/17/2014

AHATS FISH AND WILDLIFE MANAGEMENT (Mammals)

Section/ Goal Created	INRMP Goal	2014 Objectives	Objective Originally Created	2014 Objective Status	2015 Update	2015 Update Created
White-tailed Deer 8/1/2007	Monitor deer population	In 2014, compile information from past research, deer harvest data, and aerial surveys, to provide a basis for determining management objectives.	4/9/2008	Completed	In 2015, compile information from past research, deer harvest data, and aerial surveys, to provide a basis for determining management objectives.	11/17/2014
		In 2014, conduct deployed soldiers archery deer hunts.	8/1/2007	Completed	In 2015, conduct deployed soldiers archery deer hunts.	11/17/2014

AHATS FISH AND WILDLIFE MANAGEMENT (Mammals)						
Section/ Goal Created	**INRMP Goal**	**2014 Objectives**	**Objective Originally Created**	**2014 Objective Status**	**2015 Update**	**2015 Update Created**
		In 2014, conduct one, 3-day volunteer archery deer hunt.	**4/9/2008**	**Completed**	**In 2015, conduct one, 3-day volunteer archery deer hunt concurrent with soldier hunt.**	**11/17/2014**
		In 2014, conduct deployed soldiers archery turkey hunts.	**12/12/2008**	**Completed**	**In 2015, conduct deployed soldiers archery turkey hunts.**	**11/17/2014**
Nuisance Animal Control **8/1/2007**	**Monitor and removal of nuisance and feral animals**	**In 2014, conduct scent post surveys to track population levels as needed.**	**8/1/2007**	**Not completed, insufficient professional staffing levels**	**In 2015, conduct scent post surveys to track population levels as needed.**	**11/17/2014**
		Annually record observations of nuisance and feral animal species.	**8/1/2007**	**Ongoing**	**Annually record observations of nuisance and feral animal species.**	**11/17/2014**
		Eliminate entry points for feral animals.	**8/1/2007**	**Ongoing**	**Eliminate entry points for feral animals.**	**11/17/2014**
		Remove nuisance and feral animals as needed.	**8/1/2007**	**Completed and ongoing**	**Remove nuisance and feral animals as needed.**	**11/17/2014**
8/1/2007 **(under RTLA)**	**Monitor faunal (Birds, Mammals, and Reptiles and Amphibians) resources on AHATS**	**In 2014, re-assess monitoring protocol for small mammals.**	**12/22/2009**	**Not completed, insufficient professional staffing levels**	**In 2015, re-assess monitoring protocol for small mammals.**	**11/17/2014**

AHATS FISH AND WILDLIFE MANAGEMENT (Birds-Herpes-Invertebrates-Protected Species)

Section/ Goal Created	INRMP Goal	2014 Objectives	Objective Originally Created	2014 Objective Status	2015 Update	2015 Update Created
Birds (Nesting Structures) 8/1/2007	Continue to make nesting structures available	In 2014, continue to map, and determine number and condition of existing artificial nesting structures.	8/1/2007	Ongoing	In 2015, continue to map, and determine number and condition of existing artificial nesting structures.	12/2/2014
		In 2014, repair, replace, or add nesting structures as necessary. Remove unused nesting structures.	8/1/2007	Completed and ongoing	In 2015, repair, replace, or add nesting structures, as necessary, and remove unused nesting structures.	12/2/2014
		In 2014, continue to enlist the help of volunteers for annual maintenance and monitoring of nesting structures.	8/1/2007	Ongoing	In 2015, continue to enlist the help of volunteers for annual maintenance and monitoring of nesting structures.	12/2/2014
Songbirds 8/1/2007	Monitor songbird populations on AHATS	In 2014, conduct annual surveys for songbirds on INRMP plots.	8/1/2007	Completed, see AHATS Bird section	In 2015, conduct annual surveys for songbirds on INRMP plots.	12/2/2014
Reptiles and Amphibians 8/1/2007	Monitor the presence and abundance of reptiles and amphibians	In 2014, continue to support the annual statewide anuran survey.	8/1/2007	Completed by MNDNR volunteer, see AHATS Amphibian and Reptile section	In 2015, continue to support the annual statewide anuran survey.	12/2/2014
		In 2014, investigate new methods for monitoring reptiles and amphibians.	8/1/2007	Not completed, insufficient professional staffing levels	In 2015, investigate new methods for monitoring reptiles and amphibians.	12/2/2014
Invertebrates 8/1/2007	Monitor the presence and abundance of terrestrial and aquatic invertebrates	Continue to support the Audubon Society's butterfly survey.	8/1/2007	Completed, see AHATS Insect section	Continue to support the Audubon Society's butterfly survey.	12/2/2014
		In 2014, review invertebrate studies and inventories.	8/1/2007	Not completed, insufficient professional staffing levels	In 2015, review invertebrate studies and inventories.	12/2/2014

AHATS FISH AND WILDLIFE MANAGEMENT (Birds-Herpes-Invertebrates-Protected Species)

Section/ Goal Created	INRMP Goal	2014 Objectives	Objective Originally Created	2014 Objective Status	2015 Update	2015 Update Created
T & E Species 8/1/2007	Manage and protect species that are listed as threatened or endangered by the federal government or the State of Minnesota	In 2014, continue to monitor resident and transient threatened and endangered species and implement management recommendations as noted in the Protected Species Management Plan (Dirks et al. 2010), as funding allows.	12/22/2009	Ongoing, conducted tiger beetle surveys in 2014 in cooperation with MNDNR, Region 3 Nongame staff, see 2014 report.	In 2015, continue to monitor resident and transient threatened and endangered species and implement management recommendations as noted in the Protected Species Management Plan (Dirks et al. 2010), as funding allows.	12/2/2014
		In 2014, continue to include annual accomplishments of the Protected Species Management Plan in the annual Conservation Program Report as part of the AHATS INRMP updates.	12/21/2009	Completed, see 2014 report	In 2015, continue to include annual accomplishments of the Protected Species Management Plan in the annual Conservation Program Report as part of the AHATS INRMP updates.	12/2/2014
		In 2014, examine additional locations for plains pocket mouse habitat enhancement adjacent to existing habitat, and survey population in 2014 (Dirks et al. 2010).	12/12/2008	Not completed, insufficient professional staffing levels	In 2015, examine additional locations for plains pocket mouse habitat enhancement adjacent to existing habitat, and survey population in 2015 (Dirks et al. 2010).	12/2/2014
		In 2014, monitor the presence and reproductive success of trumpeter swans (Dirks et al. 2010).	8/1/2007	Completed, see AHATS Birds section	In 2015, monitor the presence and reproductive success of trumpeter swans (Dirks et al. 2010).	12/2/2014
		In 2014, continue a monitoring program for state threatened Blanding's turtles.	8/1/2007	Ongoing, see AHATS Reptile and Amphibian section	In 2015, continue a monitoring program for state threatened Blanding's turtles.	12/2/2014
		Annually monitor for the presence of bald eagles (Dirks et al. 2010).	8/1/2007	None present - Ongoing	Annually monitor for the presence of bald eagles (Dirks et al. 2010).	12/2/2014

AHATS FISH AND WILDLIFE MANAGEMENT (Birds-Herpes-Invertebrates-Protected Species)						
Section/ Goal Created	**INRMP Goal**	**2014 Objectives**	**Objective Originally Created**	**2014 Objective Status**	**2015 Update**	**2015 Update Created**
		In 2014, monitor for the presence of the state endangered Henslow's sparrow (Dirks et al. 2010).	**8/1/2007**	**Completed, see AHATS Bird section**	**In 2015, monitor for the presence of the state endangered Henslow's sparrow (Dirks et al. 2010).**	**12/2/2014**
		Maintain suitable habitat for Henslow's sparrows (Dirks et al. 2010).	**12/12/2008**	**Ongoing**	**Maintain suitable habitat for Henslow's sparrows (Dirks et al. 2010).**	**12/2/2014**
8/1/2007	**Monitor faunal (Birds, Mammals, and Reptiles and Amphibians) resources on AHATS**	**In 2014, continue an annual monitoring program for birds on permanent plots.**	**12/12/2008**	**Completed, see AHATS Bird section**	**In 2015, continue an annual monitoring program for birds on permanent plots.**	**12/2/2014**
		In 2014, re-assess monitoring protocol for reptiles and amphibians.	**12/12/2008**	**Not completed, insufficient professional staffing levels**	**In 2015, re-assess monitoring protocol for reptiles and amphibians.**	**12/2/2014**
		In 2014, develop sampling locations and monitor, via ANABAT detector, for presence of northern long-eared bat and other state special concern species.	**12/16/2013**	**Northern long-eared bats were proposed to be listed as federally endangered under the Endangered and Threatened Species Act in April 2015. Not completed, insufficient professional staffing levels**	**In 2015, develop sampling locations and monitor, via ANABAT detector, for presence of northern long-eared bat and other state special concern species.**	**12/2/2014**

AHATS LAND USE

Section/ Goal Created	INRMP Goal	2014 Objectives	Objectives Originally Created	2014 Objective Status	2015 Update	2015 Update Created
Land Use 8/1/2007	Identify and develop appropriate land use opportunities	Continue to allow public access to AHATS for recreation and educational activities.	12/13/2011	Reference OU2 LUCRD Sept. 2010	Facilitate public access to AHATS for recreation and educational activities after retrocession of jurisdiction has been completed as recommended by staff judge advocate.	12/16/2014
		Continue to participate in Urban Bird Festival	12/13/2011	Reference OU2 LUCRD Sept. 2010; Not completed	Continue to participate in Urban Bird Festival.	12/16/2014
8/1/2007		Continue to foster relationships with local interest groups that want to help maintain and develop AHATS natural resources.	12/13/2011	Reference OU2 LUCRD Sept. 2010	Continue to foster relationships with local interest groups that want to help maintain and develop AHATS natural resources.	12/16/2014

AHATS GIS

Section/ Goal Created	INRMP Goal	2014 Objectives	Objectives Originally Created	2014 Objective Status	2015 Update	2015 Update Created
GIS 12/9/2011	Achieve and maintain compliance with all mandated GIS requirements	Complete metadata for all new and updated layers prior to loading into GDB.	Dec. 2009	Incomplete	Complete metadata for all new and updated layers prior to loading into GDB.	12/16/2014
		Maintain compliance with SDSFIE.	Dec. 2009	Completed	Maintain compliance with SDSFIE.	12/16/2014

AHATS GIS

Section/ Goal Created	INRMP Goal	2014 Objectives	Objectives Originally Created	2014 Objective Status	2015 Update	2015 Update Created
		Provide appropriate data and documentation in the required format for all Army and NGB data requests.	Dec. 2009	Completed	Provide appropriate data and documentation in the required format for all Army and NGB data requests.	12/16/2014
GIS 12/9/2011	Maintain the MNARNG geographic database with sufficient completeness, consistency and accuracy for reliable query, analysis and application development	Identify data requirements and procedures in support of environmental/INRMP initiatives. Capture status and update frequency for each required layer.	Dec. 2011	Completed	Identify data requirements and procedures in support of environmental/INRMP initiatives. Capture status and update frequency for each required layer.	12/16/2014
		House current copies of the Camp Ripley and AHATS aerial photos in the GDB.	Dec. 2009	Completed	House current copies of the Camp Ripley and AHATS aerial photos in the GDB.	12/16/2014
		Ensure copies of digital statewide aerial photos are available to environmental staff.	Dec. 2009	Completed	Ensure copies of digital statewide aerial photos are available to environmental staff.	12/16/2014
GIS 12/9/2011	Maintain hardware and software systems appropriate for the info management needs of Camp Ripley	Develop GIS management plan to include data, software, hardware, application, and staffing requirements. Must correspond with STEP and ITAM reporting requirements.	Dec. 2012	In Progress	Develop GIS management plan to include data, software, hardware, application, and staffing requirements. Must correspond with STEP and ITAM reporting requirements.	12/16/2014
		Identify hardware needs for sustainment of data requirements.	Dec. 2009	Completed	Identify hardware needs for sustainment of data requirements.	12/16/2014

AHATS GIS

Section/ Goal Created	INRMP Goal	2014 Objectives	Objectives Originally Created	2014 Objective Status	2015 Update	2015 Update Created
GIS 12/9/2011	Develop, implement, and maintain applications to meet the info needs of the MNARNG user community	Maintain user-friendly web application(s) through ArcGIS Server to support data access needs to help achieve select INRMP goals and objectives.	Dec. 2011	Completed	Maintain user-friendly web application(s) through ArcGIS Server to support data access needs to help achieve select INRMP goals and objectives.	12/16/2014
		Maintain content of the digital map library.	Dec. 2009	Completed	Maintain content of the digital map library.	12/16/2014
GIS 12/9/2011	Ensure geospatial data and applications support MNARNG enterprise GIS initiatives.	Conduct monthly MNARNG GIS Working Group meetings and participate in the NGB GIS subcommittee.	Dec. 2009	Completed	Conduct monthly MNARNG GIS Working Group meetings and participate in the NGB GIS subcommittee.	12/16/2014
		Coordinate development and acquisition of geospatial data and applications with other users through the MNARNG GIS Working Group.	Dec. 2009	Completed	Coordinate development and acquisition of geospatial data and applications with other users through the MNARNG GIS Working Group.	12/16/2014
		Make appropriate geospatial data available in a centralized location to reduce redundancy.	Dec. 2009	Completed	Make appropriate geospatial data available in a centralized location to reduce redundancy.	12/16/2014
		Store data in an organized structure allowing end users to more easily locate appropriate data layers.	Dec. 2009	Completed	Store data in an organized structure allowing end users to more easily locate appropriate data layers.	12/16/2014

APPENDIX C: CAMP RIPLEY TRAINING CENTER ANNUAL MEETING MINUTES, 2014

MEMORANDUM FOR RECORD 25 February 2014

SUBJECT: Minutes of the DMA, DNR and USFWS Annual Meeting, 25 February 2014

1. **Introduction.** Mr. Jay Brezinka at, 0905 25 February 2014, called the DMA, DNR and, USFWS, annual meeting to order. The meeting was held at the Martin J. Skoglund Environmental Classroom, Camp Ripley, MN.

   Members present:

   Department of Military Affairs:
   LTC Chad Sackett, Deputy Post Commander
   MAJ Joseph Sanganoo, Operations Officer
   Mr. Marty Skoglund, Environmental Program Director
   Mr. Jay Brezinka, Environmental Program Manager
   Mr. John E. Maile, Natural Resource Manager
   Mr. Patrick Neumann, Cultural Resource Specialist
   Mr. Craig Erickson, GIS Manager
   Ms. Lee Anderson, GIS Specialist
   Ms. Mary Lee, AHATS Environmental Protection Specialist
   Mr. Tim Notch, Training Area Coordinator
   Mr. Adam Thompson, RTLA Specialist
   Mr. Jason Linkert, LRAM Specialist
   Mr. Brian Sanoski, ITAM Coordinator
   Mr. Joe LaForce, NEPA/ECOP
   Department of Natural Resources:
   Mr. John Korzeniowski, Area Forest Supervisor (Little Falls)
   Mr. Walker Wearne, Forester (Little Falls)
   Mr. Tod Tonsager, Assistant Wildlife Manager (Little Falls)
   Mr. Brian Dirks, Animal Survey Coordinator (Camp Ripley)
   Ms. Nancy Dietz, Animal Survey Asst. (Camp Ripley)
   Mr. Mark Hauck, Community ACUB Coordinator (St. Cloud)
   Mr. Paul Roth, Crow Wing State Park Manager (Fort Ripley)
   Mr. Steve Marod, Fisheries Specialist (Little Falls)
   Ms. Joyce Kuske, Conservation Officer (Little Falls)
   Ms. Crystal Payment, Area Hydrologist (Little Falls)
   Mr. Nick Schwaegerl, DNR Technician (Fort Ripley)
   Mr. Greg Russell, Forestry Regional Manager (St. Paul)
   Ms. Christine Reitz, Area Wildlife Manager (Brainerd)
   United States Fish & Wildlife Service:
   Ms. Mags Rheude, Biologist (Bloomington)
   The Nature Conservancy
   Todd Holman

   2. Opening Remarks.

LTC Sackett welcomed everyone to Camp Ripley and provided a review of last year's training activities and what to expect for 2014. LTC Sackett thanked all of those present for their support and partnership with the MNARNG. Partnering with these organizations and agencies allows the MNARNG to continue training soldiers to meet their federal and state missions.

3. Discussion.

MAJ Sanganoo presented the past throughput and the forecasted throughput for FY 14, overview of range developments which included the Multi Purpose Machine Gun Range and Scout/Recce Ranges. MAJ Sanganoo also briefed on the current construction of the addition to the education center, which includes 40 single person lodging, additional classrooms, 400 person dining facility and conference center.

The Camp Ripley Environmental Team presented their 2013 accomplishments and 2014 work plan in addition to an update on the Army Compatible Use Buffer (ACUB) program.

Natural Resources:

1. This is our eight year of implementing the conservation report concept. The conservation report encompasses all of the previous year's accomplishments for the conservation program of the MNARNG.
2. Within the conservation report are the updated goals and objectives for all the conservation and ITAM programs for Camp Ripley and AHATS.
3 Funding levels have decreased in FY14.

Cultural Resources:

1. Camp Ripley hired a cultural resources manager, Patrick Neumann.
2. 2002 acres were surveyed for cultural resources, 25 sites discovered and protected.
3. A human bone that was discovered in 2013 and was reinstated in a previously established cemetery near the location of where the bone was found.
4. Multiple construction projects were submitted to SHPO and tribal consultants for approval.

Vegetation: (Flora)

1. 66.5 acres of aspen and 69 aces of northern hardwoods were harvested in 2013.
2. 9,327 acres of prescribed fire was applied to the training area of Camp Ripley.
3. Continued distribution maps of targeted invasive plants, Spotted Knapweed, Common Tansy and Leafy Spurge.
4. Chemical application to 30 acres that were infested with Spotted Knapweed and Common Tansy.
5. Continue to implement the Invasive Species Research Project with SCSU. Graduate student Kayla Malone completed field collection data in the summer of 2013 and coordinated with SCSU students to expand control measures.
6. Assessed south half of Camp Ripley roads and trails for damage and needed repairs.
7. Assessed 21 firing points and repaired 8 acres of maneuver damage.

Wildlife: (Fauna)

1. All hunts were successful and safe. The 2013 white-tailed deer harvest on Camp Ripley was 366.
2. The deployed soldiers and disabled veterans turkey hunt was again held on Camp Ripley in 2013 with 42 turkeys harvested.
3. The fisher study is still going. Currently four fishers are collared with the great help of Central Lakes College students.

4. Continued implementation of fauna surveys (songbird, anuran, osprey, owls, bear, Blanding's turtle etc).
5. Continue to monitor listed species and species of greatest conservation need.
6. Blanding's turtle nest protection remains an annual activity with evidence of turtles surviving.

ACUB:

1. To date $22,099,000 in federal funding and state 2,773,000 (FY2004-2013) have been received.
2. MN DNR has completed 19 land transactions and BWSR has completed 86 land transactions.
3. Currently 220 interested landowners remain on the ACUB waiting list.

USFWS

1. Mags Rheude from the USFWS commented that eagle numbers are remaining strong and new nest sites are identified each year.
2. Regional office have move and combined with Minnesota and Wisconsin. Mr. Fastbender is the new regional director.
3. Northern Long-eared bat is proposed to be a federally listed endangered species. Surveying for roosting locations of this bat species will be primary activity this field season. Avoiding summer forest harvest is recommended until more is known where the bats roost.
4. Take permits can be transferred from one person or organization to another but at a cost, current estimate to be approximately $8,000.

Meeting was adjourned at 1:19 pm.

Minutes Submitted By:
John Maile, Natural Resource Manager

APPENDIX D: ARDEN HILLS ARMY TRAINING SITE ANNUAL MEETING MINUTES, 2014

MEMORANDUM FOR RECORD 28 March 2014

SUBJECT: Minutes of the DMA, DNR and USFWS Annual Meeting, 27 March 2014

1. **Introduction.**
LTC Sackett called the annual meeting of the Arden Hills Army Training Site (AHATS) Natural Resources partners to order. The meeting was held at the Arden Hills Readiness Center. Members present:

Department of Military Affairs:
LTC Chad Sackett, Deputy Post Commander
CPT Kelli Mangan, Operations
SSG Janice Hawkins, AHATS Training Area Coordinator
Mr. Jay Brezinka, Environmental Conservation Supervisor
Mr. Mark Erickson, FMO Environmental
Mr. Todd Hendricks, AHATS DPW
Ms. Mary Lee, AHATS Environmental Specialist
Mr. Jason Linkert, LRAM Coordinator
Mr. John Maile, Natural Resources Manager
Mr. Patrick Neumann, Cultural Resources Manager
Mr. Tim Notch, Training Area Coordinator
Mr. Brian Sanoski, ITAM Coordinator
Mr. Jim Tatro, DPW Supervisor
Department of Natural Resources:
Mr. Brian Dirks, Animal Survey Coordinator
Ms. Jamie Gangaware, Regional Wildlife Coordinator
Mr. Christopher Smith, Nongame Specialist
Twin Cities Army Ammunition Plant
Mr. Mike Fix, Commander Representative
Minnesota Department of Agriculture:
Mr. Jonathan Osthus, Biocontrol Coordinator
U.S. Army Reserve:
Mr. Marshal Braman, Environmental Specialist, 88th RSC
Minnesota Audubon:
Mark Martell, Director of Bird Conservation
St. Paul Audubon:
Mr. Clay Christensen, Volunteer
Ms. Chase Davies, Volunteer
Mr. Julian Sellers, Volunteer
Raptor Center, U of M
Ms. Gail Buhl
Bell Museum of Natural History, U of M
Ms. Anita Cholewa, Ph. D., Consulting Botanist
DNR Volunteers:
Ms. Jane Heinks, Instructor
Ramsey County Parks and Recreation Department
Mr. Mike Goodnature
Ramsey County CWMA
Ms. Carol Gernes, Coordinator

Natural Resources Restoration, Inc:
Mr. Craig Andresen
Metropolitan Mosquito Control Division
Ms. Carla Mitchell

2. Opening Remarks.

Department of Military Affairs (DMA) Minnesota National Guard (AHATS)
LTC Sackett welcomed everyone to AHATS and provided information on the Minnesota National Guard Federal, State, and community missions and a brief history of the natural resources program. LTC Sackett thanked all of those present for their commitment and hard work in helping implement the natural resources program at AHATS. The objectives of the meeting were to discuss 2013 accomplishments and 2014 work plans for the AHATS Integrated Natural Resources Management Plan (INRMP).

3. Discussion.

Operations:
CPT Mangan presented information about training area improvements in both the cantonment and training area on AHATS.

Environmental Program:
Mr. Brezinka reviewed the Integrated Natural Resources Management Plan (INRMP) for AHATS to include administration, environmental programs, program funding, 2013 Conservation Report, goals and objectives, and the 2014 work plan.

Cultural Resources Program:
Mr. Neumann provided an overview of the cultural, historical, architectural, and archaeological management of the facility and requirements.

Woodland Management:
Mr. Maile provided summary of oak savannah management, girdled cottonwood trees, and proposed timber sale.

Vegetation Management:
Mr. Linkert described the 2013 invasive species accomplishments and work plan for the upcoming year.

Wildlife Monitoring and Research:
Mr. Brian Dirks detailed the wildlife monitoring and research on AHATS. Mr. Dirks reviewed the songbird surveys and highlighted the Species of Greatest Conservation Need (SGCN) known on AHATS. Mr. Dirks also recapped the breeding bird atlas, butterfly and anuran survey results, and provided white-tailed deer survey objectives. There was further discussion on the northern long-eared myotis, a bat proposed for federal listing and the review of American burying beetle surveys conducted in 2013. Mr. Dirks discussed the outreach and recreational activities on AHATS to include archery hunts and the successes of 2013 and goals for 2014.

Land Use:
Ms. Mary Lee provided an update on the Land Use Control Remedial Design (LUCRD), Natural Resources Damage Assessment (NRDA), and the retrocession of jurisdiction process.

4. Roundtable Discussion and Comments:
Volunteers from St. Paul Audubon highlighted success of songbirds on AHATS and voiced concerns regarding the retrocession of jurisdiction, recommendation was to follow up with Ramsey County Attorney's Office. Ramsey County highlighted the changes on the western boundary (former Twin Cities Army Ammunition Plant), Natural Resources Management, and county submissions to NRDA trustees. Ramsey County Cooperative Weed representative detailed new invasive concerns. MNDNR emphasized continuation of monitoring for tiger beetles on the site, in addition to snake and bat research. Mr. Andresen discussed successes with prescribed burns and non-native vegetation efforts. Ms. Gangaware addressed continuing the management of deer, turkeys and prescribed burning assistance. Mr. Mark Erickson reviewed results of the Comprehensive Stormwater Study. U of M botanist emphasized the importance of seed dispersal and significance of efforts on AHATS. Mr. Osthus detailed the emerald ash borer efforts and other biological controls monitored on AHATS.

5. Closing.
LTC Sackett thanked all for participating and welcomed any input for future goals and planning. Copies of the 2013 Conservation Program Report were provided. The meeting adjourned at 11:50.

Minutes Submitted By:
Mary L. Lee, AHATS Environmental