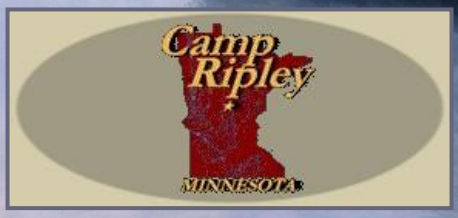
CAMP RIPLEY AND ARDEN HILLS MINNESOTA ARMY NATIONAL GUARD TRAINING SITES



CONSERVATION PROGRAM REPORT

2009 ANNUAL REPORT

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Camp Ripley and Arden Hills
Minnesota Army National Guard Training Sites
Conservation Program Report

2009 Annual Report

January 1 – December 31, 2009

Brian J. Dirks, Animal Survey Coordinator
Nancy J. Dietz, Animal Survey Assistant

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

MINNESOTA DEPARTMENT OF NATURAL RESOURCES
CAMP RIPLEY SERIES REPORT NO. 19

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Signature Page for Camp Ripley and AHATS INRMP updates.

Document Title:	**Approval:**
2009 Conservation Report	Richard A. Weaver, Colonel Camp Ripley Post Commander Minnesota National Guard **Signature:** **Date:** 10 JAN 10
Approval: Mr. Joe Kurcinka Regional Director MN-DNR Central Region **Signature:** **Date:** 12/21/09	**Approval:** Tony Sullins, Field Supervisor USFWS , Twin Cities Field Office **Signature:** **Date:** 1/6/10

Update/Review Requirements:

The 2009 Conservation Program Report provides Integrated Natural Resources Management Program (INRMP) accomplishments and therefore represents an annual update to the Camp Ripley and Arden Hills Army Training Site (AHATS) INRMPs. This report outlines accomplishments for the year of January 1 to December 31, 2009. The report summarizes accomplishments and provides updates to the goals and objectives for the INRMP's of the MNARNG, 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.

Document Owner and Office Symbol:
Martin j. Skoglund
JFMN-CRC-SE

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

Document History

Document	Effective Date	Update Summary
Camp Ripley INRMP	Jan 1998	2009 Conservation Report
AHATS INRMP	Oct 2001	2009 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 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 while also promoting sound conservation stewardship principles.

This document replaces the Animal Survey Report that was completed annually by the Minnesota Department of Natural Resources (MNDNR) for the Minnesota Army National Guard (MNARNG) from 1991 to 2006. The INRMP goals and objectives that have been accomplished are addressed in this report for the year January 1 to December 31, 2009; 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, forestry, vegetation management, water resources, wildlife, fisheries, pest management, land use management, integrated training area management, outreach and recreation.

In 2009, six pending cultural resources projects on Camp Ripley and AHATS were submitted to the State Historic Preservation Office (SHPO) for their concurrence. The Integrated Cultural Resource Management Plan 2009-2013 was submitted to National Guard Bureau for review and was approved.

Three Nature Conservancy staff again assisted with the re-inventory of Camp Ripley forest stands. During the year, the crew completed re-inventory of 4,400 acres of forest stands which meets the goal of completing ten percent of the forest inventory database annually. A total of 23,824 acres has been completed from 2003 to 2009. In 2009, seven tracts of timber totaling 402 acres were offered for harvest at the sealed bid auction on Camp Ripley. Thirty-eight individuals acquired fuelwood permits from Range Control and MNDNR, Division of Forestry, in 2009. The Department of Military Affairs and Minnesota Department of Corrections again worked together to facilitate a fuelwood program for families of deployed soldiers. Tree planting was accomplished at Camp Ripley in a buffer area adjacent to Morrison County Highway # 1, a buffer along D-range, and reforestation activities on the deer exclosure in training area #64. 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 tree stock for aforementioned buffer and reforestation activities and forest inventory. In a partnership with Camp Ripley, Crow Wing County, and St. Cloud State University, Light Detection and Ranging (LiDAR) technology was used to derive forest metric data to explore a method to minimize annual forest inventory efforts and to improve the understanding of the relationship between forest structure and breeding birds at Camp Ripley.

Prescribed fire was implemented on Camp Ripley for hazard reduction (10,000 to 12,000 acres) and ecological (1,028 acres) burns. In 2009, about 60 acres at AHATS were prescribed burned for ecological purposes. In 2009, the Department of Biological Sciences at St. Cloud State University continued to monitor and test control methods for invasive plant species at Camp Ripley. Water

quality testing continued at Sylvan Dam Reservoir on the Crow Wing River, results indicated poorer than expected water quality.

Species in greatest conservation need (SGCN) have been identified at Camp Ripley and AHATS. 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 57 plots; a total of 563 birds of 63 different species were counted. Additional bird species were monitored including bluebirds, wood ducks, bald eagles, owls, red-shouldered hawks, ruffed grouse and wild turkeys.

At the beginning of 2009, three radio-collared wolves were on Camp Ripley; one additional wolf was collared in the fall. Two packs of gray wolves continue to inhabit Camp Ripley, and were monitored through radio-telemetry throughout 2009. Human caused wolf mortality continues to be high off Camp.

Ground and aerial radio tracking were used to monitor reproductive success, movements and mortality of ten collared black bears on Camp Ripley through 2009. A scent post survey was conducted on Camp Ripley to track population trends of major furbearer-predator species. Six scent stations were used to detect Canada lynx, cougars, and bobcats in 2009. A graduate student continued research as part of the MNDNR fisher project; four fishers were radio-collared and monitored. Beaver management was accomplished through the cooperative effort of the Camp Ripley Environmental Office, the MNDNR, and the Camp Ripley Department of Public Works.

Surveyors again searched Camp Ripley for Blanding's turtles and their nests. Seventeen Blanding's turtles were observed and eight nests were protected. Frog and toad monitoring surveys were conducted. Fish surveys were conducted on four Camp Ripley lakes and game fish were harvested from six lakes for stocking.

At AHATS songbird surveys were conducted on 13 plots. State listed endangered Henslow's sparrows were documented again in 2009 and were observed four of the past five years. Trumpeter swans raised one cygnet during 2009. Plains pocket mice, a state special concern species, were live-trapped at the AHATS gravel pit. An analysis of bat ultrasonic calls recorded in 2007 documented the presence of the eastern pipistrelle, a state species of special concern, at AHATS. One hundred and four deer were counted during the AHATS aerial deer survey. A butterfly survey was conducted by the Saint Paul Audubon Society on June 27, 2009, and two species new to the area were observed.

To date, 247 willing landowners have expressed interest in Camp Ripley's Army Compatible Use Buffer program. These landowners represent about 35,036 acres of land. Over 93 percent of the interested landowners desire permanent conservation easements rather than acquisition. ACUB accomplishments through 2009 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 at Camp Ripley and AHATS.

In 2009, the environmental team gave presentations or tours to 97 groups totaling 4,247 people. Also in 2009, Camp Ripley hosted the fifth annual Disabled American Veteran's (DAV) wild turkey hunt, first annual deployed soldier's archery turkey hunt, and the eighth annual youth archery hunt. Camp Ripley also held the fourth annual deployed soldier's archery deer hunt in conjunction with the eighteenth 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 2009. At AHATS, a deployed soldier's archery wild turkey hunt, two youth archery deer hunts, and the fourth annual deployed soldier's archery deer hunt were also held.

INTRODUCTION

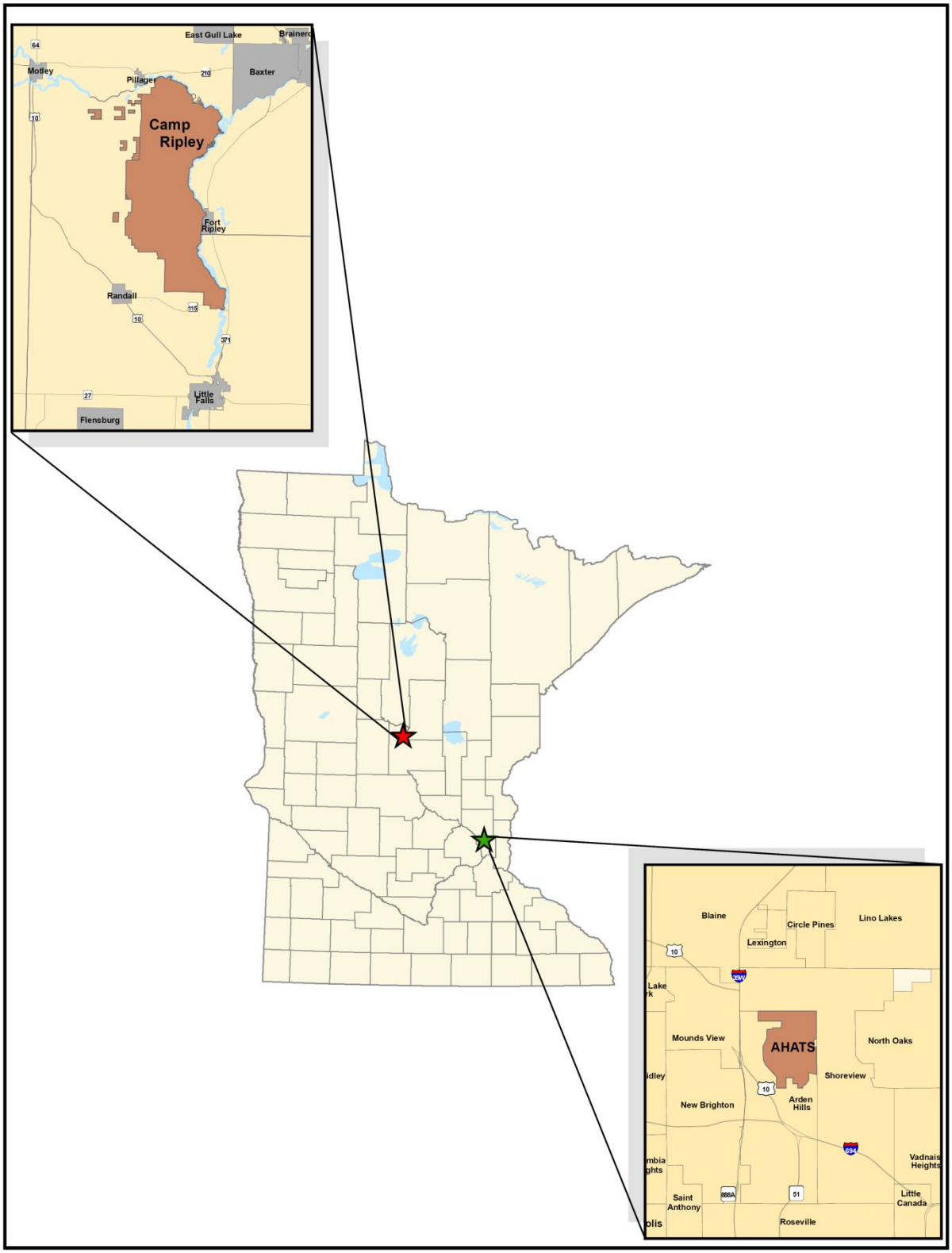
The purpose of this report is to summarize accomplishments for the Conservation Program of the Minnesota Army National Guard (MNARNG) during calendar year 2009. The Camp Ripley and Arden Hills Army Training Site (AHATS) Integrated Natural Resources Management Plans (INRMP) (Minnesota Army National Guard 2003, Minnesota Army National Guard 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 is required by the Sikes Act (16 USC 670a et seq.) and several other Federal directives including regulations and guidance issued by the United States 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 (Minnesota Army National Guard 2006) and pest management (Minnesota Army National Guard 2004) have individual management plans, and their accomplishments are also addressed in this report. This document replaces the Animal Survey Report that was completed annually by the Minnesota Department of Natural Resources (MNDNR) for the Minnesota Army National Guard (MNARNG).

CAMP RIPLEY TRAINING SITE

Camp Ripley is located in the central portion of Minnesota approximately 100 miles northwest of the Minneapolis/St. Paul metropolitan area (Figure 1). 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 odd areas.

Figure 1. Location of Camp Ripley and Arden Hills Army Training Sites (AHATS), Minnesota.



Since 1994, when Camp Ripley first started tracking utilization with a military scheduling program, more than four million personnel have trained at Camp Ripley. Organizations include: All branches of the military, many foreign military units, as well as civilians from a variety of organizations including federal, state and local law enforcement agencies. Camp Ripley supports the state 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 civilian 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.

Population studies of flora and fauna will be an ongoing part of the installation's INRMP, which was completed in December of 2003 (Minnesota Army National Guard 2003) with annual updates in 2007 (Dirks et al. 2008), 2008 (Dirks and Dietz 2009), and 2009 (Appendix A). The data obtained will be used to help manage the natural resources on Camp Ripley.

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 1). Presently, AHATS consists of 1,500 acres, which is available for military training and consequently, environmental management. AHATS lies 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 will be an ongoing part of the installation's INRMP, which was completed in November of 2001 and updated in 2007 (Dirks et al. 2008), 2008 (Dirks and Dietz 2009), and 2009 (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.

RESPONSIBILITIES

Camp Ripley Command-Site Environmental (CRC-SE) 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 (GIS) support, preparing reports, and facilitating

land use activities between military operations and other natural resource agencies. The environmental personnel who work directly for the Post 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 cooperative agreements with the Minnesota Department of Natural Resources (MNDNR), Division of Ecological Resources (Appendices C and D) and Division of Forestry, Saint Cloud State University, and Central Lakes College in Brainerd. These have been extremely cost effective and beneficial. The MNARNG also relies on expertise of personnel from other state agencies and organizations who contribute significantly to the support of the MNARNG Conservation Program, including: Minnesota Board of Water and Soil Resources, The Nature Conservancy, 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, Morrison County Soil and Water Conservation District, Crow Wing County Soil and Water Conservation District, and Cass County 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.

PROGRAM AREAS

For the purpose of documenting accomplishments for 2009, the Conservation Program of the MNARNG will be divided into the following program areas: cultural resources, natural resources, land use management, geographic information systems (GIS), and outreach and recreation.

Cultural Resources

During 2009, the Minnesota State Historic Preservation Office (SHPO) responded with concurrence on several projects previously submitted for their review. In March, the SHPO responded that the "Campus" area at AHATS contained no cultural or historic features which cleared the way for the construction of the proposed Readiness Center. Their comments, however included the contingency that the construction would not negatively impact potentially eligible properties located

on TCCAP land, and that the four sites potentially eligible on AHATS would be protected until further evaluation determined eligibility or a protection plan was in place.

In April, the SHPO responded that no adverse effect would be caused by the pending construction on the Camp Ripley Cantonment Area under the Economic Stimulus Incentive initiative.

In June, the SHPO concurred with the determination of the Cold War Thematic Study (1946-1989) and Inventory of Early Cold War Era Properties (1946-1961) as revised, stating that: 1) no properties evaluated on Camp Ripley were eligible , 2) none of the inventoried armories were eligible for their association with the Cold War, but they may have local association significance under Criterion A, and 3) the Hibbing Armory did meet National Register criteria as an example of Bettenburg, Townsend, and Stolte design.

In August, the SHPO concurred with the determination made by the Heritage Sites firm that no historic properties would be impacted by the construction of a parking lot at the Chisholm Armory. In a separate response the SHPO responded that the design of the elevator construction at the NR eligible or listed Armories at Madison and New Ulm were in compliance with the Secretary of the Interior's Standards for Rehabilitation.

In October, the SHPO concurred with the archaeologist's findings that on the south side of Training Area 1 an historic site needs to be protected until further evaluated and that the remainder of Training Area 1 contained no historic or prehistoric features.

In September, the SHPO concurred with the findings of the evaluation made by Heritage Sites of the Improvised Explosive Device Defeat Lane on Chorwan Road that found no cultural materials within the project area but did locate a prehistoric site just east of the project area that is being protected until further evaluation.

Heritage Sites also completed the field investigations for the Forward Operating Base (FOB)-North that located a prehistoric site between two small wetland areas. That site location was one factor that necessitated the relocation of the FOB site further north. The north site was also evaluated by Heritage Sites.

Field work was completed on the proposed site for the construction of a Field Maintenance Shop (FMS) for the Mankato Armory. That contract was the first to require a Tribal monitor. The utilization of a Tribal monitor in this instance proved to be most productive. The final reports will be submitted to the SHPO for concurrence.

During the summer of 2009, work was completed on the revision of the Integrated Cultural Resource Plan (ICRMP). The ICRMP was submitted to NGB for review and signature. The Integrated Cultural Resource Management Plan 2009-2013 is now approved, signed and a working document.

As of the end of 2009, 15,932 acres on Camp Ripley had been evaluated for prehistoric and historic sites (Figure 2). On AHATS, the entire 1,500 acres have been evaluated for historic features and all of the 128 acres of undisturbed soils have been evaluated for prehistoric features. In addition,

all of the buildings on AHATS have been evaluated and determined not eligible for the National Register of Historic Places.

The Consultation Agreement developed by MNARNG and the Tribal consulting partners was submitted to NGB for review. The document is now awaiting final legal determination at NGB before returning to Consultation, Tribal legal review and signature by all parties.

Natural Resources

Natural resource planning is an integral part of the Conservation Program for the MNARNG. The MNARNG uses the INRMPs as the guidance documents for implementing the Conservation Program. The planning process used in developing the INRMPs focuses on using key stakeholders from the MNARNG, MNDNR, U.S. Fish and Wildlife Service, and other organizations that have an interest in the MNARNGs 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 INRMPs not only satisfy the military mission but also provide a foundation for sound stewardship principles. Annually, stakeholders discuss and review the INRMPs for both Camp Ripley and AHATS, and present their annual accomplishments and work plans for the next year. Please refer to Appendices E and F for the 2009 Camp Ripley and AHATS annual meeting minutes.

FORESTRY

Forest Inventory

During 2009, the inventory crew consisted of the The Nature Conservancy Land Steward and two technicians, Adam Thompson and Jason Linkert, as part of a Cooperative Agreement between MNARANG and St. Cloud State University. During 2009, the crew completed re-inventory of about 4,400 acres of forest stands for a total for 2003 to 2009 of 23,824 acres completed (Figure 3). The amount re-inventoried meets or exceeds the goal of completing ten percent of the forest inventory database annually.

Forest Inventory and Analysis – Northern Research Station

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,

Figure 2. Culturally evaluated areas with concurrence of no adverse effect and farmstead locations at Camp Ripley, 1985-2009.

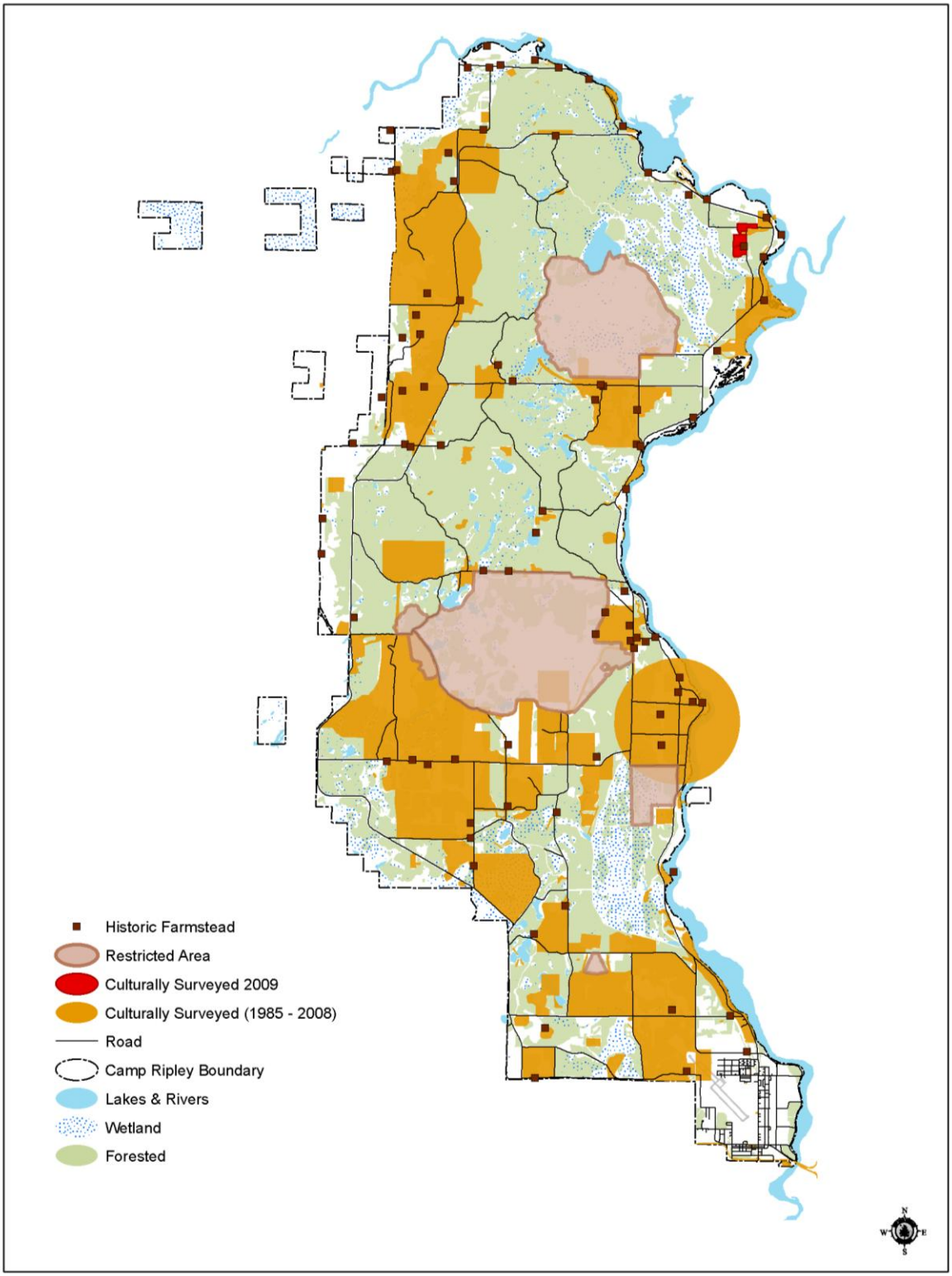
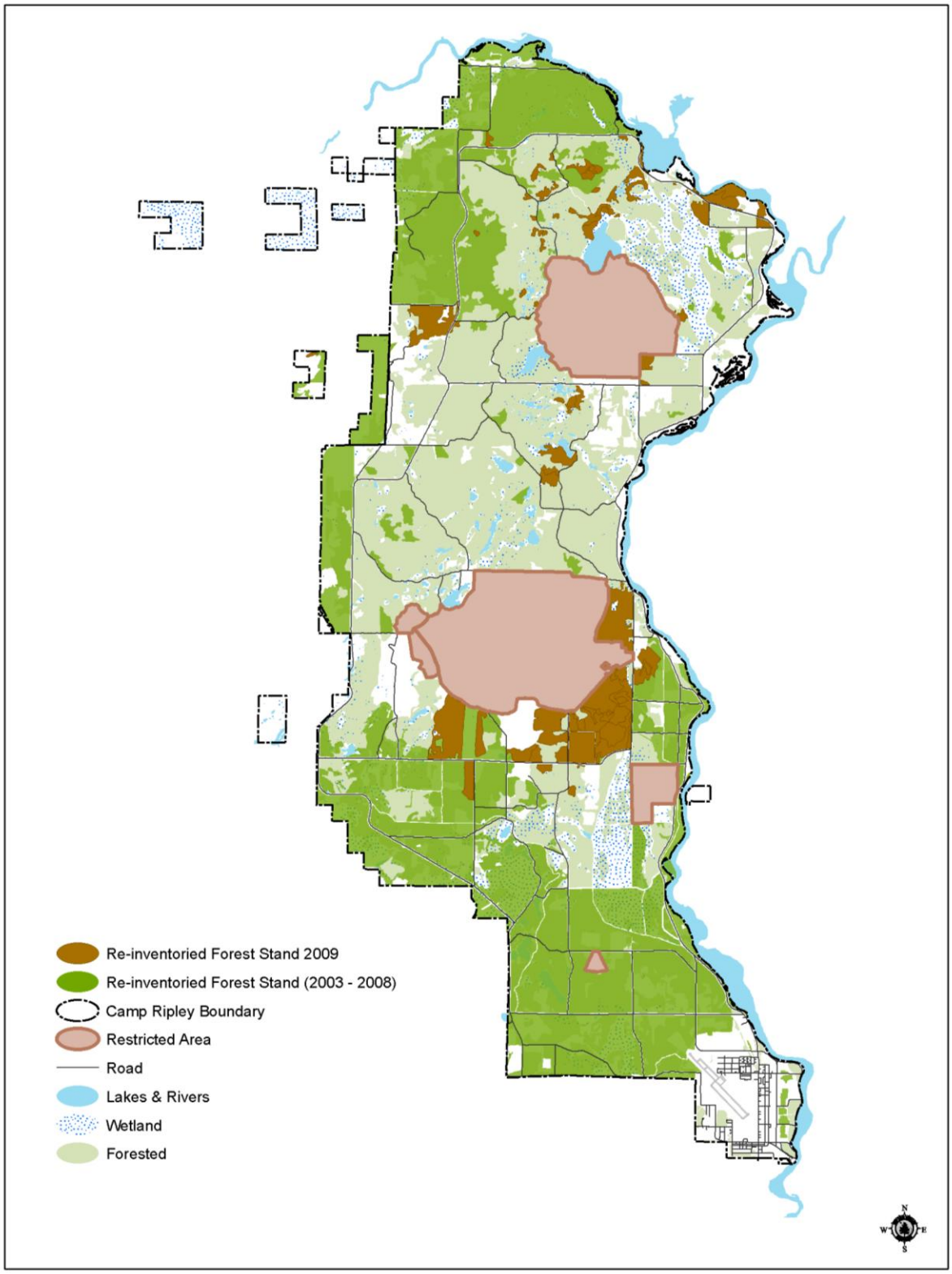


Figure 3. Forest stands re-inventoried at Camp Ripley, 2003-2009.



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. In any given year, one-fifth of the plots, called a 'panel' are measured (Table 1 and Figure 4).

Table 1. Schedule of number of plots on the Forest Inventory and Analysis sample grid at Camp Ripley, 2008-2012.

State Name	Area Name	2008	2009	2010	2011	2012
Minnesota	Camp Ripley	2	6	3	3	2

The Phase two component consists of one field sample site for every 6,000 acres. Field crews collect data on forest type, site attributes, tree species, tree size, and overall tree condition. Data is also collected on the understory vegetation, site productivity, and physical attributes of the site (e.g., slope, aspect, etc.). Each plot is visited once every five years on the annual system.

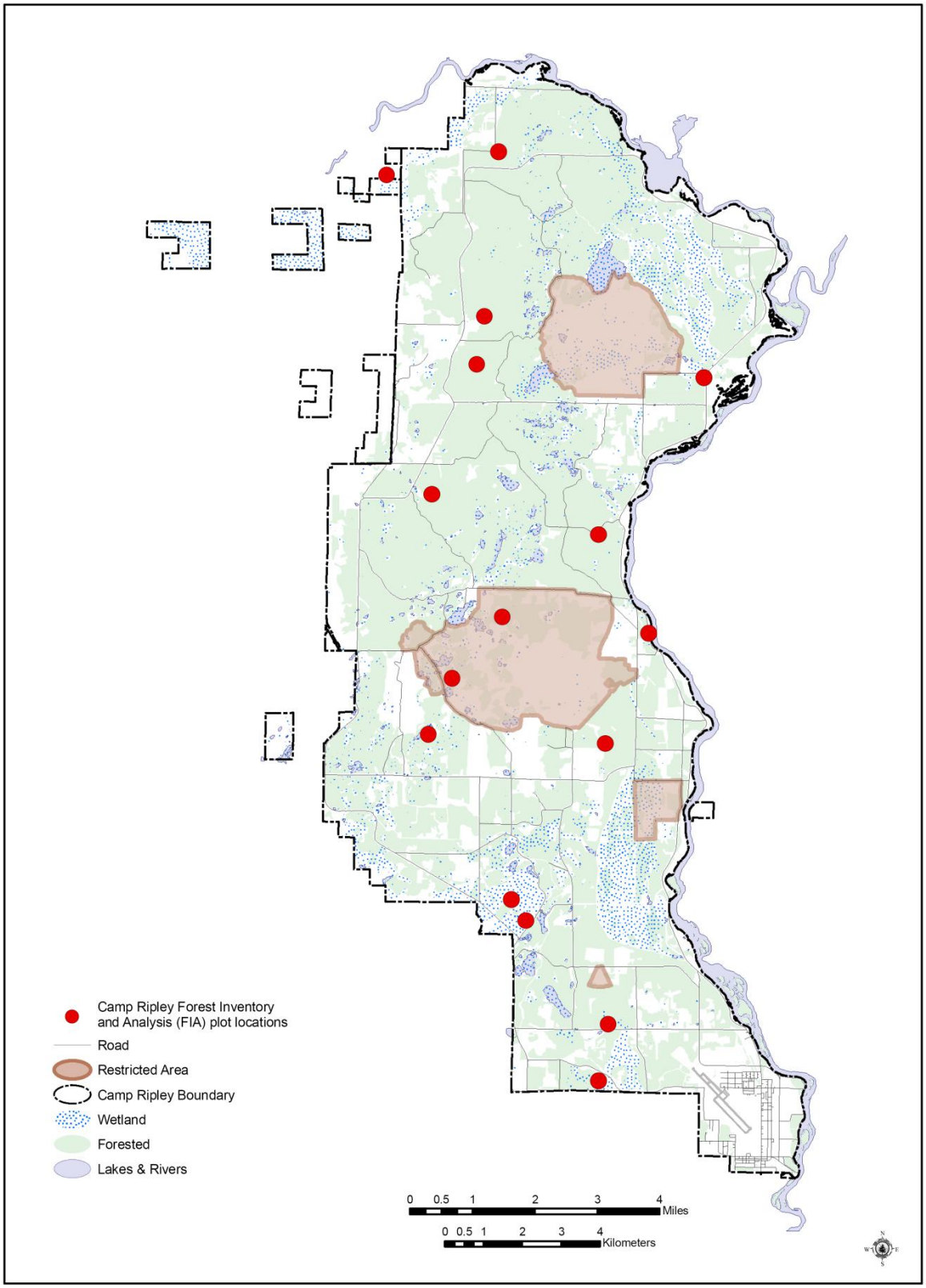
The Phase 3 component consists of a subset of Phase 2 sample plots that are measured for a broader suite of forest health attributes. These attributes include tree crown condition, understory vegetation, downed woody materials, and soil attributes. Additionally, soil samples are collected, sent to a laboratory for chemical analysis, and then completely destroyed. There is approximately one Phase 3 plot for every 16 Phase 2 plots, or one Phase 3 plot for every 96,000 acres.

Timber Sales

In early September the annual timber auction was conducted by the DNR at Range Control. Six of the seven tracts offered were sold the day of the auction sale with the remaining tract being sold the next day. The auction results are listed in Table 2 and Figure 5.

In preparation for the 2010 Exportable Combat Training Capability (XCTC) Camp Ripley Operations Department decided to expand the Y-2 Forward Operating Base (FOB); this entailed removing all of the trees and stumps on 46 acres adjoining the FOB to the west. DNR Forestry prepared the area for sale but potential contractors failed to purchase the permit and complete the removal by November 1, 2009. Camp Ripley staff then negotiated with a biofuels firm to complete the project in the allotted time by felling, skidding and chipping all of the residual biomass. Military troop labor was allowed to begin the site preparation for the expanded FOB. Negotiations are currently underway to accomplish the same treatment for a new FOB-North along Chorwan Road by the end of March 2010.

Figure 4. Forest Inventory and Analysis plot locations at Camp Ripley.



The status of 2009 timber sale permits on Camp Ripley is listed below (Tables 2-4):

Table 2. Camp Ripley timber sales, 2009.

Permit #	Acres	Cords/Species	Revenue	Successful Bidder
B011023	15	295 Aspen 51 Paper birch 12 Red maple	$6,332.45	Hodgedon Logging Inc.
B011024	78	230 Aspen 174 Maple spp. 155 Paper birch 390 Red oak 12 Bur oak	$14,913.60	Hodgedon Logging Inc.
B011025	72	542 Aspen 24 Basswood 153 Paper birch 100 Red maple 103 Red oak 32 Sugar maple 55 White oak	$14,046.74	Edin Logging Inc.
B011026	65	2 Basswood 163 Maple spp. 179 Paper birch 120 Red oak 700 Aspen 28 White oak	$16,214.10	Edin Logging Inc.
B011027	61	8 Jack pine 307 Red pine	$3,687.90	Bill Madsen
B011028	83	8 Bur oak 310 Jack pine 160 Maple spp. 305 Paper birch 1,130 Aspen	$33,424.40	Edin Logging Inc.
BO11029	28	601 Aspen 38 Basswood 49 Paper birch 11 Red maple 27 Sugar maple	$11,167.17	Shawn Fletcher Trucking
2009 TOTAL	**402**	**6,482 cords**	**$99,786.36**	

Figure 5. Location of timber sales at Camp Ripley, 2009.

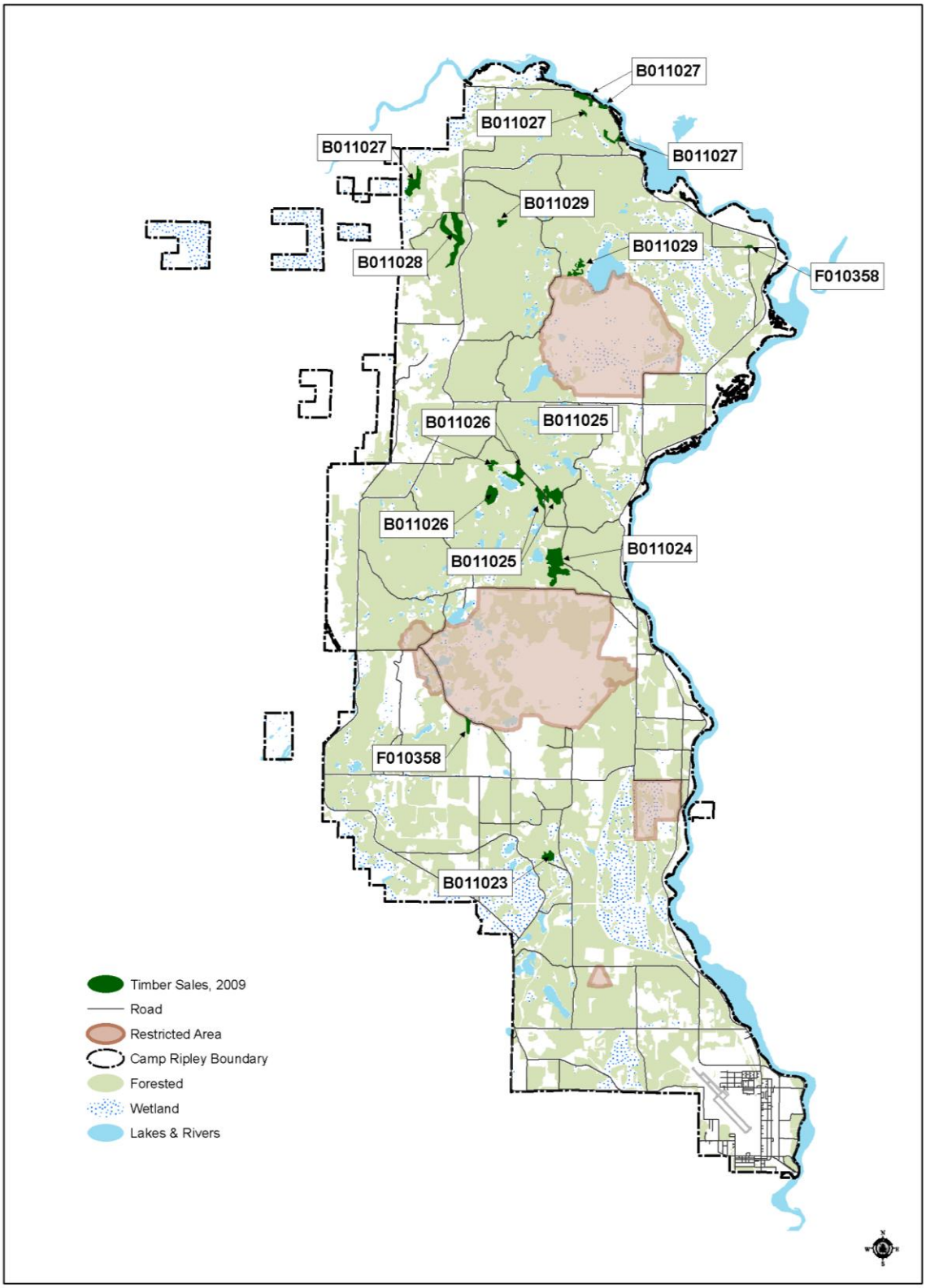


Table 3. Timber sale update at Camp Ripley, 2009.

Status		Volume Sold (Cds)	Sold Value	Scaled Value
Auction Sales Closed in 2009				
	B010655	4,980	$157,772.58	$119,200.73
	B010656	4,105	153,830.43	$161,520.61
	X011140	1,033	$34,940.50	$34,940.50
Auction Sales Active (as of 11/20/2009)				
	B011023	358	$6,332.45	
	B011026	1,192	$16,214.10	
	B011027	315	$3,687.90	
Auction Sales Sold in 2009 (not Active)				
	B011024	961	$14,913.60	
	B011025	1,017	$14,046.74	
	B011028	1,913	$33,424.40	
	B011029	726	$11,167.17	
Previous Auction Sales (Sold, but Uncut)				
	X011138	735	$17,532.00	
	X011141	1,355	$32,266.00	
Informal Sales				
	F010358	212	$2,541.00	
	F010384**	1,100	$440.00	
	F010385**	1,500	$600.00	

**Denotes Biomass Sale, Volume measured in 1,000 pounds.

Table 4. Timber sale summary at Camp Ripley, 2002-2009[a].

Year	2002	2004	2005	2006	2007	2008	2009
Acres	189	218.5	217	139	188	641	**402**
Volume	1500 cds.	4040 cds.	4412 cds.	3140 cds.	3624 cds.	12,893 cds.	**6,482 cds.**
Appraised Value	$25,357.50	$86,943.00	$114,123.00	$85,705.00	$67,140.00	$206,326.00	**$87,895.00**
Sold Value	$52,632.00	$230,140.00	$413,321.30	$133,740.00	$125,483.56	$406.703.38	**$99,786.36**
Type of Harvest	Pine Thinning (88 ac.) Buffer Thinning (101 ac.)	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 FOB 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.)**

[a] No timber sales occurred during 2003.

Fuelwood Permits

For the permit period from April 1, 2009 through March 31, 2010, there were 38 individuals that acquired fuelwood permits (37 – 5 cord and 1 - 10 cord) from Range Control and MNDNR, Forestry Division.

In August of 2009, the Sentence to Serve crew leaders returned to Camp Ripley for their annual chainsaw training. The area selected this year was on the airfield over-run. Over 100 individuals participated in the week long training exercise, and cut down nearly 300 trees. In September, STS crews returned to Camp Ripley and along with troop labor and the Department of Public Works (DPW) personnel, transported the firewood to the enclosed area behind the DPW shop designated for the collection site for firewood for families of deployed soldiers. There the Sentence to Serve crews cut the trees into firewood lengths and split the wood into firewood for another very successful joint venture between Camp Ripley and the Department of Corrections to benefit the families of deployed soldiers.

The Camp Ripley firewood policy was rewritten in 2009 to better clarify the regulations governing individual and deployed soldiers fuelwood permits and collection (Appendix G)

Tree Planting

Reforestation activities on Camp Ripley involved planting 6,000 containerized jack pine (*Pinus banksiana)* seedlings on the deer exclosure site in training area # 64, under-planting 3,000 bare-root stock, white spruce (*Picea glauca*) on the west edge of the red pine plantation buffering Morrison County Highway #1, and planting 200 butternut (*Juglans cinerea*) seedlings and 100 black hills spruce (*Picea mariana*) saplings as a buffer to the D-Range.

Insects and Disease

Other than the impacts on hardwood trees resulting primarily from the two-lined chestnut borer (*Agrilus bilineatus*), no significant presence of insect or disease problems were noted on Camp Ripley in 2009.

Land Fund

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

The potential income is outlined below (Table 5):

Table 5. Timber sale summary at Camp Ripley and Land Fund potential receipts, 2008-2009.

2008 Sales				
Permit Holder	**Permit Number**	**Date Closed**	**Volume Harvested**	**Receipts**
Sappi	B010656	Mar-09	5,841 cds	$161,566.33
Sappi	B010655	Apr-09	4,632 cds	119,200.30
Great Northern Logging	X011138	Uncut	735 cds	$17,532.00
Bill Madsen	X011139	9-Feb	685 cds	$15,893.37
Edin Logging	X011140	Active	1,033 cds	$34,940.53 (+$338.00 Added Timber)
Sawyer Logging	X011141	Uncut	1,355 cds	$32,266.00
Informal Sales				
Joe Kallis	F010158	August, 2008	5.6 MBF	$654.03
Edin Logging	F010152	August, 2008	141 cds	$2,648.88
			TOTAL	**$384,701.44**

2009 Sales				
Hodgden Logging	B011023	Uncut	358 cds	$6,332.45
Hodgden Logging	B011024	Uncut	961 cds	$14,913.60
Edin Logging	B011025	Uncut	1017 cds	$14,046.74
Edin Logging	B011026	Active	1192 cds	$16,214.00
Bill Madsen	B011027	Uncut	315 cds	$3,687.90
Edin Logging	B011028	Uncut	1,913 cds	$33,424.40
Fletcher Trucking	B011029	Uncut	726 cds	$11,167.17
Informal Sales				
Kent Ginter	F010358	Active	212 cds	$2,541.00
			TOTAL	**$102,327.26**
			Total Potential Income	**$487,028.70**

The expenses to date from the land fund are listed below from 2008 through 2009.

EXHIBIT A
Scope of Work and Breakdown of Costs
Forest Development, Camp Ripley, Little Falls, Minnesota
(Project No. 09906D)

DNR Project Number	Project Description	Estimated Cost
CR-Dev09-001	Plant White spruce and Butternut Bareroot stock in designated areas for buffer and to maintain a butternut component in forest.	$2,000.00
CR-Dev09-002	Plant containerized jack pine seedlings in fenced site. Apply shade treatments to Chorwan Road deer exclosure fenced areas.	$8,000.00
CR-Dev09-003	Site preparation for 9-acre Jack pine timber sale (28-133-30W, TA71) in spring. This will prepare the site for planting.	$2,400.00
CR-Dev-09-004	Supplies: paint, flagging for timber sale development	$500.00
CR-Dev-09-005	Type Mapping, check-cruising and FIM updates for Re-Inventory acres	$3,000.00
CR-Dev-09-006	Contract for and supervision of vegetation removal in Center Range expansion south of Normandy Road (49 acres).	$4,100.00
Total Amount Not to Exceed:		$20,000.00

Note: See attached Forest Development Proposals for more details.

The reforestation projects initiated above obligate additional expenditures from the land fund for herbicide release and herbivory control for out years not reflected above. A five-year (2010-2015) land fund expenditure plan is under development.

Light Detection and Ranging (LiDAR)

Light Detection and Ranging (LiDAR) is a technology that utilizes lasers to determine the distance to an object or surface. It is similar to radar but incorporates laser pulses rather than sound waves. Both systems determine distance by measuring the travel time between transmission and reflection and detection of a pulse. Common airborne systems consist of a LiDAR laser scanner mounted in the bottom of an airplane (similar to an aerial camera) along with an Inertial Measuring Unit and Airborne GPS.

In spring of 2007, a partnership between Camp Ripley, Crow Wing County, and St. Cloud State University contracted Merrick & Company to execute a LiDAR acquisition survey. Acquisition areas included Camp Ripley, Crow Wing County, and the Mille Lacs Indian Reservation.

The contracted Camp Ripley project area included the installation and a three mile buffer excluding the area that falls within Crow Wing County. Although the MNARNG does not own the data for this exclusion area Crow Wing County has provided the data along with permission for its use. Therefore, the Camp Ripley LiDAR data set currently covers Camp Ripley as well as a three mile buffer surrounding the installation.

Camp Ripley LiDAR data
Acquisition period: 9 May - 24 June 2007
Avg point density: 1.7 points/m^2
Number of returns: 4
Tiling scheme: 5000 x 5000ft

Data deliverables
All data points classified into ground and non-ground
- LAS format (also includes intensity values)
-ASCII format

Digital Terrain Model (DTM) sufficient to generate 2ft contours derived from LiDAR
- mass points and break lines in ESRI shapefile format
- Triangulated Irregular Network (TIN) format
- 1m ESRI Grid format

2ft contours derived from DTM
-ESRI shapefile format

LiDAR acquisition efforts are typically based upon the need for detailed terrain information. Although terrain deliverables were an important component of this project, recently developed analysis methods for quantifying various forest stand structural metrics (e.g., stem density, basal area, tree height and volume) were the true catalyst.

The LiDAR derived forest metric data was pursued for two primary purposes:

1. Explore a method to minimize annual inventory efforts.
2. Improve understanding of the relationship between forest structure and breeding birds at Camp Ripley

Specific information regarding these efforts can be found in their respective sections.

LiDAR Forest Metrics

Recently developed analysis methods for quantifying various forest stand structural metrics (canopy height, diameter at breast height, basal area, stem density, and volume) were applied to the Camp Ripley LiDAR data set (see GIS section for more information regarding the LiDAR data set). This was the initial step of a project to improve understanding of the relationship between forest structure and breeding birds at Camp Ripley (see Wildlife section for more information on the breeding bird habitat analysis). In addition, Camp Ripley Environmental staff were interested in exploring this method to minimize annual inventory efforts through remote sensing and analysis.

Figure 6.

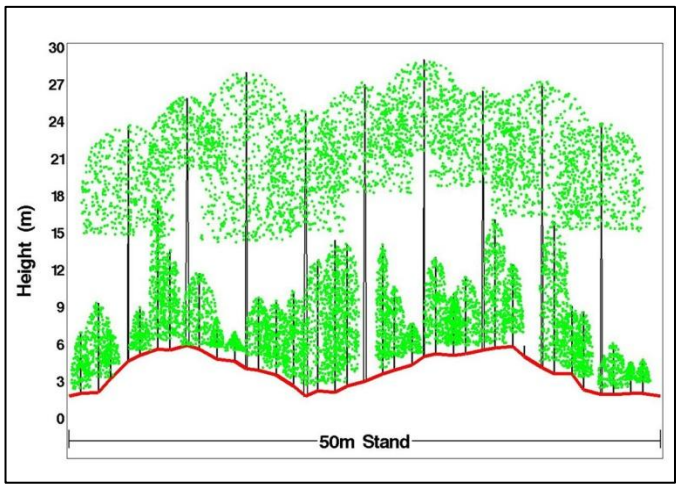
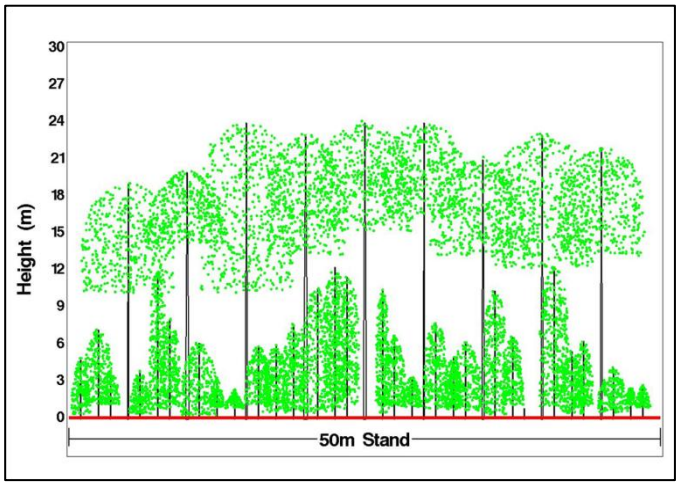


Figure 7.

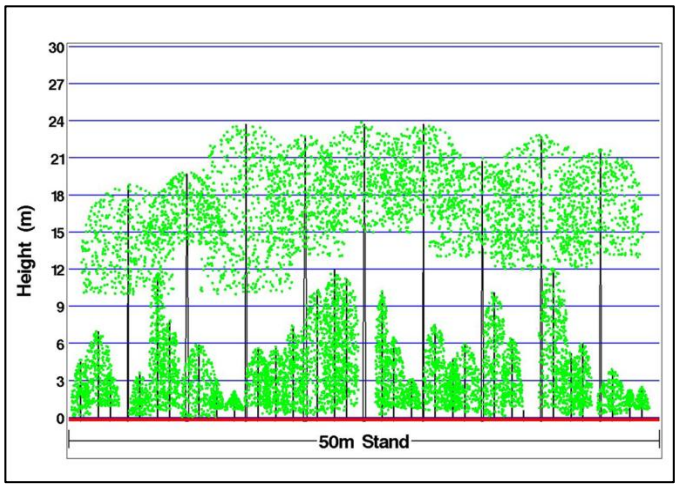


The analysis was conducted by Wes Newton, USGS Statistician, utilizing statistical models he generated for a mixed forest landscape in central Maine with similar forest characteristics as Camp Ripley. The initial step in this process was to "filter" or classify LiDAR data points into ground hits and canopy hits. In Figure 6, the ground hits are red and canopy hits are green.

Typically LiDAR data is delivered as elevation above sea level, hence ground must be subtracted from the canopy to calculate heights above ground as represented in the Figure 7. Ground values, derived from the digital terrain model (DTM), were subtracted from each of the canopy hits to derive the canopy heights above the ground or terrain, or what is sometimes termed canopy height surface (CHS) or canopy surface model (CSM).

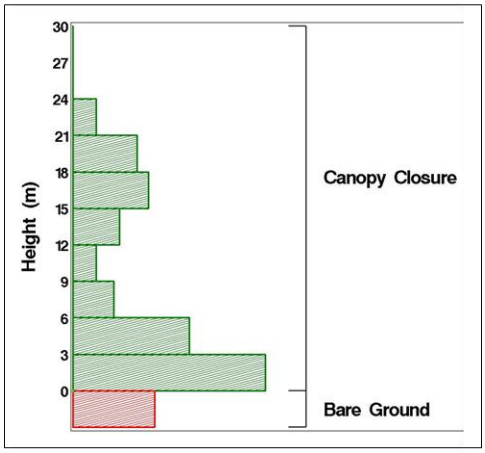
Canopy hits are then classified into vertical profile bins above the ground. Camp Ripley data was binned into 1 meter vertical profiles (Figure 8-for illustration purposes this image shows binning into 10 3m bins). The number of hits were then tallied for each bin, including the ground hits, to derive the proportion of hits falling within each vertical height bin. These are then expressed as proportions of the total hits within a designated cell size (canopy closure was defined in both 10m and 50m cells). The information in these vertical bars were then used as explanatory variables to model and estimate forest metrics. For more information on the statistical models used refer to Restani and Newton (2009).

Figure 8.



Canopy cover results can be displayed as a vertical canopy profile (histogram), where the sum of the bars equals 100%, including the ground hits (Figure 9). By examining these bars and their magnitudes we can visualize what the forest stand within a cell will look like.

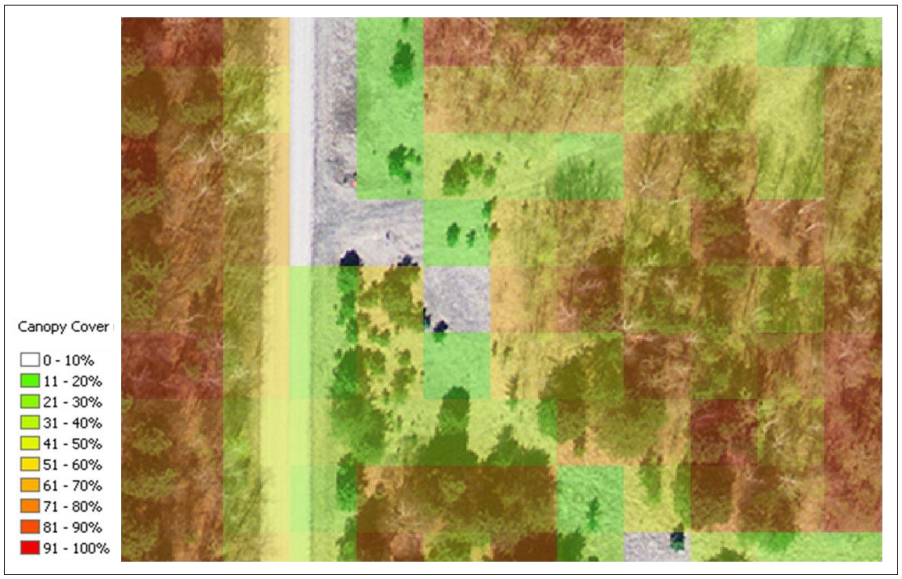
Figure 9.



In addition to the binned canopy closure values, the canopy cover data set contains X and Y coordinates for the center of each cell. With these centroids a raster layer with the appropriate cell size can be generated and the cells can be populated with the associated canopy cover values. This provides another method for displaying results. Figure 10 shows total canopy cover, however individual vertical profiles, or a combination of profiles, could also be displayed. These raster layers can then be used for spatial analysis within a GIS.

In the spring/summer 2009, an assessment was conducted on 40 bird plots and 40 random points across multiple land cover types to evaluate the accuracy of forest metric estimates. A wandering quarter method was used to select trees randomly in each of four quadrants (NE, NW, SW, and SE) beginning from the plot center. Trees were defined as stems ≥ 10 cm dbh with saplings defined as stems < 10 cm dbh. Trees and saplings were sampled separately for dbh (m), canopy height (m), and ground-to-live canopy height (m) (trees only), as well as distance to nearest neighbor (m), which will allow for estimation of stem densities within each plot.

Figure 10.



The evaluation of forest metric estimates has not yet been conducted. Results will be used to identify a confidence level for the forest metric data. In the event results are unsatisfactory the baseline data will be used to refine statistical models which the estimates were based upon.

VEGETATION MANAGEMENT

Camp Ripley Prescribed Fire

Camp Ripley uses prescribed fire as a management tool to enhance the military training environment (also known as mission-scape) and for ecological purposes. Prescribed fire target areas include native prairie grass enhancement, woody encroachment, seed production, brush control, fuel-hazard reduction, forest management, and to improve habitat for threatened and endangered species. The management strategy for prescribed fire on Camp Ripley is provided within the wildland fire management plan.

Two types of prescribed burns are conducted at Camp Ripley; hazard reduction and ecological. Two of the largest training areas on Camp Ripley are designated as impact areas. These areas are burned every spring along with eight other firing ranges to reduce fuel build up and minimize wildfires due to military training exercises. A large wetland complex is also burned annually on the basis of fire hazard reduction due to its location adjacent to a firing range. These are categorized as hazard reduction burns. The total acreage of fire hazard reduction burns is approximately 10,000 to 12,000 acres a year.

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 FMO-DPW and local MNDNR Forestry personnel prior to execution of the burn. Camp Ripley Department of Public Works (DPW) partnered with the environmental staff and The Nature Conservancy to implement prescribed fire on these units.

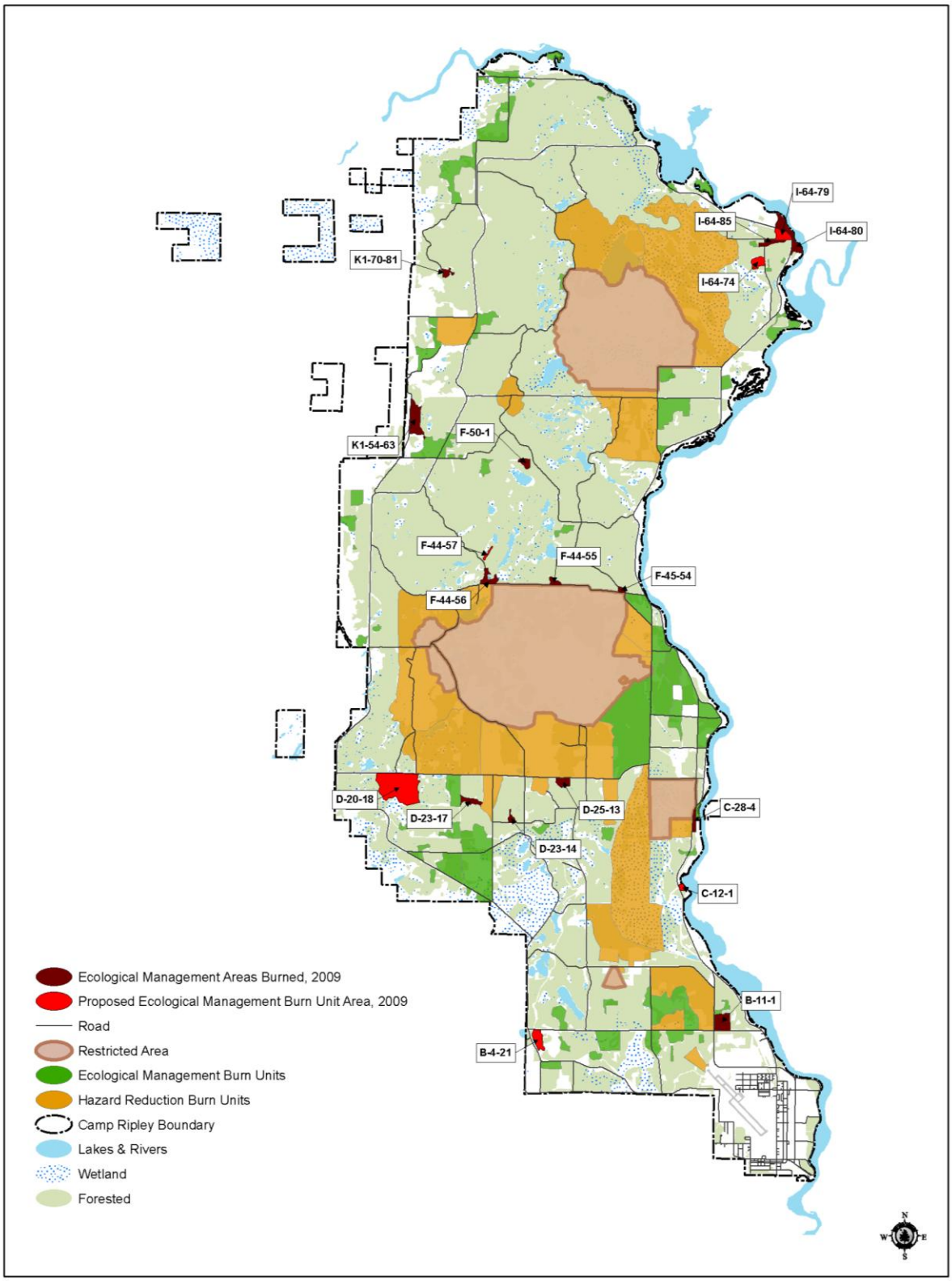
Potential prescribed fire units for 2009 consisted of 19 units that totaled 2,072 acres (Table 6 and Figure 11). Measurable objectives for all units were described in the plans, they are: 1) burn and consume 90 percent of fine dead grassy fuels, and 2) reduce the influx of hazel in the unit by 50 percent. Objective one is measured by visual inspection of available fuels left on the site immediately after completion of the burn. Objective two is measured after sufficient green up is attained to quantify percent kill on hazel.

Table 6. Planned prescribed burn units, Camp Ripley, 2009.

Burn Unit	Permit Issued	Date Burned	Acres
I-64-74	No		118
I-64-79	No		159
I-64-80	Yes	11/18/2009	53
I-64-85	Yes	8/10/2009	22
F-45-54	Yes	5/8/2009	6
F-44-55	Yes	5/22/2009	10
F-44-56	Yes	5/22/2009	23
F-44-57	Yes		5
F-50-1	Yes	5/21/2009	14
K1-54-63	Yes	4/24/2009	445
K1-70-81	Yes	5/21/2009	11
B-4-21	No		144
B-11-1	Yes	5/6/2009	99
C-12-1	No		93
C-28-4	Yes	4/29/2009	19
D-20-18	No		525
D-23-14	Yes	4/22/2009	208
D-23-17	Yes	5/4/2009	99
D-25-13	Yes	4/17/2009	19
Acres Completed			**1,028**

All goals and objectives were achieved on all burn units which demonstrates the effectiveness of phenological timing of the burn events**.** The ecological burns were completed by The Nature Conservancy prescribed fire crew under the direction of the RxB2 burn boss Tom Rothleutner, DPW Supervisor.

Figure 11. Fire units burned for ecological management at Camp Ripley, 2009.

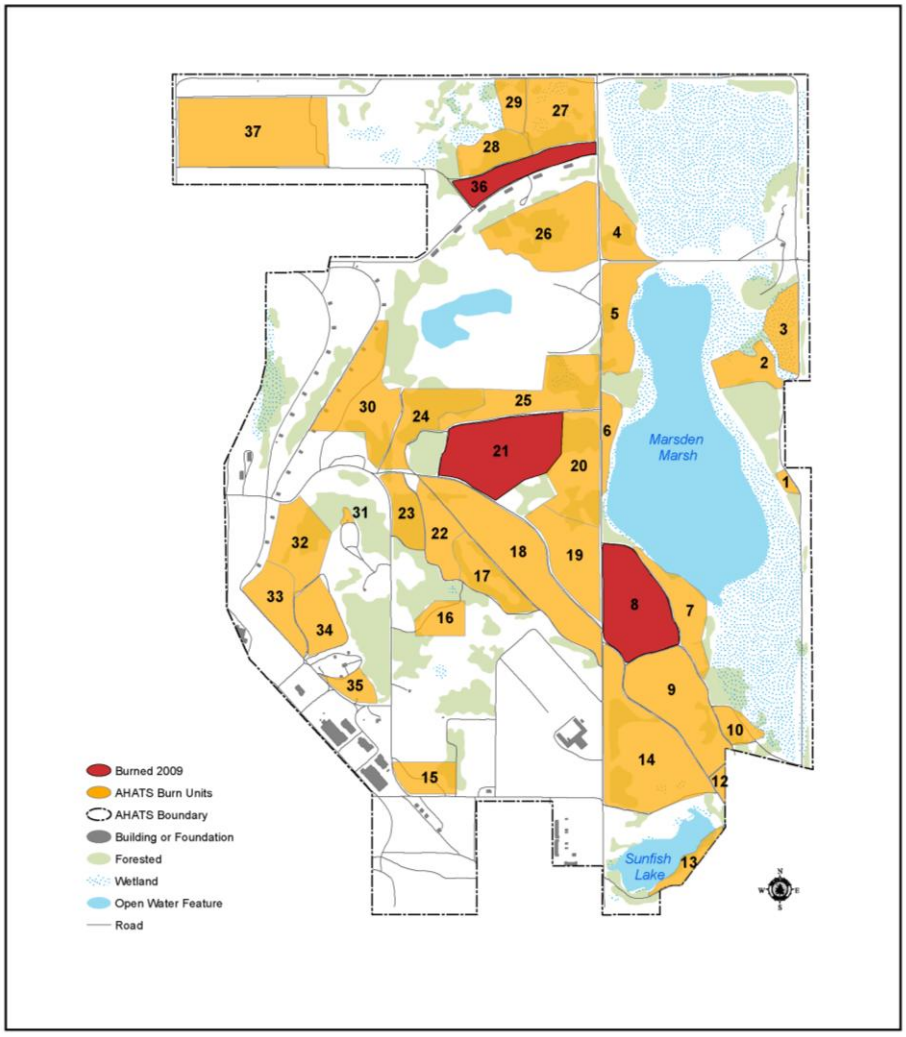


Arden Hills Army Training Site Prescribed Fire

Prescribed fire is used at the Arden Hills Army Training Site as a management tool, similar to Camp Ripley, to enhance the military training environment (also known as mission-scape) and for ecological purposes. Prescribed fire target areas include native prairie grass enhancement and restoration, reducing woody encroachment, invasive and noxious vegetation management, native plant seed production, brush control, fuel-hazard reduction, oak savanna management, and to improve habitat for state threatened and endangered species and species in greatest conservation need (SGCN). The management strategy for prescribed fire on AHATS is provided within the AHATS INRMP (Minnesota Army National Guard 2007).

In 2009, approximately 60 acres were prescribed burned (Figure 12). AHATS burn units #8, 21, and a new burn unit were completed.

Figure 12. Fire units burned for habitat management at Arden Hills Army Training Site, 2009.



Camp Ripley and Arden Hills Army Training Sites Invasive Plants

Invasive species are alien species, not native to the ecosystem, whose introduction does or is likely to cause economic or environmental harm or harm to human health. Invasive species have contributed to 42 percent of endangered and threatened species declines. In the United States 100 million acres (an area approximately the size of California) suffer from invasive plant infestations, and the annual cost of invasive species due to their impacts and control is five percent of the world's economy (The Nature Conservancy 2009). Federal agencies have been asked (Executive Order 13112) to prevent the introduction of invasive species, control existing populations, monitor populations, conduct research on invasive species, and promote public education of invasive species (U.S. Department of Agriculture 2009). In response to this Executive Order, Environmental Office staff contracted with St. Cloud State University (SCSU) in 2002 to begin an assessment of invasive plant species on Camp Ripley and AHATS. Sixteen and seventeen invasive plant species are found at Camp Ripley and AHATS, respectively (Table 7).

Table 7. Invasive plant species on Camp Ripley and Arden Hills Army Training (AHATS) Sites (Babski 2002).

Family	Scientific Name	Common Name	Camp Ripley	AHATS
Brassicaeae	*Berteroa incana*	Hoary alyssum	X	X
Poaceae	*Bromus inermis*	Smooth brome	X	X
Asteraceae	*Carduus nutans*	Musk thistle	X	X
Asteraceae	*Centurea maculosa*	Spotted knapweed	X	X
Asteraceae	*Chrysopsis villosa* var. *foliosa*	Golden aster	X	X
Asteraceae	*Cirsium arvense*	Canada thistle	X	X
Elaeagnaceae	*Elaeagnus angustifolia*	Russian olive		X
Euphorbiaceae	*Euphorbia cyparissias*	Cypress spurge		X
Euphorbiaceae	*Euphorbia esula*	Leafy spurge	X	X
Asteraceae	*Grindelia squarrosa*	Gum weed	X	X
Guttiferae	*Hypericum perforatum*	St. Johnswort	X	
Lythraceae	*Lythrum salicaria*	Purple loosestrife		X
Fabaceae	*Melilotus alba*	White sweet clover	X	X
Fabaceae	*Melilotus officinalis*	Yellow sweet clover	X	X
Fabaceae	*Robinia pseudoacacia*	Black locust		X
Poaceae	*Phalaris arundinacea*	Reed canary grass	X	X
Poaceae	*Phragmites australis*	Common reed	X	X
Rhamnaceae	*Rhamnus cathartica*	Buckthorn	X	X
Caryophyllaceae	*Saponaria officinalis*	Bouncing bet	X	
Asteraceae	*Tanacetum vulgare*	Tansy	X	
Anacardiaceae	*Toxicodendron radicans*	Poison ivy (native)	X	
Ulmaceae	*Ulmus pumila*	Siberian elm	X	X

In 2009, the Department of Biological Sciences at SCSU continued to monitor invasive plant species at Camp Ripley and AHATS, and to provide control recommendations. The goal of this project is to establish a comprehensive long-term control management program with minimal

environmental damage to native communities. Following are the 2009 accomplishments and 2010 work plan submitted by Jorge Arriagada, Alan Einck, and Jamie Hanson, St. Cloud State University.

Camp Ripley Common Tansy Chemical Herbicide Treatments

During the 2009 growing season, a large scale treatment of common tansy (*Tanacetum vulgare)* (one of the three major invasive species) was performed. The integrated treatment consisted of burning the plot area followed by an herbicide application approximately two weeks later. The chemicals used for this treatment were Escort ® and 2,4-D in combination. The large scale prescribed burn and herbicide treatment was done according to recommendations from the two-year tansy experiment completed in the fall of 2008 (Final results of the project are soon to be published). Preliminary results of the experiment are shown in Figure 13. There was a large decrease in the percent cover of common tansy as well as an increase in native plant species (Figures 14 and 15).

Figure 13. Preliminary results of the two-year common tansy experiment. The combination treatment showed the largest decrease in percent cover as compared to the other variables.

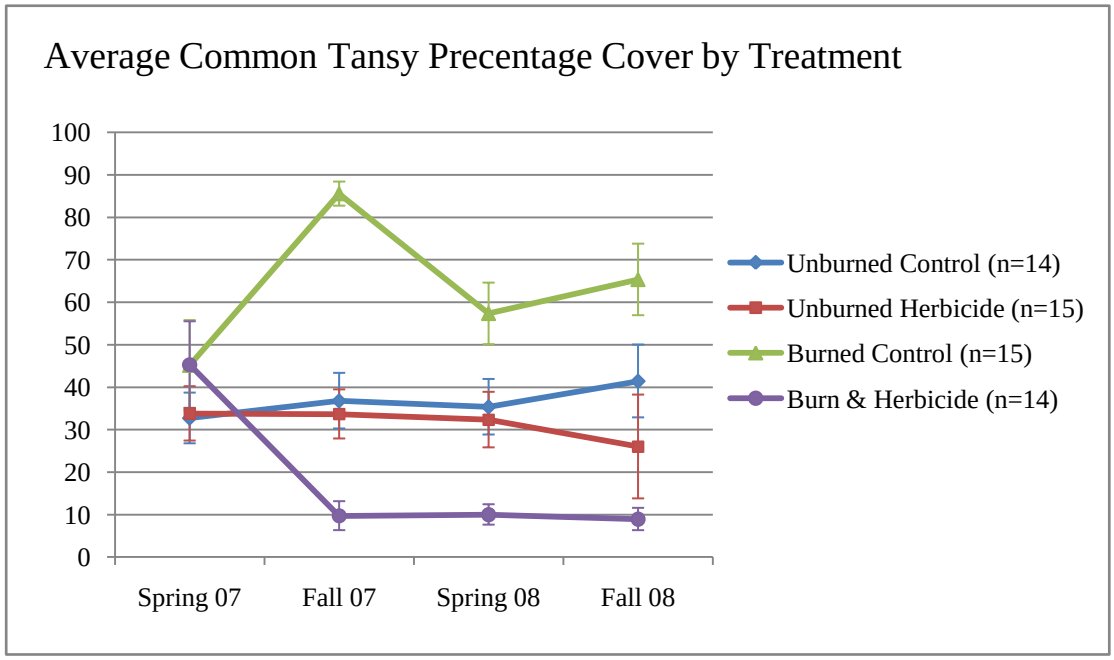


Figure 14. Picture of the large scale burning and herbicide pretreatment taken on 7-31-2008. The large yellow flowered plants are common tansy.

Figure 15. Picture of the large scale burning and herbicide post treatment taken on 9-11-2009.

Camp Ripley Spotted Knapweed and Leafy Spurge Chemical Herbicide Treatment

The other two major invasive plant species within the training facilities are spotted knapweed (*Centaurea maculosa*) and leafy spurge (*Euphorbia esula*). The current chemical being used is Overdrive®, produced by the BASF chemical company, with 2-4D. This was found to be the most cost effective combination according to the previous five years of testing. New chemicals will be tested during the 2010 growing season (discussed in the Future Research section). The current treatments being used for leafy spurge are chemical combinations that include Plateau ® from the BASF chemical company. Below are results of treatments done on plot 5 for spotted knapweed and plot 4 for leafy spurge (Figure 16 and 17).

Figure 16. Results from spraying an Overdrive ®, 2,4-D combination. Herbicide was applied in June and October, 2005 and May, 2006.

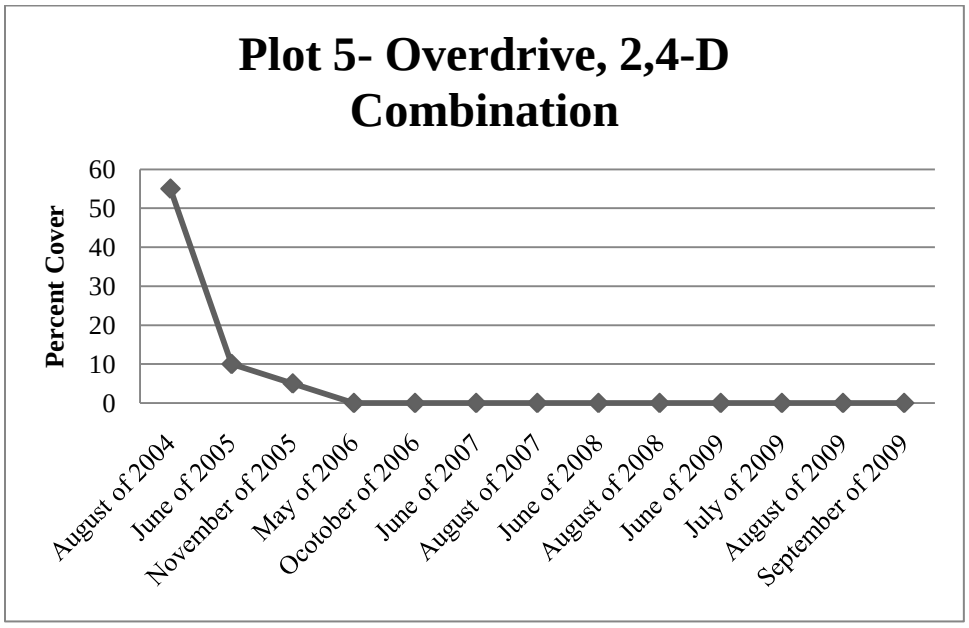
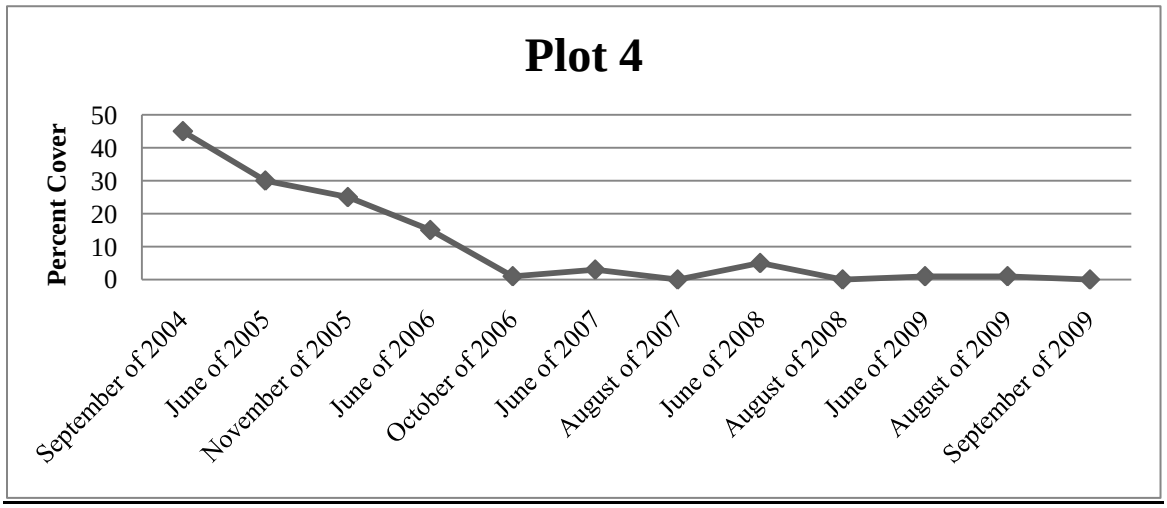


Figure 17. Results from spraying a Plateau®, 2,4-D combination. Treatments were done in June 2005, November 2005, June 2006, October 2006, and August 2007.



Biological Control

In 2003, the first biological control agents were released at Camp Ripley and AHATS by SCSU. At Camp Ripley, 50 *Cyphocleonus achates* were released in training area 17 on an infestation of the target species spotted knapweed. At AHATS 20,050 biological control agents were released at five sites. These releases included two 5,000 insect counts of *Aphthona lacertosa* on two leafy spurge sites, two 5,000 insect counts of *Aphthona lacertosa* on two cypress spurge (*Euphorbia cyparissias*) sites, and a 50 insect release of *Cyphocleonus achates* on a spotted knapweed site.

In 2004, the biological control program was continued with the release of 780 biological control agents at Camp Ripley. All biological control agents were released on two spotted knapweed infestations. Four hundred and fifty *Larinus minutus* and 40 additional *Cyphocleonus achates* were released on the same knapweed infestation in training area 17. In addition, 40 *Cyphocleonus achates* and 250 *Larinus minutus* were released on a knapweed infestation near the bone yard in the cantonment area.

In 2005, five thousand seven hundred and fifty biological control agents were released at the two military training sites. These releases included a 5,000 insect release of *Aphthona lacertosa* on an existing leafy spurge site at AHATS. Also at AHATS, 450 *Larinus minutus* and 40 *Cyphocleonus achates* were released on a spotted knapweed site. At Camp Ripley 300 *Cyphocleonus achates* were released. A 100 insect count was released near the bone yard at the previous release site and a 200 insect count was release in training area 17 at the other previous release site.

In 2006, six hundred and ninety five biological control agents were released at the two military training sites. All 2006 biological controls were released on previously established spotted

knapweed biological control sites. These releases included: 275 *Larius minutus* at a previously established site at AHATS, and two identical releases of 200 *Larius minutus* and 20 *Cyphocleonus achates* on the two previously established knapweed biological control sites at Camp Ripley.

In 2007, 50 *Cyphocleonus achates* agents were released at Camp Ripley. This release was the only release of biological control agents in 2007. The previously established training area 17 release site at Camp Ripley had a hearty population of *Larius minutus*. This spotted knapweed infestation showed visible signs of recession from the release point. After sweep net samples were collected it was determined that it would be safe to move a moderate amount of *Larius minutus* out of the training area 17 site and establish new biological control sites on other knapweed infestations at Camp Ripley. A total of 1,400 *Larius minutus* were collected from training area 17 and moved to three new release sites all in training area 18. Although the agents had spread to training area 18 on their own, the insect population levels were low, indicated by the sparseness of the sighting. The release of this extra 1,400 insect count could help boost *Larius minutus* population levels in training area 18 and hopefully start to put a dent into this larger population of spotted knapweed.

In 2008, all biological control sites were visited and all sites either showed a healthy population of biological control or large reduction in the amount of the target invasive plant species. The ultimate goal of a biological control program is not the complete eradication of the invasive plant species, but rather a reduction in the plant's invasiveness; that is trying to reduce the invasive plant species from one that takes over fields and forms monocultures, into a less invasive plant that can mix with the native bio-diversity. This makes a "successful" biological control release hard to define.

Figure 18. Picture of *Larius minutes* on spotted knapweed.

In 2009, the biological control sites were visited. The populations of biological controls were healthy, but were not large enough to do a collection to move to other areas. The sites were visited multiple times during the summer and each time insects were located along with the damage they inflict to the target plants. Below is a picture of the *Larius minutes* taken during the summer of 2009 (Figure 18).

Website

A website for the SCSU and DMA collaborative project was completed in 2008. This website spans the entire project from initial species inventories and distributions, to the testing of different

techniques, to current 2009 updates and information. This information could be a source for future treatment plans, could keep environmental managers and ground maintenance workers on the same page, and shares the knowledge gained though the research with the public. The website is in the process of being linked to the Department of Natural Resources website. For up to date information on the invasive plant species project visit <http://web.stcloudstate.edu/invasiveplants/>.

Future Research

Research is going to be conducted during the 2010 growing season using new herbicides to help combat the spotted knapweed invasion. The new herbicide being tested is Milestone produced by DowAgro®. The herbicide is a non-federally restricted use pesticide due to the low toxicity and rate of spray. The herbicide will be used in conjunction with prescribed burns to find the most effective means of control for spotted knapweed with the lowest toxicity.

To be in compliance with Section 2(a)2-IV of Executive Order 13112: which states that federal agencies should "…provide for restoration of native species and habitat conditions in ecosystems that have been invaded," a 2010 project is being designed that would restore invaded areas within Camp Ripley. Specifically, areas invaded with leafy spurge, spotted knapweed and common tansy will be used as test sites for analyzing how best to restore degraded habitats into a native plant community. The experimental design will implement the use of herbicide, fire, and mechanical control in the initial stage of the project. Later, the use of multiple seeding methods and the implementation of a competitive cover crop will be used to promote succession of these areas towards increasing the presence of native grasses and forbs at Camp Ripley. This project stands to improve methods for restoring areas invaded by these aggressive terrestrial invasive plant species.

CAMP RIPLEY WATER RESOURCES

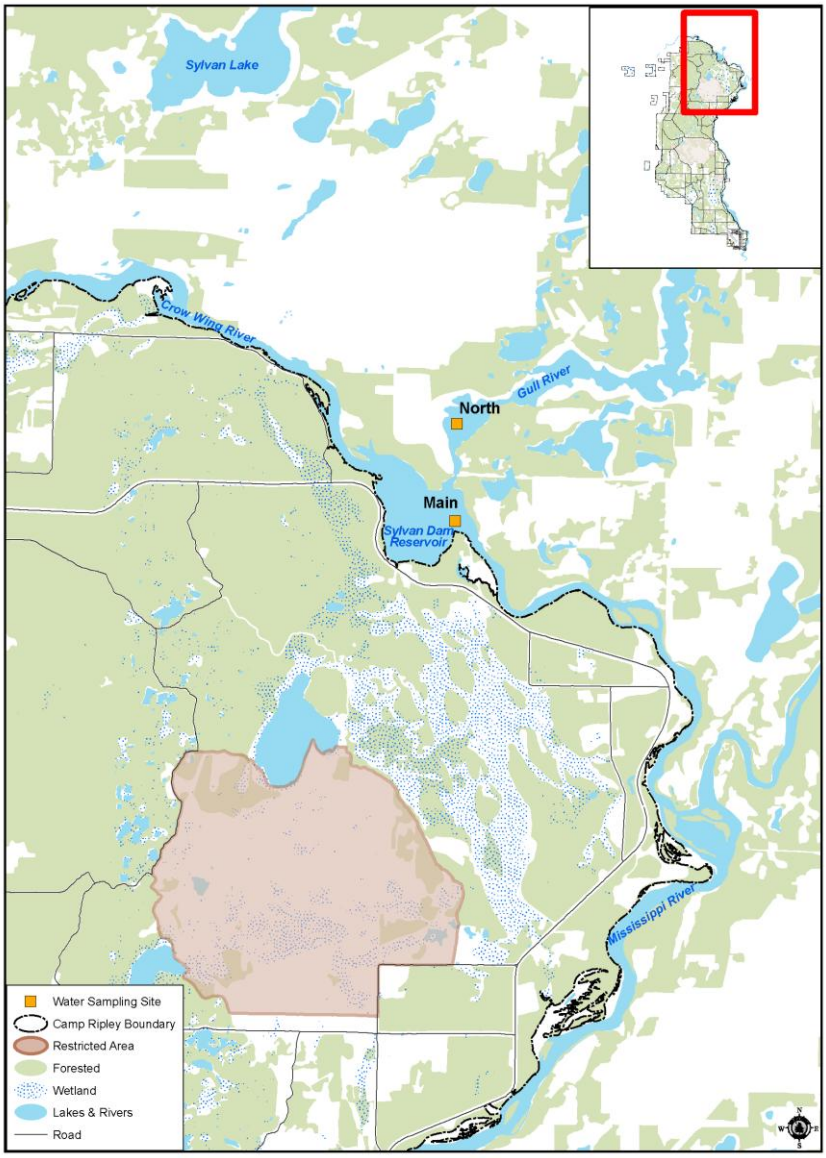
Sylvan Dam Reservoir Water Quality Analysis

Sylvan Dam Reservoir water quality sampling was continued in 2009. This reservoir is located above the Sylvan Dam on the Crow Wing River. Aided by a grant from the Morrison County Lake monitoring program, staff from The Nature Conservancy (TNC) at Camp Ripley supplemented data collected from the Sylvan basin in 2008. The sampling helps Morrison County gain data on lakes that had very little previous data. The data can be used in the Morrison County water plan and help with statewide lake reports. Collected water samples were sent to a private testing company, RMB Environmental Laboratories, Inc. for detailed analysis of total phosphorus and chlorophyll-a (algae concentration).

Water samples were collected from the area just above Sylvan dam in two predetermined areas named Sylvan-Main and Sylvan-North (Figure 19) at a frequency no less than four samples from each testing site per summer. One quart and one gallon water samples were obtained from each site along with secchi disk readings to determine water clarity.

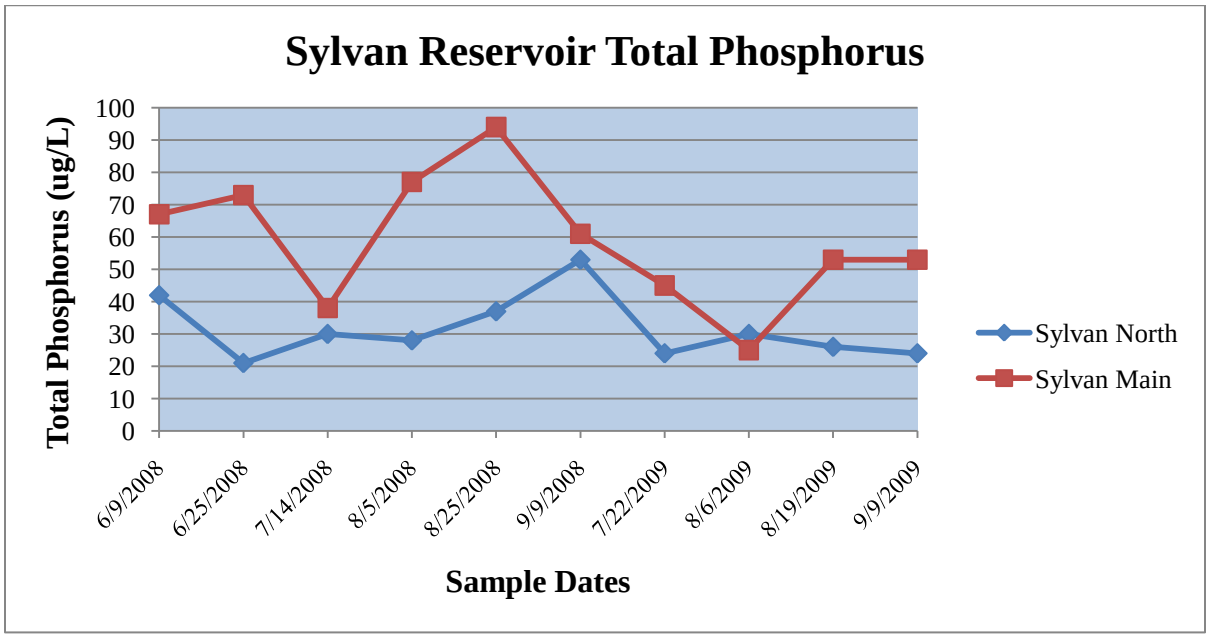
In most Minnesota lakes, phosphorus is the least available nutrient and thus high or low concentrations can have a major effect on total lake quality. Increased levels of phosphorus from wide ranging sources such as sewage treatment plants, lawns, or farmland runoff can trigger additional algae growth reducing water clarity. Combined readings of phosphorus, chlorophyll a (algae abundance), and secchi disk transparency were used to define the trophic status index (TSI), or level of lake growth for both Sylvan sample sites.

Figure 19. Water sample locations at Sylvan Dam Reservoir on Crow Wing River, Camp Ripley, since 2008.



Final results of water testing reveal that Sylvan-North (ID# 49-0036-02) and Sylvan-Main (ID# 49-0036-01) contain higher than projected total phosphorus (Figure 20), which indicates poorer than expected water quality for the area. The total phosphorus mean (2008-2009) for Sylvan-North is 31.5 ug/L and the 2009 levels were below this mean. Sylvan-Main's levels of total phosphorus, chlorophyll-a, and Secchi depth were all higher than expected, which also indicates poorer than average water quality for lakes in the Northern Lakes and Forests Ecoregion. The Sylvan-Main total phosphorus mean (2008-2009) is 60.1 ug/L and 2009 levels were below this mean. The differences for this trend in water quality can be related to the width of the two areas. Sylvan-Main, being the confluence of the Crow Wing and Gull rivers is wider and shallower than Sylvan-North and consequently experiences additional aquatic plant and algae growth during the summer months.

Figure 20. Total phosphorus results Sylvan Dam Reservoir – Main and Sylvan Dam Reservoir-North, Camp Ripley, 2008-2009.



It should be noted however that compiling two years of lake testing data limits any long-term, interpretations in lake quality. Short-term testing (2-3 yrs) data can easily become distorted by different wet and dry seasons, water levels, or weather variations. A minimum testing period of 8-10 years with four or more per season is recommended by the Minnesota Pollution Control Agency (MPCA) to evaluate long term lake health. TNC staff in conjunction with the Environmental office will continue to monitor water quality at Sylvan-Main and Sylvan-North to further assess lake health in the future.

WILDLIFE

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 was that all states and territories develop a wildlife action plan by October 2005. "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).

In Minnesota, 292 species meet the definition of species in greatest conservation need. All listed species (federal and state) are included on 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). More than 65 SGCN species, including 51 bird species of which 28 are songbirds, have been identified on Camp Ripley. AHATS provides habitat for 38 SGCN, including 36 bird species of which 22 are songbirds (Appendix J). Additional research will be directed toward identifying other SGCN species on Camp Ripley and AHATS, and management or conservation actions that could be implemented to benefit these species.

Camp Ripley 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. The northwest portion of Camp Ripley is within one of these circles. Each count is conducted during a single calendar day within two weeks of Christmas. CBC data is primarily used to track winter distribution patterns and population trends of various bird species.

The 2009 Christmas Bird Count did not occur within Camp Ripley due to significant snowfalls the week prior (6 inches on 12/23/08 and 14 inches on 12/30/09) to the scheduled count on January 1, 2009 and unsafe road conditions downrange.

Songbirds

Songbirds are excellent indicators of habitat change because of the large number of species, the relative ease with which they can be detected and identified in the spring breeding season, and the large variety and diversity of habitats they inhabit (Sauer et al. 2000). Songbird surveys have been conducted on permanent plots (formerly Land Condition-Trend Analysis (LCTA) and Range Training Land Assessment (RTLA) (Tazik et al. 1992)) throughout Camp Ripley since 1993. The number of plots that are surveyed each year varies according to training, weather, and survey strategy. Additionally, certain plots are no longer surveyed due to complete habitat alteration. During 2001 and 2002, only a subset of the total 90 plots were surveyed in order to reduce the amount of effort expended by staff in any one year. However, after the rapid spread of West Nile Virus across the country, and the possible negative implications to various bird species and populations, it was decided that 90 or more plots would again be surveyed each year.

Totals and Trends

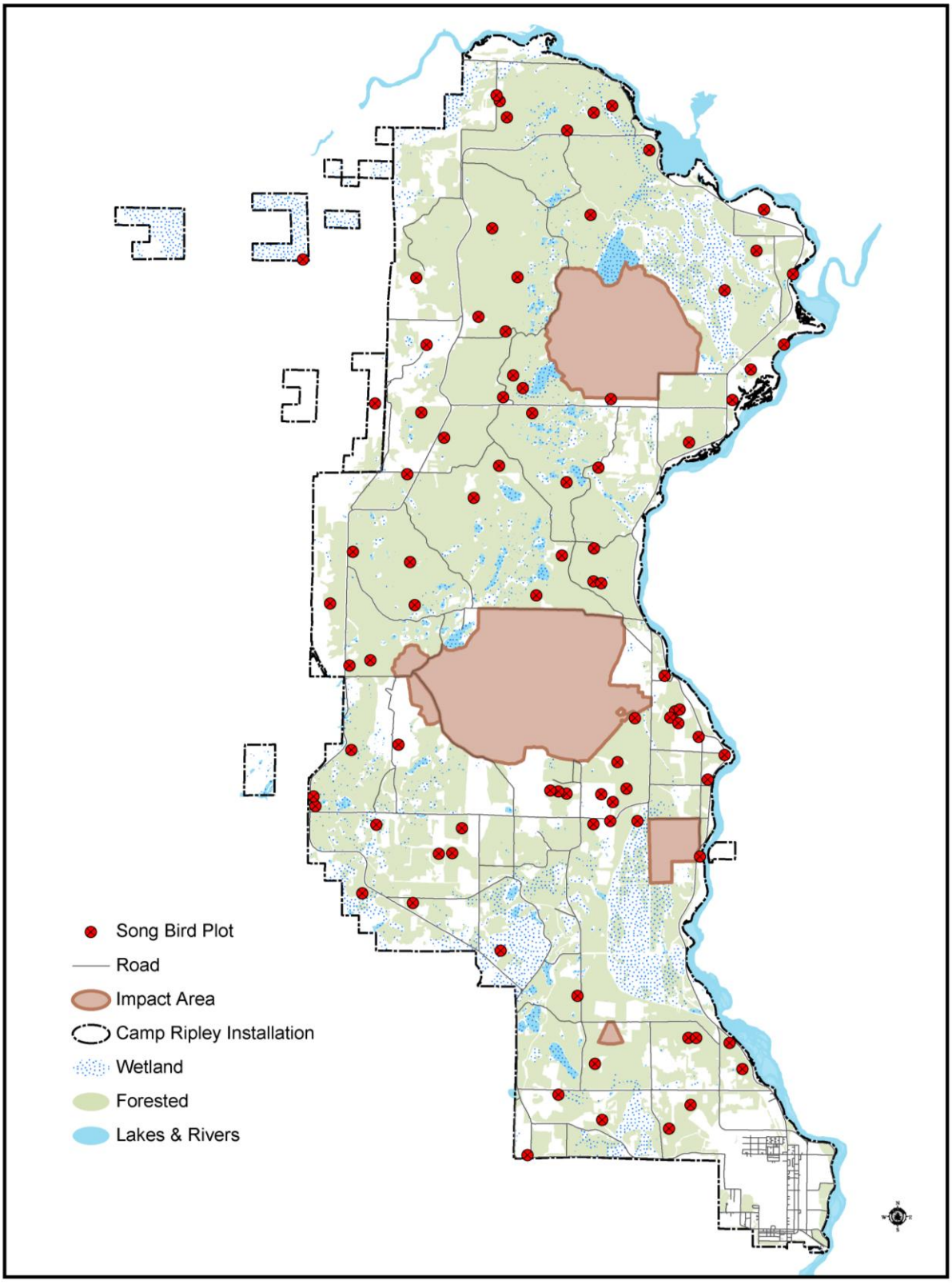
Camp Ripley provides important breeding and migratory habitat for many SGCN birds. Fifty-one SGCN birds have been identified on Camp Ripley; which includes both breeding and transient species (Appendix J). Twenty-nine SGCN birds including waterbirds, raptors, and songbirds are known to breed on Camp. Of the 14 SGCN songbirds that have been documented during past point count surveys, 11 were recorded this year.

Songbird surveys were conducted between June 8 and June 26, 2009 on 57 permanent plots (Figure 21). A total of 563 birds of 63 different species were counted. However, 14 species made up 69 percent of the total number of birds recorded. On Camp Ripley, the average number of species surveyed per plot and the average number of birds on each plot has remained relatively constant since 2000. The average number of birds per plot was 9.87 and the average number of species per plot was 7.26 (Table 8). Similar to past years, the most common birds documented on plots were ovenbird (*Seiurus aurocapillus*), red-eyed vireo (*Vireo olivaceus*), American redstart (*Setophaga ruticilla*), veery (*Catharus fuscescens*), scarlet tanager (*Piranga olivacea*), and least flycatcher (*Empidonax minimus*). Ovenbird, red-eyed vireo, and American redstart accounted for 38 percent of the total birds recorded on all plots. However, this is the first year that more ovenbirds were recorded than red-eyed vireos.

Table 8. Songbird survey data Camp Ripley, 2000-2009.

Year	Field Surveyors	Number of 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**

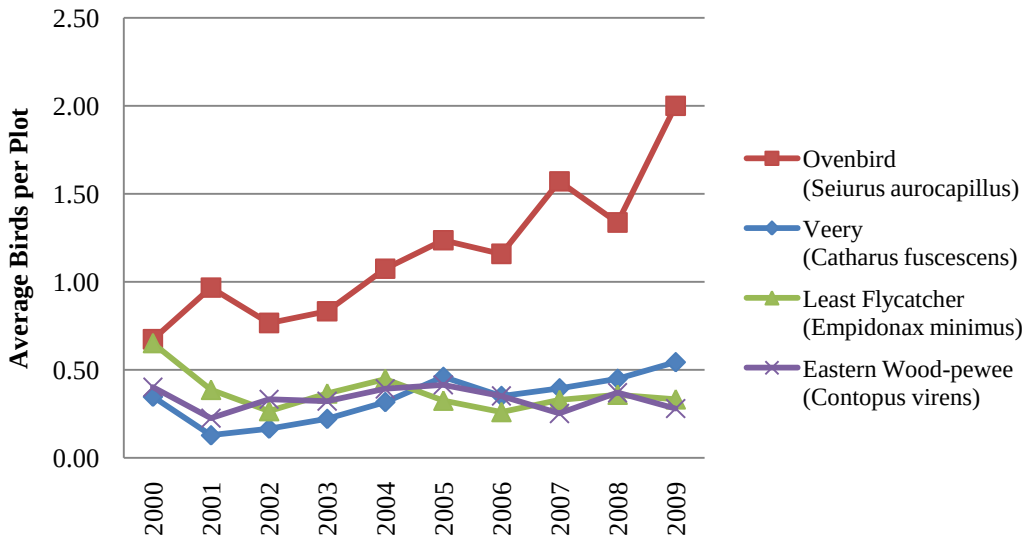
Figure 21. Permanent songbird survey plot locations at Camp Ripley.



The ovenbird, one of the most common forest bird species on Camp Ripley, and a species in greatest conservation need, has shown an increasing trend since 2000. In fact, the average number of ovenbirds per plot and total number of ovenbirds counted had more than doubled by 2007 and increased substantially again in 2009 (Figure 22). The Breeding Bird Survey trend for ovenbirds has been increasing in the state, within the Great Lakes Transition physiographic region (in which Camp Ripley is located), regional, and national levels since 2000 (Sauer et al. 2008), but not to the same extent as on Camp Ripley.

Ovenbirds have the capability to use a number of different plant communities for breeding. However, certain vegetative structural characteristics of ovenbird territories have been identified. Vegetation features from ovenbird territories show a more closed canopy, larger trees, less ground cover, and smaller conifer basal area than adjacent areas of unoccupied forest. Of primary importance for breeding is a large area of contiguous, interior forested habitat (Van Horn and Donovan 1994). Except for ground cover, these are similar requirements for red-eyed vireos. Red-eyed vireos are usually absent from sites where understory shrubs are sparse or lacking. Both species are more abundant in forest interior than near edges, which indicates they are susceptible to forest fragmentation.

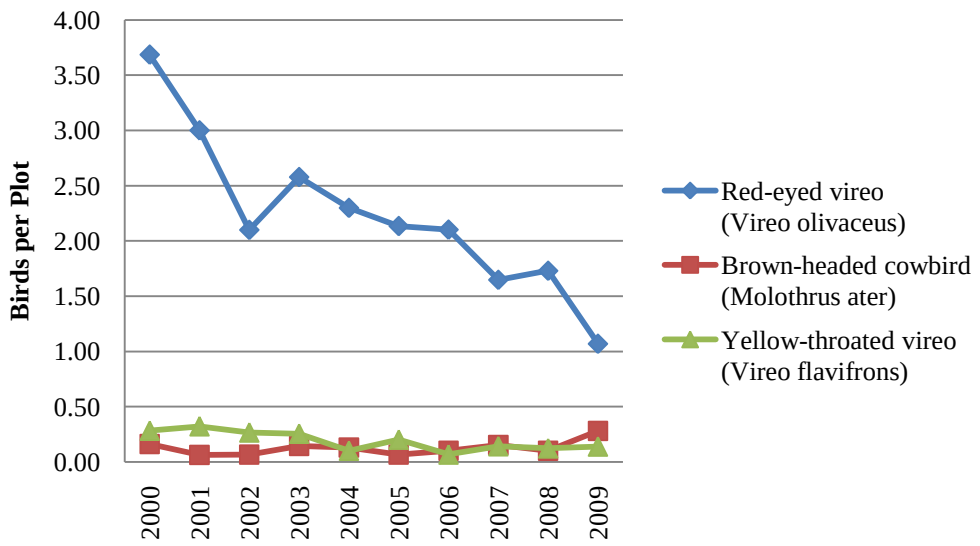
Figure 22. Camp Ripley selected songbirds of greatest conservation need, 2000 to 2009.



*In 2001 and 2002 only 31 and 30 plots were surveyed respectively.

In the past, red-eyed vireos 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 23). This decrease is not known to occur in other surveys in the state, region and country.

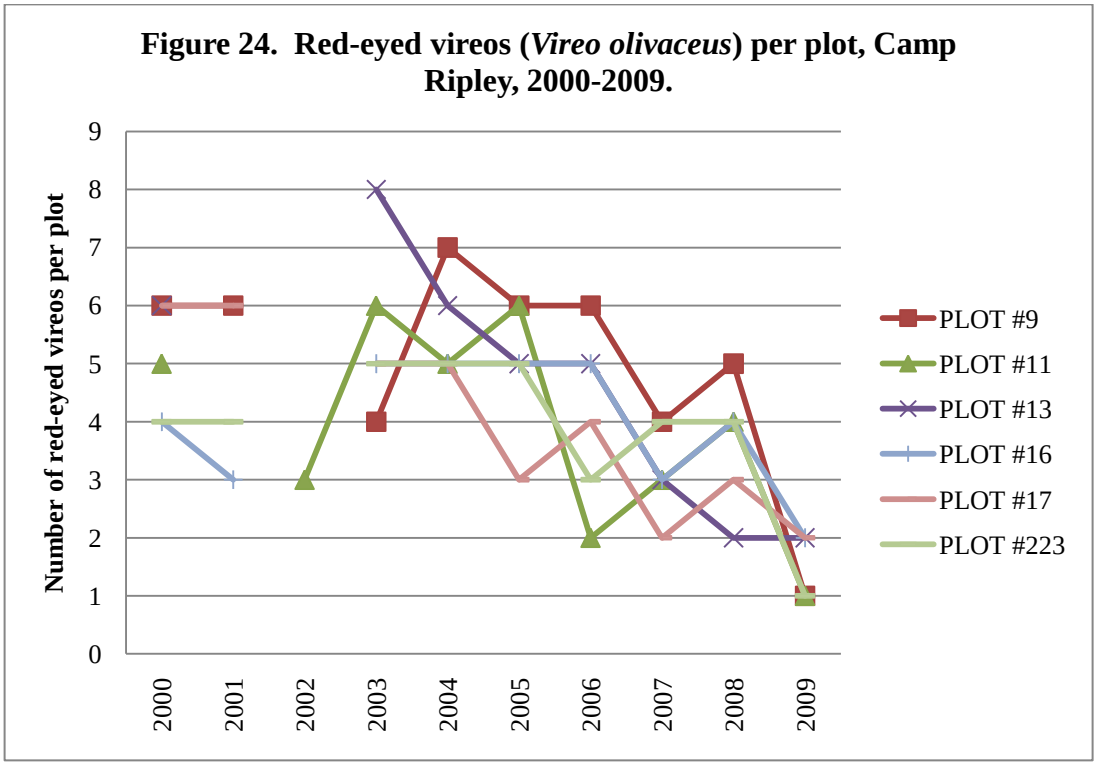
Figure 23. Camp Ripley selected songbird average birds per plot, 2000-2009.



To investigate the reason for the decline in red-eyed vireo numbers the first consideration was the potential impact of changes in the quantity and/or quality of available habitat. Although habitat alteration may impact small segments of a population, its impact on individual species throughout Camp Ripley is difficult to determine. For example, timber harvest has the potential to benefit or negatively impact ovenbirds and red-eyed vireos on Camp Ripley. Because they require unfragmented forest types and near complete canopy cover, clearcuts could negatively impact both species. Thinning or selective tree harvest has the potential to favor ground nesting ovenbirds by leaving most of the canopy cover and opening up the forest floor; this same forestry practice may negatively impact red-eyed vireos by removing understory nesting sites. Other changes in habitat due to increased use of prescribed fire in wooded areas, mechanical removal of subcanopy woody plant species, and range development on Camp all have the potential to impact available red-eyed vireo habitat.

To determine if habitat alterations were responsible for the significant decrease in red-eyed vireo numbers on Camp Ripley a subsample of permanent songbird plots was selected. First, only forest habitat songbird plots surveyed in 2009 were selected, and then those plots with the highest total number of red-eyed vireos from 2000-2009. Finally, to try to eliminate other factors that may have contributed to the decline, only plots in areas that had not been altered or disturbed (timber harvest, range development etc) in recent years were selected. The purpose of choosing these plots was to determine if plots with a high density of red-eyed vireos on unaltered plots exhibited this decline. The results show that even those plots with the greatest number of red-eyed vireos in undisturbed sites exhibited a similar decline (Figure 24). Other factors that were considered were the impact of nest parasitism by brown headed cowbirds (*Molothrus ater*), however the number of cowbirds per plot has not changed significantly since 2000 (Figure 24). Observer error or changes in

methodology were also considered, however bird plots have been surveyed primarily by the same people since 2000 and no significant changes in methodology have been made during that time.



*In 2001 and 2002 only a subsample of plots were surveyed.

Light Detection and Ranging (LiDAR) Songbird Models (Restani and Newton 2009)

The Department of Defense (DOD) is the second largest land steward in the U.S. Although the primary mission of large installations is to support military training, DOD also mandates maintenance of its lands in conditions similar to when training facilities were established to meet regulatory requirements of natural resource policies, such as the Endangered Species Act and the National Environmental Policy Act. Camp Ripley, in north-central Minnesota, is a state-owned National Guard training facility that has adopted DOD policy and developed and formally implemented an Integrated Natural Resource Management Plan. The natural resources management program at Camp Ripley exists to ensure that multiple demands for land use can be satisfied without sacrificing the integrity of either military training missions or biodiversity conservation. Forests and the diversity of breeding forest songbirds are focal areas for management.

Managers periodically inventory breeding birds and forest structure to guide resource conservation. Typical forest inventories conducted at plots or points are not spatially explicit, and thus are only moderately useful to military personnel and resource managers. Remote sensing techniques are available for estimating spatial features and for modeling some parameters of interest to managers at various spatial resolutions (e.g., cover types, patch size). However, these data are

typically two-dimensional (XY) and do not provide a third spatial dimension (Z), which is important for modeling vertical forest structure and related breeding bird occurrences. Light detection and ranging (LiDAR) is a relatively recently developed remote-sensing tool that can quantify various forest stand structural metrics (e.g., stem density, basal area, tree height and volume).

Our goal was to improve understanding of the relationship between forest structure and breeding birds at Camp Ripley, thereby enabling managers to predict the effects of military activities on forest ecosystem patterns and processes. We used discrete return LiDAR data (1) to derive a digital elevation model, (2) to develop and evaluate empirical models estimating forest stand structural metrics, and (3) to develop and evaluate empirical models estimating breeding bird occurrences. The study area included Camp Ripley and the surrounding Army Compatible Use Buffer.

LiDAR data consisting of 1-m nominal ground post-spacing of four returns were acquired from 9 May - 24 June 2007. The dataset for the study area contained 378 ASCII files of more than 1.1 billion records. We used 0.25-ha plots (50 m X 50 m cells) for modeling forest stand metrics and relative mean abundance of breeding birds recorded at point counts (n = 91). We developed 11 candidate models relating various LiDAR-derived explanatory variables to bird abundance for 12 species that had adequate counts for the period 2006-2008. Analyses were conducted at three spatial scales: center 50 m X 50 m cell, a block of nine 50 m X 50 m cells surrounding the center cell, and a block of 25 50 m X 50 m cells surrounding the center cell. We used generalized linear models to relate mean bird abundance to forest metric explanatory variables. An information-theory approach provided evidence for which of the 11 candidate models best described variation in mean bird counts. We also assessed model fit by examining adjusted R^2 and adjusted PRESS R^2, by plotting observed mean count versus predicted mean count, and by computing simple correlations.

Models for red-eyed vireo (*Vireo olivaceus*), ovenbird (*Seiurus aurocapilla*), vesper sparrow (*Pooecetes gramineus*), and veery (*Catharus fuscescens*) had Adj. PRESS $R^2 \geq 0.23$ and thus provided some insight into the relationship between forest structure and bird abundance. The number of models receiving substantial support (i.e., Δ AIC ≤ 2) varied from three models (veery) to one model (ovenbird and vesper sparrow). The following patterns existed for red-eyed vireo habitat use at the 50-m cell spatial scale: existence of little understory vegetation (1-2 m), moderate amounts of vegetation at midstory (2-4 m), and large amounts of overstory canopy closure > 9 m in height. The only clearly discernable vegetation pattern at the nine 50-m cell scale was heterogeneity in canopy closure for trees > 9 m in height. Ovenbirds used areas with large amounts of canopy closure at 6-12 m and 12-18 m. At the 25-cell scale, ovenbirds used homogenous stands composed of trees 6-12 m in height. Additional but weaker support for stand homogeneity at the 25-cell scale was revealed by (1) high variation for trees >18 m in height (i.e., most trees reached a maximum height of 12-18 m), and (2) three of the five SD variables had negative coefficients signaling low variation. At the 50-m scale, veeries used areas with high amounts of understory at 0-2 m and high amounts of canopy closure at 6-12 m, the latter use was similar to that expressed by ovenbirds. In contrast to ovenbirds, veeries used heterogeneous stands at the 25-cell spatial scale. For vesper sparrows, only one model, which narrowly partitioned vegetation at low heights, received strong support for describing the relationship between relative abundance and vegetation structure. As expected, habitat use of this

shrubland/grassland sparrow was highest in areas with vegetation 1-2 m in height. Areas with shorter and taller vegetation received less use. In general, LiDAR data overestimated abundance at low observed counts and underestimated abundance at high observed counts.

We offer the following general recommendations to improve the usefulness of LiDAR with respect to modeling the relationship between vegetative structure and bird species abundance: (1) establish additional bird point counts on Camp Ripley to capture the full range of vegetative structure. Forest metric estimates derived from LiDAR data can be used to identify new areas for bird abundance sampling; (2) focus counts on detecting the 12 focal species used in this analysis; (3) estimate probabilities of detection based on distance-sampling techniques or double sampling techniques. Or, consider use of spot mapping of territories; (4) combine structural data from LiDAR with cover type data (e.g., Quickbird) to improve the predictive ability of models estimating the relationship between vegetation structure and bird species abundance.

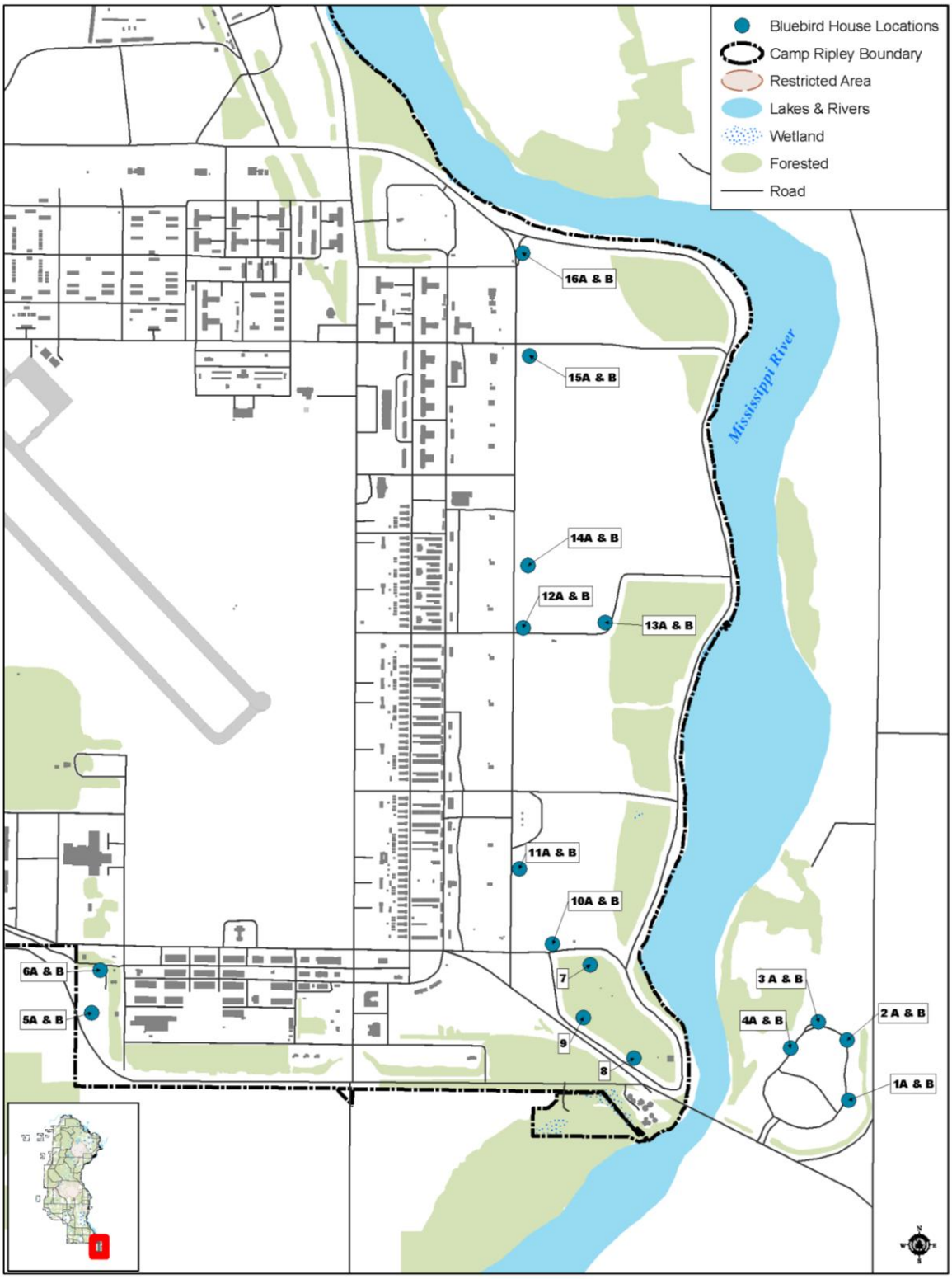
Finally, our analyses of LiDAR data focused only on estimating forest metrics and the relationship between vegetation structure and bird abundance. The LiDAR acquired in 2007 can have a multitude of uses applicable to INRMP and military training. We strongly encourage use of this dataset in applications related to forest management, other wildlife research, and military training (e.g., estimating vehicle and personnel concealment in different areas across Camp Ripley).

Eastern Bluebird (*Sialis 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 2007). 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 MNDNR. These recovery efforts were centered upon providing artificial nest boxes for eastern bluebirds. Camp Ripley has participated in the eastern bluebird recovery by establishing artificial nest boxes since 1994 at the Minnesota Veteran's Cemetery. In addition, the nest boxes at the Minnesota Veteran's Cemetery provide visitors viewing opportunities. Bluebird nest boxes were also established along the Camp Ripley cantonment fence in 2007.

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. As an event for National Public Lands Day, new bluebird boxes (Gilbertson PVC) were constructed and installed at the Minnesota Veteran's Cemetery (4 pairs (located across the Mississippi River from Camp Ripley)), DeParc

Figure 25. Location of eastern bluebird houses at Camp Ripley Veteran's Cemetery and Camp Ripley cantonment area, since 2008.



Woods (3 single boxes) and Camp Ripley cantonment (9 pairs) (Figure 25). 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. These new locations have been effective and eliminated use by house wrens in 2009.

During 2009, all twenty-nine Gilbertson PVC artificial bluebird nest boxes (North American Bluebird Society 2008b) were monitored regularly during the breeding season (May 5 to August 20) by DeAnna Gehant and Mike Ratzloff, Camp Ripley volunteers. Seventeen boxes were occupied by bluebirds, none by house wrens (*Troglodytes aedon*), five by tree swallows (*Tachycineta bicolor*), and two by black-capped chickadees (*Poecile atricapillus)*. Attempts to nest were made by invasive house sparrows (*Passer domesticus*), but their nests were removed. Bluebird nestlings were first observed in nest boxes on May 29, 2009. Eighteen bluebirds fledged from the nest boxes at the Veteran's Cemetery and 67 fledged from nest boxes within the cantonment area. The production of bluebird fledglings was up significantly from the nine birds produced at the Minnesota Veteran's Cemetery in 2007 and similar to production in 2008. This increase can be attributed to regular maintenance and monitoring which greatly improves the success of bluebird houses. Additionally, 16 tree swallows successfully fledged.

Trumpeter Swan (*Cygnus buccinator*)

Trumpeter swans were a common breeding bird in western Minnesota until the mid-1800s; the last 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 2,400 free-flying birds in Minnesota. Trumpeter swans are monitored each year (Dirks et al. 2009) through aerial flights and ground observation by field staff.

The first record of trumpeter swans breeding on Camp Ripley occurred in 1991 when an active nest was located in a wetland north of Normandy Road. Trumpeter swans have continued to be documented at various lakes throughout Camp Ripley, but successful reproduction has not been documented in more than ten years. In 2009, a breeding pair, including a swan on a nest was documented on Mud Lake; however, no swans were observed on Mud Lake on subsequent checks and no cygnets were observed. In early August 2009, cygnets and adults were observed on an unnamed pond in the northeast corner of Marne Marsh, just southeast of Miller and Holden lakes.

Wood Duck (*Aix sponsa*) Nest Boxes

Wood ducks (*Aix sponsa*) were nearly extinct by the early 1900s due to habitat loss and the lack of old, dead trees where the ducks nest. However, management efforts, in part due to artificial nest boxes and an increase in beaver ponds, have helped increase the wood duck population (Ducks Unlimited, Inc. 2008 and MNDNR 2007). Camp Ripley established 35 artificial wood duck boxes in 2008 that were placed on eight foot steel sign posts with metal predator guards, based on recommendations from the Wood Duck Society (Wood Duck Society 2008).

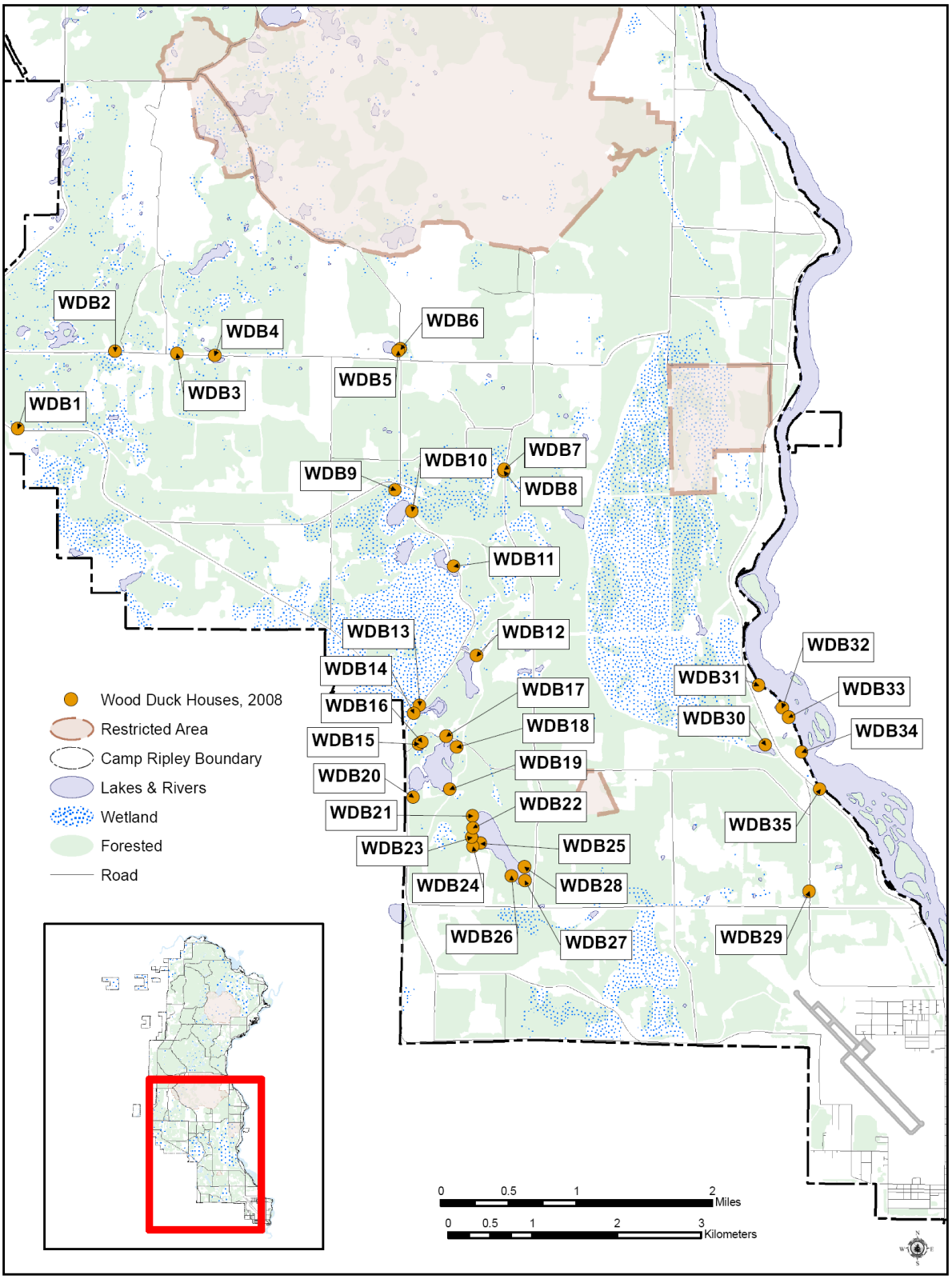
Figure 27. Hooded merganser ducklings (Box #25), 2009.

During 2009, Camp Ripley interns monitored thirty-five wood duck houses adjacent to Ferrell Lake, Round Lake, Goose Lake, the Mississippi River, and other water bodies in the southern portion of Camp Ripley (Figure 26). On May 19, 2009, interns began monitoring houses with the last visit occurring on June 29, 2009. Four nest boxes were active. One box contained one wood duck egg and was abandoned (Box #9), another box had nine hooded merganser eggs that were destroyed and a hen merganser carcass was found near the nest box (Box #23). The two remaining active boxes hatched 13 and 7 hooded mergansers (Boxes #22 and #25, respectively; Figure 27). The new design and placement of nest boxes on sign posts helped simplify monitoring of nest box use from the ground. A volunteer will be recruited for the 2010 nesting season to maintain and monitor nest box use.

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 is one of the states with 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 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 NGB Eagle Policy Guidance, Bald and Golden Eagle Protection Act (USFWS 2008a), and Bald Eagle Management Guidelines (USFWS 2007).

Figure 26. Wood duck nesting box locations at Camp Ripley, 2009.



Bald eagles are closely monitored at Camp Ripley (Dirks et al. 2009). Since 1991, between two and six nests have been active within Camp Ripley, fledging from one to nine young annually (Table 9). The bald eagle nesting season in 2009 was not as productive as 2007 or 2008. Bald eagle pairs were found on four of eight nests throughout Camp Ripley (Figure 28). The Yalu, North Range, and Mud Lake nests were confirmed active and the North Range nest had two young fledge, the other active nest's success is unknown. The Lake Alott and Tamarck Lake nests were confirmed inactive. The Rest Area 3 nest was inactive; however, an injured adult bald eagle was recovered in March 2009 within 100 yards of the nest. This bald eagle was transported to Wild and Free wildlife rehabilitation center in Garrison but was euthanized due to its injuries. The status of the Prentice Pond 2 nest was unknown due to military training preventing access to the area.

A U.S. Fish and Wildlife permit (MB217435-0) for the North Range eagle nest was received on June 11, 2009. This permit is a "bald eagle take exempted under Endangered Species Act" permit. The permit provides for incidental take as it relates to disturbance during the construction of the Urban Assault Course on Camp Ripley. The permit expires on December 31, 2012.

Table 9. Bald eagle nests and fledglings at Camp Ripley, 1991-2009.

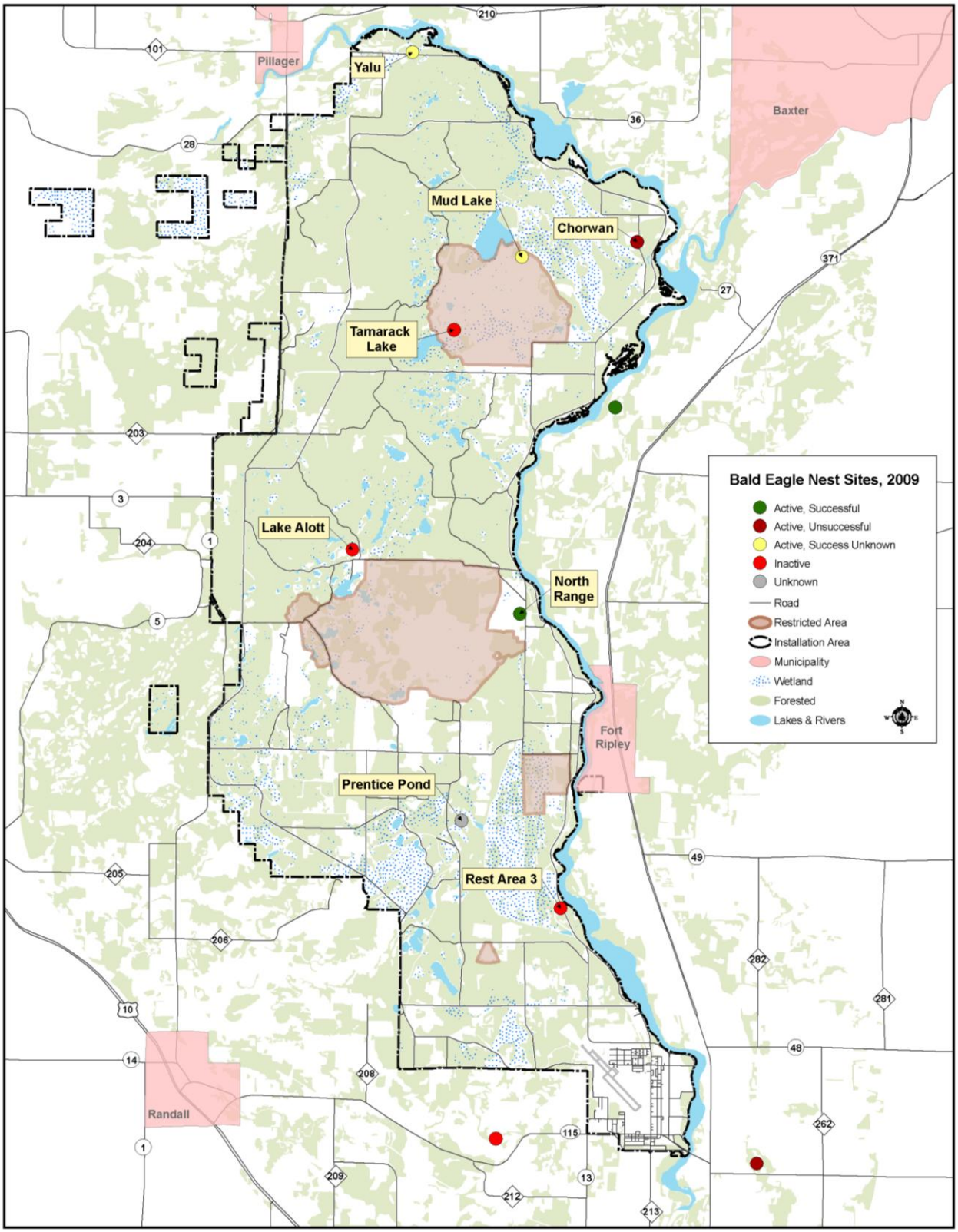
Year	Number of Active Nests	Number of Young Fledged
1991-1992	4	?
1993	2	4
1994	3	5
1995	3	4
1996	3	4
1997	3	6
1998	2	4
1999	3	3
2000	4	8
2001	4	8
2002	2	1
2003	3	4
2004	3	4
2005	5	5
2006	6	1+?*
2007	5	9
2008	5	5
2009	**4**	**2***

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

In 2008, the East Boundary Road nest was active in the spring but the nest fell down and the pair began to build a new nest approximately 200 meters south of the original nest. No further construction occurred on this new nest during 2009. However, one new eagle nest was discovered along Chorwan Road approximately 400 yards northwest of the old East Boundary nest. No breeding activity occurred on the nest in 2009.

Three eagle nests within one mile of the Camp Ripley boundary are also monitored. Two of the nests were occupied in 2009, one nest was active but unsuccessful and the other nest fledged one chick. The third nest directly south of Camp Ripley was inactive.

Figure 28. Bald eagle nests at and near Camp Ripley, 2009.



Osprey (*Pandion haleaetus*)

Ospreys (*Pandion haleaetus*) were observed on the nest platform on Sylvan Reservoir in April 2009. However, these ospreys did not stay to raise young.

Owl Surveys

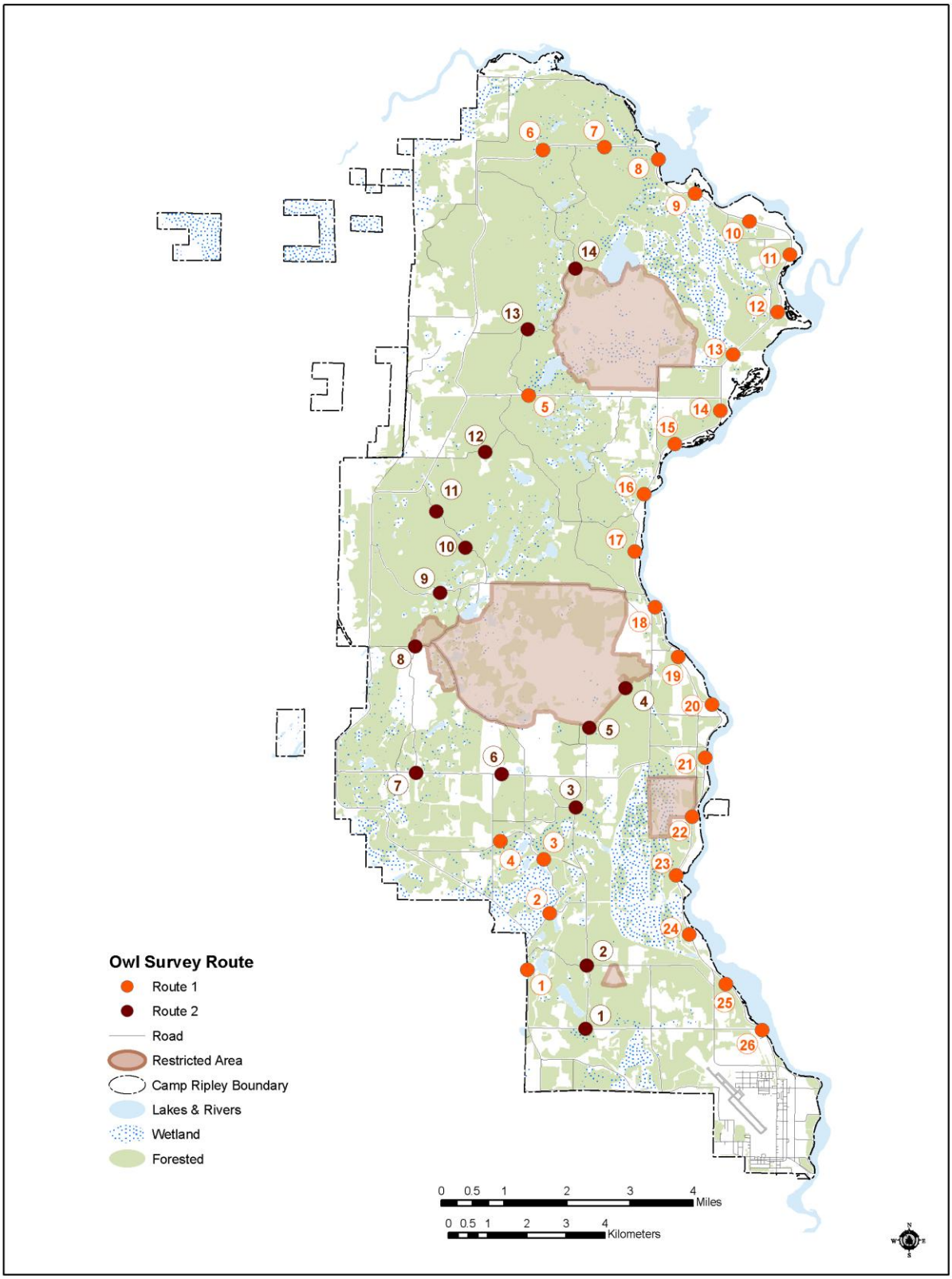
Owl surveys at Camp Ripley began in 1994, and continued annually until 1999. These surveys were placed on a four-year rotation in 2000, but with the threat of West Nile Virus occurring in owl populations, the survey is now conducted every year. Data from these surveys is also used to monitor state and 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 29). 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 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 Western Great Lakes region. 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 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 Western Great Lakes Region survey analysis of seasonal calling activity data suggested one survey period in April is adequate to detect all species of interest for monitoring purposes.

In 2009, portions of owl surveys for route #1 were conducted on April 7 (points #6-26), April 8 (point #5), and April 9 (points #1-4). The route #2 survey was conducted on April 8 (points #7-14) and April 9 (points #1-6). Fewer barred owls (*Strix varia*) were heard on route #1 this year than from

Figure 29. Owl survey route at Camp Ripley.



2004-2006 and more than were heard from 1993-1999 (Figure 30). One northern saw-whet owl (*Aegolius acadicus*) was heard on route #1 in 2009. Fewer barred owls were heard on Route #2 this year than in 2004-2006, but similar to 2007 (Figure 31). No great horned owls (*Bubo virginianus*), where heard in 2007 and 2009 on route #2.

Figure 30. Owl numbers from route #1, April 1-15 survey, Camp Ripley, 1993-2009[a].

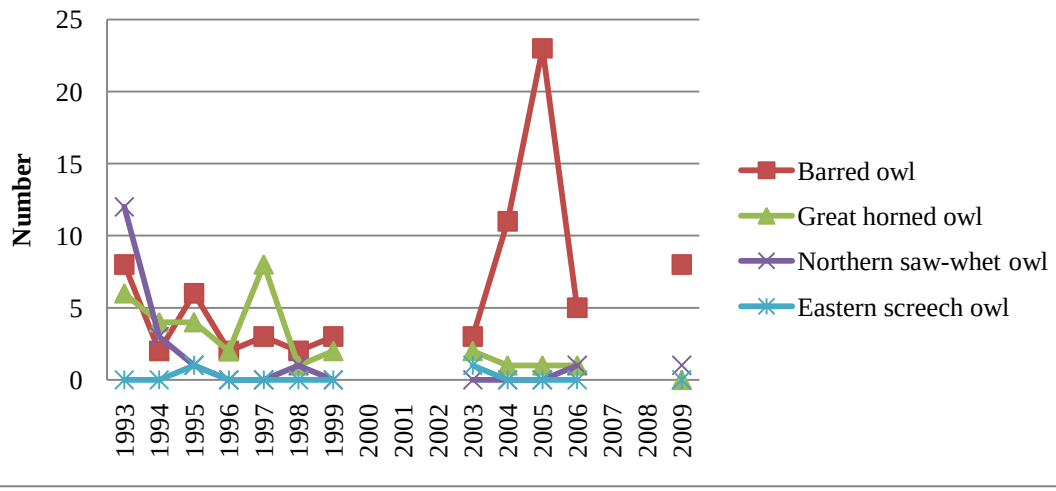
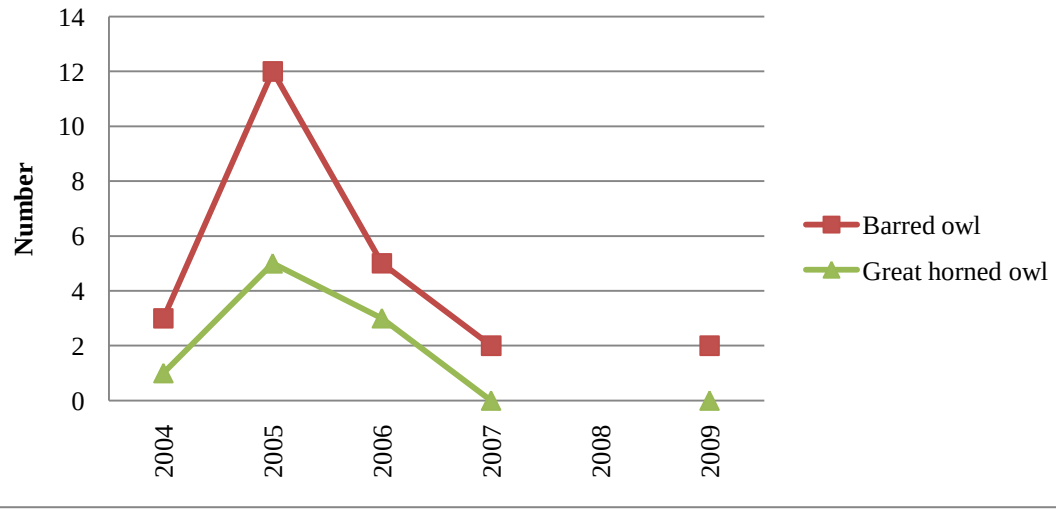


Figure 31. Owl numbers from route #2, April 1-15 survey, Camp Ripley, 2004-2009[a].



[a] 1993- 2006 survey conducted with three minute passive listening period and 2007-2009 survey conducted with five minute passive listening period.

Red-shouldered Hawk (*Buteo lineatus*) 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 threatened species (Dirks et al. 2009).

In 2004 and 2005, a red-shouldered hawk study was conducted on Camp Ripley (Henneman 2006). The 2009 survey used a subset (n=64) of the same call-broadcast points used in 2005 by Henneman (2006) (n=130). A subset of call points was selected due to staff constraints to complete the full call broadcast survey (n=130) conducted during 2004-2005. Call point subset selection criterion were: 1) positive response points during 2004 and 2005 (Figure 32 and 33), and 2) points selected were close to existing roads or trails. Survey techniques used in 2009 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 is the same number used by Henneman (2006).

In 2009, a total of 64 call-broadcast points were sampled from March 30 to May 18, 2009 (pre-incubation period). Sixty-one points (95.3%) were included in the analysis because either a positive response was recorded or they were sampled ≥4 times (Table 10 and Figure 34). Seventy-six percent of these call-broadcast points were occupied in 2009. Occupancy for red- shouldered hawks

Table 10. Red-shouldered hawk call broadcast surveys, Camp Ripley, 2004, 2005, and 2009.

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%**

[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, positive response call points were considered occupied and sampling ceased.

at Camp Ripley was similar to 2004, but higher than in 2005. In 2005, more of the southern portion of Camp Ripley was surveyed where fewer red-shouldered hawks reside due to habitat differences; therefore, the occupancy would be lower. In 2009, eight call points were south of Normandy Road (Figure 34) whereas 33 points were in 2005 (Figure 33). In addition, in 2009, the subset of sampled points included only those responsive points from 2004 and 2005, which may have increased the positive responses. Future call-broadcast surveys should use a random sample of the existing call points.

Figure 32. Red-shouldered hawk call-broadcast response and sample locations, Camp Ripley, 2004.

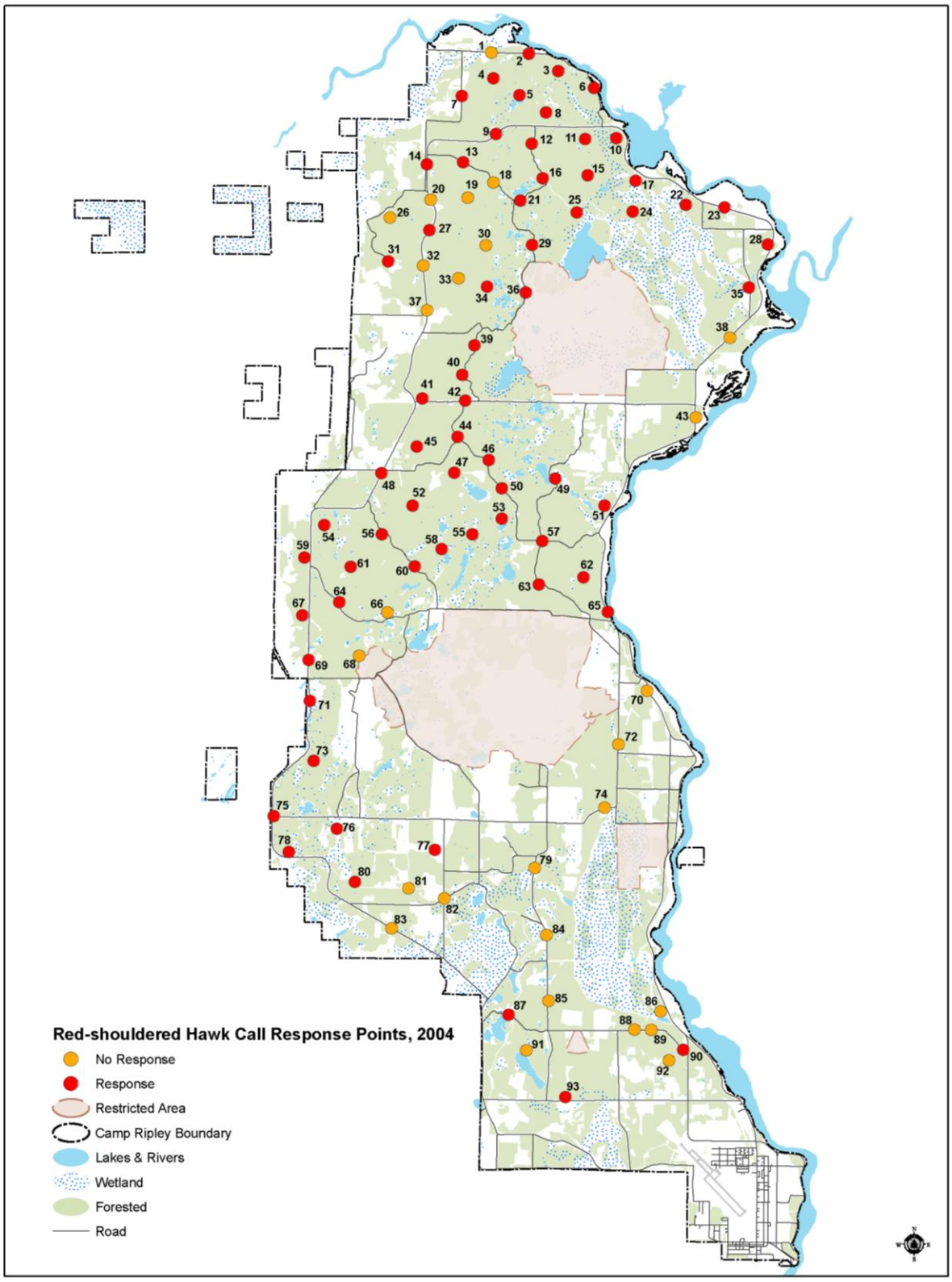


Figure 33. Red-shouldered hawk call-broadcast response and sample locations, Camp Ripley, 2005.

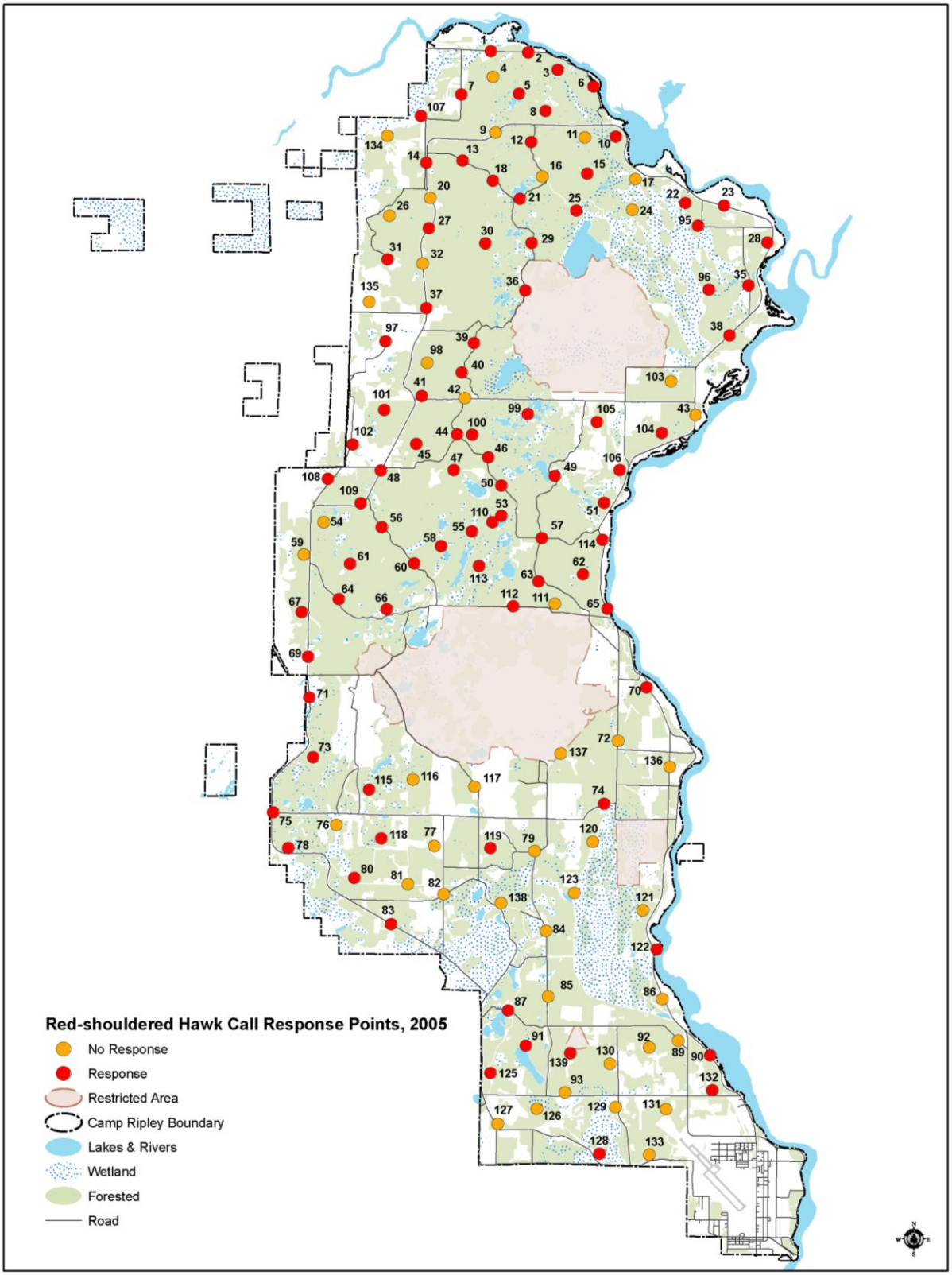
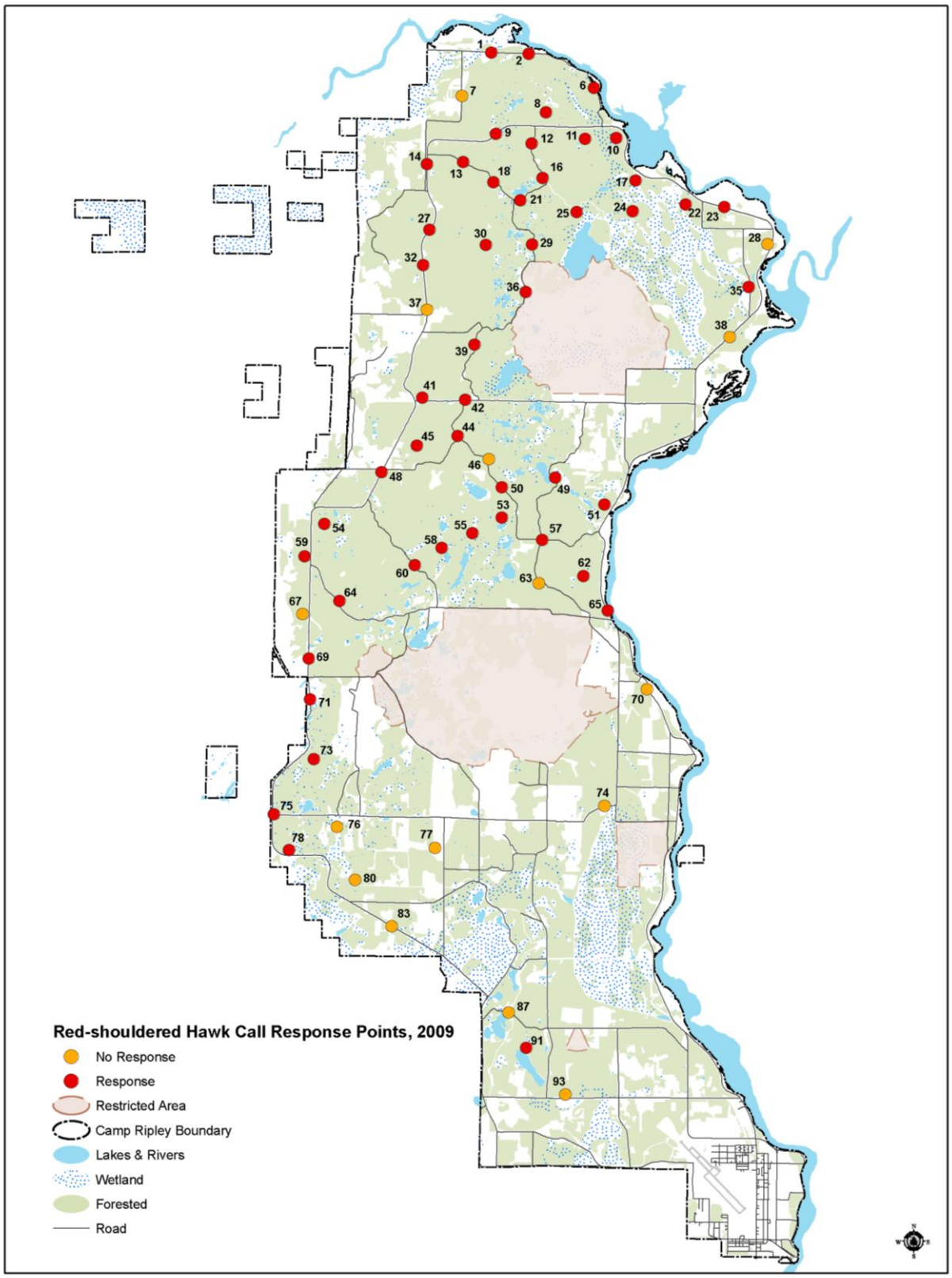


Figure 34. Red-shouldered hawk call-broadcast response and sample locations, Camp Ripley, 2009.



Ruffed Grouse (*Bonasa umbellus*)

Ruffed grouse drumming counts were conducted on two survey routes (#38 and #39) as part of the MNDNR survey throughout Minnesota's ruffed grouse range. The data is used as an index to track grouse population trends across the state. Route #38, the official MNDNR survey route, has been run since 1979. Route #39 was added by Camp personnel in 1998 (Figure 36). Drumming counts are conducted for four minutes at ten points along each route.

The official count for route #38 occurred on May 4, 2009. Eight drums were heard in 2009, which is a decrease since only six stops were counted in 2008 (Figure 35). Camp Ripley's ruffed grouse population decreased after a high in 1999 but began to increase in 2002, which is similar to other routes in the Little Falls area (Figure 37). Higher ruffed grouse populations were found throughout most of Minnesota during 2009 (Figure 38). Five grouse were heard drumming on ten stops along route #39, surveyed on May, 5 2009. Counts on this route have been low since 2001 but increased substantially in 2007, fell again during 2008, and rebounded somewhat in 2009 (Figure 35).

Although Camp Ripley is not managed specifically for ruffed grouse, habitat is generally stable. Aspen stands of varying age classes provide the best ruffed grouse habitat along both routes. Aspen stands that had been clearcut along both of these routes have been maturing. Ruffed grouse will benefit as timber harvest for forest management continues to maintain a wide range of age classes of aspen.

Figure 35. Ruffed grouse surveys at Camp Ripley, 1979-2009. Gaps in the graph indicate years when the survey was not conducted. Route #38 had only six stops in 2008.

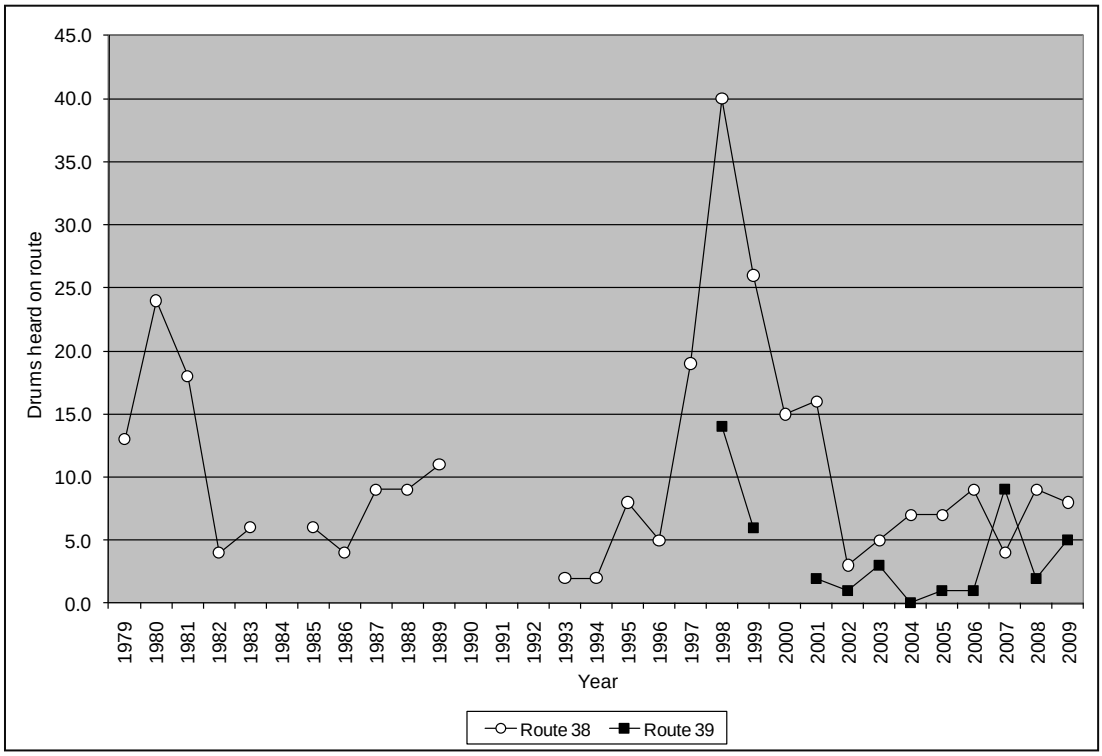


Figure 36. Ruffed grouse spring drumming survey route at Camp Ripley.

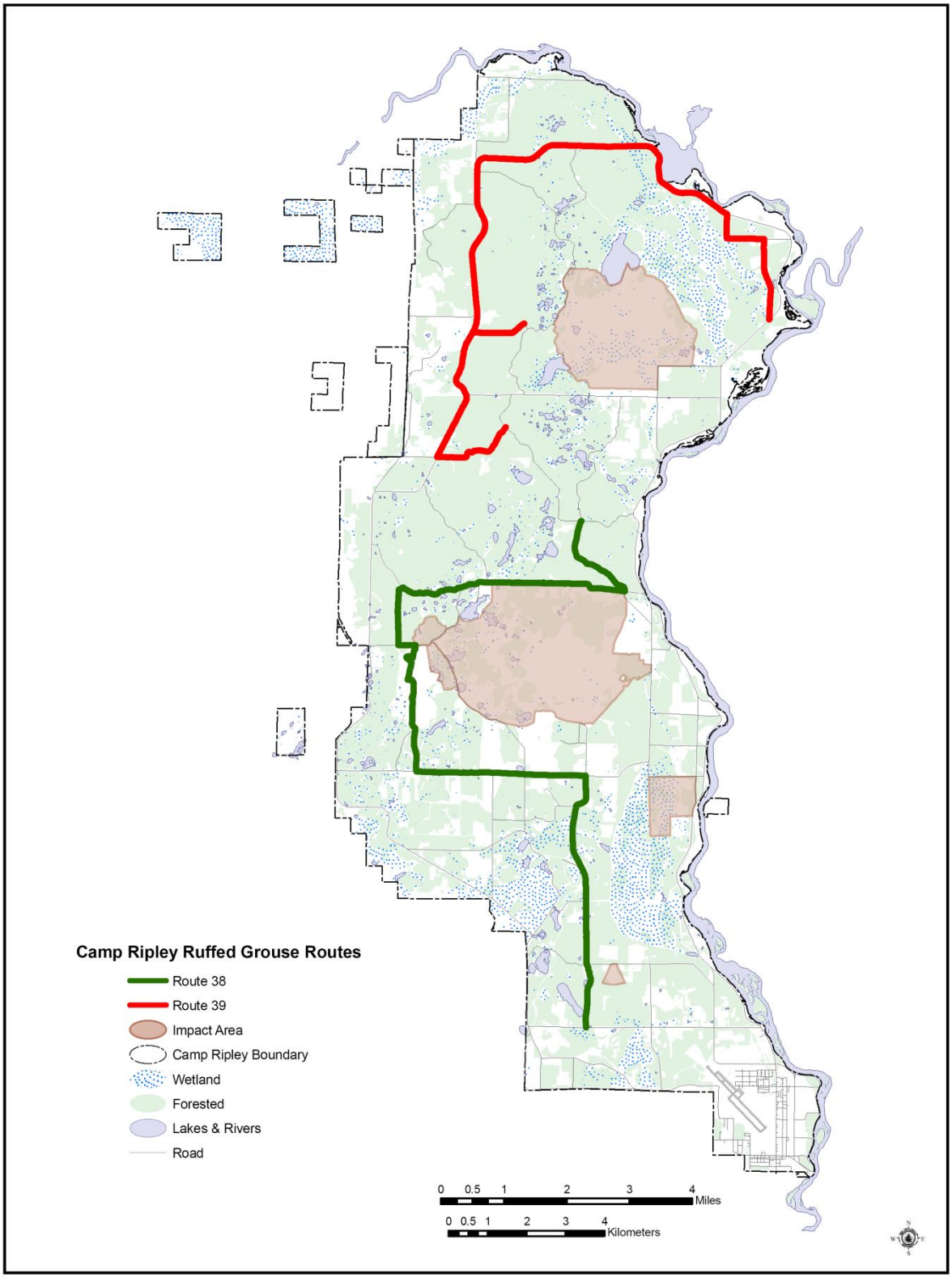


Figure 37. Ruffed grouse drumming surveys in Little Falls Area, 1979-2009. Gaps in the graph indicate years when the survey was not conducted.

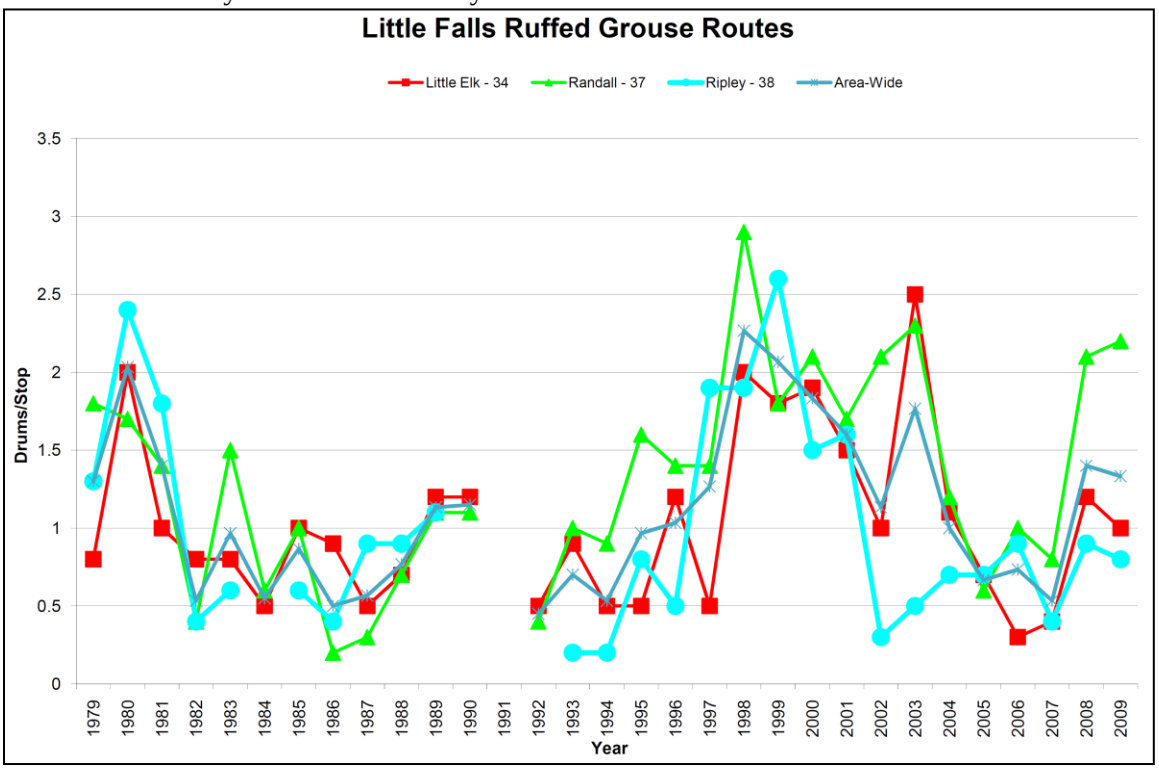
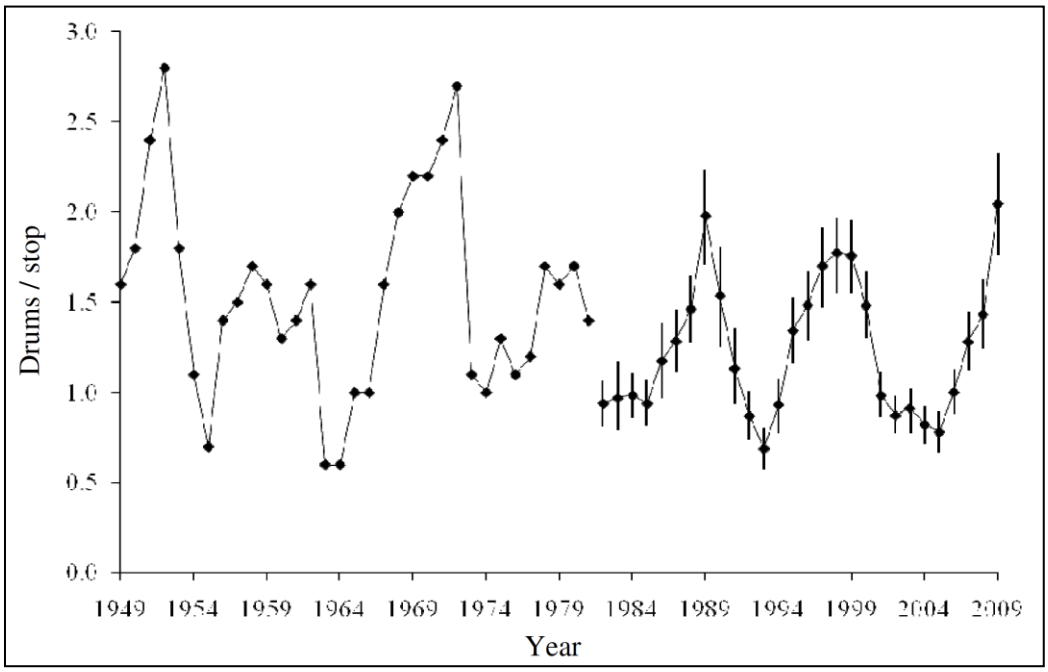


Chart courtesy of Beau Liddell, MNDNR, Division of Fish and Wildlife, Little Falls, MN.

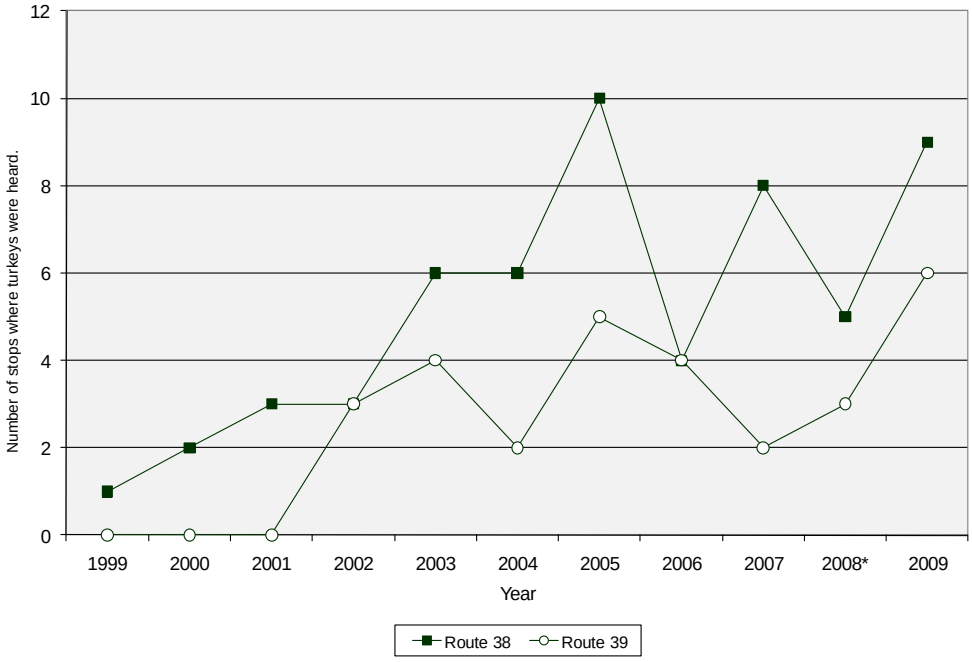
Figure 38. Minnesota's ruffed grouse drum count index values, 1949-2009. Vertical error bars represent 95% confidence intervals based bootstrap samples (Larson 2009).



Wild Turkey (*Meleagris gallopavo*)

As recently as the year 2000, wild turkey sightings and broods at Camp Ripley were recorded as uncommon events. The turkey population at Camp has increased substantially since that time, and in 2009 wild turkeys were observed throughout Camp Ripley. During ruffed grouse counts in early May, turkeys were documented on nine of ten stops on survey route #38 and six of ten stops on route #39 (Figure 39). In 2009, both survey routes had near record or record high turkey numbers since 1999. Other surveys, such as brood counts in the spring and summer, and winter flock counts were considered in the past but were determined to be unnecessary due to the solid population numbers recorded through spring gobbling counts and observations in the field.

Figure 39. Wild turkeys heard on ruffed grouse spring drumming routes at Camp Ripley, 1999-2009. *In 2008, only six stops were visited on route #38.



In 2009, Camp Ripley participated in a wild turkey winter food habits study in northern Minnesota conducted by the MNDNR Farmland Wildlife Population Group (Appendix K). The study will evaluate wild turkey food habits during winter on the northern fringe of their range, and investigate the association of agriculture and snow conditions with food habits and body condition. The study objectives are to: 1) determine winter foods used by wild turkeys on the northern fringe of their range in Minnesota, 2) describe diet as a function of agriculture and snow conditions, and 3) compare body condition of wild turkeys with access to high-energy diets to those without.

Camp Ripley staff collected four wild turkeys for the study during February 2009. Collection of wild turkeys on Camp Ripley proved challenging because a large proportion of the population moves off Camp to utilize agricultural fields for winter food resources. Preliminary data from the winter food habits study found that turkey crops collected in forested habitats frequently contained acorns (*Quercus* spp.), grass (*Poa* spp.), and leaf litter. While crop contents from turkeys collected in agricultural habitats contained predominantly corn (*Zea mays*) or corn parts, sunflower seed

(*Helianthus* spp.), and grass (*Poa* spp.). Adult females from forested habitats had 32% less body weight, and 72% less total fat than adult females from agricultural habitats (Dunton et al. 2009). The MNDNR will collect approximately 15 to 20 turkeys on Camp Ripley from December 2009 through March 2010.

Camp Ripley 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 gray wolf was first protected under the Endangered Species Act in 1974. During the mid- to late-1970's the MNDNR estimated the wolf population at about 1,000 to 1,200; based on a 2003-2004 survey, the population had grown to approximately 3,000 animals. Results from the 2007-2008 survey estimated that the current population remains at just under that number (2,921) (Erb 2008).

For decades, the number of wolves in Minnesota has exceeded the recovery criteria established by the federal wolf recovery plan. Currently, Minnesota's population of more than 2,900 wolves is second only to Alaska among U.S. states and exceeds the federal delisting goal of 1,251-1,400. Minnesota's wolves occupy nearly all of the suitable areas in the state. Minnesota has one of the highest wolf densities recorded anywhere, and the population has remained stable for nearly 10 years.

On March 12, 2007, the U.S. Fish and Wildlife Service removed Endangered Species Act protection for the gray wolf in the states of Minnesota, Wisconsin, and Michigan. Management of wolves in Minnesota was turned over to the state based upon its 2001 Minnesota Wolf Management Plan. However, on September 29, 2008, the U.S. District Court for the District of Columbia overturned the Department of the Interior's decision to remove the gray wolf (Great Lakes Distinct Population Segment) from federal Endangered Species Act (ESA) protection. The status of gray wolves in Minnesota is once again threatened under the Endangered Species Act.

All provisions of state wolf management have been suspended until gray wolves are delisted again in Minnesota. Wolf management authority lies with the U.S. Fish and Wildlife Service (USFWS). Under federal law no one can take a wolf under any circumstances to protect livestock and pets. Wolves may be killed in defense of human life. Authorized government agents may take wolves where verified depredation occurs. Taking of wolves to protect livestock and pets, which was allowed under state management, is no longer allowed (MNDNR 2009).

Wolf Monitoring Background

Section 4(g) of the Endangered Species Act requires the federal government (through the US Fish and Wildlife Service) to monitor, for a minimum of five years, any species that is delisted due to its recovery. The federal Endangered Species Act and the Minnesota Wolf Management Plan encourage area-specific telemetry monitoring of wolves be continued. A great amount of information has been gathered concerning Camp Ripley's wolf packs; however, questions remain concerning survival rates, causes of mortality, and dispersal. Monitoring radio-collared wolves will provide additional information concerning Camp Ripley's wolf packs.

Besides serving as a National Guard training facility, 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 fifteen years, thirty-five 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 11). In addition, Camp Ripley is cooperating with the MNDNR Forest Wildlife Populations and Research Group in developing a new winter track survey as part of the state wolf monitoring program. Camp Ripley is the center of one of three sites selected for this research. Beginning in September 2009, researchers radio-collared wolves on Camp and in the surrounding area to allow locating known packs during winter track surveys.

Since 2001, Camp Ripley has supported two wolf packs. 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, this year more evidence was obtained that wolves that move off Camp are moving into a more hostile environment where they die from illegal and accidental killing by humans.

Wolf Movements and Status

At the beginning of 2009 three radio-collared wolves were on Camp Ripley, two in the north pack and one in the south. Wolf #31 was first captured via helicopter in March 2008. A large (93 lb) male, he was collared with a conventional Advanced Telemetry Systems VHF radio collar. In October 2009, padded leg hold traps were set to capture additional wolves in each pack. The only south pack wolf captured was #31; the current alpha male, he weighed 75 pounds and is now estimated to be 6-7 years old. This was the only collared wolf in the south pack this year (Figure 40).

The only other wolf caught during fall trapping was a wolf pup (#35). Captured on October 6, 2009 he weighed 55 pounds. Because he was not fully grown he was collared with a padded VHF collar (Figure 41). The padding on the collar will wear off allowing more room as he grows. A two-year-old female Wolf (#29) was also first captured in 2006. Due to military training we could not locate her den sites. She was often found traveling with the alpha male and may have been the breeding female in the north pack. Shortly after wolf #35 was collared, wolf #29's collar was retrieved on November 5, 2009; it had been chewed off, probably by her pups (Figure 41). Because additional wolves were not captured, a helicopter capture is planned for February 2010.

Table 11. Gray wolves captured at Camp Ripley 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	9/10/96	9/10/96	57		dead	Trapped/shot in Cass County (8/97)
2	F	2	Pup	9/19/96	8/29/97	42		dead	Shot-poacher
3	F	1	Yearling	9/20/96	9/20/96	80		dead	Poisoned
4	M	2	Yearling	9/23/96	1/31/98	79		dead	Hit by car
5	F	1	Yearling	2/21/97	2/21/97	55		unknown	Dropped collar for data retrieval
6	F	3	4-5 years	2/21/97	7/24/98	90		dead	Hit by car
7	M	3	10 month	2/21/97	2/1/98	55		dead	Shot-poacher
8	F	1	10 month	2/21/97	2/21/97	50		unknown	Dropped collar for data retrieval
9	M	2	3-4 years	2/21/97	2/3/98	90		unknown	Pillsbury State Forest
10	M	1	Pup	8/29/97	8/29/97	20		dead	Starved? (9/23/07)
11	F	4	Pup	10/31/97	2/4/99	59		dead	Shot in Hillman area? Collar found in swamp
12	M	2	Yearling	11/4/97	2/3/98	60		dead	Killed by ADC in Pine County (7/26/99)
13	M	1	Yearling	2/3/98	2/3/98	88		unknown	Dropped collar for data retrieval
14	F	3	Yearling	9/14/98	1/30/02	76		unknown	Collar failed -2003
15	M	3	>3 yrs	2/2/99	1/17/01	107		dead	Found dead on Camp (7/01)
16	F	1	1-2 years	1/18/01	1/18/01	65		dead	Found dead in Michigan- shot (9/02) (Sue)
17	M	2	1-2 years	9/26/01	2/4/2004	88		unknown	missing
18	M	3	3-4 years	11/15/01	2/25/03	95		dead	Struck by car on Hwy 371 (Lucky)
19	F	2	1-2 years	1/30/02	12/13/02	76		dead	Shot south of Camp
20	F	2	>3 years	1/30/02	1/30/2006	79		dead	Found dead west of Camp Unk. (8/07) (Lady)
21	F	1	1-2 years	2/25/03	2/25/03	68		dead	Found dead in cornfield (Shot?)
22	M	1	2-3 years	2/4/2004	2/4/2004	100		dead	Killed by ADC 4/24/04 in Cass County
23	M	2	1-2 years	2/4/2004	1/30/2006	72		dead	Shot during firearms deer season (11/07) (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	Shot during firearms deer season (11/08) (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**	**Orange 4/Orange 2**	**Dead**	**Shot - was north pack alpha male (Big Foot)**
29	**F**	**1**	**2 years**	**1/30/2006**	**1/30/2006**	**67**	**Orange 1/Blue 11**	**ALIVE**	**Collar chewed off -11/09 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)

Table 11. Gray wolves captured at Camp Ripley 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
31	**M**	**1**	**4-5 years**	**3/22/08**	**3/22/08**	**75**	**Yellow 47/Blue 10**	**ALIVE**	**South pack – alpha male**
32	F	1	2-3 years	3/22/08	3/22/08	84	Yellow 38/Orange 21	Unknown	South pack, GPS collar failed – 2008, dropped 2009
33	F	1	2 years	3/22/08	3/22/08	76		dead	Killed by depredation trapper in Manitoba, Canada (7/08)
34	M	1	4-5 years	3/22/08	3/22/08	92	Yellow 44/Yellow 36	dead	Shot on 11/12/09 (Techno)
35	**M**	**1**	**Pup**	**10/6/09**	**10/6/09**	**55**	**Metal 2117/2466**	**ALIVE**	**North pack; VHF collar (Trickster)**

Figure 40. Locations for Wolf #31 at Camp Ripley, 2009.

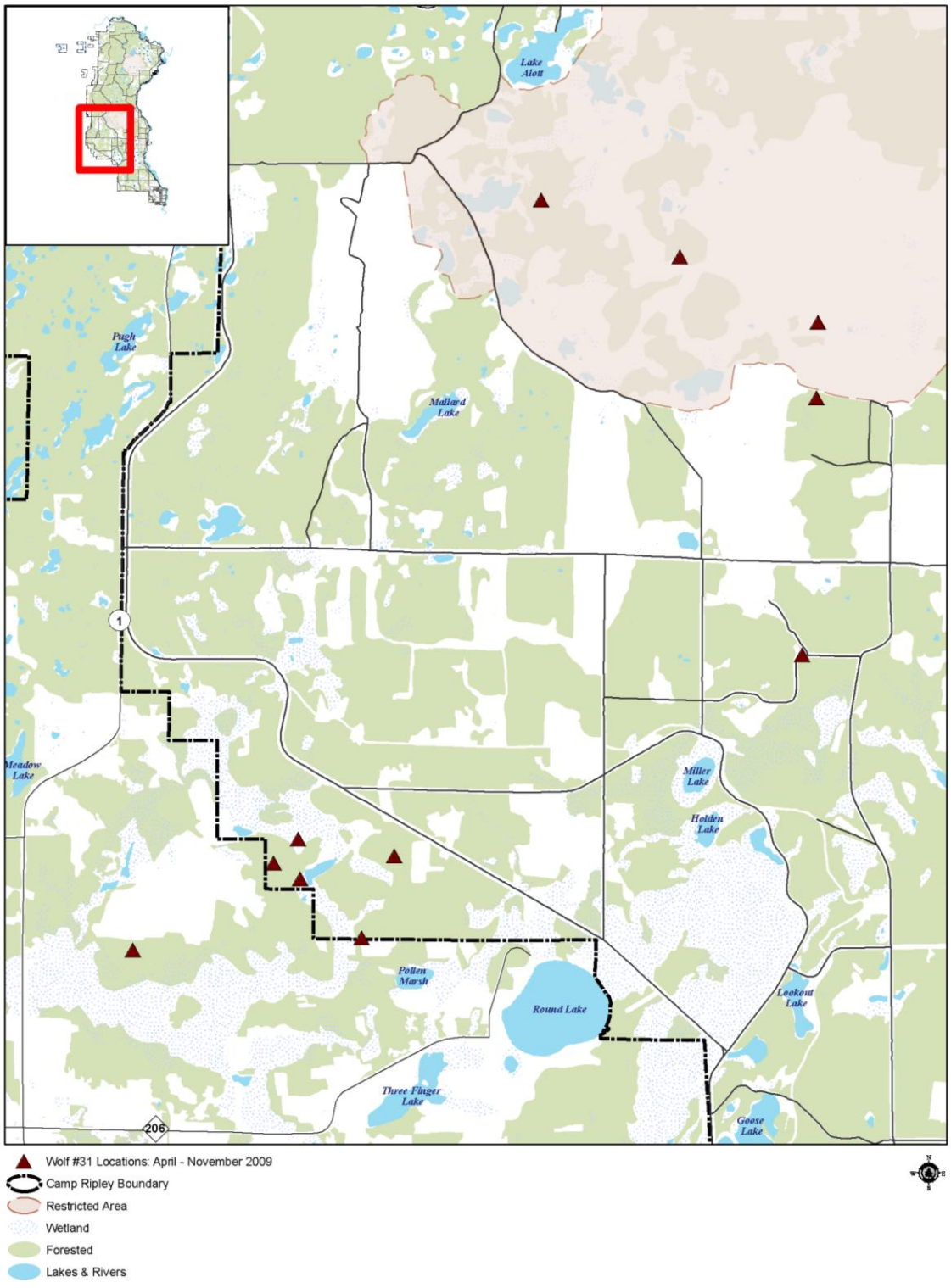
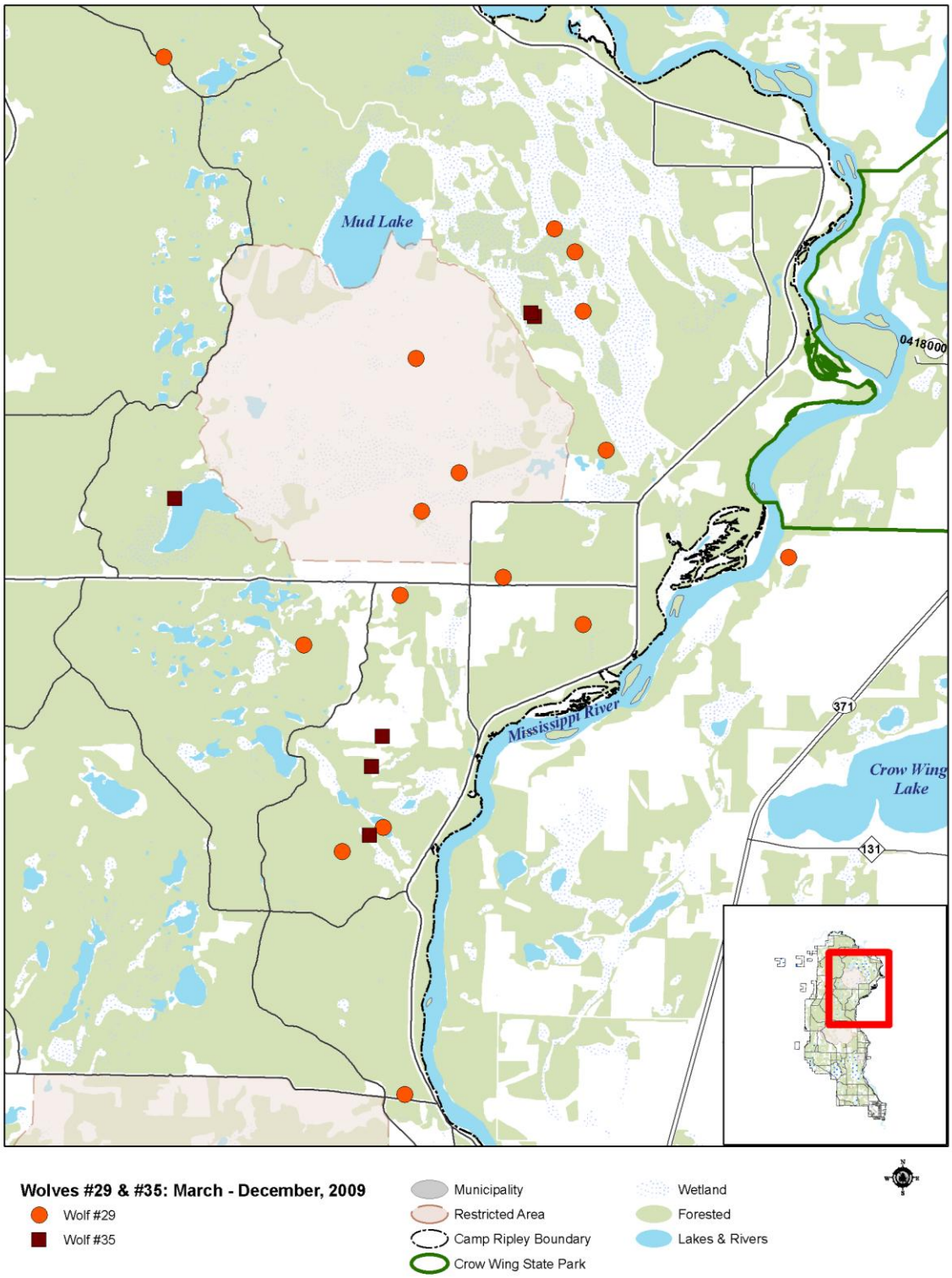


Figure 41. Locations for Wolf #29 and Wolf #35 at Camp Ripley, 2009.



Wolf Mortalities

Wolf #28 was first captured in the north pack during a helicopter capture event in January, 2006. He weighed 103 pounds, was four to five years old, and was fitted with a standard VHF collar (Advanced Telemetry Systems). We noted that his feet were noticeably larger than usual for Camp Ripley wolves, which made his tracks easy to identify. He was the alpha male in the north pack, and over the next few years we observed an increase in track size of wolves in that pack. Unfortunately, wolf #28 reinforced the fact that wolves that move off Camp Ripley are moving into a more hostile environment; he was found dead in January 22, 2009 on the east side of the Mississippi River. Necropsy revealed that he had been shot. The location where he was found was unusual because he had only been located off Camp once in the past (Figure 42). However, on two other occasions alpha male wolves from the north pack moved east of the Mississippi River when their status in the pack changed.

A north pack wolf (#34) that had been collared in 2008 with a GPS/Satellite collar (Northstar Science and Technology, Globalstar GPS) was recovered this year. The wolf had moved off Camp and again we were reminded that the area surrounding Camp is a harsh environment as it was found south of Staples, Minnesota where it had been shot.

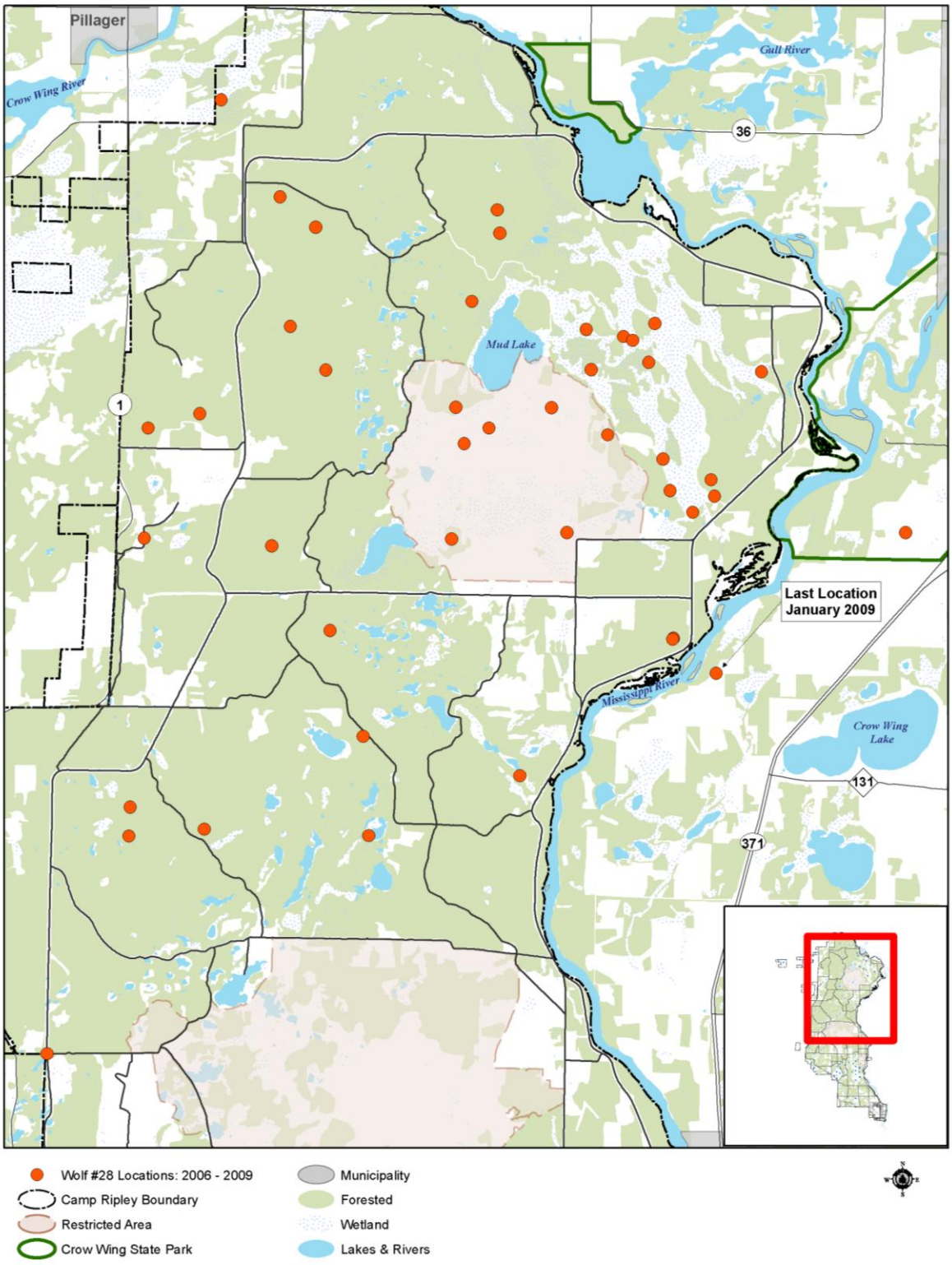
A large (85 lb) female wolf (#30) was captured in 2006 and identified as the alpha female in the south pack. In the 2008 Conservation Program Report we reported that wolf #30 was found dead in February, 2008 in the southwest corner of Marne Marsh near Round Lake. Since that time necropsy results revealed that she had been killed by other wolves. This is only the third collared wolf that has died on Camp and all three have been of natural causes. In contrast, since 1996, 20 collared wolves have died outside of Camp Ripley boundaries and been recovered; of these, ten were shot illegally, one was suspected shot, four were hit by vehicles, three were killed during animal damage control trapping (one in Canada and none in the local area), one was poisoned, and one cause of death was undetermined. (Table 11).

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 the bear range in Minnesota. The principal objectives of this study include: 1) continued

Figure 42. Locations for Wolf #28 at Camp Ripley, 2006-2009.



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.

In 2008, the MNDNR Forest Wildlife Populations and Research Group initiated a study site at the edge of bear range in northwestern Minnesota. The goal is to assess the factors that may limit range expansion, including highly fragmented forested habitat, lack of agricultural crops that bears can eat, and human-related mortality. Comparisons will be made between GPS collared bears at the northwestern edge of bear range and collared bears at Camp Ripley, along the southern edge of their range (Garshelis et al. 2007).

Mortalities and Reproduction

Ground and aerial tracking were used to monitor reproductive success, movements and survival of ten collared black bears (eight females, two males) through 2009 (Table 12). Bear #2063 had one cub in 2005 and 2007; this year (2009) at eight years old, she had three cubs and continues to occupy the northeast portion of Camp Ripley. Bear #2610 was an orphaned cub placed with bear #2063 in March 2007. Two years old in January 2009, she spent most of the year on Camp, but occasionally moved across the Crow Wing River. In mid-November she was on Camp, but crossed the Crow Wing River again and denned in a less populated area of southwest Baxter, Minnesota (Figure 43).

Bear #2079 (seven years old in 2009) had three cubs in 2007 and an orphan cub was also placed with her that spring. All four cubs, including the orphaned cub, survived to den in December, 2007. Three of the four, including the orphan, were females; in March 2008 all three females were collared with expandable collars and survived through the summer, however, the orphan (#2611) has not been located since August 2008. The other two females (#2107 and #2108) were not handled at den visits in 2009, but were located throughout the year in #2079's home range. Bear #2092 (four years old Jan. 2009) had two cubs in 2009, she is one of bear #2079's cubs and her territory overlaps her mother's. In the fall of 2008 a landowner reported that he had found a bear den on his land south west of Green Prairie Fish Lake. On March 12, 2009 a 200 pound male bear (#2122) was collared at the site. This bear occupied much of #2079's territory and was on Camp several times during the year. Although bear #2079 can still be found on Camp occasionally, she is usually located south of Camp (Figure 44).

Figure 43. Locations for black bear #2063 and #2610 at Camp Ripley, 2009.

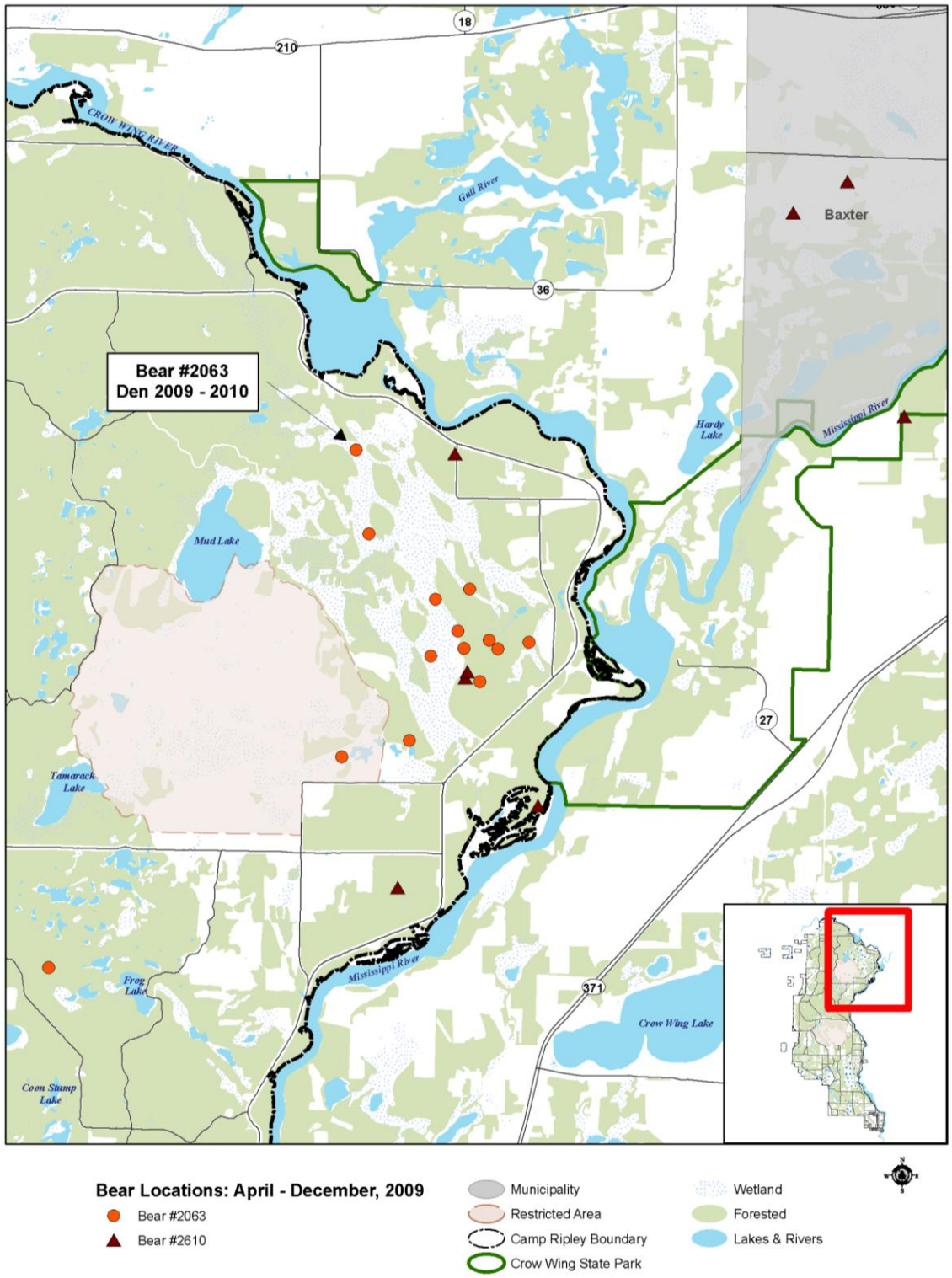
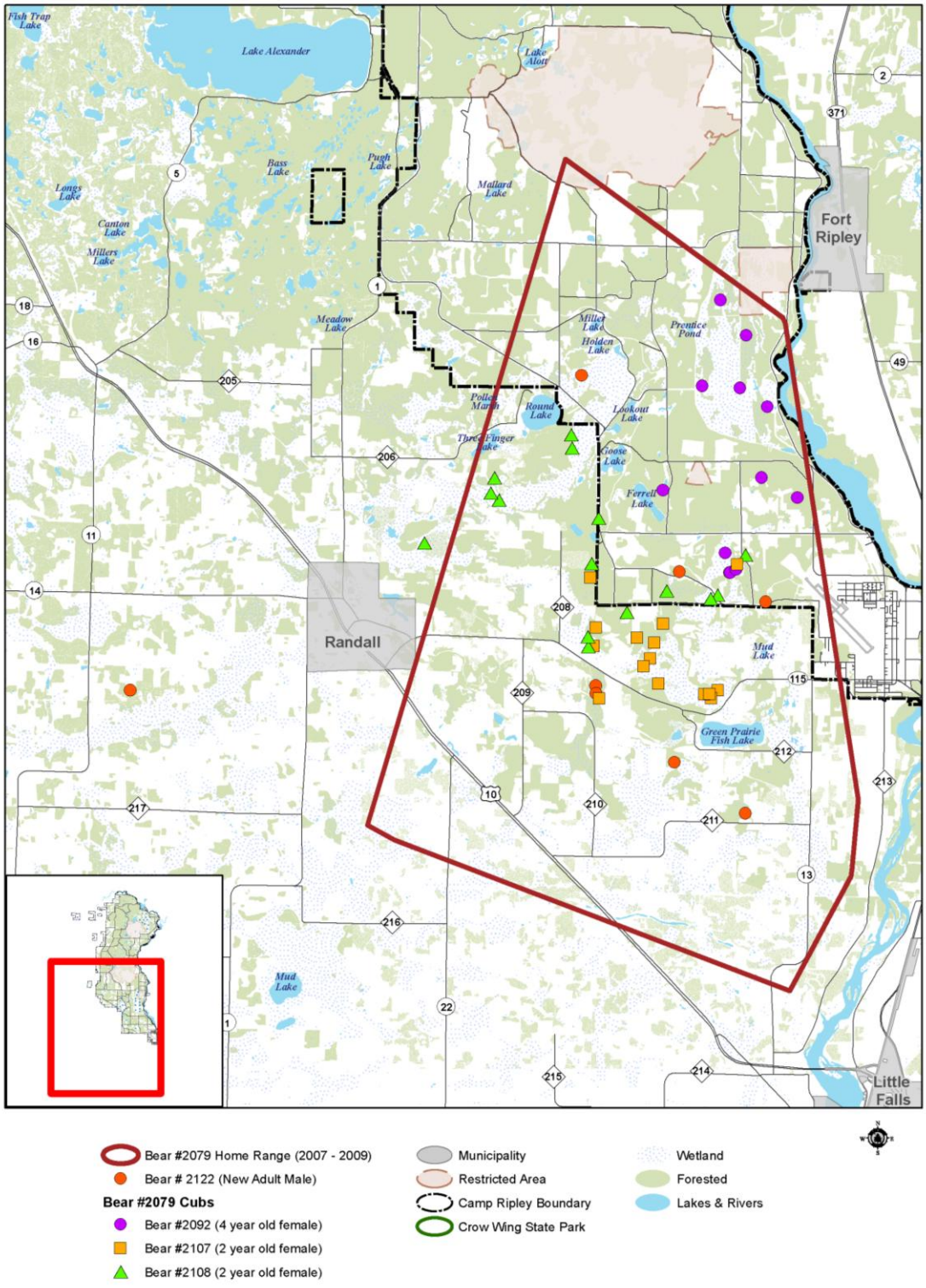


Figure 44. Bear #2079's (7 year old female) home range and locations of her four year old cub #2092 and two year old cubs #2107 and #2108 at Camp Ripley, 2009.



Bear #2081 (ten years old in 2009) occupies an area in south central Camp Ripley. Two of her yearlings were radio-collared in 2009 (male #2113 and female #2115). Both shared her home range during the year, but were not located during late fall flights (last located September 24, 2009) (Figure 45). In 2008, bear #2105 had two small cubs. Her den site was not located in the fall of 2008, however, her signal was picked up in March 2009 and she was observed with one yearling in Training Area 51. There was still snow on the ground which allowed her tracks to be followed back to her den site in a road culvert. An attempt to recapture her was unsuccessful and in April her GPS collar ran out of battery power and released (Figure 46).

Table 12. Black bears monitored at Camp Ripley, 2009.

Bear ID	Sex	Age Jan/09	Date of First Capture	Age at First Capture	Weight at Last Capture (lbs)	Ear Tag Color & Number (Left/Right)	Status
2063	F	8	2001	Cub	195 (3/09)	Orange 40/Red 134	Alive
2076	M	13	2003	7 yrs	397 (3/07)	Lt. Blue 64/ Orange 140	Alive - Dropped collar August 2007, observed west of Randall in 2009
2079	F	7	2004	2 yrs	244 (3/09)	Lt. Blue 100/Red 132	Alive
2081	F	10	2004	5 yrs	181(3/09)	Lt. Blue 59/ Lt. Blue 60	Alive
2092	F	4	2005	Cub	195 (3/09)	None/Purple 73	Alive (79's cub)
2105	F	Unkn	2006	Unkn	124 (3/08)	Purple 89/Orange 142	Alive (3/09) Dropped collar
2107	F	2	2007	Cub	37 (3/08)	Green 175/Green 174	Alive (79's cub)
2108	F	2	2007	Cub	50 (3/08)	Yellow 121/Lt. Blue 73	Alive (79's cub)
2610	F	2	2007	Cub	141 (2/09)	None/Orange 39	Alive - Orphaned cub placed with 63 in 2007
2611	F	2	2007	Cub	59 (3/08)	Purple 93/Yellow 120	Missing - orphaned cub placed with 79 in 2007
2113	M	1	2008	Cub	60 (3/09)	None/White 40	Alive
2115	F	1	2008	Cub	37 (3/09)	Lt. Blue 96/None	Alive
2122	M	Unkn	2009	Unkn	200	None	Alive

Figure 45. Bear #2081's home range and locations of her two yearlings #2113 and #2115 at Camp Ripley, 2009.

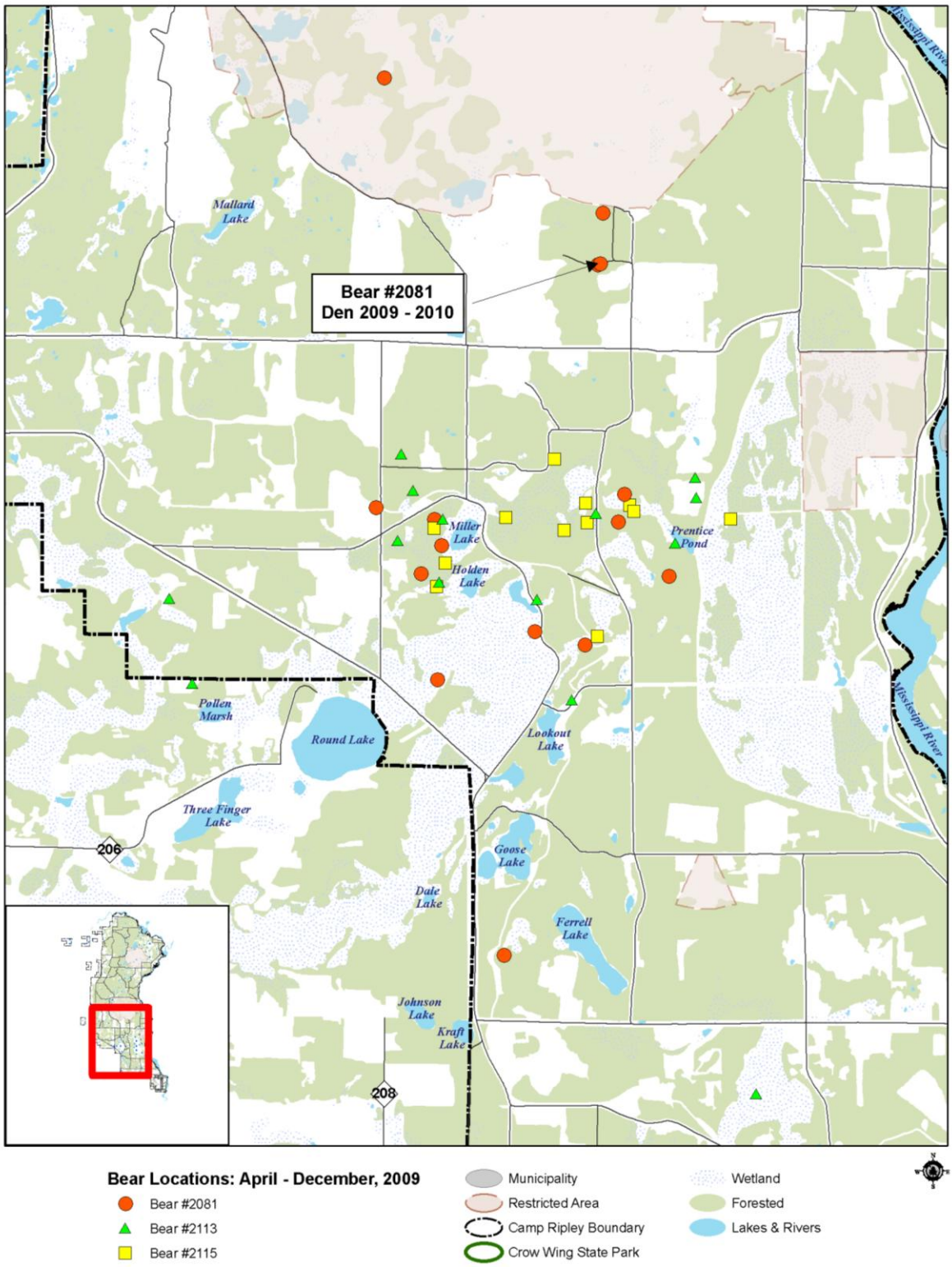
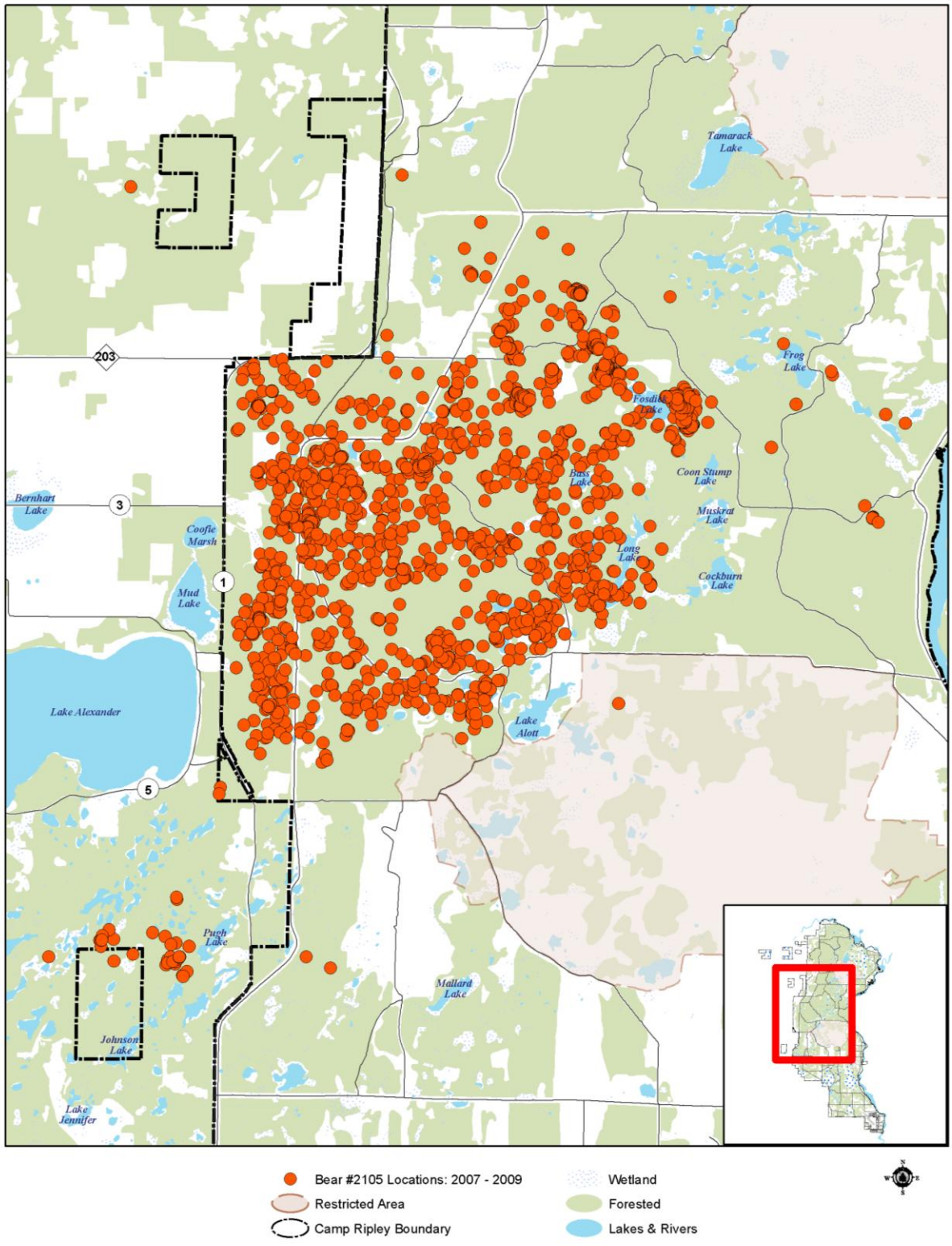


Figure 46. Bear #2105's locations at Camp Ripley, 2009.



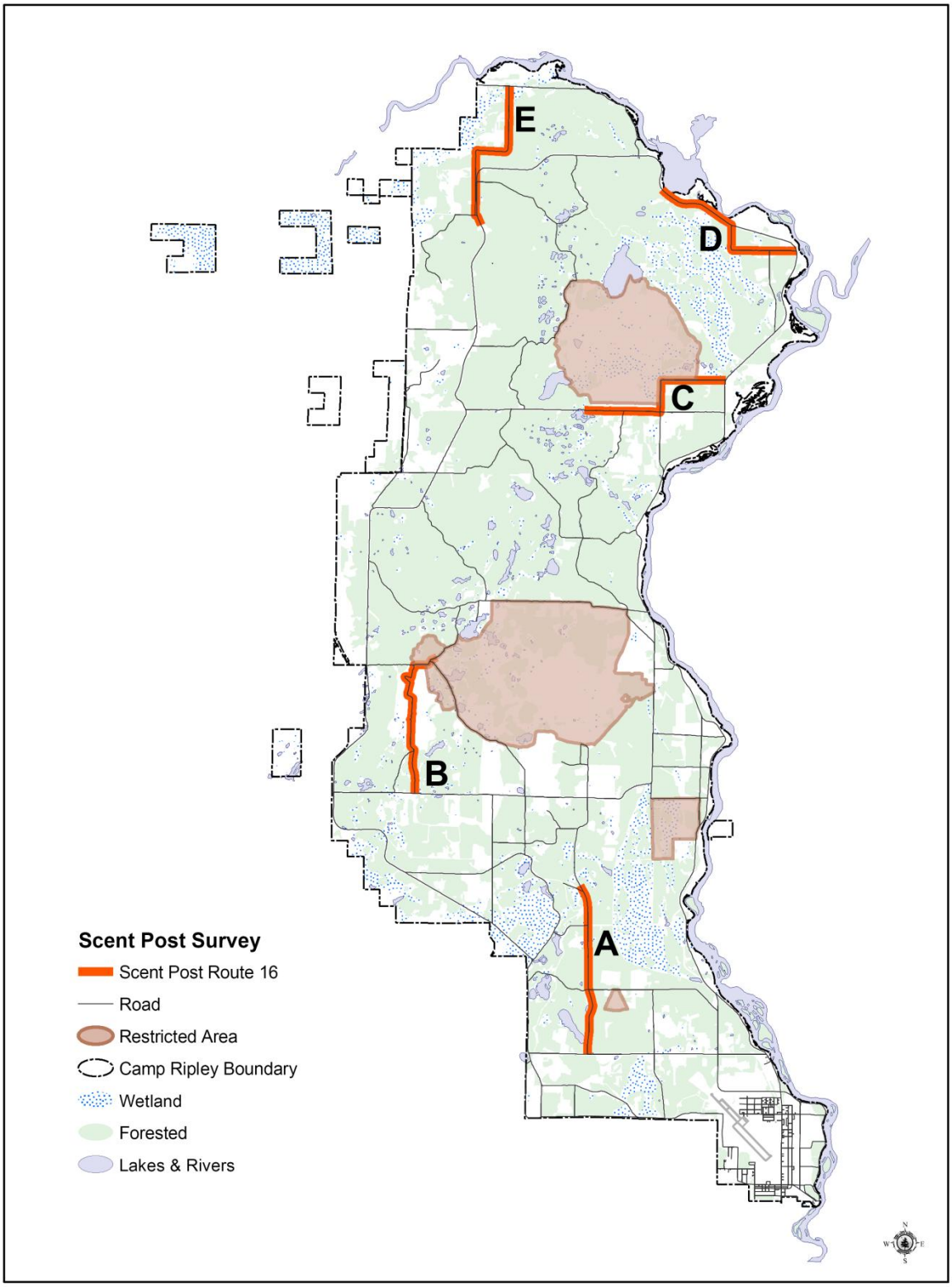
Scent Post Survey

The MNDNR has conducted scent post surveys throughout the state for the past 34 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 47). 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 the following morning after placement for tracks. Segment A was checked on September 3, segment B was checked on September 15, segment D was checked on September 16, and segments C and E were checked on September 17. Only eight of the ten stations were set on segment B due to military training occurring on the remaining two stations.

The most common animals to leave tracks through survey plots during 2009 were gray wolf and either gray (*Urocyon cinereoargenteus*) or red fox (*Vulpes vulpes*). Other species that were documented this year were white-tailed deer, wild turkey, bobcat (*Lynx rufus*), fisher, opossum (*Didelphis virginiana*), striped skunk (*Mephitis mephitis*), and common raccoon (*Procyon lotor*). During 2009, red fox or either gray or red fox were the most frequent visitors to scent stations. Opossum tracks were noted for the first time in 2008 and again in 2009; however, opossum have been observed on Camp Ripley since 2007.

Statewide, route visitation rates (% of routes with detection) were highest for red fox (*Vulpes vulpes*) (42%), followed by skunk (*Mephitis mephitis*) (38%), raccoon (34%), domestic cat (32%), coyote (*Canis latrans)* (22%), and dog (18%). Camp Ripley routes are located in the survey's Forest zone and at the boundary with the Transition zone. The coyote index in the Forest zone remains below the long-term average while raccoon indices in the Forest and Transition zones have been relatively stable. This data must be considered carefully due to discrepancies such as weather, timing, and natural animal movements (Erb 2009). For example, few wolf tracks were observed in survey plots in previous years, which in the absence of other data could indicate a population decline. However, radio-telemetry of this species allows closer tracking of population trends, which are currently stable at Camp Ripley.

Figure 47. Scent post survey routes, Camp Ripley.



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

Historically, cougars or mountain lions (*Puma concolor*) were never common in Minnesota; however, they likely ranged throughout the state before European settlement (MNDNR 2007). Camp Ripley staff receives several reports annually of cougar sightings on Camp. Although observations of cougars in Minnesota are extremely rare, there have been recent documented sightings in Minnesota near Floodwood (Niskanen 2007) and unconfirmed sightings throughout the state. Two unconfirmed observations were reported on Camp Ripley in 2008.

Since March 2000, the Canada lynx (*Lynx canadensis*) 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.

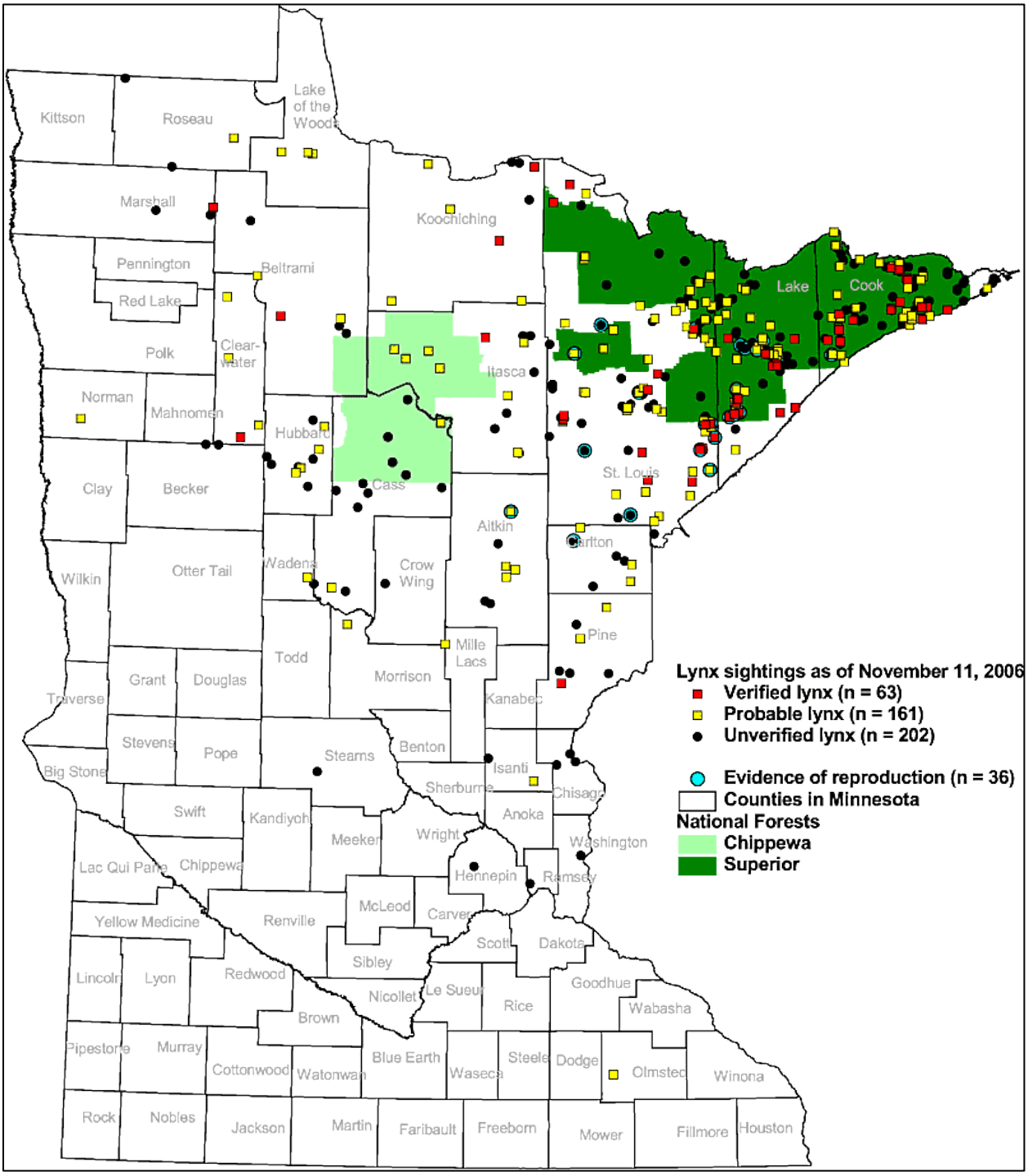
Minnesota historically supported the largest lynx population in the Great Lakes region. Studies are currently underway to understand their distribution, abundance, persistence, and habitat use in and near the Superior National Forest in northeastern Minnesota. This research indicates that Canada lynx 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 (Figure 48).

Figure 49. Camp Ripley cougar and Canada lynx detection survey, 2007-2009. Foreground is fence post with barbed wire and center is plastic pipe with scent and mat of hook fasteners attached to pipe.

The bobcat inhabits much of the same forested country as the lynx, but it is 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.

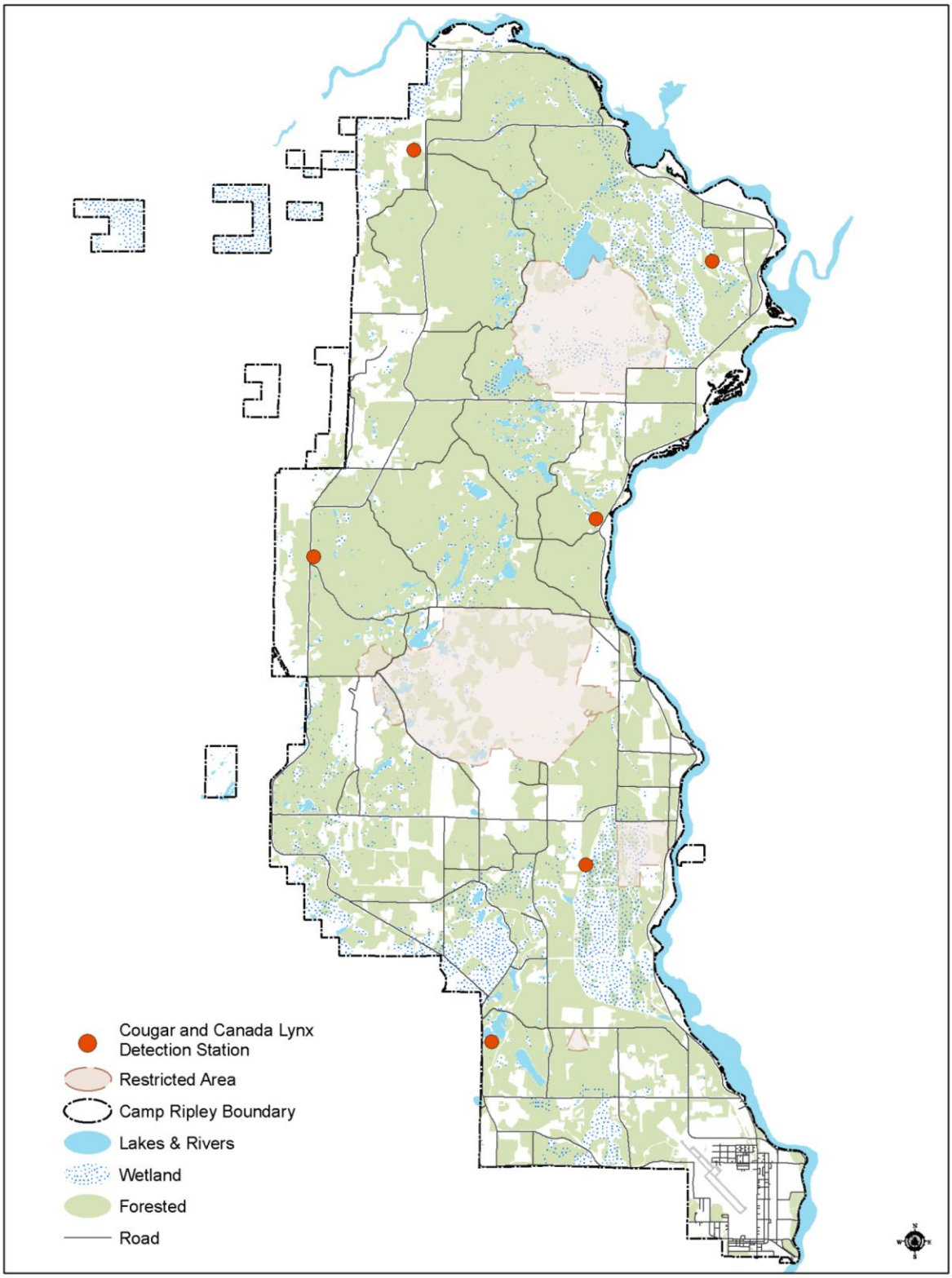
To further assess the presence of large cats on Camp Ripley, scent stations were established that can be used to detect lynx, cougars, and bobcats. Six Envirotel cougar detection systems (Envirotel Inc. 2007) were installed throughout Camp (Figures 49 and 50) in 2007. The detection system consists of a perforated plastic pipe installed over a 7 foot fence post. The plastic pipe has a 2-foot sheet of the hook side of Velcro fastener at the base. In addition, a 12 x 12 foot square area around the central pole is fenced with two strands of barbed wire at heights of 18 inches above ground and 12-18 inches above the first strand. A solid scent lure is placed under the plastic pipe cap, and the hook fastener mat is sprayed with liquid cougar

Figure 48. Canada lynx sightings, Minnesota, thru November 11, 2006.



Map courtesy of MNDNR (MNDNR 2007).

Figure 50. Cougar and Canada lynx detection survey locations, since 2007.



lure (either cougar urine or catnip scent). In addition, wild catnip is used as a lure when available. The barbed wire fence also collects hair samples from animals visiting the plastic scent pole.

The detection sites were monitored by staff every 4 to 8 weeks during the growing season, as permitted by training activities. During these visits, hair samples were removed from the barbed wire and center pole hook fasteners, and the center pole is sprayed with cougar lure. Hair sample collection continued in 2009 (n=6), and more than 25 hair samples have been collected since late November 2007. These samples will be analyzed during 2010 to determine the species of mammals visiting the stations.

Fisher (*Martes pennanti*)

During 2007, Camp Ripley began participation 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. 2007; 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 2008, a cooperative agreement was developed between Camp Ripley, Central Lakes Community College, Minnesota State University-Mankato, and the MNDNR to establish a graduate student project for fisher. The graduate student proposal can be found in Appendix L. The graduate project was designed to integrate with the MNDNR statewide project needs.

Fisher trapping on Camp Ripley commenced in September 2008 continuing through March 2009 and resumed again on September 13, 2009 and continued into mid-December 2009. Four fisher were trapped during 2009, fisher #458, #480, a recapture of fisher #480, and #461 (Table 13).

Table 13. Fisher monitored at Camp Ripley, 2007-2009.

Fisher ID	Sex	Age at Capture	Date of First Capture	Weight at Capture (kgs)	Ear Tag Number (Right/Left)	Status
F07-326	F	Sub-adult	11/14/2007	2.7	327/326	Unknown, collar fell off
F08-466	F	Sub-adult	9-22-2008	3.0	488/466	Unknown, collar fell off
F09-458	M	Adult 2+ yrs	2-27-2009	6.0	454/458	Found dead, unknown cause
F09-480	M	Sub-adult	3-15-2009	4.6	487/480	Collared
F09-480	M		11-13-09	5.3	481/480	Collar removed due to injury, not fitted with new collar
F09-461	F	Juvenile	12-13-2009	2.9	460/461	Collared

Ground and aerial tracking were used to monitor movements and survival of four radio-collared fisher through 2009. Fisher #466 was captured in September 2008. Radio locations were obtained for this fisher through February 2009 when its collar fell off. The reception of the collar frequency had decreased the last several months due to the antennae breaking at the point where it was sown into the collar material. Fisher #466 was captured on Camp Ripley but spent a large majority of its time along the east side of the Mississippi River (Figure 51).

Fisher #458 was captured in late February 2009, and only a few radio locations were obtained for this fisher. It is not known if the fisher spent time off Camp Ripley. It was found dead in Training Area 65 on May 26, 2009. Fisher #480 was captured in mid-March 2009, and continued to retain a radio-collar until November 2009. Fisher #461 was captured in mid-December of 2009. The following paragraphs are the 2009 accomplishments submitted by Lucas Wandrie, Minnesota State University-Mankato graduate student, Dr. John Krenz, Minnesota State University-Mankato, and Dr. Bill Faber, Central Lakes College.

Fisher Graduate Project

Efforts to trap and radio-collar fisher for a home-range and habitat use study were continued in 2009. The 2009 trapping effort totaled 1604 trap nights and yielded the successful capture of the target species plus 8 non-target species (Table 14). A female (F08-466) captured during the 2008 season dropped her radio-collar in February 2009 before it could be determined if she had established a natal den. Two males (F09-458 and F09-480) and one female (F09-461) were caught and fitted with radio-collars in 2009 (Table 13). One adult male (F09-458) was found deceased two months after capture and only one triangulated location point had been collected during the time he was collared. The transmitter on another male (F09-480) began to malfunction during the summer months. He was successfully recaptured in November but was not refitted with a new collar because of injury to his neck. His injuries were attended to and he was released.

A total of 22 location points were gathered for the four fisher in 2009 (Table 15). The number of location points found for one male and two females were adequate for estimating home range size. The two females were captured during previous trapping seasons. Home-range sizes were 3.43, 5.60, and 5.57 km^2 for these three fishers, respectively (Figure 51). Forest metric data gathered by light detection and ranging information (LiDAR) were used to determine habitat use preferences by fisher. It appears that the fishers selected areas with more-closed forest canopies (Figure 52).

Table 14. Capture data for species and total trap nights per month in 2009.

Month	Trap Nights	Blue Jay	Fisher	Gray Squirrel	Hairy Woodpecker	Porcupine	Raccoon	Red Squirrel	Snowshoe Hare	Striped Skunk
January	214	0	0	0	0	0	1	0	0	0
February	438	0	1	0	1	0	5	7	0	2
March	470	1	1	1	0	1	27	1	0	9
September	147	0	0	0	0	0	2	0	0	0
October	29	0	0	0	0	0	1	0	1	0
November	169	0	1	0	0	1	4	0	0	2
December	137	0	1	0	0	0	0	0	0	0
Total	**1604**	**1**	**4**	**0**	**0**	**2**	**40**	**9**	**1**	**13**

Table 15. Total number of locations points for each fisher in 2009.

Fisher	Sex	Number of Location Points	Period Collared
F08-466	F	6	Jan. – Feb.
F09-458	M	3	Feb.-May
F09-480	M	12	March-Nov.
F09-461	F	4	December

Beaver (*Castor canadensis*)

Beaver are an important part of the natural ecosystems at Camp Ripley and AHATS. This species can have a large effect on the environment in which it lives. In a natural system, beavers block the flow of water, creating or enlarging wetland areas and trapping nutrients and helping to reduce flooding by holding and slowly releasing water. However, problems occur in localized areas of Camp Ripley and AHATS when beavers plug road culverts, causing water to flow over roads, damaging them in the process. When this occurs, a cooperative effort between the Environmental Office, MNDNR, and Camp Ripley Department of Public Works (DPW) is initiated to identify problem areas, identify solutions for each area, 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 MNDNR conservation officer. Camp Ripley beaver removal is conducted by MNDNR and nuisance beaver trappers at the direction of MNDNR staff. During 2009, 32 beaver were removed from problem areas. Beaver removal occurred in the following areas: Chorwan Road (n=2), Coon Stump Lake (n=5), Luzon Road in Training Area 20 (n=2), Marne Marsh south outlet (n=1), Goose Pond (n=7), west Normandy (n=10), and East range (n=5). Nuisance beaver trappers reported no beaver activity at the Mud Lake outlet, Trout Pond, and at the south end of Firebreak trail.

Figure 51. Calculated 90% minimum complex polygons for fishers F09-480, F08-466, and F07-326 were 5.57, 5.60, and 3.43 km^2, respectively. Fishers F08-466 and F07-326 established home-ranges outside of Camp Ripley. Fisher F09-480 established a home-range within Camp Ripley.

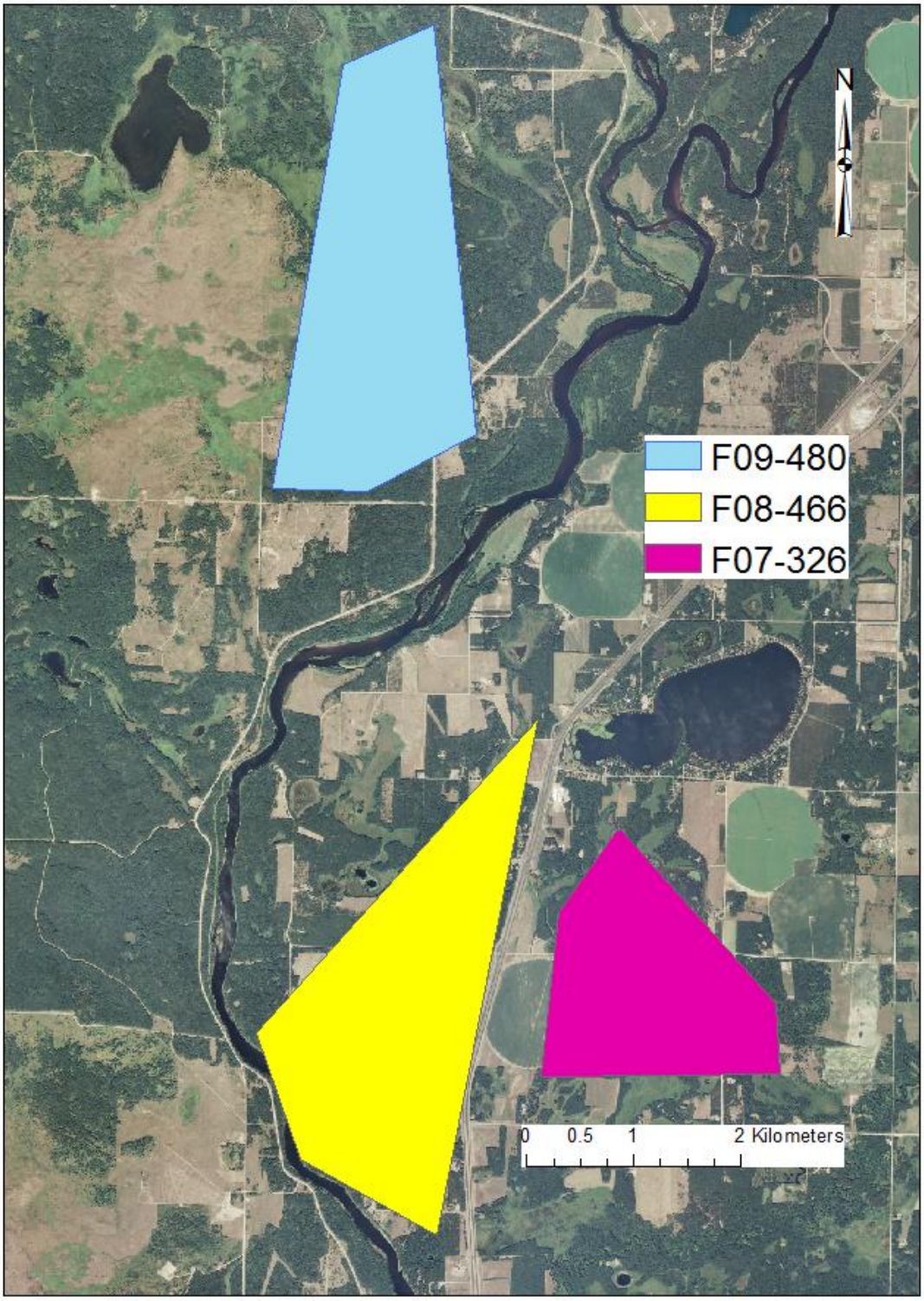
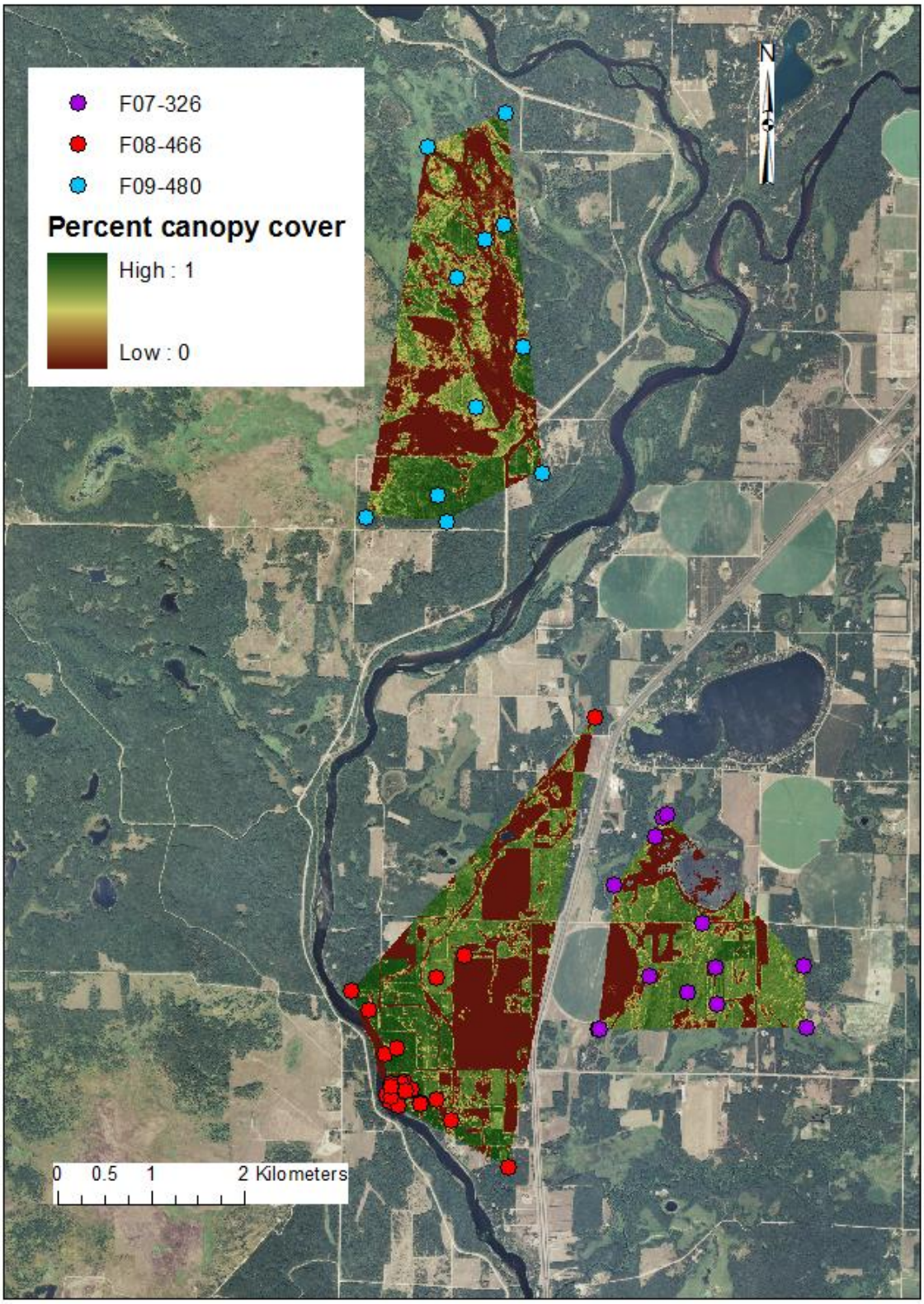


Figure 52. Using location point within each calculated home-range it was determined that all three fisher used areas with a high percentage of canopy closure.



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 (Figure 53). However, two beaver deceivers were removed in 2009. These deceivers functioned well for several years but failed due to high water (Cody Road Pond) and floating cattail mats (north end of Fort Ripley Road). These deceivers will be redesigned to address failures, and reinstalled.

Beaver ponds throughout Camp Ripley provide habitat for Blanding's and other turtles, numerous reptiles and amphibians, as well as feeding areas for birds, and habitat for waterfowl. 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, 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).

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). Fisher are effective predators of porcupines.

Porcupines can also be a nuisance when they gnaw on wooden objects, tires, and plastic tubing. Camp Ripley obtained a porcupine nuisance permit from the MNDNR in 2009. Porcupines were taken only on problem areas identified by Range Control. No nuisance porcupines were taken under the MNDNR permit in 2009.

Bat Surveys

Bat surveys have been conducted to document which of Minnesota's seven potential species are using Camp Ripley and to compliment the long-term INRMP monitoring on Camp Ripley. Foraging bats were surveyed during July 2007 using an ANABAT II bat detector that remotely records the ultrasonic calls made by bats (Corben and O'Farrell 1999). The calls were recorded as electronic files that were later reviewed to identify species. Surveys were conducted for several nights at one location (night sets) (Figure 54). For night sets, ANABAT detectors were placed on a six foot ladder in a protective box and set to run from one-half hour before sunset, until one-half hour after sunrise. These sets were run for one night. Bat calls were recorded and then transferred to digital format. Calls were reviewed and analyzed by MNDNR Minnesota County Biological Survey staff experienced with identification of ANABAT recordings.

Figure 53. Locations of beaver treatment areas and 2010 installation needs.

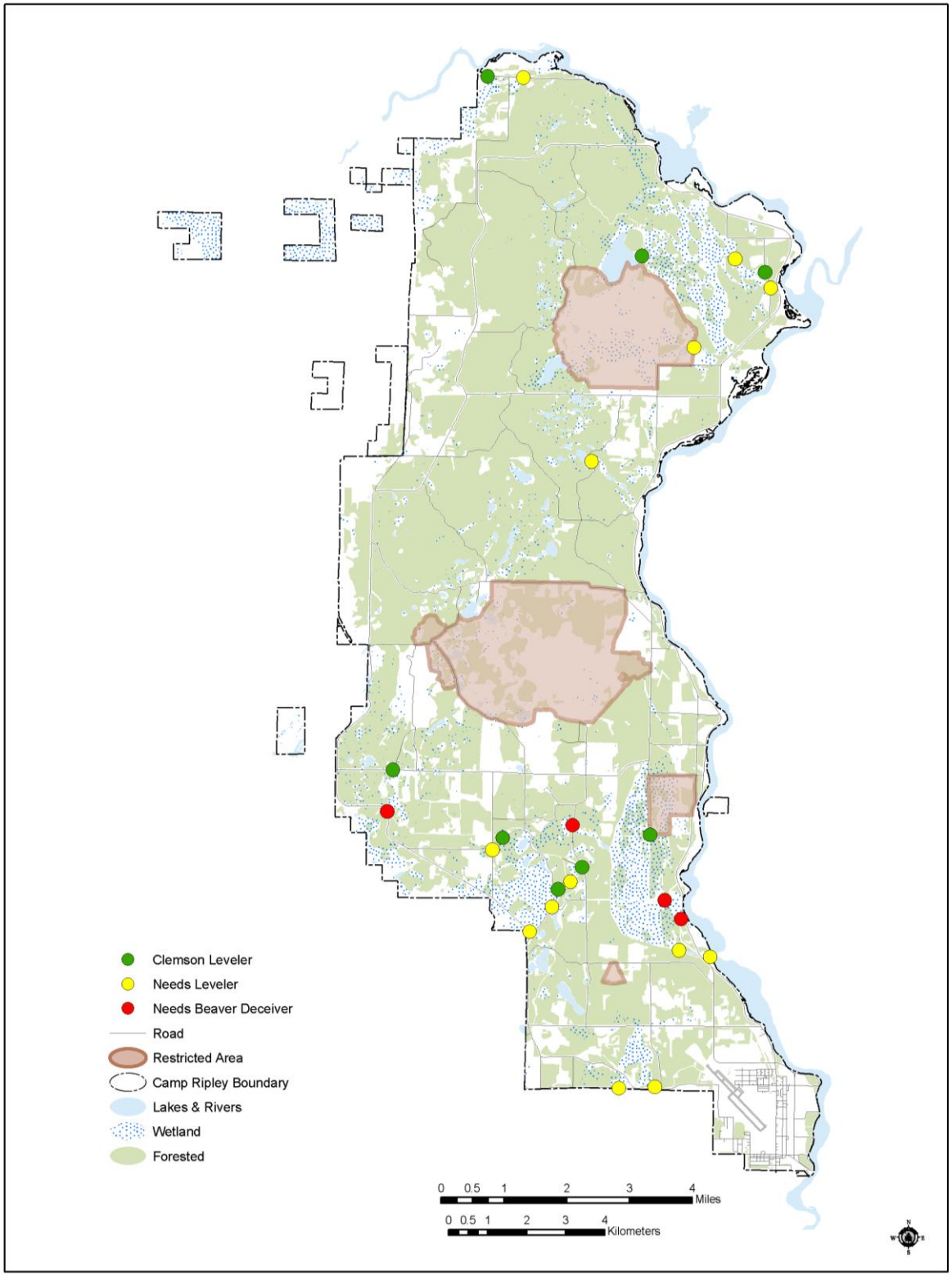
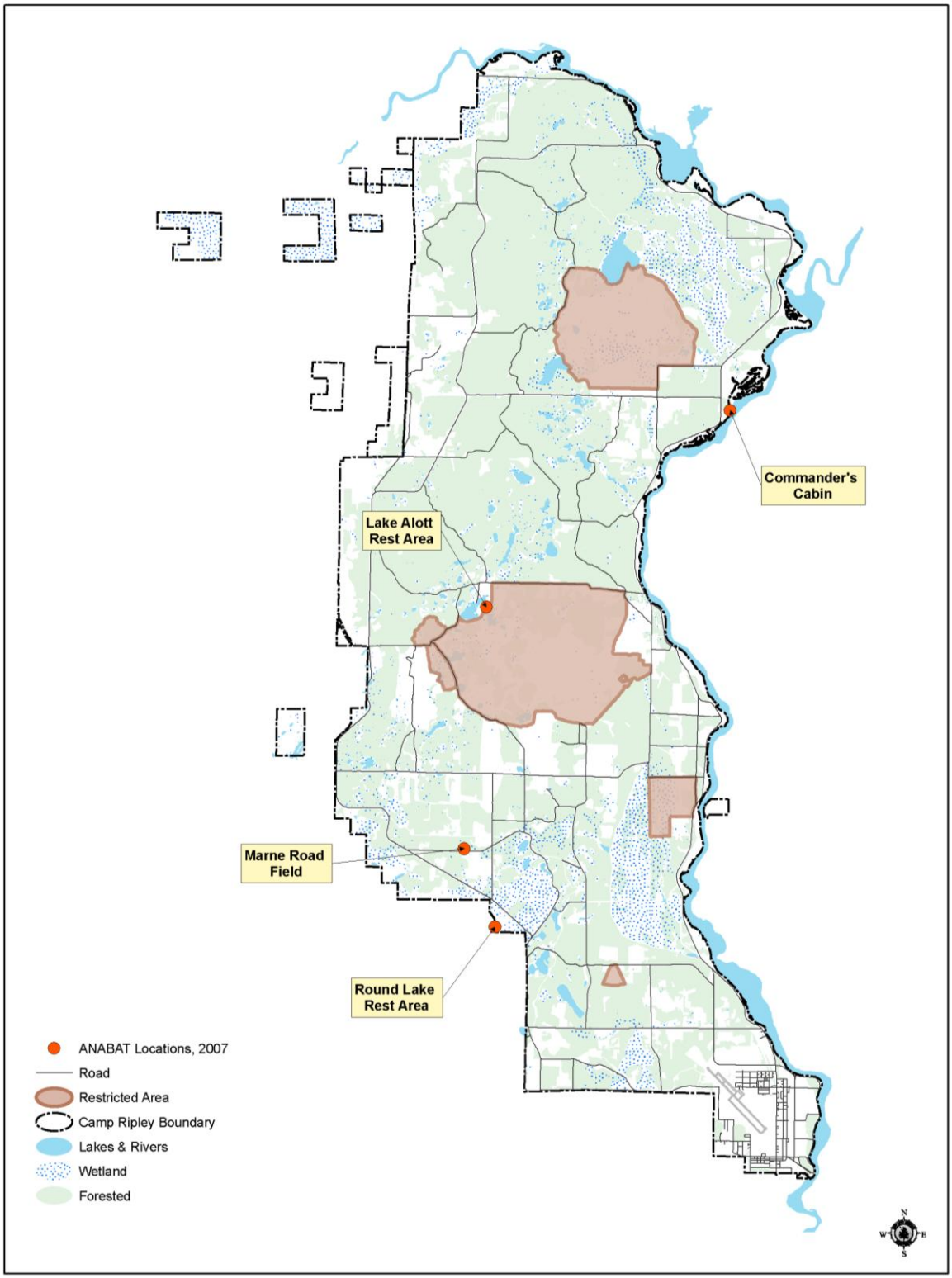


Figure 54. Locations of ANABAT surveys at Camp Ripley Army Training Site, 2007.



Over the past several years, six of seven Minnesota species have been identified on Camp Ripley. Species identified are: little brown myotis (*Myotis lucifugus*), big brown bat (*Eptesicus fuscus*), hoary bat (*Lasiurus cinereus*), silver-haired bat (*Lasionycteris noctivagans*), and eastern red bat (*Lasiurus borealis*). In 2006, a new species, northern myotis (*Myotis septentrionalis*) was located in three locations on Camp (Bog Walk, Goose Lake, and Sylvan Dam). This species is of particular interest because it is a state species of special concern. Analysis of the 2007 ANABAT recordings documented no additional bat species. Due to a mechanical failure in the ANABAT equipment, no ANABAT surveys were conducted in 2008 and 2009. Surveys will be continued in other areas using an ANABAT detector at various locations throughout Camp Ripley.

Camp Ripley Reptiles and Amphibians

Blanding's Turtles (*Emys blandingii*)

The Blanding's turtle is listed as a state threatened species by the MNDNR. Camp Ripley is part of a MNDNR Blanding's turtle priority area. This species depends upon a variety of wetland types and sizes, and uses sandy upland areas for nesting. Surveys of Blanding's turtles have occurred at Camp Ripley since 1992. Because nest predation is extremely high, road surveys are conducted annually throughout known Blanding's habitats to find and protect nests. Surveyors spent 205 hours on traditional and exploratory routes from June 10 through June 28, 2009 (Table 16). Seventeen Blanding's turtles were observed this year (Figures 55 and 56). To aid in future identification, notches are filed into turtle scutes and each turtle is given a unique alpha code. Twelve turtles had been previously marked, four were newly marked this year (2 on Yalu Road and 2 on Luzon Road), and one was not marked. 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 until it completes nesting, then capture and identify it.

Eight Blanding's turtle (ACD, ABK, ADX, ADY, BDI, BDJ, BDP) nests were protected and monitored through November 3, 2009 (Figures 55 and 56). One nest was partially destroyed when discovered, was recovered with soil, and protected on June 17, 2009. Nests were monitored for hatching success and where no evidence of hatching was observed these nests were excavated on October 20-21, 2009. Four Blanding's turtle nests hatched (ADY; BDI; BDJ; ADX), and based upon actual number of hatched turtles and an estimate from egg cap remains, a minimum of 57 turtles were produced. Research has shown that few Blanding's turtle hatchlings actually arrive at a wetland. Therefore, a five inch berm was created along the exterior of protected nests, which facilitated escorting hatchlings to a nearby shrub wetland such as Marne Marsh (Training Area 17) and Firebreak Marsh (Training Area 65). Nest incubation for hatched nests ranged from 97 to 120 days.

Table 16. Summary of Blanding's turtle nest search surveys at Camp Ripley, 2000-2009.

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 During Survey Period*[*]
2000	May 31-June 23	June 5	No nests found	June 14	91.5	11	60
2001	June 6-?	June 15	No nests found	June 27	79	9	66
2002	June 7-25	June 11	June 11	June 22	75	19	67
2003	June 6-22	June 9	June 11	June 17	129.5	10	65
2004	June 2-July 2	June 14	June 14	July 2	225	12	61
2005	June 6-23	June 10	June 12	June 17	225	18	68
2006	June 2-30	June 2	June 8	June 20	158	10	66
2007	June 1-21	June 3	June 7	June 20	189	19	68
2008	June 4-July 1	June 14	June 18	June 27	243	33	64
2009	**June 11-June 28**	**June 11**	**June 13**	**June 27**	**205**	**17**	**68**

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

Four turtle nests (ACD, ABK, BDP, and a partially destroyed nest) were excavated. All of these nests had recently hatched turtles contained in the nest cavity and/or egg shell incased nearly fully developed turtles. Nests were recovered with excavated soil, were monitored for hatching success until the ground froze (early November), and will be left to overwinter and be rechecked in the spring of 2010.

A 2008 protected Blanding's turtle nest (ACJ) was excavated on October 15, 2008 and had a top layer of eggs, with a live fully developed turtle and 3 eggs shells cracked with developed turtles inside. Deeper nest chamber excavation did not occur and the nest was recovered with excavated soil. This nest was not disturbed further and was left to overwinter. The nest chamber was excavated again during the spring of 2009 and the nest was successful.

During the 2009 survey season, the first Blanding's turtle was observed on June 11, 2009. Historically, turtles have been observed between June 2 and July 2. Spring air temperatures affect the number of Blanding's turtles that will be observed in June (Figures 57 and 58, U.S. Department of Commerce 2008). Higher average temperatures during survey periods also correlate with an increase in turtle observations (Table 16). Research in Michigan concerning painted turtles (*Chrysemys picta*) supports this theory. Painted turtles on Beaver Island, in Michigan nested earlier when the previous spring temperatures were warmer (Rowe et al. 2003). Additionally, painted turtles which were allowed more time for basking ate more food, and passed that food more quickly through their bodies (Koper and Brooks 2000). Warmer spring temperatures not only allow turtles to grow larger, but also provide females with energy for producing and laying larger clutches, and for the travel required to deposit the eggs. The amount of precipitation prior to (Figure 58) or during the survey period (Figure 59) does not seem to affect the number of Blanding's observed.

Figure 55. Observations and nest locations of Blanding's and snapping turtles in the north portion of Camp Ripley, 2009.

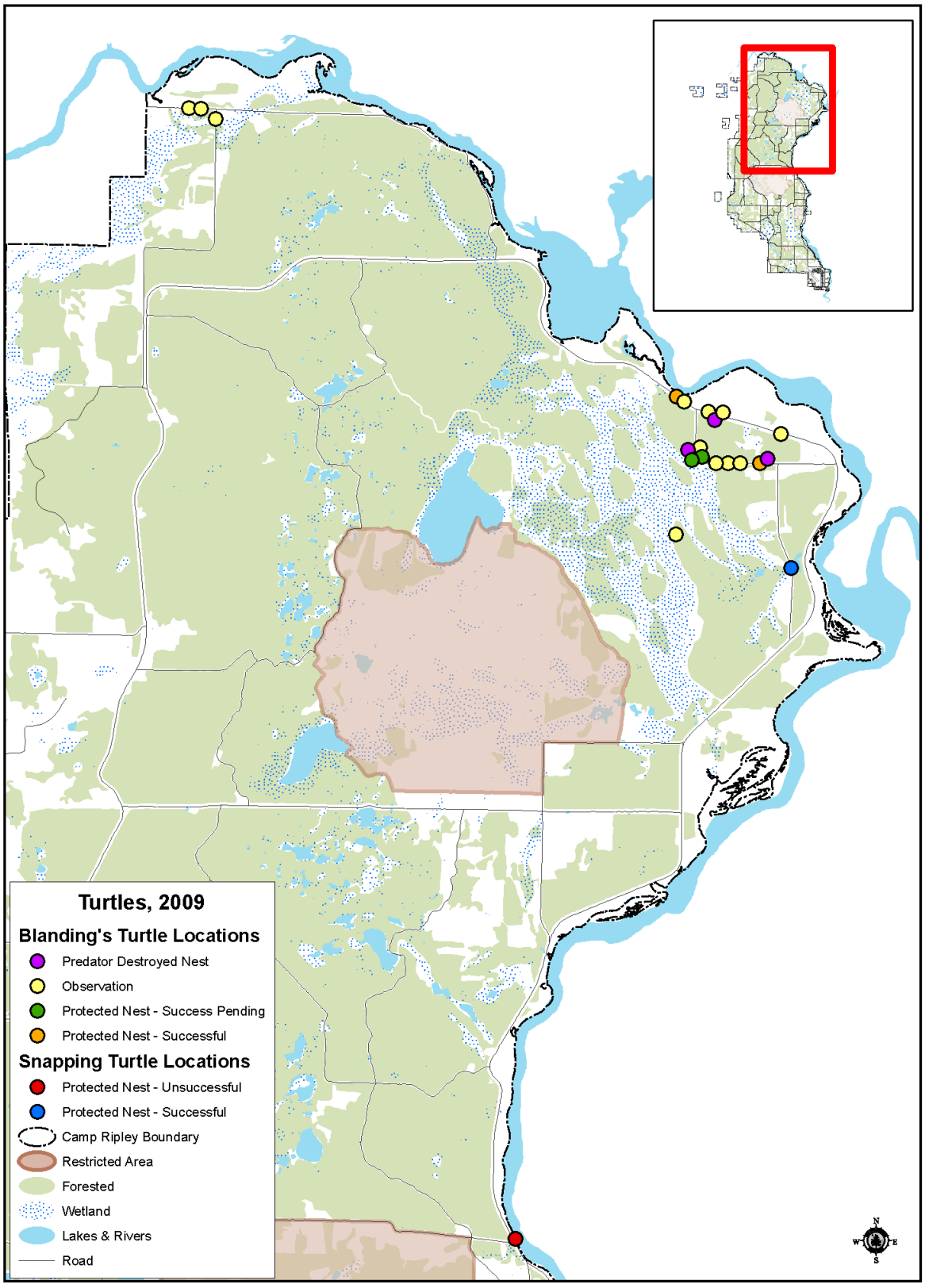


Figure 56. Observations and nest locations of Blanding's turtles in the south portion of Camp Ripley, 2009.

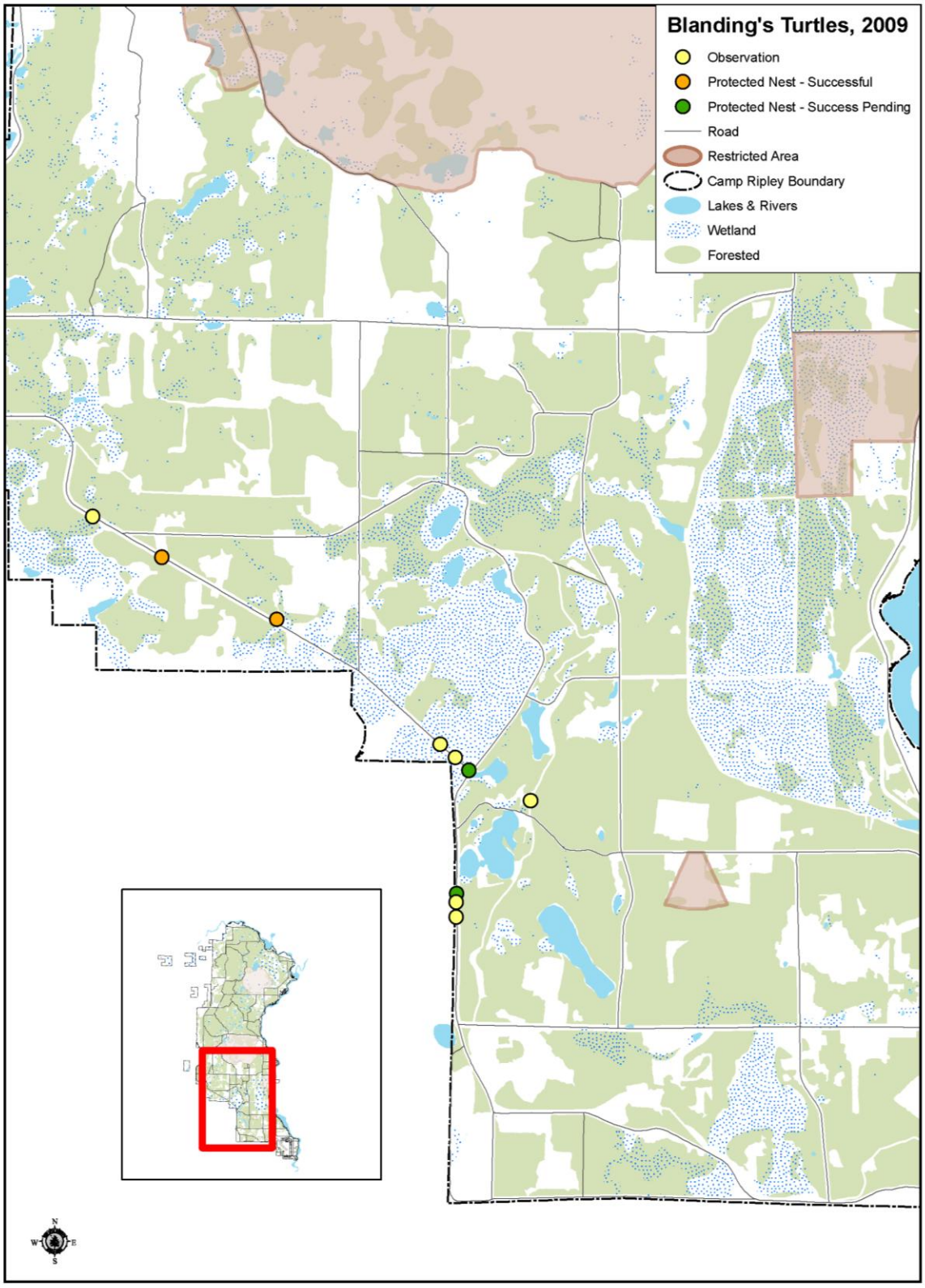


Figure 57.

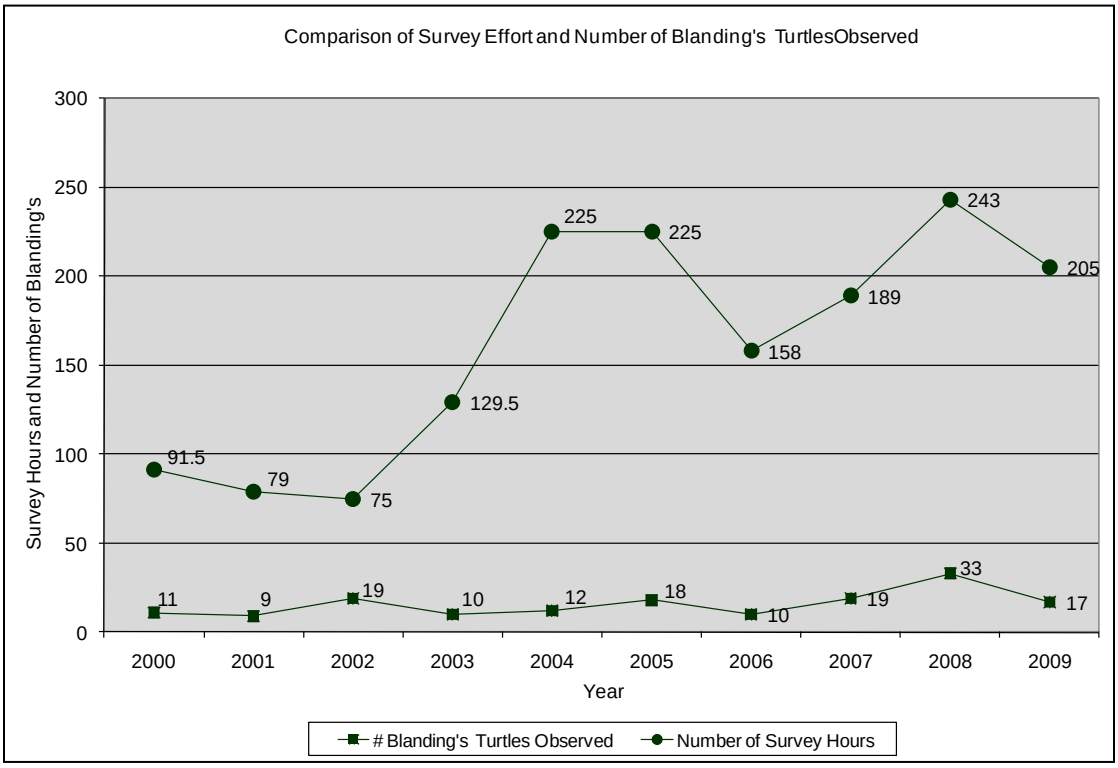


Figure 58.

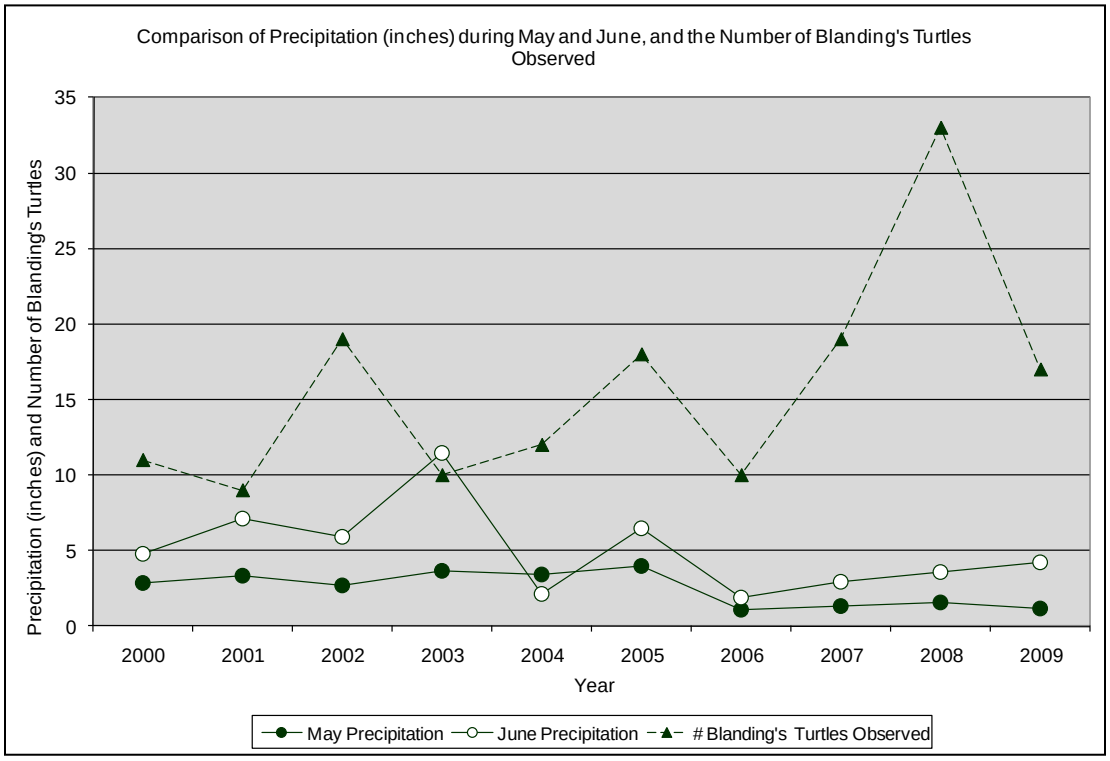
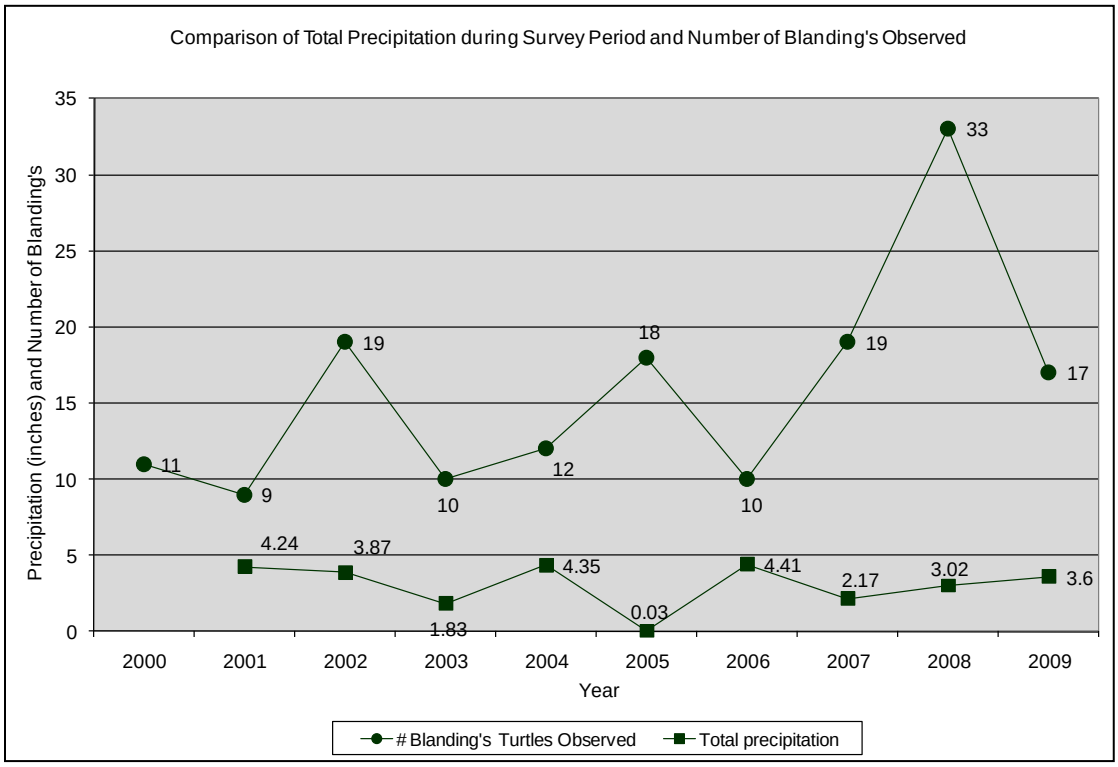


Figure 59.



A high speed Improvised Explosive Device (IED) defeat lane is being constructed along Chorwan, Wonsan, and Pusan roads during 2009 and 2010. These roadways are traditional travel and nesting areas for Blanding's turtles. The training activities will significantly increase roadway traffic, vehicle speeds (maximum of 40 mph), and night maneuver use particularly during the Blanding's turtle nesting season. During 2009 several Blanding's turtles where marked with reflective tape along the northeast traditional nesting area (Figures 60 and 61). Blanding's turtles were marked to increase visibility and improve avoidance during IED defeat lane maneuvers, particularly night maneuvers.

Figure 60. Blanding's turtle (BDI) marked with reflective tape, Camp Ripley, 2009.

Four Blanding's turtles (BDY, BDI, PW, BDJ) were marked with a 1 x 2 inch self-adhesive, marine safety reflective tape (3 mil-SOLAS) (Figure 60). This reflective tape is visible with night vision optics.

Figure 61. Reflective tape marked Blanding's turtle burrowed into leaf litter, Camp Ripley, 2009.

The tape was adhered to the head and tail end of the turtle shell with either the tape's self-adhesive (PW & BDJ), a 5-minute epoxy (BDI) glue, or marine epoxy (BDY). The use of the reflective tape proved immediately useful. Figure 61 shows the tape reflection of a marked Blanding's turtle burrowed into the leaf litter after it moved off the roadway where it was test digging for a nest site. The marked turtle was found with the use of a spot light which reflected light off the reflective tape.

Anuran Surveys

Frog and toad calling surveys were conducted by MNDNR staff on April 27, May 31, and July 7, 2009. The south route (route #50195) was not surveyed during the first and second time period due to training activities, and the north route (route #50295) was surveyed during the first and second time period, but not the third. These surveys are conducted as part of a larger statewide survey, and have been conducted at Camp Ripley since 1993. 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 62).

During the first survey period (April 15 – 30), a lower index of spring peepers (*Pseudacris crucifer*), boreal chorus frogs (*Pseudacris maculata*), and northern leopard frogs (*Rana pipiens*) were heard than in previous years (Figure 63, Table 17), but a higher index of wood frogs (*Rana sylvatica*). During the second survey period (May 15-June 5), a higher index of spring peepers and similar index for gray treefrogs (*Hyla versicolor*), Cope's gray treefrogs (*Hyla chrysoscelis*), and American toads (*Bufo americanus*) were heard (Figure 64).

Figure 62. Anuran survey routes at Camp Ripley, 1994-2009.

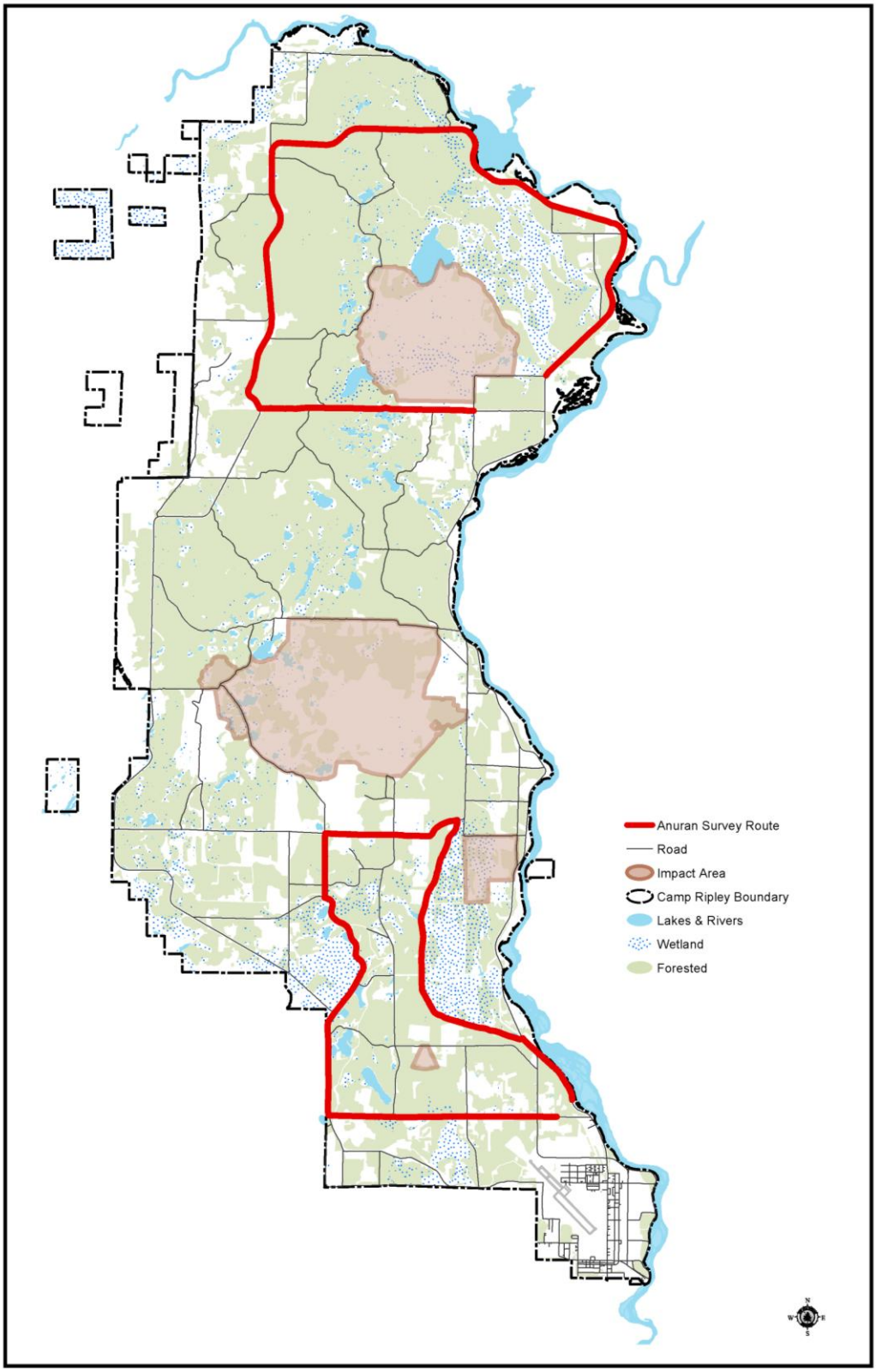
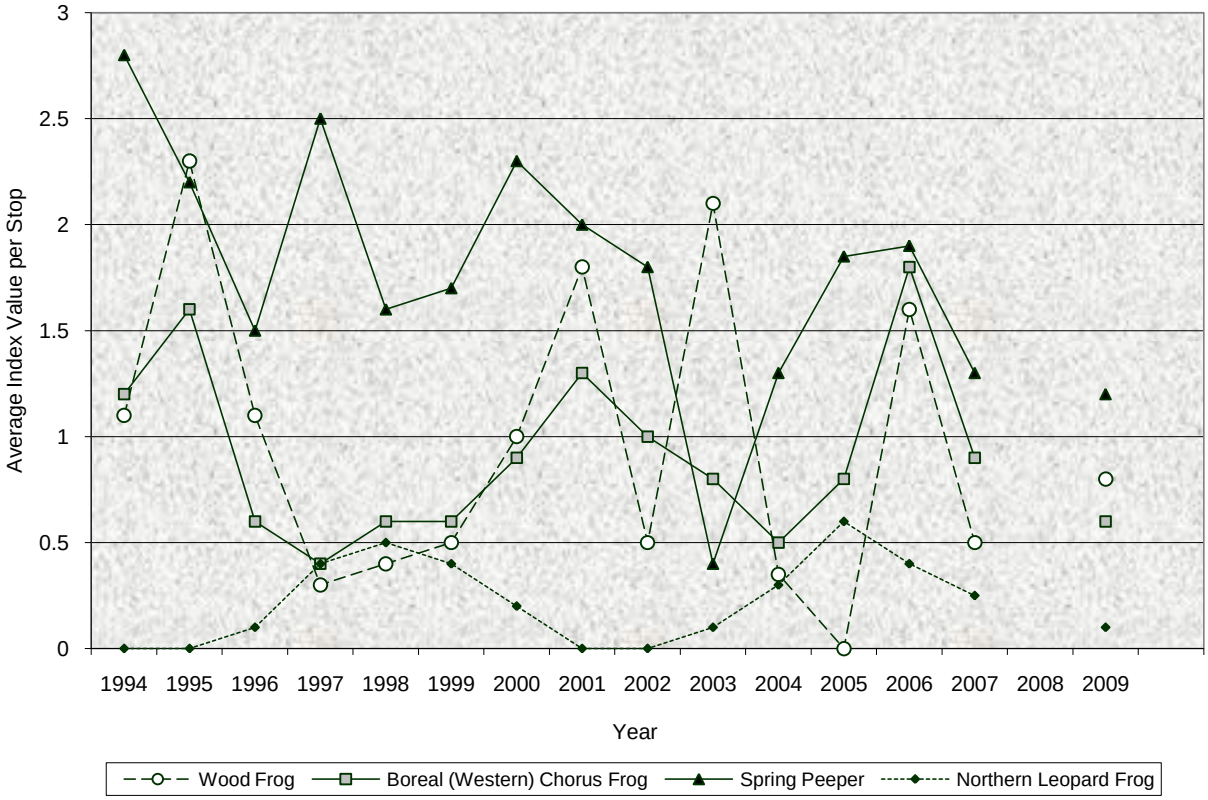


Figure 63. Average anuran index value during the first survey period at Camp Ripley, 1994-2009. Surveys were not conducted during 2008.



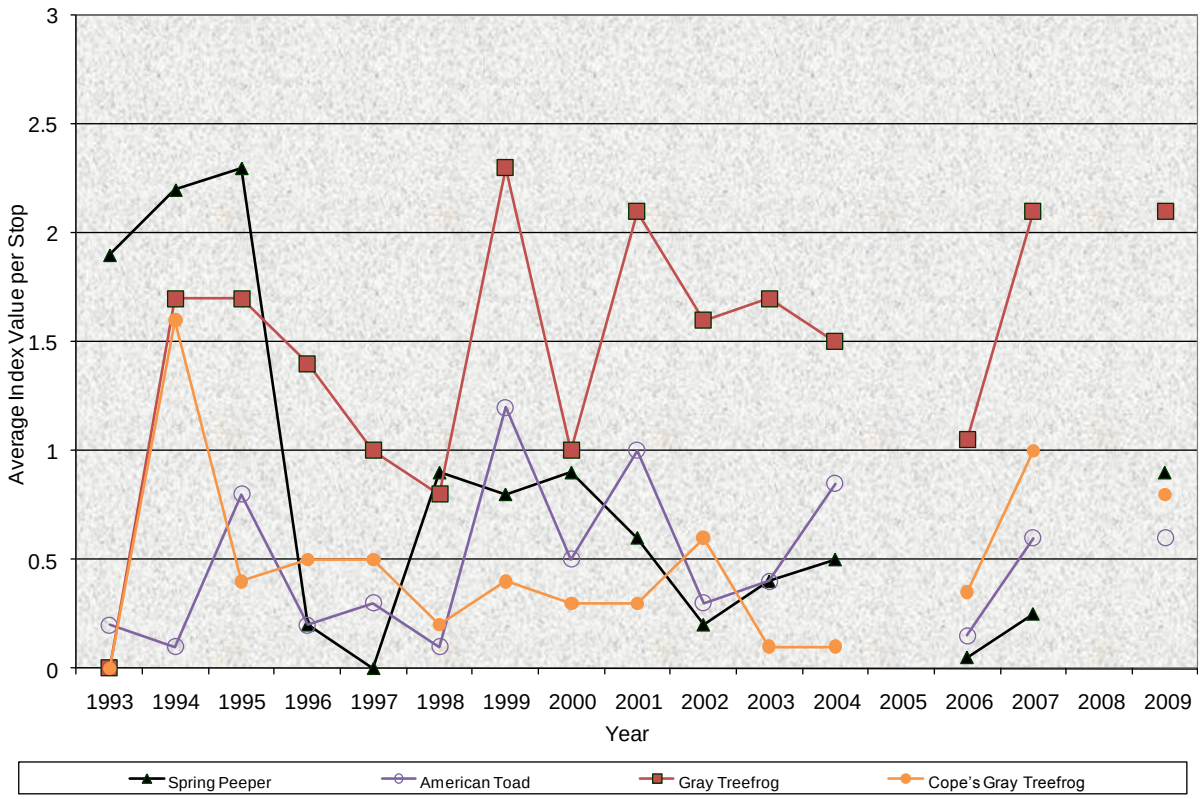
Since 1993, the third survey period frequently has not been surveyed due to training restrictions and weather constraints. The same species of frogs were located during the third survey period as in 2002, 2005, and 2007, the most recent years the routes have been available. In 2009, the green frog (*Rana clamitans)*, gray treefrog, Cope's gray treefrog indices were higher than any previous years (1995, 1996, 2001, 2002, 2005, and 2007) during the third survey period. (Table 17). Mink frogs (*Rana septentrionalis)* were not heard during 2009. Since 1995 they have been documented in five of seven survey years (1995, 1996, 2002, 2005, and 2007), but were not documented during the 2001 survey.

Fewer spring peepers and gray treefrogs have been heard on statewide routes for the last few years (MNDNR 2005, Monstad 2006, MNDNR 2007), which corresponds with Camp Ripley data from the first survey period in 2007, but not the second survey period. Statewide results were not available for 2009 at the time of publication of this document.

Table 17. Anuran survey index data at Camp Ripley, 1993-2009.

Survey Period 1	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
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
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
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
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
American toad	*	0	0	0	0	0	0	0	0	0	0	0	0.8	0	0	*	0
Gray treefrog	*	0	0	0	0	0	0	0	0	0	0	0	1.35	0	0	*	0
Cope's gray treefrog	*	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
Green frog	*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	0
Survey period 2	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**
Wood frog	2.4	0.1	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
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
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
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
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
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
Mink frog	0	0	0	0.2	0.1	0.1	0	0	0	0	0	0	*	0	0	*	0
Green frog	0	0	0	0.1	0.1	0	0	0	0	0	0	0	*	0	0	*	0.1
Survey period 3	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**
Wood frog	*	*	0	0	*	*	*	*	0	0	*	*	0	*	0	*	0
Boreal (Western) chorus frog	*	*	0.1	0	*	*	*	*	0	0	*	*	0	*	0	*	0
Spring peeper	*	*	0	0	*	*	*	*	0	0	*	*	0	*	0	*	0
Northern leopard frog	*	*	0	0	*	*	*	*	0	0	*	*	0	*	0	*	0.3
American toad	*	*	0	0	*	*	*	*	0	0	*	*	0	*	0	*	0
Gray treefrog	*	*	0.2	0	*	*	*	*	0.2	0.3	*	*	0.25	*	0.4	*	0.5
Cope's gray treefrog	*	*	0	0	*	*	*	*	0	0.3	*	*	0.1	*	0.12	*	0.3
Mink frog	*	*	0.3	0.4	*	*	*	*	0	0.1	*	*	0.05	*	0.06	*	0
Green frog	*	*	0	0.3	*	*	*	*	0.3	0.1	*	*	0.25	*	0.06	*	0.7

Figure 64. Average anuran index value during the second survey period at Camp Ripley, 1993-2009. Surveys were not conducted during the second survey period in 2005 and 2008.



AHATS Birds

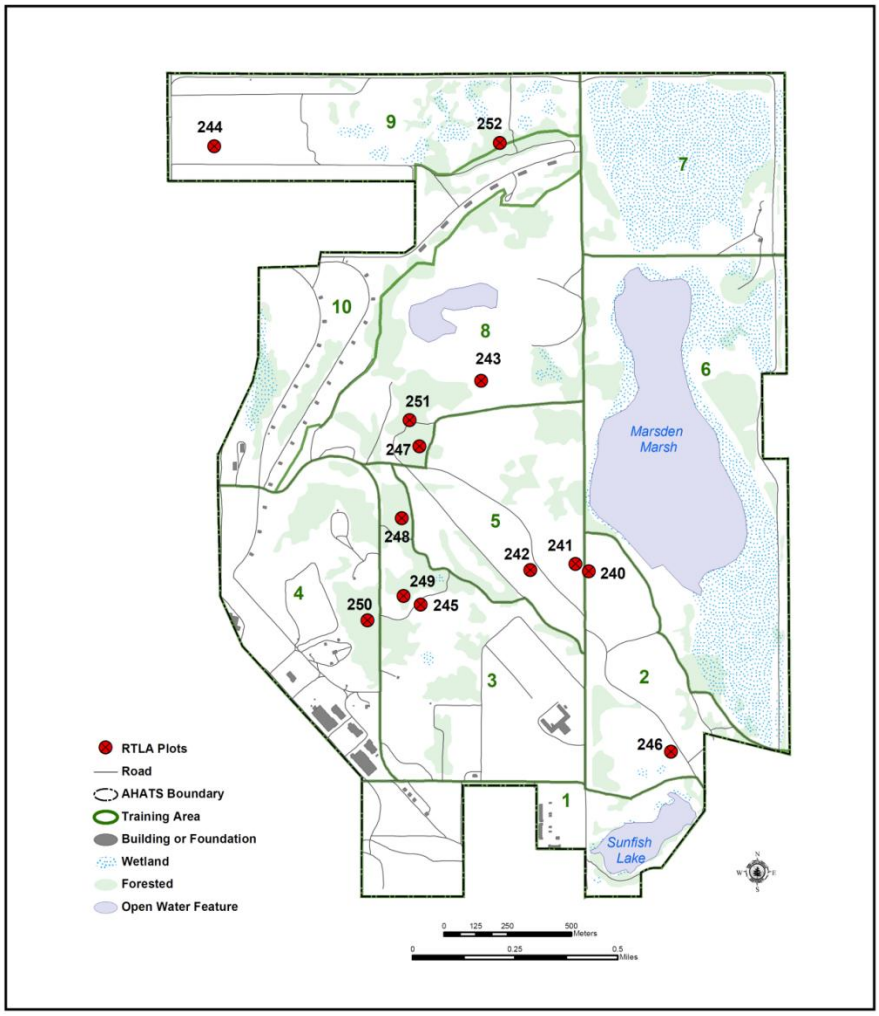
Songbirds

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 J). Nineteen SGCN birds including waterbirds, raptors, and songbirds are known to breed on AHATS; five were recorded during songbird point count surveys this year.

Songbird surveys were conducted on 13 permanent plots (Figure 65) on May 29, 2009. Surveys have been conducted on these plots since 2001. A total of 119 birds consisting of 35 different species were recorded. The average number of birds per plot was 9.15 and the average number of species per plot was 7.69 (Table 18 and Figure 66). More than 25 SGCN, including 20 bird species, have been identified on AHATS (MNDNR 2006). Trends of three grassland songbirds that are SGCN are presented in Figure 67.

Grassland plots (*n*=7) contained 20 bird species and 46 total birds. The average number of birds found on grassland plots was 9.28 and the average number of species per plot was 6.71 (Table 18 and Figure 66). Six of the past eight years, clay colored sparrows (*Spizella pallida*) were the most abundant species recorded on grassland plots. However, in 2009 grasshopper sparrow, a SGCN, was equally abundant on grassland plots (Table 19). 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)*.

Figure 65. Permanent songbird survey plots at Arden Hills Army Training Site, since 2001.



Woodland plots (*n*=6) contained 25 species and 73 total birds. The average number of birds found on woodland plots was 12.16 and the average number of species per plot was 10.5 (Table 18 and Figure 66). The most abundant birds on woodland plots in 2009 were blue jay (*Cyanocitta cristata*), American robin (*Turdus migratorius*), eastern wood-pewee (*Contopus virens*), red-eyed vireo (*Vireo olivaceus*), and common yellowthroat (*Geothypis trichas*) (Table 19 and Figure 66).

Table 18. Summary of songbird surveys at Arden Hills Army Training Site, 2001-2009.

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**
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**

Figure 66. Arden Hills Army Training Site average number of songbird species per plot, 2001 to 2009.

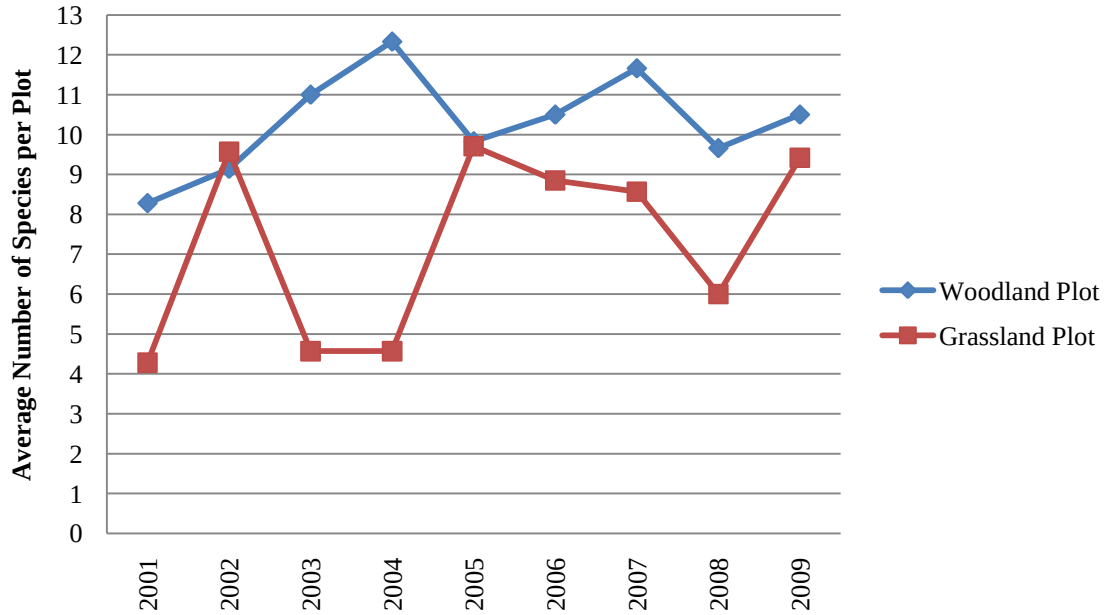


Figure 67. Arden Hills Army Training Site selected grassland songbird SGCN, 2001 to 2009.

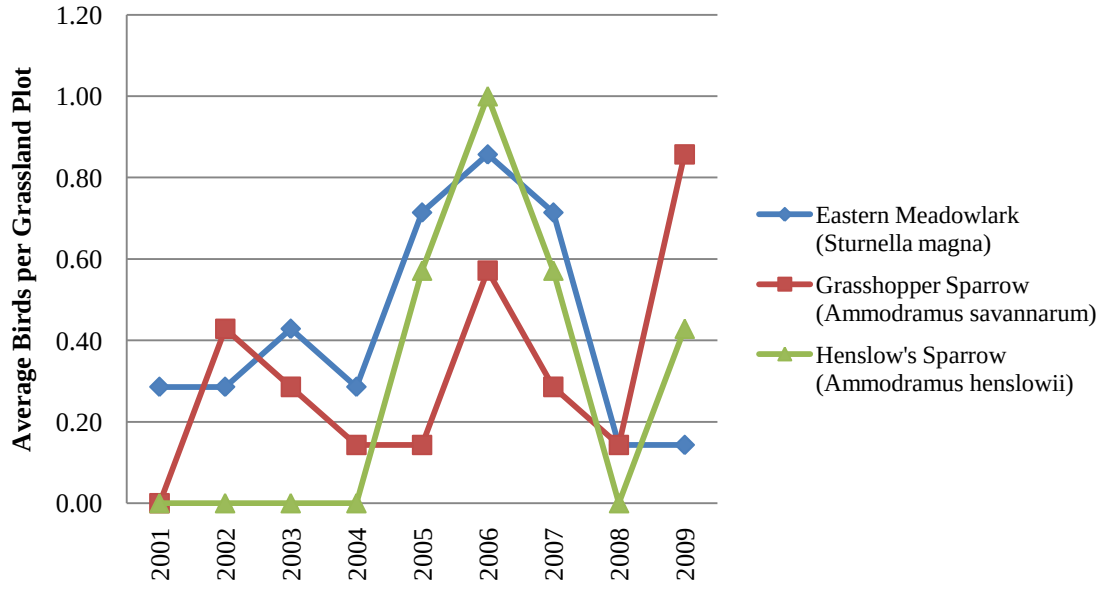


Table 19. Most abundant songbirds observed on plots at Arden Hills Army Training Site, 2001-2009. The number of birds documented is indicated in columns.

Grassland Plots (*n*=7)										
Common Name	**Scientific Name**	**July 12, 2001**	**July 1, 2002**	**June 17, 2003**	**June 29, 2004**	**June 1, 2005**	**June 2, 2006**	**June 5, 2007**	**July 9, 2008**	**May 29, 2009**
Mourning dove	*Zenaida macroura*								2	
Eastern kingbird	*Tyrannus tyrannus*				6			5	2	**4**
American crow	*Corvus brachyrhynchos*					10				
Tree swallow	*Tachycineta bicolor*						5			**4**
Black-capped chickadee	*Poecile atricapillus*				3					
House wren	*Troglodytes aedon*	3							4	
Sedge wren	*Cistothorus platensis*	5				6				
Eastern bluebird	*Sialia sialis*							5	4	**4**
Gray catbird	*Dumetella carolinensis*								2	
Clay-colored sparrow	*Spizella pallida*	6	5	7		5	8	11	6	**6**
Field sparrow	*Spizella pusilla*	3			5				4	
Vesper sparrow	*Pooecetes gramineus*							4		
Song sparrow	*Melospiza melodia*		7	6						
Henslow's sparrow	*Ammodramus henslowii*						7	4		**3**
Grasshopper sparrow	*Ammodramus savannarum*									**6**
Red-winged blackbird	*Agelaius phoeniceus*		10	4		5				
Eastern meadowlark	*Sturnella magna*			3		5	6	5		
Brewer's blackbird	*Euphagus cyanocephalus*		8							
American goldfinch	*Carduelis tristis*				7	7			2	
Woodland Plots (*n*=6)										
Common Name	**Scientific Name**	**July 12, 2001**	**July 1, 2002**	**June 17, 2003**	**June 29, 2004**	**June 1, 2005**	**June 2, 2006**	**June 5, 2007**	**July 9, 2008**	**May 29, 2009**
Mourning dove	*Zenaida macroura*						4			
Tree swallow	*Tachycineta bicolor*									**4**
Eastern wood-pewee	*Contopus virens*		6		7	6	6	4	3	**5**
Great crested flycatcher	*Myiarchus crinitus*							4	3	
Red-eyed vireo	*Vireo olivaceus*					6				**5**
Blue jay	*Cyanocitta cristata*								6	**6**
Black-capped chickadee	*Poecile atricapillus*		7	6				7		**3**
White-breasted nuthatch	*Sitta carolinensis*								5	
House wren	*Troglodytes aedon*	11	7	7	5	8	5	11		**3**
American robin	*Turdus migratorius*	6	6	7	6	5	7		5	**6**
Gray catbird	*Dumetella carolinensis*								3	
Eastern towhee	*Pipilo erythrophthalmus*	6							3	
Common yellowthroat	*Geothlypis trichas*									**5**
Yellow warbler	*Dendroica petechia*									**3**
Song sparrow	*Melospiza melodia*								5	
Northern cardinal	*Cardinalis cardinalis*						4	4	3	**3**
Indigo bunting	*Passerina cyanea*								3	
Red-winged blackbird	*Agelaius phoeniceus*						4	5	4	**3**
Brown-headed cowbird	*Molothrus ater*								3	
Baltimore oriole	*Icterus galbula*									**4**
American goldfinch	*Carduelis tristis*	10		6	9			4		**4**

Henslow's sparrow (*Ammodramus henslowii*)

Henslow's sparrows, a SGCN, were recorded in 2009 and were observed for four of the past five years at AHATS during INRMP surveys. None were observed during 2008. 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 (Figure 67). 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. 2009).

Henslow's sparrows are listed as endangered by the MNDNR and six other states, but are not listed by the U.S. Fish and Wildlife Service. This species usually breeds in the grasslands to the 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 et al. 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 in the same year, allowing some habitat to remain each year. These grasslands should be burned 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. 2009). Habitat requirements and management for Henslow's sparrows will be included in the development of future habitat restoration plans.

Osprey (*Pandion haleaetus*)

During the 2009 nesting season, an osprey (*Pandion haleaetus*) pair was observed on the nesting platform at Marsden Lake. In July, two female osprey chicks were banded and one unhatched egg was also found. The osprey chick banding was conducted in cooperation with the University of Minnesota Raptor Center and Excel Energy, who provided the bucket truck for access to the platform.

Bird Nest Boxes

Nest boxes have been installed at AHATS in previous years by the Audubon Society and other local groups. These nest boxes are monitored and maintained by Craig Andreson, a volunteer with the St. Paul Audubon Society. In 2009, 388 bluebird nest boxes fledged approximately 415 eastern bluebirds, 250 tree swallows, and over 200 house wrens. In addition,

nine American kestrel (*Falco sparverius*) nest boxes located at AHATS, fledged 44 American kestrels.

Trumpeter Swans (*Cygnus buccinator*)

A pair of trumpeter swans with one cygnet was observed on Marsden Lake during June 2009 (Figure 65); it's unknown if the cygnet survived into the fall. During late summer, up to 13 adult and juvenile trumpeter swans were observed on Marsden Lake. Trumpeter swans are listed as a threatened species in Minnesota and have been monitored each year at Marsden Lake for presence and reproduction (Dirks et al. 2009) (Table 20). The MNDNR 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.

Table 20. Trumpeter swans raised at AHATS since 1995.

Year	Cygnets Raised
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**
Total	**44**

AHATS Mammals

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

Historically, winter 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 at AHATS, 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 has increased in the past few years to a high of 124 in 2007. 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 heavily on hunting pressure. As the number of deer surveyed increased since 2003, the number of hunts and total number of deer harvested have also increased to try 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 the AHATS and TCAAP properties on January 20, 2009. One hundred and four deer were counted during the survey (Table 21), which may indicate that additional hunting pressure may be needed to reduce the deer population.

Table 21. Aerial surveys of White-tailed deer at the Twin Cities Army Ammunition Plant and Arden Hills Army Training Site, 1999-2009.

Year	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Deer Counted	41	47	30	--	30	47	--	84	124	87	**104**

Plains Pocket Mouse (*Perognathus flavescens*)

The plains pocket mouse (*Perognathus flavescens*) is listed as a state special concern species. AHATS is the site of the only known plains pocket mouse population in Ramsey County. First documented at AHATS in 1995, this species has been located in 13 other counties in Minnesota and is the largest known population of pocket mice in the state (MNDNR Rare Species Guide 2009). The closest pocket mouse capture was in Anoka County, 10.5 miles from AHATS.

At AHATS, plains pocket mice are found in a gravel pit near Marsden Lake (Figure 65). The preferred habitat for the plains pocket mouse contains well-drained sandy soils, with sparse, grassy or brushy vegetation (Higgins et al. 2000 and MNDNR Rare Species Guide 2009). The vegetation around the gravel pit area is gradually becoming thicker due to lack of disturbance. At AHATS, thicker vegetation is more commonly inhabited by meadow voles and *Peromyscus* species. In order to maintain the amount of suitable habitat available for the plains pocket mouse at AHATS, vegetation manipulations need to be conducted. In October 2003, an ATV was used to drag a chain link harrow to partially remove vegetation in a 2,700 m^2 (0.67 acre) parcel of land to the north of the pocket mouse capture sites (Dirks and DeJong 2004).

On May 28, 2009, 78 Sherman live traps were placed in locations where pocket mice had been live trapped in previous years at the gravel pit. The traps were placed in the survey areas then left closed for 12 days so the mice could acclimate to the traps. The areas were trapped the nights of June 9 to June 11, then closed for several days, and trapped again for the nights of June 23 to June 25, for a total of 468 trap nights. The traps were baited with a mixture of rolled oats lightly coated with peanut butter. Traps were set then checked the following the morning. Four different species were captured in 2009 (Table 22); one *Peromyscus* spp., one meadow vole (*Microtus pennsylvanicus*), two meadow jumping mice (*Zapus hudsonius*), and three plains pocket mice. It is unknown if the same pocket mouse was recaptured as they were not marked upon capture. There were at minimum two individuals captured as one pocket mouse was noticeably smaller in size than two captured earlier in the week. Both capture sites in 2009 were within the 2003 vegetation treatment area (Figure 68).

Figure 68. Plains pocket mouse treatment area and capture sites, 2004 and 2009.

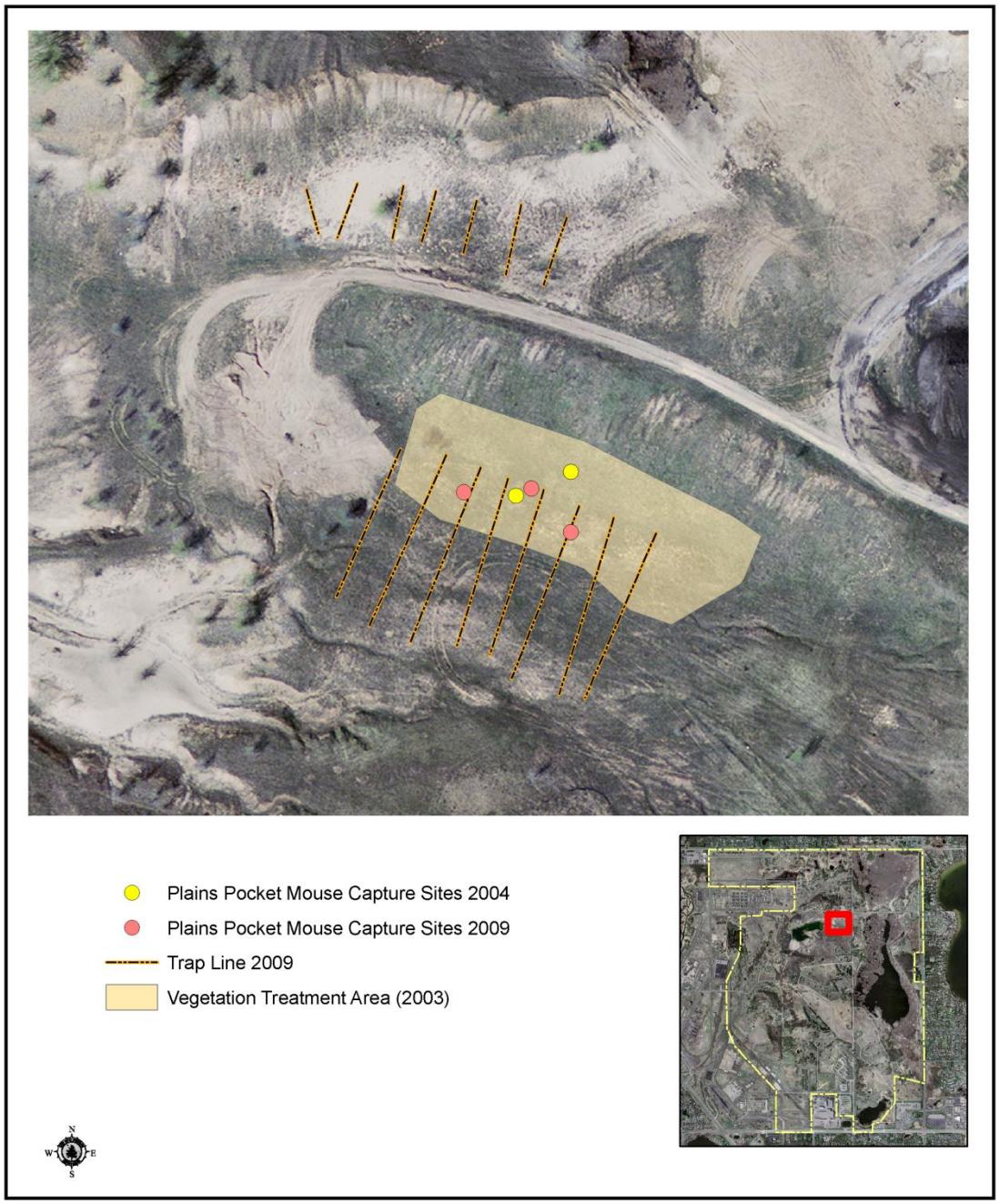


Table 22. Small mammal live trapping results for Arden Hills Army Training Site gravel pit area, 2003, 2004, and 2009.

Common Name	Scientific Name	Live Trap Month/s and Year (trap nights)			
		June 2003 (1,032)	**August 2003 (580)**	**September/October 2004 (868)**	**June 2009 (468)**
Plains pocket mouse	*Perognathus flavescens*	25	6	1	**2-3**
Meadow voles	*Microtus pennsylvanicus*	46	4	5	**1**
White-footed mouse	*Peromyscus* spp.	14	44	7	**1**
Meadow jumping mouse	*Zapus hudsonius*	0	5	2	**2**
Shrew - Unknown		0	0	1	**0**
Total		**85**	**59**	**16**	**7**

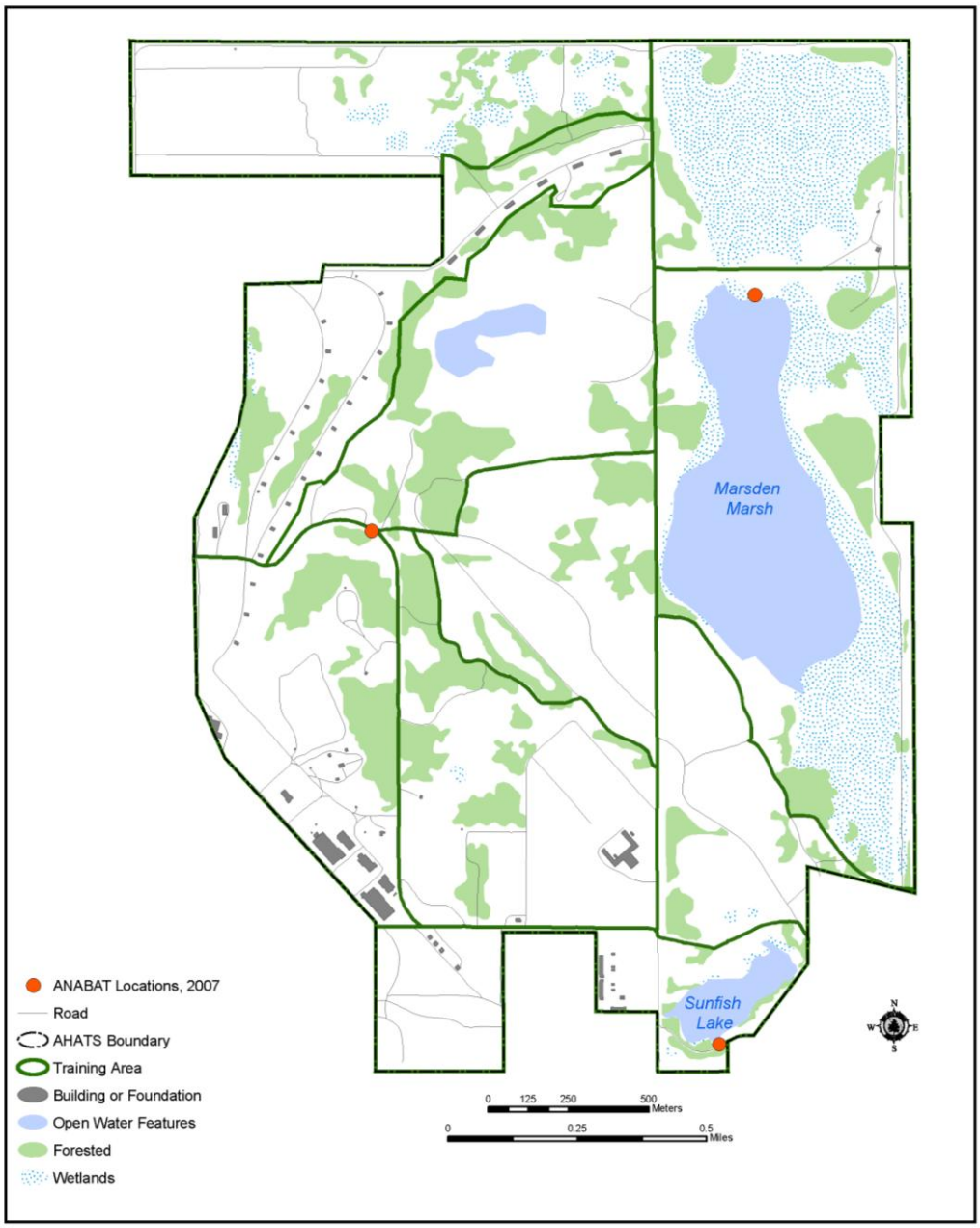
Bat Surveys

Bat surveys have been conducted to document which of Minnesota's seven potential species are using AHATS and to compliment long-term monitoring. Foraging bats were surveyed during August 2007 using an ANABAT bat detector that remotely records the ultrasonic calls made by bats (Corben and O'Farrell 1999). The calls were recorded as electronic files that were later reviewed to identify species. Surveys were conducted for several nights at one location (night sets). For night sets, ANABAT detectors were placed on a six foot ladder in a protective box and set to run from one-half hour before sunset, until one-half hour after sunrise. These sets were run for one to two nights. Bat calls are recorded and then transferred to digital format. Calls were then reviewed and analyzed by MNDNR Minnesota County Biological Survey staff experienced with identification of ANABAT recordings.

Bats were surveyed at three locations on AHATS (Figure 69). Analysis of the 2007 ANABAT recordings documented four of seven Minnesota bat species on AHATS. They are: little brown myotis (*Myotis lucifugus*), big brown bat (*Eptesicus fuscus*), eastern pipistrelle (*Pipistrellus subflavus*), and eastern red bat (*Lasiurus borealis*). The eastern pipistrelle is of particular interest because it is a state species of special concern.

Due to a mechanical failure in the ANABAT equipment, no ANABAT surveys were conducted in 2008 and 2009.

Figure 69. Locations of ANABAT surveys at Arden Hills Army Training Site, 2007.



AHATS Insects

Butterfly Survey

The Saint Paul Audubon Society (18 observers, two groups) conducted their annual survey for butterflies at AHATS on Saturday, June 27, 2009. The survey began at 12:00 noon

and was completed by 3:30 PM. Survey weather conditions were overcast (75-90% overcast) with temperatures rising to 80° F. and winds 3 to 18 mph. Two new species were observed, the northern cloudywing skipper (*Thorybes pylades*) and least skipperling (*Ancyloxypha numitor*) (Table 23). More European skippers (*Thymelicus lineola*) were observed this year than in the previous five years, but significantly fewer common wood nymphs (*Cercyonis pegala*) were observed than in previous years. Twenty-two species were recorded for a total of 156 individuals. The number of different species observed is similar to 2005; however, there were more individuals in 2009.

Table 23. Number of butterflies at Arden Hills Army Training Site, St. Paul Audubon Society, 2001-2009.

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
Black swallowtail	*Papilio polyxenes*	1				1	1	1		
Eastern tiger swallowtail	*Papilio glaucus*	4				2			2	**1**
Swallowtail species	*species undetermined*	1		1						
Checkered white	*Pontia protodica*	3								
Cabbage white	*Pieris rapae*		5			1		1	5	**2**
"Whites"	*Pieris species*					1				
Clouded sulphur	*Colias philodice*	?	2	8		2	6	42		
Orange sulphur	*Colias eurytheme*	100s	35	1	1	1		30		
Dainty sulphur	*Nathalis iole*	1								
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**
Striped hairstreak	*Satyrium liparops*	1						1		
Hairstreak species	*species undetermined*			2						**1**
Eastern tailed-blue	*Everes comyntas*	5	100's	4		6	32	34		
'Summer' spring azure	*Celastrina ladon neglecta*	4	1	3						**8**
Variegated fritillary	*Euptoieta claudia*	1		1						
Great spangled fritillary	*Speyeria cybele*	12	11	40	9	16	5	13	2	**4**
Aphrodite fritillary	*Speyeria aphrodite*	4	4	dozen	19	10	14	2	2	**4**
Regal fritillary	*Speyeria idalia*									
Silver-bordered fritillary	*Boloria selene*									
Fritillary species	*species undetermined*	32	10	14	14+		14	28		**14**
Silvery checkerspot	*Chlosyne nycteis*				1					
Pearl crescent	*Phyciodes tharos*	11			1					
Northern crescent	*Phyciodes selenis*			7	2		1			**1**
Northern pearl crescent	*Phyciodes selenis/tharos*					1	1	7	2	
Crescent species	*species undetermined*		2	4						**6**
Baltimore checkerspot	*Euphydryas phaeton*	15		6	13	5	4	10	1	**3**
Question mark	*Polygonia interrogationis*		1				2			
Silvery checkerspot	*Chlosyne nycteis*				1					
Eastern comma	*Polygonia comma*			1			3		2	
Mourning cloak	*Nymphalis antiopa*	2	2	5	2	5		3	2	**1**
American lady	*Vanessa virginiensis*	6	2	1		1		4		
Painted lady	*Vanessa cardui*	5								
Vanessa species			1							
Red admiral	*Vanessa atalanta*	12+		3			2	11		
Common buckeye	*Junonia coenia*	7	1			1		6		
White admiral	*Limenitis arthemis arthemis*								3	

Table 23. Number of butterflies at Arden Hills Army Training Site, St. Paul Audubon Society, 2001-2009.

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
Red-spotted purple	*(Limenitis a . astyanax)*								1	**1**
Viceroy	*Limenitis archippus*	1	2	5		1			2	
Hackberry emperor	*Asterocampa celtis*							2		
Northern pearly-eye	*Enodia anthedon*	2	4	7	1	5	9	5		
Marsh-eyed brown	*Satyrodes eurydice*	46	15-20	22	3	5	32	26	1	
Little wood satyr	*Megisto cymela*								2	**7**
Common ringlet	*Coenonympha tullia*	4							6	**11**
Common wood nymph	*Cercyonis pegala*	dozen	dozen	100-	100+	36	104	173		**44**
Monarch	*Danaus plexippus*	11	10	11	1	17	64	38	4	**10**
Silver-spotted skipper	*Epargyeus clarus*	2	2	1	1	1	2	2		**2**
Northern Cloudywing Skipper	***Thorybes pylades***									**1**
Least skipperling	***Ancyloxypha numitor***									**1**
European skipper	*Thymelicus lineola*	6		dozen	2	1		5	23	**32**
Peck's skipper	*Polites peckiums (=coras)*								2	
Northern cloudy skipper	*Thorybes pylades*									
Tawny-edged skipper	*Polites themistocles*	4						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		
Mulberry wing	*Poanes massasoit*	1	1	1	3	1	6	1		
Hobomok skipper	*Poanes hobomok*									
Dion skipper	*Euphyes dion*							1		
Black dash	*Euphyes conspicua*							3		
Dun skipper	*Euphyes vestris*	1		3			8	4		
Skipper species					1		4	2	2	**1**

AHATS Other Wildlife Observations

Table 24. Bird species observed at Arden Hills Army Training Site, during St. Paul Audubon Society's annual butterfly survey, June 27, 2009.

Family	Scientific Name	Common Name
Gaviidae	*Gavia immer*	Common loon
Ardeidae	*Ardea herodias*	Great blue heron
	Casmerodius albus	Great egret
Anatidae	*Cygnus buccinator*	Trumpeter swan
Cathartidae	*Cathartes aura*	Turkey Vulture
Accipitridae	*Pandion haliaetus*	Osprey
	Buteo jamaicensis	Red-tailed hawk
Cathartidae	*Cathartes aura*	Turkey vulture
Columbidae	*Zenaida macroura*	Mourning dove
Picidae	*Colaptes auratus*	Northern flicker
Hirundinidae	*Tachycineta bicolor*	Tree swallow
Corvidae	*Cyanocitta cristata*	Blue jay
	Corvus brachyrhynchos	American crow
Paridae	*Parus atricaillus*	Black-capped chickadee
Sittidae	*Sitta carolinesis*	White-breasted nuthatch

Table 24. Bird species observed at Arden Hills Army Training Site, during St. Paul Audubon Society's annual butterfly survey, June 27, 2009.

Family	Scientific Name	Common Name
Troglodytidae	*Troglodytes aedon*	House wren
Turdidae	*Turdus migratorius*	American robin
Mimidae	*Dumetella carolinensis*	Gray catbird
Parulidae	*Geothlypis trichas*	Common yellowthroat
Emberizidae	*Spizella pallida*	Clay-colored sparrow
	Spizella pusilla	Field sparrow
	Melospiza melodia	Song sparrow
Cardinalidae	*Passerina cyanea*	Indigo bunting
Icteridae	*Agelaius phoeniceus*	Red-winged blackbird
	Molothrus ater	Brown-headed cowbird
Fringillidae	*Carpodacus mexicanus*	House finch
	Carduelis tristis	American goldfinch
Passeridae	*Passer domesticus*	House sparrow

CAMP RIPLEY FISHERIES

Spring Harvest

Several lakes and ponds were test netted by the Environmental Office to determine fish presence for the purpose of determining suitability of walleye or muskie rearing activities (Table 25). Two test nets were used in each basin.

Table 25. Spring fish presence on selected lakes at Camp Ripley, 2009.

Lake Name	Fish Present
Miller Pond	2 gallons of bullheads, mud minnows
Frog Lake	5 gallons of minnows (red dace, mud minnows)
Muskrat Lake	Nothing
Coon Stump Lake	Nothing

Rapoon Lake showed evidence of walleye fingerlings, and was harvested (Table 26).

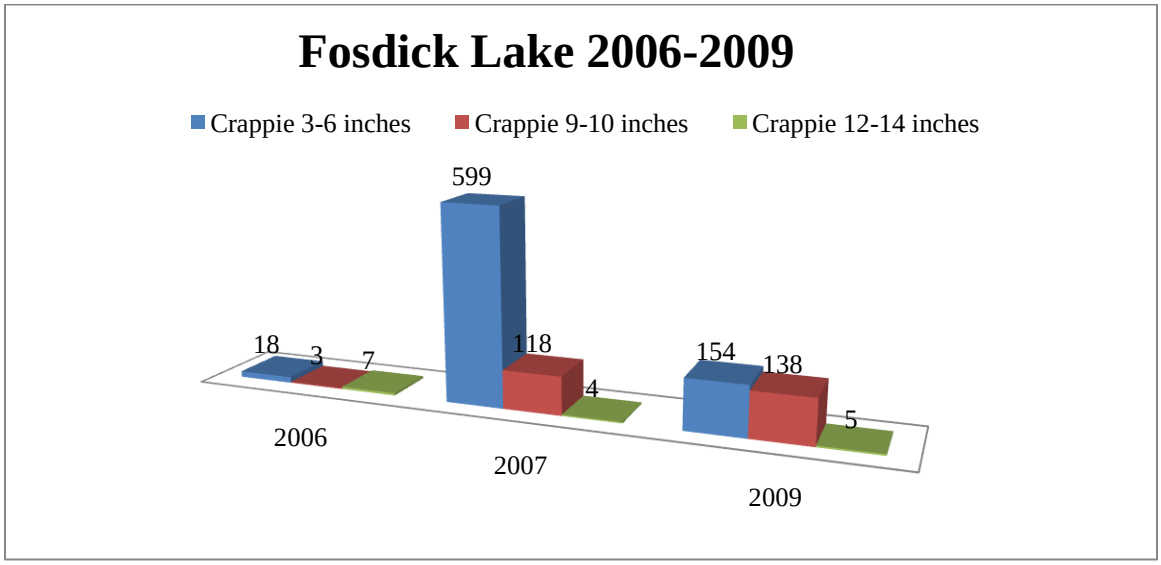
Table 26. Spring walleye harvest at Camp Ripley, 2009.

Lake Name	Harvest Amount	Rate	Stocking Location
Rapoon Lake	3 walleye fingerlings	1/lb (3 lbs)	Ferrell Lake

Spring walleye stocking occurred on four lakes, they are: Coon Stump, Muskrat, Cockburn, and Rapoon. Spring muskie stocking took place on Frog Lake and Miller Pond.

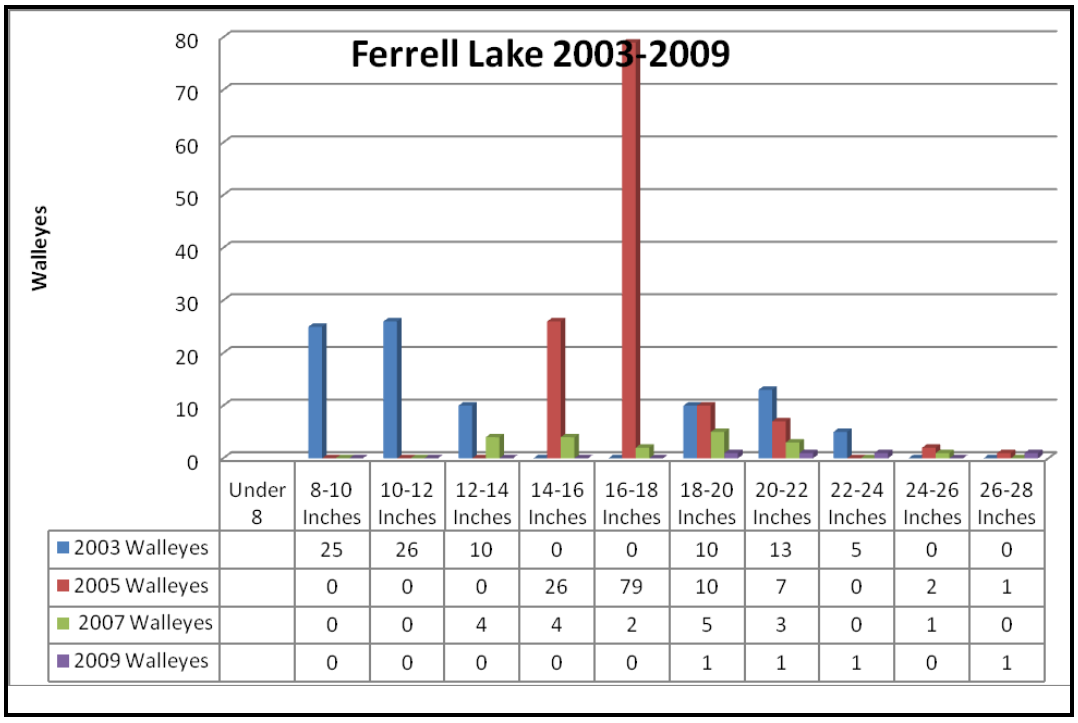
Lake surveys were completed on three lakes on Camp Ripley. They included Fosdick Lake (Figure 70), Ferrell Lake (Figure 71), and Lake Alott. All three lakes were netted to determine the quantity and size of fish present. Fosdick Lake is managed for crappies and the graph below shows the size and fish present.

Figure 70.



Ferrell Lake is managed as a bluegill, largemouth bass and walleye fishery. Currently the only stocking that takes place on the lake is for walleye. Below is a graph that shows walleye size and quanity for the survey years of 2003, 2005, 2007, and 2009. Based on the 2009 lake survey, there were no small walleyes left in the lake, and those that remained are 18-24 inches in length. Walleye stocking efforts in 2010 will focus on increasing the walleye numbers in Ferrell Lake. Only three walleyes were stocked into Ferrell Lake this spring.

Figure 71.



	Under 8	8-10 Inches	10-12 Inches	12-14 Inches	14-16 Inches	16-18 Inches	18-20 Inches	20-22 Inches	22-24 Inches	24-26 Inches	26-28 Inches
2003 Walleyes		25	26	10	0	0	10	13	5	0	0
2005 Walleyes		0	0	0	26	79	10	7	0	2	1
2007 Walleyes		0	0	4	4	2	5	3	0	1	0
2009 Walleyes		0	0	0	0	0	1	1	1	0	1

Lake Allot is managed for a wide diversity of fish, and currently is stocked only with walleyes. A lake survey will be completed on Lake Allot in 2010.

Fall Harvest

Four lakes (Coon Stump, Muskrat, Cockburn and Rapoon) were harvested by MNDNR for walleye fingerlings, and two lakes were harvested for muskellunge (Frog and Miller) (Table 27). The walleyes were stocked in other public lakes off the installation.

Table 27. Fall harvest of walleye and muskellunge, Camp Ripley, 2009.

Lake Name	Harvest Amount	Rate (pounds)
Coon Stump Lake	5441 walleyes	111 lbs
Muskrat Lake	2068 walleyes	94 lbs
Cockburn Lake	507 walleyes	190.6 lbs
Rapoon Lake	12800 walleyes	160 lbs
Frog Lake	247 muskellunge	91.6 lbs
Miller Pond	411 muskellunge	82.2 lbs

Land Use Management

CAMP RIPLEY ARMY COMPATIBLE USE BUFFER (ACUB)

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 Site. 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, 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 (MNDNR) 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 MNDNR and BWSR, 20 partners have expressed a willingness to assist in implementing ACUB including, in some cases, committing their own funds.

- To date, 247 willing landowners have expressed interest in ACUB. These landowners represent about 35,036 acres of land. Over 93 percent of the interested landowners desire permanent conservation easements rather than acquisition

- Federal funding in the amount of $12,981,500 has been awarded to the Camp Ripley ACUB since 2004.

- In addition to federal funding, MNDNR and BWSR attempted to secure state funding in support of ACUB through the Legislative Citizen Commission on Minnesota Resources (LCCMR) and the Lessard-Sams Outdoor Heritage Council (LSOHC). While the LCCMR proposal was unsuccessful, the LSOHC proposal was approved in the amount of $843,000.

- 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 2004 (start) through fiscal year 2009 are provided in the fiscal year 2009 annual report that was presented to NGB. A summary of actions taken by MNDNR and BWSR are presented below.

Minnesota Department of Natural Resources Summary

Upon receiving Assistant Chief of Staff for Installation Management approval of the Camp Ripley ACUB on May 3, 2004, the Minnesota National Guard designated DNR to serve as its primary partner. NGB and the State of Minnesota, acting by and through MNDNR, entered into a Cooperative Agreement (CA) 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 MNDNR'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 five times to accommodate supplemental funds in the amount of $2,849,000 for a total of $3,349,000. No additional funds have been allocated to the MNDNR since cooperative agreement modification number 5. MNDNR's funding allocation to date is as follows:

	DOD	Army	NGB	
Fiscal Year 2004 Original CA	N/A	N/A	$500,000	
Fiscal Year 2005 Mod No. 1	$500,000	N/A	$500,000	
Fiscal Year 2006 Mod No. 2	$500,000	N/A	N/A	
Fiscal Year 2007 Mod No. 3	N/A	N/A	N/A	
Fiscal Year 2007 Mod No. 4	$749,000	N/A	N/A	
Fiscal Year 2007 Mod No. 5	N/A	N/A	$600,000	
Fiscal Year 2008 N/A	N/A	N/A	N/A	
TOTAL	**$1,749,000**	**+**	**$1,600,000**	**=$3,349,000**

Minnesota Department of Natural Resources Past Actions/Monitoring

From fiscal year 2004 to fiscal year 2008, the DNR completed nine land transactions. As such, the MNDNR is forever responsible for monitoring the parcels of land that are associated with these transactions. All parcels were inspected by MNDNR personnel during fiscal year 2009 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 MNDNR's annual monitoring plan calls for annual site visits in the spring (April or May) of each year. Reports of site visits are filed for each land parcel and are available through the MNDNR. All parcels were found to be in compliance based on the monitoring inspections.

Minnesota Department of Natural Resources Fiscal Year 2009 Accomplishments

MNDNR completed and recorded two land transactions in fiscal year 2009 totaling 124 acres and $978,749 and has initiated action on six additional land transactions totaling 580 acres and $2,147,670 that are pending as near-term targets (Figure 72). 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.

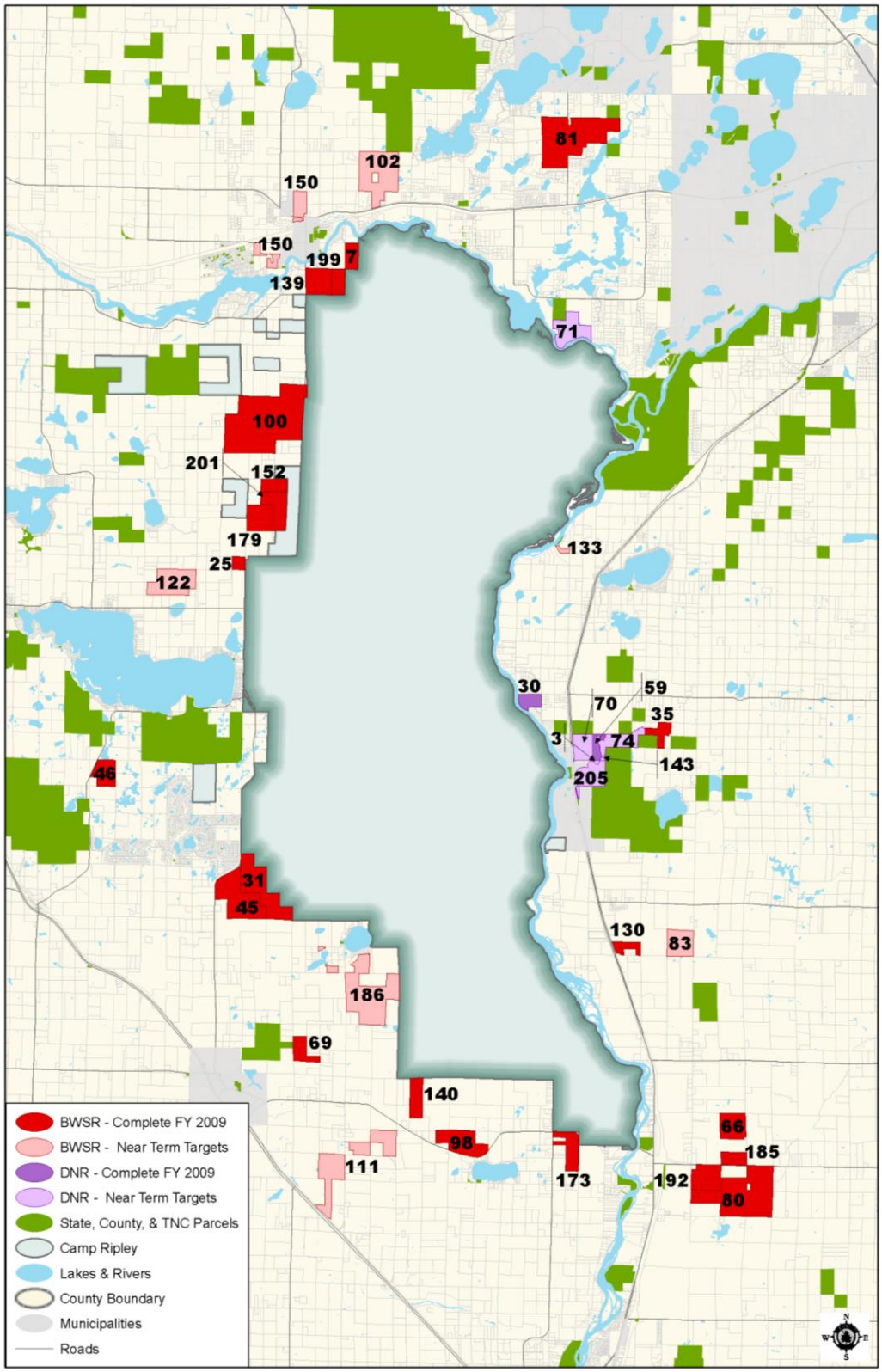
Minnesota Board of Water and Soil Resources Summary

Realizing the capability and mutual goals of BWSR, the Minnesota National Guard also designated BWSR to serve as partner to work in conjunction with the MNDNR. 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 cooperative agreement has subsequently been modified nine times to accommodate supplemental funds in the amount of $9,132,500 for a total of $9,632,500. Following is a summary of BWSR's funding allocation of federal funding since their involvement in the program in fiscal year 2006:

	DOD	Army	NGB
Fiscal Year 2006 Original CA	$500,000	N/A	N/A
Fiscal Year 2007 Mod No. 1	$1,000,000	N/A	N/A
Fiscal Year 2007 Mod No. 2	N/A	N/A	$500,000
Fiscal Year 2007 Mod No. 3	N/A	N/A	$1,000,000
Fiscal Year 2007 Mod No. 4	N/A	N/A	$807,000
Fiscal Year 2008 Mod No. 5	$840,000	N/A	N/A
Fiscal Year 2008 Mod No. 6	N/A	N/A	$1,235,500
Fiscal Year 2008 Mod No. 7	N/A	N/A	$1,500,000
Fiscal Year 2009 Mod No. 8	750,000	N/A	N/A
Fiscal Year 2009 Mod No. 9	N/A	N/A	1,500,000
TOTAL	**$3,090,000**	**+**	**$6,542,500=$9,632,500**

Figure 72. Camp Ripley ACUB fiscal year 2009 accomplishments and near term targets.



Minnesota Board of Water and Soil Resources Past Action/Monitoring

From fiscal year 2006 to fiscal year 2008, BWSR completed 12 land transactions totaling 1,951 acres. As such, BWSR is forever responsible for monitoring the parcels of land that are associated with these transactions. During fiscal year 2009, all parcels were inspected by County 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 fiscal year 2009.

Minnesota Board of Water and Soil Resources Fiscal Year 2009 Accomplishments

BWSR completed and recorded 24 additional land transactions in fiscal year 2009 totaling 4,821 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. BWSR has also initiated action on seven additional transactions or near term targets totaling 1,758 acres which will be completed in fiscal year 2010 using obligated NGB funds. Near term targets only includes those parcels for which the landowner has committed in writing to participate and therefore is obligated to the terms and conditions of the conservation easement. Figure 72 depicts the location of all BWSR transactions including those that have been completed to date and distinguishes accomplishments in fiscal year 2009 and the near term target land transactions that are pending.

CAMP RIPLEY INTEGRATED TRAINING AREA MANAGEMENT (ITAM)

Program Overview

The increased technology of military weapons and equipment 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 (USACERL) has developed the Integrated Training Area Management (ITAM) program. The ITAM program is a comprehensive tool that consists of five components necessary to maintain and improve the condition of natural resources. The ITAM program funding requirements to implement the five components are identified in the ITAM Workplan Analysis Module. These requirements are submitted to the 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. RTLA collects physical and biological resources data to relate land conditions to training and testing activities. This data is intended to provide information to effectively manage land use and natural and cultural resources.

To determine the mission requirements on Camp Ripley, our customers and their requirements were identified. The first step was to coordinate with range control and use the Range Facility Management Scheduling System to determine the types and intensity of training that occurs on Camp Ripley. The second step was to coordinate with the Plans, Operations and Training Office (POTO) and range control to identify future training requirements for the MNARNG and to determine whether Camp Ripley has the land capability and condition to meet those requirements. It was determined that training at Camp Ripley can be broken down into five major categories: field artillery, mechanized maneuver, engineering, patrolling/convoy operations, and assembly area or bivouac activities. While each of these categories has specific requirements, they all share some common characteristics that help form the mission-scape for each training category. Since the start of the Global War on Terrorism, added emphasis was put into training for patrolling and convoy operations 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 current theater of operations. Mechanized, engineer, and field artillery units are still required to conduct branch specific training to maintain Military Occupational Specialty skills.

Based on the training area requirements the RTLA component was divided into eight assessments that are conducted to ensure that the training areas are sustainable for future use, they are:

1. Annual assessment of Camp Ripley's trails and firebreaks 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 drop zones.
4. An assessment of forest structure and condition to inform the location and development of heavy maneuver corridors in maneuver area K1 on Camp Ripley.
5. An RTLA project to identify and organize hazardous, restricted, and off-limits areas.
6. Monitoring the traversability of Camp Ripley's land navigation courses.
7. Assessment of maneuver training areas for potential hazards.
8. Aerial assessment of maneuver lands using Tactical Unmanned Aerial System.

In the fall of 2009, trail and firebreak conditions were evaluated on the southern portion of Camp Ripley and at AHATS. This assessment generated 99 sites at Camp Ripley and 35 sites

at AHATS. These sites will be rehabilitated in 2010 under the LRAM program. Realistic artillery training requires firing points to be at least 15 acres of open area, each having greater than 300 meters between the firing point and the tree line, sufficient ingress/egress, and several 'hides' within the adjoining forestland. Twenty-three field artillery firing point assessments were conducted to monitor forest encroachment and provide for optimum training. Second phase of the maneuver trail creation was conducted in 2009. This work consisted of clearing, grubbing, and reseeding 43 acres of land to accommodate heavy vehicle maneuvers within a tactical concealment area. Camp Ripley's A-11 and B-3 land navigation course was also assessed and improved for traversibility. An assessment of maneuver training area hazards found that Camp Ripley has 88 farmstead sites that currently interfere with field maneuvers. These farmstead remnants can pose a safety hazard to troops, especially during limited visibility. This project will fill in all depressions, remove foundations, and reseed with native grasses at designated sites each year until completed. In 2009, 15 of the farmstead sites were closed (Figure 73), in addition to the 15 closed in 2008. Table 28 details the monitoring schedule for these assessments.

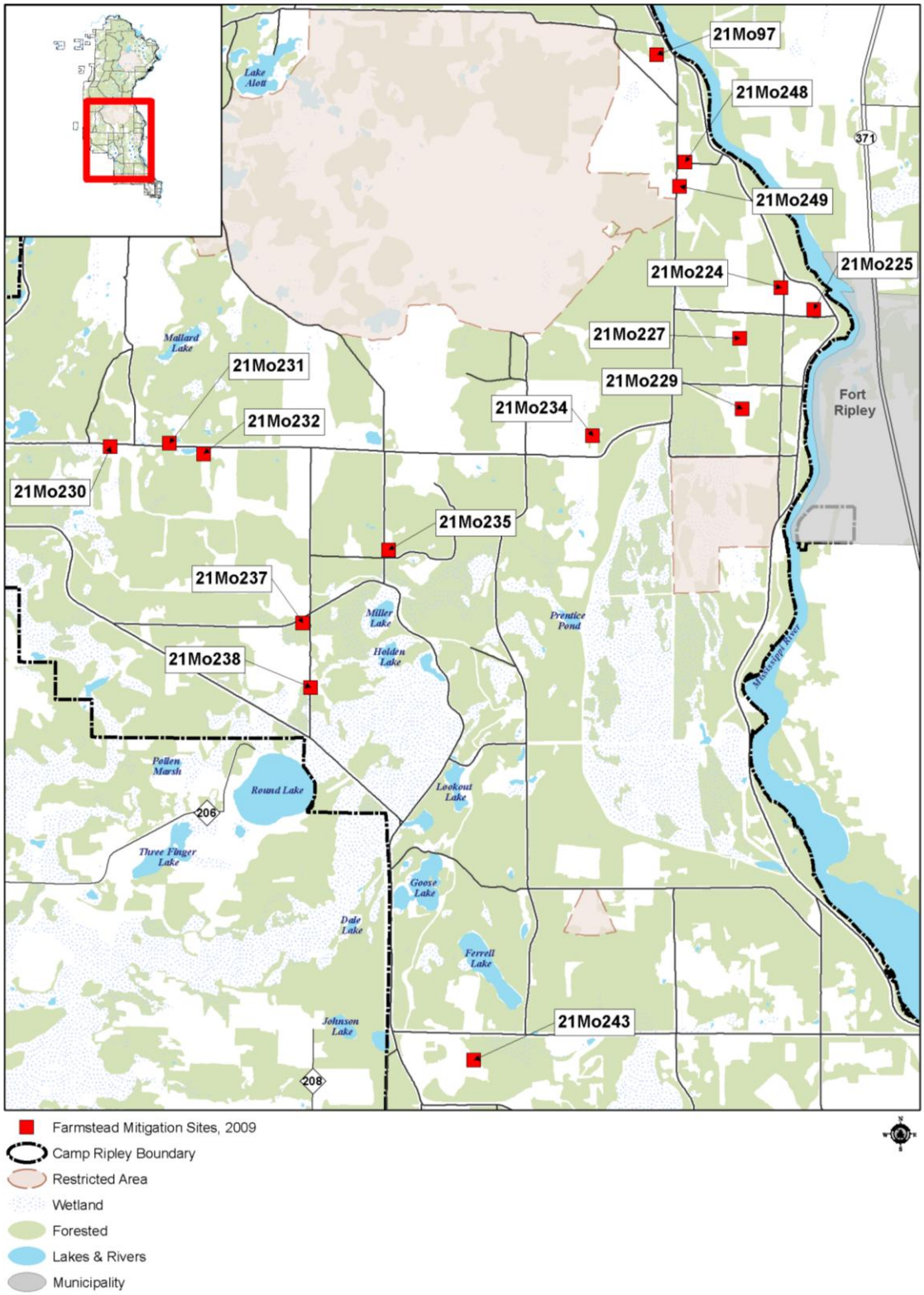
Table 28. Monitoring schedule for RTLA assessments.

Project Name	FY08	FY09	FY10	FY11	FY12	FY13	FY14
Trail and Firebreak Condition	North	South	North	South	North	South	North
Artillery Points	Set A (n-=23)	Set B (n=23)	Set C (n=22)			Set A	Set B
Open Maneuver & Drop Zones	Arno	Ripley			Arno	Ripley	
Maneuver Trails	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5		
Restricted Areas	Entire				Entire		
Land Navigation Courses	B-5	A-11, B-3	B-7	B-5	A-11, B-3	B-7	B-5
Training Hazards	South	Center	North				
UAV Aerial Survey	Entire	Entire	Entire	Entire	Entire	Entire	Entire

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 ITAM. A key component of the LRAM program is an annual assessment that is conducted to document LRAM needs attributable to past years activities. In 2009, the LRAM program rehabilitated and improved over 93 sites at Camp Ripley and 35 sites at AHATS.

Figure 73. Farmstead mitigation sites, Camp Ripley, 2009.



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. In 2010, an ITAM work plan and accomplishment document will be created.

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 to prevent damage to natural and cultural resources. The SRA component applies to soldiers, installation staff, and other land users. The SRA component also includes efforts to inform environmental professionals and the community about Camp Ripley's mission and training activities through soldier field cards, leaders' handbooks, videos, posters, and maps of Camp Ripley and AHATS.

ARDEN HILLS ARMY TRAINING SITE NATURAL RESOURCE DAMAGE ASSESSMENT

Natural resource injuries may occur at sites as a result of releases of hazardous substances or oil. Natural Resource Damage Assessments are used to assess injury to natural resources held in the public trust. This is an initial step toward restoring injured resources and services and toward compensating the public for their loss.

The Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) provides a comprehensive group of authorities focused on one main goal: to address any release, or threatened release, of hazardous substances, pollutants, or contaminants that could endanger human health and/or the environment. CERCLA's response provisions focus on the protection of human health and the environment. The statute also provides authority for assessment and restoration of natural resources that have been injured by a hazardous substance release or response.

A natural resource damage assessment (NRDA) is the process of collecting, compiling, and analyzing information to make these determinations. The overall intent of the assessment regulations is to determine appropriate restoration and compensation for injuries to natural resources. Restoration actions are principally designed to return injured resources to baseline conditions (EPA 2009).

At the Arden Hills Army Training Site (AHATS) facility, sustainability of natural vegetation cover has been a top priority in all planning efforts to ensure a realistic training environment and quality wildlife habitat. All natural resources conservation activities are designed to maintain and enhance the training areas for soldiers, thus serving the military mission.

In order to meet its sustainability objectives the MNARNG has requested funding through the Natural Resources Damage Assessment (NRDA) process to implement projects from the AHATS Integrated Natural Resources Management Plan (INRMP). The AHATS INRMP, which was developed in concert with partners from the Minnesota Department of Natural Resources (MNDNR) and United States Fish and Wildlife Service (USFWS), provides a foundation for managing AHATS' natural resources. These NRDA land management projects are intended to eliminate hazards relating to infrastructure, restore wildlife habitat, and help eliminate invasive species on the AHATS facility (Appendix M).

Geographic Information Systems (GIS)

As part of the Environmental and Integrated Training Area Management (ITAM) programs, GIS is used to support management of these programs at the Army, NGB, and MNARNG levels and is subsequently used to implement related resource management plans.

GIS STANDARDIZATION

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 states and national efforts organized.

In accordance with these regulations, ITAM and Environmental related layers within the MNARNG GIS repository are compliant with the Spatial Data Structure for Facilities, Installations, and Environment (SDSFIE) version 2.6. Required data layers are based upon the NGB Common Installation Picture (CIP) and Army Sustainable Range Program (SRP) Quality Assurance Plans (QAP).

To support visibility and analysis efforts, the Army and NGB submit annual requests to states for geospatial data and map products. This year the Range Complex Master Plan (RCMP) and CIP requests have been satisfied.

Representing NGB, the MNARNG is participating in a pilot project to define an Army adaptation for the upcoming release of SDSFIE 3.0. Review of current compliance with SDSFIE and interviews with GIS staff will be used to define potential alterations of the standard in an effort to accommodate specific data requirements. SDSFIE 3.0 implementation tools will then be developed based upon the Army adaptation and tested by pilot project participants.

GEOSPATIAL DATA

Based upon business need, maintenance and development of geospatial data layers has continued throughout the year (Appendix N). This also includes changes which occurred during implementation of the NGB Range Reconciliation standardization initiative.

Light Detection and Ranging (LiDAR) data has also been acquired for Camp Ripley. LiDAR is a technology that utilizes lasers to determine the distance to an object or surface. It is similar to radar but incorporates laser pulses rather than sound waves to determine distance by measuring the travel time between transmission and reflection and detection of a pulse. Common airborne systems consist of a LiDAR laser scanner mounted in the bottom of an airplane (similar to an aerial camera) along with an Inertial Measuring Unit and Airborne GPS.

In spring of 2007, a partnership between Camp Ripley, Crow Wing County, and St. Cloud State University contracted Merrick & Company to execute a LiDAR acquisition survey. Acquisition areas included Camp Ripley, Crow Wing County, and the Mille Lacs Indian Reservation.

The contracted Camp Ripley acquisition area included the installation and a 3 mile buffer excluding the area that falls within Crow Wing County. Although the MNARNG does not own the data for this exclusion area Crow Wing County has provided the data along with permission for its use. Therefore, the Camp Ripley LiDAR data set currently covers Camp Ripley as well as the complete 3 mile buffer surrounding the installation.

Camp Ripley LiDAR data set

Acquisition period: 9 May - 24 June 2007
Average point density: 1.7 points/m^2
Number of returns: 4
Tiling scheme: 5000 x 5000ft

Data deliverables

All data points classified into ground and non-ground
- LAS format (also includes intensity values)
-ASCII format

Derived Digital Terrain Model (DTM) sufficient to generate 2ft contours
- mass points and break lines in ESRI shapefile format
- Triangulated Irregular Network (TIN) format
- 1m ESRI Grid format

2 ft contours derived from DTM
-ESRI shapefile format

UTILIZATION

As referenced in the goals and objectives for each section of the INRMP, GIS capabilities have been interwoven into the overall management of natural resources within the MNARNG.

Custom maps (digital and hard copy) continue to be the primary GIS product for non-GIS staff. This past year there were nearly 2000 map requests (800-training, 600-environmental, 400-events, 100-planning, 25-facilities).

A Map Library (http://sharepoint/JFHQ/JSTAFF/J6/TeamSite/GIS/MapLibrary/default.aspx) has been created on sharepoint to house commonly requested maps. This repository has allowed for wider dissemination of maps and has reduced the amount of time GIS staff allocates to these common requests.

Recently developed analysis methods for quantifying various forest stand structural metrics (e.g., stem density, basal area, tree height and volume) were applied to the Camp Ripley LiDAR data set. In addition, these metrics along with data obtained through years of bird count surveys have been used to generate occurrence probability models for select bird species. Specific information regarding these efforts can be found in their respective sections.

J6 COORDINATION

The J6 directorate is responsible for hardware and software support for the MNARNG. Both are essential components of a GIS. With increasing network security the ability to manage these components has been limited. In order to obtain the necessary permissions and priority to maintain the GIS a member of the GIS staff has been functioning as a liaison with the J6 Directorate.

This coordination has lead to the added benefit of application development support from the J6 Automation section. Development of GIS web applications are currently underway and will be used to put GIS visualization and mapping capabilities into the hands of non-GIS staff.

Migration of GIS databases to J6 production servers has also begun. This will allow for a cost savings to the Environmental and ITAM programs by reducing the requirement for a data

server and the software licenses for database and operating systems on that device. In addition, storage space for GIS project development and flat file storage is being pursued through the J6.

Outreach and Recreation

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 staff have been active in such activities as the Morrison County Water Festival, Earth Day, National Public Lands Day at Camp Ripley and AHATS, and Habitat Day. The AHATS National Public Lands day projects included construction of two wood duck nesting boxes and a 16 hole purple martin nest structure. In addition, 30 cubic yards of spotted knapweed was hand pulled near the viewing platform and was reseeded with native wildflower seed.

Camp Ripley's environmental team has also been involved in a job shadow program. The shadow program provides an out-of-classroom experience for those students interested in the natural resources field. The environmental team provides about 20 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. Camp Ripley is also available for environmental presentations and tours. In 2009, the environmental team gave presentations or tours to 97 groups totaling 4,247 people and 375 man hours. A majority of these presentations occur in the Environmental Learning Center at Camp Ripley.

In 2008, AHATS along with the adjacent Rice Creek, was designated an Important Bird Area (IBA) by Audubon Minnesota, the state office of the National Audubon Society, and the MNDNR Nongame Program. The AHATS-Rice Creek Important Bird Area is one of 23 such areas in Minnesota, and part of 7,500 sites in nearly 170 countries. AHATS participated in the fourth annual Urban Bird Fest of Ramsey County from May 14-18, 2009 by hosting an afternoon bird hike. The tour hosted 75 participants and offered opportunities to a variety of birding skill levels. AHATS plans to participate in the Urban Bird Fest again in 2010.

SALVAGE PERMITS

Camp Ripley maintains two permits for the purpose of salvaging animals for the Environmental Learning Center, they are: State of Minnesota salvage permit No. 14815 and Federal Fish and Wildlife Permit MB776466-0. One greater sandhill crane, two black bear skulls, a hen wild turkey, a gray wolf, a gray fox, and oppossum were salvaged for educational purposes in 2009.

Camp Ripley has had an active hunting program since 1954. The hunting results for the various hunting programs are provided in the information that follows.

Camp Ripley Disabled American Veteran's Firearms Wild Turkey Hunt

Camp Ripley hosted the fifth annual Disabled American Veteran's (DAV) turkey hunt on April 22-23, 2009. The hunt was organized and conducted by the Veteran's Administration and Minnesota Chapter of the National Wild Turkey Federation with support from Camp Ripley staff and MNDNR. Thirty-five hunters participated in this year's turkey hunt. Twenty-three hunters were successful, for a 66 percent success rate (Table 29).

Table 29. Disabled American Veteran's wild turkey hunts at Camp Ripley, 2005-2009.

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**
Total	**88**		**159**	**144**		
Avg.	**17.6**	**60%**	**32**	**27**		

Camp Ripley Deployed Soldiers Firearms Wild Turkey Hunt

Camp Ripley hosted its first Deployed Soldier turkey hunt on April 27-29, 2009. The hunt was organized and conducted by the MNARNG-Environmental Office. Twenty-eight hunters participated in this year's turkey hunt. Eighteen hunters were successful, for a 64 percent success rate (Table 30).

Table 30. Deployed soldiers wild turkey hunt at Camp Ripley, 2009.

Year	Turkeys Harvested	Hunter Success	Permits Issued	Number of Hunters	Dates	Largest Turkey (lbs)
2009	**18**	**64%**	**45**	**28**	**April 27-29**	**23.8**

Camp Ripley Disabled American Veteran's Firearms Deer Hunt

The eighteenth annual Disabled American Veteran's firearms deer hunt on Camp Ripley was held October 7-8, 2009. This year 52 hunters participated in the hunt. The weather was warm, with some precipitation. Thirteen deer were killed (Table 31). The largest deer taken was a 174 pound buck.

Table 31. Disabled American Veteran's firearms white-tailed deer hunt at Camp Ripley, 1992-2009.

Year	Deer Harvested	Percent Hunter Success	Buck	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**
Total	**191**		**62**	**86**	**43**		**752**		
Avg.	**11**	**26%**	**3**	**5**	**2**		**42**		**151**

Camp Ripley Deployed Soldiers Archery Deer Hunt

The fourth annual deployed soldier's archery deer hunt was held in conjunction with the DAV firearms hunt on Camp Ripley. Permits were issued to soldiers that have been mobilized to support the Global War on Terrorism since September 11, 2001. Soldiers were allowed to hunt in any non-restricted areas north of Cassino Road. One hundred and fifty permits were available, 126 hunters applied and 51 hunters participated in this year's hunt. Eleven deer were taken, for a success rate of 20 percent (Table 32).

Table 32. Deployed soldier's archery deer hunt at Camp Ripley, 2006-2009.

Year	Deer Harvested	Percent Hunter Success	Buck	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**
Total	**41**		**13**	**22**	**6**		**203**		
Avg.	**10**	**19.75%**	**3.25**	**5.5**	**1.5**		**51**		

Camp Ripley Youth Archery Deer Hunt

The eighth annual youth archery hunt was held October 10-11, 2009. The weather was partly cloudy with some showers. 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 DMA, and the MNDNR. A total of 150 permits were issued with 130 hunters participating in 2009 (Table 33). Youth hunters harvested 12 deer, for a success rate of eight percent. Each hunter was required to have completed a safety course, and have an adult mentor present while hunting.

Table 33. Youth archery white-tailed deer hunt at Camp Ripley, 2002-2009.

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**
Total	**106**		**34**	**50**	**22**	**1152**	**1872**	**1001**		
Avg.	**13**	**10.6**								

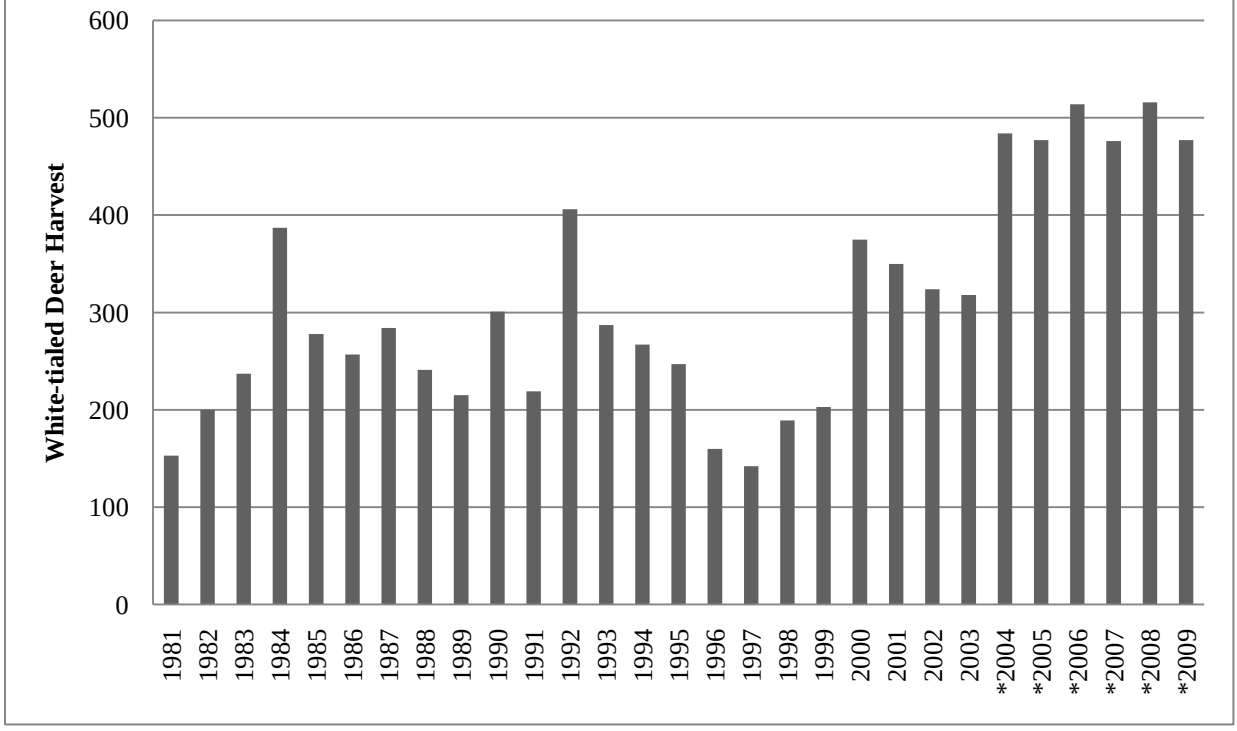
Camp Ripley General Public Archery Deer Hunt

An annual archery deer hunt has been held at Camp Ripley since 1954. This hunt draws nationwide attention. It is one of the largest archery deer hunts in the United States, and provides the opportunity to pursue one of Ripley's notoriously large bucks. Hunters are allowed to apply for one of two, 2-day seasons. This year, the hunts were held on October 15-16 and October 31-

November 1. For the sixth year, hunters were permitted to use a bonus tag, allowing them to take a second antlerless deer. In 2009, the number of permitted hunters was 5,005.

A total of 4,126 hunters participated in the 2009 archery hunts (Figure 74 and Table 34). There were 477 deer taken during the two hunts. Hunter success was approximately 11.4 percent which is greater than the long-term average of 9 percent; however, this increased hunter success is likely due to use of bonus tags. Approximately 60 percent of the harvested animals were does and fawns.

Figure 74. General public archery white-tailed deer hunt, Camp Ripley, 1981-2009.



*Years when bonus tag use allowed.

Table 34. General public archery white-tailed deer hunts at Camp Ripley, 1981-2009.

Year	Deer Harvested	Adult Males	%	Adult Females	%	Fawns	%	Permits Issued	# of Hunters	% Success	1st Season	2nd Season	Largest Deer (lbs)
1981	153	48	31	45	29	60	39	2587	1972	7.8	OCT.10-25	3 Weekends	272
1982	200	67	34	86	43	47	23	3000	2274	8.8	OCT. 23-24	OCT. 30-31	236
1983	237	89	38	94	40	54	22	3500	2831	8.4	OCT. 8-9	OCT. 15-16	253
1984	387	162	42	151	39	74	19	4500	3815	10.1	OCT. 6-7	OCT. 27-28	238
1985	278	118	42	113	41	47	17	5000	3996	7.0	OCT. 12-13	OCT. 27-28	257
1986	257	106	41	83	32	68	26	5000	3940	6.5	OCT. 11-12	OCT. 25-26	243
1987	284	122	43	91	32	71	25	5000	4112	6.9	OCT. 10-11	OCT. 24-25	250
1988	241	91	38	101	42	49	20	5000	4090	5.9	OCT. 8-9	OCT. 22-23	262
1989	215	95	44	75	35	45	21	4000	3136	6.9	OCT. 17-18	OCT. 28-29	226
1990	301	137	46	115	38	49	16	3500	2585	11.6	OCT. 27-28	NOV. 17-18	225
1991	219	87	40	90	41	42	19	4000	2217	9.9	OCT. 19-20	NOV. 30-DEC. 1	232
1992	406	228	56	140	35	38	9	4500	3156	12.9	OCT. 31-NOV. 1	NOV. 21-22	224
1993	287	147	51	82	29	58	20	5000	4127	7.0	OCT. 21-21	OCT. 30-31	237
1994	267	136	51	95	36	36	13	4000	3158	8.5	OCT. 20-21	OCT. 29-30	237
1995	247	102	41	100	41	45	18	4500	3564	6.9	OCT. 19-20	OCT. 28-29	256
1996	160	78	49	55	34	27	17	4000	3154	5.1	OCT. 17-18	OCT. 26-27	248
1997	142	67	47	57	40	18	13	3000	2316	6.1	OCT. 16-17	OCT. 25-26	243
1998	189	116	61	50	26	23	12	3000	2291	8.2	OCT. 15-16	OCT.31- NOV. 1	249
1999	203	100	49	83	41	20	10	3000	2335	8.7	OCT. 21-22	OCT. 30-31	251
2000	375	228	61	109	29	38	10	4000	3128	12.0	OCT. 19-20	OCT. 28-29	247
2001	350	192	55	126	36	32	9	4500	3729	9.4	OCT. 18-19	OCT. 27-28	272
2002	324	186	57	102	31	36	11	4500	3772	8.6	OCT. 17-18	OCT. 26-27	235
2003	318	161	51	120	38	37	11	4500	3810	8.3	OCT. 16-17	OCT. 25-26	247
***2004**	484	218	45	206	43	60	12	4521	3836	12.4	OCT. 21-22	OCT. 30-31	235
***2005**	477	186	39	218	46	73	15	4522	3813	12.5	OCT.20-21	OCT.29-30	245
***2006**	514	165	32	241	47	108	21	5009	4351	11.8	OCT. 19-20	OCT. 28-29	244
***2007**	476	150	32	228	48	98	20	5014	4294	11.1	OCT. 18-19	OCT. 27-28	255
***2008**	516	183	35	220	43	113	22	5005	4167	11.9	OCT. 19-20	OCT. 26-27	234
***2009**	**477**	**190**	**40**	**202**	**42**	**85**	**18**	**5005**	**4126**	**11.4**	**OCT 15-16**	**OCT 31-NOV 1**	**265**

*Years when bonus tag use allowed.

AHATS Deployed Soldiers Archery Wild Turkey Hunt

AHATS hosted its first Deployed Soldier archery turkey hunt on April 15-17, 2009. The hunt was organized and conducted by the MNARNG- Environmental Office. Eight hunters participated in this year's turkey hunt. Two hunters were successful, for a 25 percent success rate (Table 35).

Table 35. Deployed Soldiers wild turkey hunt at AHATS, 2009.

Year	Turkeys Harvested	Hunter Success	Permits Issued	Number of Hunters	Dates	Largest Turkey (lbs)
2009	**2**	**25%**	**8**	**8**	**April 15-17**	**20.9**

AHATS Deployed Soldiers Deer Hunt

In 2009, the fourth annual deployed soldiers archery deer hunt was held on October 7 to 9, October 9 to 11, October 12 to 14, October 30 to November 1, and December 4 to 6. Permits were issued to soldiers that have been mobilized to support the Global War on Terrorism since September 11, 2001. Soldiers were allowed to hunt in any non-restricted areas on AHATS. Five, three-day hunts were allowed. All 126 applicants for either the Camp Ripley or the AHATS deployed soldier hunts were allowed to hunt (Table 37).

Table 36. Deployed soldier's archery white-tailed deer hunt at Arden Hills Army Training Site, 2006-2009.

Year	Deer Harvested	Buck	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**	**308**

AHATS Youth Archery Deer Hunt

Fifty-four hunters participated in the two youth archery deer hunts at Arden Hills (Table 38). The hunts were held October 15 to 16, and October 17 to 18, 2009. Thirty youth hunters were allowed for each 2-day hunt. During the two, 2-day hunts, eight deer were harvested.

Table 38. Youth archery white-tailed deer hunt at Arden Hills Army Training Site, 2003-2009.

Year	Deer Harvested	Buck	Does	Fawns	Number of Hunters	Dates
2003	9	6	2	1	57	Oct 16-19
2004	5	2	3	0	56	Oct 21-24
2005	11	5	5	1	56	Oct 20-23
2006	9	4	5	0	52	Oct 19-22
2007	8	3	4	1	55	Oct 18-21
2008	4	3	0	1	54	Oct 16-19
2009	**8**	**3**	**5**	**0**	**55**	**Oct 15-18**

AHATS Volunteer Archery Deer Hunt

The hunt runs smoothly due to Minnesota Deer Hunters Association and Minnesota State Archery Association volunteers. Seventy-nine volunteers that assisted with the youth and deployed Soldier hunts were allowed access to hunt deer at AHATS November 27 to 29, 2009. Twenty-eight deer were harvested during the volunteer hunt (Table 39).

Table 39. Volunteer archery white-tailed deer hunt at Arden Hills Training Site, 2003-2009.

Year	Deer Harvested	Buck	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**

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Appendix A: Camp Ripley Integrated Natural Resources Management Plan Updated Goals and Objectives

ADMINISTRATION							
Section	**INRMP Goal**	**Goal Created**	**2009 Objective**	**Objective Created**	**Comments**	**2010 Update**	**Update Created**
INRMP	**Ensure adequate funding and resources to implement Camp Ripley's Conservation program**	**1/1/2003**	**Hire staff to provide full time support for ITAM and ecosystem management at Camp Ripley**	**1/1/2003**	**4 DMA staff involved in Conservation and ITAM Programs at Camp Ripley**	**Maintain 4 DMA Staff to support the implementation of the Conservation and ITAM Programs at Camp Ripley**	**12/8/2009**
			Formalize a Cooperative Agreements 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**		**Update and Execute 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**	**12/8/2009**
			Conduct an annual meeting of the Cooperative Planning Committee to review the annual work plans and for presenting an annual report of accomplishments from the preceding year	**1/1/2003**	**Meeting conducted 22 Jan, 2009, Local DNR Staff meetings on Dec 8, 2009 to review and update goals and objectives.**	**Conduct an annual meeting of the Natural Resources Planning Committee for review the annual work plans and for presenting an annual update of INRMP accomplishments from the preceding year**	**12/8/2009**
			Conduct long-range natural resources planning at the same time as site development planning for military training	**1/1/2003**	**Ongoing**	**Annually integrate long-range natural resources planning with site development planning for the military mission**	**12/8/2009**

ADMINISTRATION							
Section	**INRMP Goal**	**Goal Created**	**2009 Objective**	**Objective Created**	**Comments**	**2010 Update**	**Update Created**
			To utilize contracts for services in conducting special natural resources projects at Camp Ripley whenever internal resources are not adequate to meet objectives (e.g. MNDNR, TNC, SCSU, etc.	1/1/2003	Current Contracts: MNDNR- Eco-services 1.5 employees SCSU-GIS-1 employee SCSU-TNC 1 land steward, 2 crew members.	In 2010 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, TNC, SCSU)	12/8/2009
			Maintain administration of the INRMP development, implementation, and updating through the Environmental Office.	1/1/2003		Maintain administration of the INRMP development, implementation, and updating through the Camp Ripley Environmental Office.	12/8/2009
			Complete an annual Conservation-INRMP update report. Update , review and obtain signatures at annual meeting with MNDNR and USFWS	12/10/2008		Complete an annual Conservation-INRMP update report. Update, review and obtain signatures at annual meeting with MNDNR and USFWS	12/8/2009
			In 2009 establish a Land Fund account and a charter - bylaws for implementation	12/10/2008		In 2010 continue to implement Land Fund Projects	12/8/2009
					New Objective	Develop and maintain a work plan of ITAM projects in the WAM that support the INRMP implementation	12/18/09

ADMINISTRATION							
Section	**INRMP Goal**	**Goal Created**	**2009 Objective**	**Objective Created**	**Comments**	**2010 Update**	**Update Created**
					New Objective	**Develop and maintain a work plan of environmental projects in the STEP that support the INRMP implementation**	**12/18/09**
					New Objective	**Develop and maintain a work plan of wild land fire projects in the Fire and Emergency Services Program that support the INRMP implementation**	**12/18/09**

FORESTRY							
Section	**INRMP Goal**	**Goal Created**	**2009 Objectives**	**Objective Created**	**Comments**	**2010 Update**	**Update Created**
Forestry	**In 2010 update the Camp Ripley forest management plan to include progress/action since initial plan dated 2002.**	**12/8/2009**			**New Goal and Objective**	**In 2010 update the Camp Ripley forest management plan to include progress/action since initial plan dated 2002.**	**12/8/2009**
					New Objective	**In 2010 develop a 5 year work plan for land fund expenditures as it relates to forest management plan.**	**12/8/2009**
					New Objective	**In 2010 develop a landscape management element for the cantonment area.**	**12/8/2009**

FORESTRY

Section	INRMP Goal	Goal Created	2009 Objectives	Objective Created	Comments	2010 Update	Update Created
Forestry	Maintain Forest Vegetation Inventory for land management planning, and for monitoring changes	1/1/2003	Update aerial imagery in 2011.	12/10/2008		In 2011 update aerial imagery.	12/8/2009
			Little Falls DNR Forestry will verify, measure, and evaluate changes to the forest landscape attributed to annual alterations.	12/10/2008		In 2010 Little Falls DNR Forestry will verify, measure, and evaluate changes to the forest landscape attributed to annual alterations.	12/8/2009
			In 2009 Re-inventory through field verification additional forest stands so that along with alterations a minimum 4000 acres of the forested area is updated annually.	12/10/2008	DNR will help identify what areas to re-inventoried.	In 2010 Re-inventory through field verification additional forest stands so that along with alterations a minimum 4000 acres of the forested area is updated annually.	12/8/2009
			Conduct LIDAR assessment of timber resources and utilize data to verify forest inventory, update LIDAR in 5 year rotation, next update in 2013.	12/22/2008		In 2010 conduct LIDAR assessment of timber resources and utilize data to verify forest inventory, update LIDAR in 5 year rotation, next update in 2013.	12/8/2009
Forestry	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	1/1/2003	Encourage clear cutting on aspen stands identified through DFC determination to be part of Installation aspen base.	12/10/2008		Encourage clear cutting on aspen stands identified through DFC determination to be part of Installation aspen base.	12/8/2009

FORESTRY							
Section	**INRMP Goal**	**Goal Created**	**2009 Objectives**	**Objective Created**	**Comments**	**2010 Update**	**Update Created**
			In 2009 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**	**Assessed 23 field artillery sites in 2009**	**In 2010develop 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.**	**12/8/2009**
			Apply emerging technology to pre-commercially thin young conifer plantations and aspen regeneration making those areas accessible to training use while developing future concealment area.	**12/10/2008**	**No longer relevant**	**Delete Objective**	**12/8/2009**
			In 2009 mark out and establish timber cut for an additional maneuver corridor in Maneuver K1.	**12/10/2008**	**One corridor harvested in July 2009. Second corridor is marked.**	**In 2010 implement a timber cut for an additional maneuver corridor in Maneuver K1**	**12/8/2009**
			In 2009 assess conifer plantings within the Mississippi and Crow Wing River corridors as visual and noise buffers to the increasing numbers of homeowners developing along the river shores.	**12/22/2008**	**Ongoing**	**In 2010 assess conifer plantings within the Mississippi and Crow Wing River corridors as visual and noise buffers to the increasing numbers of homeowners developing along the river shores.**	**12/8/2009**
			Encourage the natural transition of the even-aged forest types to longer-lived species by extending the age of regeneration-harvest consideration to the threshold age when the stand will be evaluated to determine the DFC Composition as follows.	**12/22/2008**	**No longer relevant**	**Delete Objective**	**12/8/2009**

FORESTRY

Section	INRMP Goal	Goal Created	2009 Objectives	Objective Created	Comments	2010 Update	Update Created
Forestry	Balance forest diversity on the Training Site by maintaining the integrity of the historic representation of forest composition	1/1/2003	Increase by 50 acres the white pine type by stimulating and encouraging the white pine component in those stands where the species is represented as a subsidiary species or part of the understory by utilizing acceptable timber stand improvement techniques.	12/10/2008	Needs to be assessed	In 2010 assess the white pine type by component in those stands where the species is represented as a subsidiary species or part of the understory.	12/8/2009
			Try to maintain 1000 acres of the jack pine type as a critical ecosystem component by continued intensive reforestation and protection efforts in those stands where harvest has been necessary as well as cutover areas formerly occupied by the species.	12/10/2008		In 2010 implement a reforestation project using the land fund account for the reforestation of jack pine.	12/8/2009
			Explore 2 innovative reforestation techniques in 2009 such as seeding or drilling of jack pine to lessen the impact of herbivory; and under-planting of shade-tolerant hardwoods and conifers to rejuvenate heavily used bivouac sites.	12/10/2008	Delete objective, addressed in the 2010 objective above		12/8/2009
			In 2010 monitor the presence and condition of butternut trees as part of cooperative research studies promoted by the U.S. Forest Service-North Central Station, MNDNR, and Camp Ripley, examining the potential of phenotypic disease resistance in the population to butternut canker.	12/10/2008		In 2010 monitor the presence and condition of butternut trees as part of cooperative research studies promoted by the U.S. Forest Service-North Central Station, MNDNR, and Camp Ripley, examining the potential of phenotypic disease resistance in the population to butternut canker.	12/8/2009

FORESTRY							
Section	**INRMP Goal**	**Goal Created**	**2009 Objectives**	**Objective Created**	**Comments**	**2010 Update**	**Update Created**
			In 2009 collect native seed from Camp Ripley to promote regeneration of proper genotype.	**12/22/2008**		**In 2010 continue to collect native seed from Camp Ripley to promote regeneration of proper genotype.**	**12/8/2009**
Forestry	**Emphasize and protect ecosystem values identified as intrinsic to forest management on the Camp Ripley Training Site and adjoining landscapes through expertise shared by MNDNR-Eco Resources Division**	**1/1/2003**	**Maintain committed partnership with The Nature Conservancy, sharing as an adjoining landholder, through common planning efforts and cross-linked goal emphasis.**	**12/10/2008**		**Maintain committed partnership with The Nature Conservancy, sharing as an adjoining landholder, through common planning efforts and cross-linked goal emphasis.**	**12/8/2009**
			Continue environmental reviews of all harvest activities (as part of the stand exam process) and implement BMP where needed.	**12/10/2008**		**Continue environmental reviews of all harvest activities (as part of the stand exam process) and implement BMP where needed.**	**12/8/2009**
			Control invasive exotic species within the forest ecosystem for the purpose of improving and sustaining training area lands and eradication of exotic species.	**12/10/2008**		**Control invasive exotic species within the forest ecosystem for the purpose of improving and sustaining training area lands and eradication of exotic species.**	**12/8/2009**

FORESTRY

Section	INRMP Goal	Goal Created	2009 Objectives	Objective Created	Comments	2010 Update	Update Created
Forestry	**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 Little Falls, monitored by the CRC-EN TAC, and set forth through Statutory authority or DOD regulation**	**1/1/2003**	**In Jan 2009 submit a 2 year harvest plan for Camp Ripley and implement the Stand Evaluation Process.**	**12/10/2008**		**In Jan 2011 submit a 2 year harvest plan to Camp Ripley for review.**	**12/8/2009**
			Maintain a single POC 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**		**Maintain a single POC as the MNDNR forester for all timber sales, firewood permits, or stand treatment contracts. Internal communications should be through the Training Area Coordinator.**	**12/8/2009**
			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 in compliance with Voluntary Site-level Forest Management Guidelines.	**12/10/2008**		**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 in compliance with Voluntary Site-level Forest Management Guidelines.**	**12/8/2009**

FORESTRY							
Section	**INRMP Goal**	**Goal Created**	**2009 Objectives**	**Objective Created**	**Comments**	**2010 Update**	**Update Created**
			Respond to Site Development Plan proposals as first priority for planning and execution with commercial timber sales given first option of consideration as well as consideration for work projects for MNDOC-Sentence-to-Serve and MNDNR-MCC.	**12/10/2008**		**Respond to Site Development Plan proposals as first priority for planning and execution with commercial timber sales given first option of consideration as well as consideration for work projects for MNDOC-Sentence-to-Serve and MNDNR-MCC.**	**12/8/2009**
			In 2009 conduct annual review of update Forest Management Plan accomplishments and future proposals with MNDNR-Forestry Office, CRC-EN, and military training staff.	**12/10/2008**	**Delete Objective addresses as a new goal.**		**12/8/2009**
			In 2009 establish a deployed soldier fuelwood collection point and maintain supply through DPW.	**12/22/2008**	**Delete objective, project completed.**		**12/8/2009**
Forestry	**Monitor fire danger levels and control wildfires**	**1/1/2003**	**In 2009 complete the wild land fire management plan.**	**12/10/2008**	**Plan is complete.**	**In 2010 implement the wild land fire management plan.**	**12/8/2009**

GRASSLANDS

Section	INRMP Goal	Goal Created	2009 Objectives	Objective Created	Comments	2010 Update	Update Created
Grasslands	Restore and manage the grassland communities for the purposes of military training, protection of species, native prairie restoration, and soil stabilization	1/1/2003	In 2009 evaluate and prioritize the grassland compartments for management needs based on previous years assessments.	12/11/2008		In 2010evaluate and prioritize the grassland compartments for management needs based on previous years assessments.	12/8/2009
			In 2010-2011 based on the RTLA assessments, define and initiate practices to maintain the grassland compartments to meet training capability needs, native prairie restoration and to control invasive -exotic species within the grassland ecosystem for the purpose of improving and sustaining training area lands.	12/11/2008		In 2010-2011 based on the RTLA assessments, define and initiate practices to maintain the grassland compartments to meet training capability needs, native prairie restoration and to control invasive -exotic species within the grassland ecosystem for the purpose of improving and sustaining training area lands.	12/8/2009

IMPROVED GROUNDS

Section	INRMP Goal	Goal Created	2009 Objectives	Objective Created	Comments	2010 Update	Update Created
Improved Grounds	Protect and develop improved grounds for functional and aesthetic qualities in the Cantonment area of Camp Ripley.	1/1/2003	In 2009 develop a landscape management plan to include maps, assessments and guidelines for maintenance, improvements and tree location.	3/26/2008	Ongoing	In 2010 develop a landscape management plan to include maps, assessments and guidelines for maintenance, improvements and tree location.	12/8/2009

IMPROVED GROUNDS

Section	INRMP Goal	Goal Created	2009 Objectives	Objective Created	Comments	2010 Update	Update Created
			In 2010 conduct an annual inspection on all boulevards, sidewalks, and facilities for dead, dying or high-risk trees and have them removed.	3/26/2008	Ongoing	In 2010 conduct an annual inspection on all boulevards, sidewalks, and facilities for dead, dying or high-risk trees and have them removed.	12/8/2009
			Maintain a tree nursery to supply landscaping needs as it relates to the landscape plan.	3/26/2008	Ongoing	Reference cantonment landscape plan regarding location and need of nursery to supply landscaping needs.	12/8/2009
			In 2009 complete SCSU Study and implement control measures identified in findings for the protection of the improved grounds in the cantonment area.	3/26/2008		In 2010 implement control measures identified in findings for the protection of the improved grounds in the cantonment area.	12/8/2009
			In 2010 start an annual update of the landscape management plan.	3/26/2008	Delete Objective, plan not complete		12/8/2009

LAND USE

Section	INRMP Goal	Goal Created	2009 Objectives	Objective Created	Comments	2010 Update	Update Created
Land Use	Identify and develop land use opportunities for the public	1/1/2003	In 2009 conduct two, two-day general public bow hunts for White-tailed deer in cooperation with MNDNR Wildlife.	12/9/2008	Currently reevaluating selected dates of two 2-day bow hunts to better complement military training.	In 2010 conduct two, two-day general public bow hunts for White-tailed deer in cooperation with MNDNR Wildlife.	12/8/2009

LAND USE							
Section	INRMP Goal	Goal Created	2009 Objectives	Objective Created	Comments	2010 Update	Update Created
			In 2009 conduct the two- day youth archery deer hunt in cooperation with MNDNR Wildlife.	12/9/2008		In 2010 conduct the two- day youth archery deer hunt in cooperation with MNDNR Wildlife.	12/8/2009
			In 2009, conduct a two-day Disabled American Veteran's deer hunt.	12/9/2008		In 2010, conduct a two-day Disabled American Veteran's deer hunt.	12/8/2009
			Continue to conduct other non-motorized public recreation events such as skiing, nature hikes, touring, dog-trialing or horseback trail riding as opportunities arise.	12/9/2008		In 2010 continue to conduct other non-motorized public recreation events such as skiing, nature hikes, touring, or dog-trialing as opportunities arise.	12/8/2009
			Maintain the following six recreation areas for picnicking, fishing or both: Area #1 De Parcq 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, Area #6 Round Lake Picnic Area.	12/9/2008		Maintain the following six recreation areas for picnicking, fishing or both: Area #1 De Parcq 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, Area #6 Round Lake Picnic Area.	12/8/2009
			Maintain approximately 21.5 miles of cross-country ski trails.	12/9/2008		In 2010 maintain approximately 21.5 miles of cross-country ski trails.	12/8/2009
			Conduct a biathlon race biennially.	12/9/2008		Conduct a biathlon race biennially.	12/8/2009
			In 2009, conduct a two-day, Disabled American Veteran's turkey hunt.	12/9/2008		In 2010, conduct a two-day, Disabled American Veteran's turkey hunt.	12/8/2009
			In 2009, conduct a two-day deployed soldier deer hunt.	12/9/2008		In 2010, conduct a two-day deployed soldier deer hunt.	12/8/2009
			In 2009, conduct a 3-day deployed soldier turkey hunt.	12/9/2008		In 2010, conduct a 3-day deployed soldier turkey hunt.	12/8/2009

LAND USE							
Section	**INRMP Goal**	**Goal Created**	**2009 Objectives**	**Objective Created**	**Comments**	**2010 Update**	**Update Created**
			In 2009, continue to negotiate with Minnesota Power regarding the use and management of the Minnesota Power land located on the northern edge of Camp Ripley just south of the Crow Wing River.	**12/9/2008**		**In 2010, continue to negotiate with Minnesota Power regarding the use and management of the Minnesota Power land located on the northern edge of Camp Ripley just south of the Crow Wing River.**	**12/8/2009**
			In 2009, develop a new boat access in Fosdick Lake to improve fishing access.	**12/9/2008**	**Access trail started in fall of 2009as a NPLD. Two sections of docks also purchased for the site.**	**In 2010, complete a new boat access in Fosdick Lake to improve fishing access.**	**12/8/2009**
Land Use	**Minimize land use conflicts on and off the installation**	**3/26/2008**	**Annually enroll 5-10 land owners in the ACUB Program.**	**12/9/2008**		**Annually enroll 5-10 land owners in the ACUB Program.**	**12/8/2009**
			Continue to partner with MNDNR and MNBWSR to implement ACUB.	**12/9/2008**		**Continue to partner with MNDNR and MNBWSR to implement ACUB.**	**12/8/2009**
			Continue to secure funding to implement ACUB and annually enroll about 1000 acres of land in the program.	**12/22/2008**		**In 2010 continue to secure funding to implement ACUB and annually enroll about 1000 acres of land in the program.**	**12/8/2009**
			In 2009, work with The Nature Conservancy on a land transfer regarding the Crow Wing River property owned by Minnesota Power.	**12/9/2008**		**In 2010, work with The Nature Conservancy on a land transfer regarding the Crow Wing River property owned by Minnesota Power.**	**12/8/2009**
			Continue to develop partnerships to protect natural resources around Camp Ripley.	**12/9/2008**		**Continue to develop partnerships to protect natural resources around Camp Ripley.**	**12/8/2009**

LAND USE							
Section	**INRMP Goal**	**Goal Created**	**2009 Objectives**	**Objective Created**	**Comments**	**2010 Update**	**Update Created**
					New Objective	**In 2010 pursue other state funding in support of ACUB including the Lessard-Sams Outdoor Heritage Fund.**	**12/8/2009**

WILDLIFE-MAMMALS							
Section	**INRMP Goal**	**Goal Created**	**2009 Objectives**	**Objective Created**	**Comments**	**2010 Update**	**Update Created**
Wildlife	**Maintain white-tailed deer population levels consistent with biological diversity, carrying capacity, and military training needs**	**1/1/2003**	**In 2009, implement fourth year of helicopter survey.**	**12/9/2008**	**No survey conducted, project complete**	**Delete Objective**	**12/8/2009**
			In 2009, coordinate with MNDNR to compare aerial survey results, harvest data information, and review deer data to establish a harvest goal.	**12/9/2008**	**Project complete, Harvest goal set at 400 deer**	**Delete Objective**	**12/8/2009**
Wildlife	**Continue to monitor the reproductive success, movements, and mortality of black bears on Camp Ripley**	**3/26/2008**	**In 2009, monitor the nine bears that are currently collared.**	**12/9/2008**	**Ongoing project, see 2009 report.**	**In 2010, monitor the ten bears that are currently collared.**	**12/8/2009**
			In 2009, continue to monitor nuisance bear activity in accordance with the range regulations.	**12/9/2008**	**Monitoring continues, No complaints in 2009**	**In 2010, continue to monitor nuisance bear activity in accordance with the range regulations.**	**12/8/2009**

WILDLIFE-MAMMALS

Section	INRMP Goal	Goal Created	2009 Objectives	Objective Created	Comments	2010 Update	Update Created
Wildlife	Monitor populations of furbearers for comparison with state and regional data	1/1/2003	In 2009, conduct MNDNR scent-post surveys on Camp Ripley.	12/9/2008	Ongoing annual survey, see 2009 report.	In 2010, conduct MNDNR scent-post surveys on Camp Ripley.	12/8/2009
			From 2008 to 2010, participate in statewide fisher study.	12/9/2008	Four captured; three radio-collared fisher in 2009. See 2009 report.	In 2010, continue our portion of the state-wide fisher study.	12/8/2009
					NEW OBJECTIVE	In 2009-2010, use LiDAR to estimate vegetation structure within delineated home ranges and around den sites to determine habitat use.	12/21/2009
RTLA-Fauna	Monitor fauna (Birds, Mammals, and Reptiles and Amphibians) resources on Camp Ripley	1/1/2003	In 2011, continue a monitoring program for small mammals on core plots during the summer	12/11/2008	Inserted from RTLA section;	In 2010, research monitoring protocol for small mammals on core plots.	12/8/2009
Wildlife	Manage beaver populations at Camp Ripley	1/1/2003	In 2009, install two Clemson levelers and one deceiver in problem areas to prevent the washout of dikes and roads.	12/9/2008	No Clemson levelers installed in 2009 and two damaged deceivers removed	In 2010, install six Clemson levelers and two deceivers in problem areas to prevent the washout of dikes and roads and submit DPW work orders.	12/8/2009
			In 2009, obtain a permit to remove nuisance beaver as needed.	12/9/2008	32 nuisance beaver removed in 2009; see 2009 report	In 2010, obtain a permit to remove nuisance beaver, as needed.	12/8/2009
			In 2009, develop nuisance beaver management guidelines.	12/9/2008	Outlined in current permit	In 2010, implement nuisance beaver management guidelines, as outlined in permit.	12/8/2009
Wildlife	Manage porcupine populations at Camp Ripley	3-26-2008	In 2009, obtain a permit to target problems areas for porcupines and harvest nuisance porcupines.	12/9/2008	No nuisance porcupines were removed in 2009	In 2010, obtain a permit to target problems areas for porcupines and harvest nuisance porcupines.	12/8/2009

WILDLIFE-BIRDS

Section	INRMP Goal	Goal Created	2009 Objectives	Objective Created	Comments	2010 Update	Update Created
Wildlife	Monitor bird populations on Camp Ripley	1/1/2003	In 2009, conduct point-count surveys on 90 plots.	12/9/2008	57 plots completed	In 2010, complete a selected subset of 80 point-count survey based upon LiDAR and/or bird population needs.	12/21/2009
					NEW OBJECTIVE	In 2010, 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.	12/21/2009
			In 2009, conduct pilot year research on bird monitoring stations (MAPS).	1/29/2009	Reviewed and dismissed	Delete Objective	12/8/2009
			In 2009, continue to analyze RTLA 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.	12/9/2008	Ongoing	In 2010, 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.	12/8/2009
			In 2009, continue to annually update species lists of birds found on Camp Ripley.	12/9/2008	Ongoing	In 2010, continue to annually update species lists of birds found on Camp Ripley.	12/8/2009
			In 2009, monitor turkey and grouse populations on Camp Ripley via spring drumming/gobbling counts.	12/9/2008	Completed - No need to monitor turkeys in the future	In 2010, monitor grouse populations on Camp Ripley via spring drumming counts.	12/8/2009
Wildlife	Continue to make bluebird-nesting boxes available for cavity nesting songbird species at the Camp Ripley Cemetery	1/1/2003	Install additional nest structures as needed.	12/9/2008	Completed	Delete Objective	12/8/2009

WILDLIFE-BIRDS							
Section	**INRMP Goal**	**Goal Created**	**2009 Objectives**	**Objective Created**	**Comments**	**2010 Update**	**Update Created**
			In 2009, recruit volunteer/s to monitor and maintain 27 bluebird nest structures (Gilbertson PVC).	**12/9/2008**	**DeAnna Gehant, volunteer, monitored 27 nest boxes at Veteran's Cemetery and Cantonment Area in 2009. See 2009 report.**	**In 2010, monitor and maintain 27 bluebird nest structures.**	**12/8/2009**
Wildlife	**Monitor raptor populations on Camp Ripley**	**1/1/2003**	**In 2009, conduct survey for owls.**	**12/9/2008**	**Completed – Ongoing; See 2009 report.**	**In 2010, participate in the statewide survey for owls.**	**12/8/2009**
			In 2009, monitor nesting success of ospreys on Camp Ripley.	**12/9/2008**	**Completed – Ongoing; See 2009 report.**	**In 2010, monitor nesting success of ospreys on Camp Ripley.**	**12/8/2009**
Wildlife	**Maintain species diversity, distribution of waterfowl populations within Camp Ripley**	**1/1/2003**	**In 2009, recruit volunteer/s to monitor productivity and maintain 35 wood duck nest structures. Relocate and add structures, as needed.**	**12/9/2008**	**Completed, Intern monitoring in 2009; See 2009 report.**	**In 2010, recruit volunteer/s to monitor productivity and maintain 35 wood duck nest structures.**	**12/8/2009**
Wildlife	**To protect waterfowl from potential injury due to ingestion of white phosphorus munitions compounds in the impact areas.**	**1/1/2003**	**Maintain the ban on the firing of white phosphorus munitions into wetland located in the Leach and Hendrickson impact areas indefinitely.**	**12/9/2008**	**Ongoing**	**Maintain the ban on the firing of white phosphorus munitions into wetland located in the Leach and Hendrickson impact areas indefinitely.**	**12/8/2009**
			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.	**12/9/2008**	**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.**	**12/8/2009**

WILDLIFE-BIRDS							
Section	**INRMP Goal**	**Goal Created**	**2009 Objectives**	**Objective Created**	**Comments**	**2010 Update**	**Update Created**
Wildlife	**Control nuisance bird problems**	**1/1/2003**	**Install bird deterrent devices on buildings at Camp Ripley as needed.**	**12/9/2008**	**DPW installs all bird deterrent devices**	**Delete objective**	**12/8/2009**
					New Objective	**In 2010, establish a BASH plan and provide training on wildlife deterrent devices-techniques used near airfields.**	**12/8/2009**

REPTILES AND AMPHIBIANS-INVERTEBRATES-FISHERIES							
Section	**INRMP Goal**	**Goal Created**	**2009 Objectives**	**Objective Created**	**Comments**	**2010 Update**	**Update Created**
Reptiles & Amphibians	**Continue to monitor the presence and abundance of reptiles and amphibians**	**1/1/2003**	**In 2008, review effectiveness of drift-fence surveys. Investigate alternative methods for 2009.**	**12/9/2008**	**Not completed, insufficient professional staff**	**In 2010, at appropriate professional staffing, review effectiveness of drift-fence surveys. Investigate alternative methods for 2011.**	**12/8/2009**
			In 2009, conduct annual anuran call surveys.	**12/9/2008**	**Completed – Ongoing; See 2009 report.**	**In 2010, participate in statewide annual anuran call surveys.**	**12/8/2009**
Invertebrates	**Continue to monitor the presence and abundance of terrestrial and aquatic invertebrates**	**1/1/2003**	**In 2009, determine need for additional invertebrate surveys and establish schedule.**	**12/9/2008**	**Not completed, insufficient professional staff**	**In 2010, with appropriate professional staffing, determine need for additional invertebrate surveys and establish schedule.**	**12/8/2009**
Fisheries	**Protect, establish, manage and enhance the fisheries resources at Camp Ripley**	**1/1/2003**	**In 2009, implement management recommendations for each lake management plan.**	**12/9/2008**	**Completed in 2008 on Ferrell, Fosdick and Lake Alott**	**In 2010, implement management recommendations for each lake management plan.**	**12/8/2009**

REPTILES AND AMPHIBIANS-INVERTEBRATES-FISHERIES

Section	INRMP Goal	Goal Created	2009 Objectives	Objective Created	Comments	2010 Update	Update Created
			Annually, continue population enhancement through fish stocking as deemed by lake management plans.	**12/9/2008**	**See 2009 report for fish stocking information**	**Annually, continue population enhancement through fish stocking as deemed by lake management plans.**	**12/8/2009**
			Continue creel census program through range control for all fishable areas on and adjacent to Camp Ripley.	**12/9/2008**		**Continue creel census program through range control for all fishable areas on and adjacent to Camp Ripley.**	**12/8/2009**
			Continue to allow fishing opportunities as training permits.	**12/9/2008**		**Continue to allow fishing opportunities as training permits.**	**12/8/2009**
			In 2009, complete a lake survey, by spring trapping of Lake Alott, Ferrell and Fosdick lakes.	**12/9/2008**	**Lake surveys were completed on all 3 lakes, data found in 2009 report.**	**In 2012, complete a lake survey, by spring trapping of Lake Alott, Ferrell and Fosdick lakes.**	**12/8/2009**
Fisheries	**Continue to allow a rearing program by MNDNR fisheries in Camp Ripley**		**In 2009, coordinate fish rearing activities on lake and pond use at Camp Ripley.**	**12/9/2008**		**In 2010, coordinate fish rearing activities on lake and pond use at Camp Ripley.**	**12/8/2009**

PROTECTED SPECIES

Section	INRMP Goal	Goal Created	2009 Objectives	Objective Created	Comments	2010 Update	Update Created
T & E Species	Manage and protect species that are listed as threatened or endangered by the federal government or species listed by the State of Minnesota	1/1/2003	In 2009, continue to monitor resident and transient threatened and endangered species that may be present at Camp Ripley and provide management recommendations as needed.	12/9/2008	Ongoing	In 2010, 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. 2009), as funding allows.	12/8/2009
			In 2009, monitor gray wolf populations and movements and integrate monitoring with the Minnesota Gray Wolf Management Plan.	12/9/2008	As of December 2009, two wolves are radio-collared. Relisted as Federal Threatened in 2009. See 2009 report.	In 2010, capture and monitor gray wolf populations and movements via radio telemetry (Dirks et al. 2009).	12/8/2009
					NEW OBJECTIVE	In 2010, monitor wolf mortality incidences and conduct necropsies on dead wolves (Dirks et al. 2009).	12/21/2009
					NEW OBJECTIVE	In 2010, monitor location/s and protect wolf rendezvous sites (Dirks et al. 2009).	12/21/2009
					NEW OBJECTIVE	In 2010, protect any known wolf den site/s (Dirks et al. 2009).	12/21/2009
			In 2009, continue to monitor bald eagle nests and provide protection to nests in accordance with the ARNG eagle policy guidance and biological opinion for North Range.	12/9/2008	Completed-Ongoing	In 2010, continue to monitor bald eagle nests and provide protection to nests in accordance with the ARNG eagle policy guidance and biological opinion for North Range (Dirks et al. 2009).	12/8/2009

PROTECTED SPECIES

Section	INRMP Goal	Goal Created	2009 Objectives	Objective Created	Comments	2010 Update	Update Created
					NEW OBJECTIVE	In 2010, conduct monthly bald eagle breeding season aerial surveys (April – July) (Dirks et al. 2009).	12/21/2009
					NEW OBJECTIVE	In 2010, monitor bald eagle mortalities and determine cause (Dirks et al. 2009).	12/21/2009
					NEW OBJECTIVE	In 2010, investigate and secure a 5-year programmatic agreement (take permit) for bald eagles on Camp Ripley (Dirks et al. 2009).	12/9/2009
			Educate users about the presence and importance of protected species	12/9/2008	Revised range regulation and bulletin	Educate users about the presence and importance of protected species	12/8/2009
			In 2009, determine the presence/absence of the Canada lynx by using Envirotel's cougar detection system (hair sampling).	12/9/2008	Completed - Ongoing	In 2010, continue to determine the presence/absence of the Canada lynx (Dirks et al. 2009) by using Envirotel's cougar detection system (hair sampling).	12/8/2009
			In 2009, continue a monitoring program for Blanding's turtles.	12/9/2008	Completed – Ongoing; See 2009 report.	In 2010, continue a monitoring program for Blanding's turtles (Dirks et al. 2009).	12/8/2009
					NEW OBJECTIVE	In 2010, research and design Blanding's turtle drift fence with turtle gates along IED defeat lane and develop nesting area enhancement (Dirks et al. 2009).	12/21/2009

PROTECTED SPECIES

Section	INRMP Goal	Goal Created	2009 Objectives	Objective Created	Comments	2010 Update	Update Created
			In 2009, continue to monitor red-shouldered hawks to provide additional data on population, nest locations, and provide management recommendations.	12/9/2008	Completed play call-back survey in 2009. See 2009 report.	In 2010, continue to monitor red-shouldered hawks to provide additional data on population, nest locations, and provide management recommendations (Dirks et al. 2009).	12/8/2009
					NEW OBJECTIVE	In 2010-2011, develop red-shouldered hawk trap methods and deploy two satellite transmitters.	12/21/2009
T & E Species	Protect populations and habitats of special concern and other rare nongame wildlife species and prevent their decline to threatened or endangered status	1/1/2003	In 2009, identify SGCN species and update the Protected Species Management Plan (PSMP) for Camp Ripley and recommend management actions.	12/9/2008	Revised draft completed	In 2010, identify SGCN species and complete the final Protected Species Management Plan for Camp Ripley and recommend management actions.	12/8/2009
					NEW OBJECTIVE	In 2010, select SGCN species and develop survey methods to monitor occurrence on Camp Ripley.	12/21/2009
					NEW OBJECTIVE	In 2010, monitor occurrence and production of trumpeter swans (Dirks et al. 2009).	12/21/2009
					NEW OBJECTIVE	In 2010, 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

RTLA

Section	INRMP Goal	Goal Created	2009 Objectives	Objective Created	Comments	2010 Update	Update Created
RTLA	Provide information to land managers about the status of natural and cultural resources on Camp Ripley		In 2009, create an ITAM annual report which documents the accomplishments for that preceding year.	12/11/2008	Ongoing	In 2010, create an ITAM annual report which documents the accomplishments for that preceding year.	12/8/2009
		1/1/2003	In 2009, analyze RTLA assessments data to determine land capability and condition, to include recommendations for management	12/11/2008	Analyzed and recommended 23 FA points and 93 LRAM sites. Included Rx for managing each site.	In 2010, analyze RTLA assessments data to determine land capability and condition, to include recommendations for management	12/8/2009
			In 2009, provide information to the Camp Ripley SDP, INRMP, IPMP, ICRMP, RCMP and Range Regulations.	12/11/2008	Ongoing	In 2010, provide information to the Camp Ripley SDP, INRMP, IPMP, ICRMP, RCMP and Range Regulations.	12/8/2009
RTLA-Floral	Provide military trainers and land managers with the necessary technical and analytical information to integrate doctrinally based training	3/26/2008	In 2009 RTLA Assessment #1 will be conducted on the southern half of the training area.	12/11/2008	Conducted initial assessments #1, 2, and 6(B-5 Complete). RTLA Assessment #4 completed survey of 70 acres of maneuver area, #7 identified x# of training hazards/farm artifacts, and #8 used UAV for monitoring of timber sales and storm damage.	In 2010 RTLA Assessment #1 will be conducted on the Northern half of the training area.	12/8/2009
			RTLA Assessment #2 will be conducted on 23 artillery firing points			RTLA Assessment #2 will be conducted on 23 artillery firing points	12/8/2009

RTLA							
Section	**INRMP Goal**	**Goal Created**	**2009 Objectives**	**Objective Created**	**Comments**	**2010 Update**	**Update Created**
			RTLA Assessment #6 will be completed on the remaining 3 Land Navigation Courses.			**RTLA #6will be completed on 3 Land Navigation courses**	**12/8/2009**
RTLA-Fauna	**Monitor fauna (Birds, Mammals, and Reptiles and Amphibians) resources on Camp Ripley**	**1/1/2003**	**In 2011, continue a monitoring program for small mammals on core plots during the summer**	**12/11/2008**	**Moved to Wildlife-Mammals**		**12/8/2009**

GIS							
Section	**INRMP Goal**	**Goal Created**	**2009 Objectives**	**Objective Created**	**Comments**	**2010 Update**	**Update Created**
GIS	**Achieve and maintain compliance with all mandated GIS requirements**	**1/1/2003**	**Complete metadata for all new and updated layers prior to loading into GDB.**	**11/26/2008**	**Completed for 2009. Ongoing.**	**Complete metadata for all new and updated layers prior to loading into GDB.**	**12/18/2009**
			Maintain compliance with SDSFIE.	**11/26/2008**	**Completed for 2009. Ongoing.**	**Maintain compliance with SDSFIE.**	**12/18/2009**
			Provide appropriate data and documentation in the required format for all Army and NGB data requests.	**11/26/2008**	**Complete. Provided data for CIP, RCMP, SDSFIE 3.0 pilot. Ongoing.**	**Provide appropriate data and documentation in the required format for all Army and NGB data requests.**	**12/18/2009**
GIS	**Maintain the MNARNG geographic database with sufficient completeness, consistency and accuracy for reliable query, analysis and application development**	**1/1/2003**	**In 2009, identify data requirements and procedures in support of environmental/INRMP initiatives. Capture status and update frequency for each required layer. Record in GIS Plan.**	**11/26/2008**	**Began process did not complete**	**In 2010, identify data requirements and procedures in support of environmental/INRMP initiatives. Capture status and update frequency for each required layer. Record in GIS Plan.**	**12/18/2009**

GIS

Section	INRMP Goal	Goal Created	2009 Objectives	Objective Created	Comments	2010 Update	Update Created
			House a current copy of the Camp Ripley forest inventory in the GDB. The source of this layer should be the DNR FIM.	11/26/2008	Completed for 2009. Ongoing.	House a current copy of the Camp Ripley forest inventory in the GDB. The source of this layer should be the DNR FIM.	12/18/2009
			Maintain ACUB data layers.	11/26/2008	Completed for 2009. Ongoing.	Maintain ACUB data layers.	12/18/2009
			House current copies of the Camp Ripley and AHATS aerial photos in the GDB.	11/26/2008	Complete.	House current copies of the Camp Ripley and AHATS aerial photos in the GDB.	12/18/2009
			Ensure copies of digital statewide aerial photos are available to env staff.	11/26/2008	Complete. Using MnGeo WMS.	Ensure copies of digital statewide aerial photos are available to env staff.	12/18/2009
GIS	Maintain hardware and software systems appropriate for the info management needs of Camp Ripley	1/1/2003	In 2009, develop GIS management plan to include data, software, hardware, application and staffing requirements.	11/26/2008	Did not complete reference new goal	In 2010, develop GIS management plan to include data, software, hardware, application and staffing requirements.	12/18/2009
			Replace GIS computers on a 5-year schedule.	11/26/2008	Delete objective, responsibility of J6 Directorate		12/18/2009
			Identify hardware needs for sustainment of data requirements. Record in CRC-SE GIS Plan	11/26/2008	Hardware requirements are known.	Identify hardware needs for sustainment of data requirements. Record in CRC-SE GIS Plan	12/18/2009
GIS	Develop, implement, and maintain applications to meet the info needs of the MNARNG user community	1/1/2003	Develop a user-friendly web application through ArcGIS Server to support data access needs to help achieve select INRMP goals and objectives.	11/26/2008	In progress. Coordinating with J6 Automation section to support this objective.	Develop a user-friendly web application through ArcGIS Server to support data access needs to help achieve select INRMP goals and objectives.	12/18/2009

GIS							
Section	**INRMP Goal**	**Goal Created**	**2009 Objectives**	**Objective Created**	**Comments**	**2010 Update**	**Update Created**
			Develop and implement process for storage and output of common digital maps	**11/26/2008**	**Complete.**	**Maintain content of the digital map library.**	**12/18/2009**
GIS	**Ensure geospatial data and applications support MNARNG enterprise GIS initiatives.**	**3/26/2008**	**Conduct quarterly MNARNG GIS Working Group meetings and participate in the NGB GIS subcommittee**	**11/26/2008**	**Completed for 2009**	**Conduct monthly MNARNG GIS Working Group meetings and participate in the NGB GIS subcommittee**	**12/18/2009**
			Coordinate development and acquisition of geospatial data and applications with other users through the MNARNG GIS Working Group.	**11/26/2008**	**Completed for 2009**	**Coordinate development and acquisition of geospatial data and applications with other users through the MNARNG GIS Working Group.**	**12/18/2009**
			Make appropriate geospatial data available in a centralized location to reduce redundancy.	**11/26/2008**	**Completed for 2009**	**Make appropriate geospatial data available in a centralized location to reduce redundancy.**	**12/18/2009**
			Store data in an organized structure allowing end users to more easily locate appropriate data layers.	**11/26/2008**	**Completed for 2009**	**Store data in an organized structure allowing end users to more easily locate appropriate data layers.**	**12/18/2009**

TRI-LRAM							
Section	**INRMP Goal**	**Goal Created**	**2009 Objectives**	**Objective Created**	**Comments**	**2010 Update**	**Update Created**
TRI	**In 2009, complete a ITAM 5 year plan**	**12/22/2008**	**Reference Army/NGB guidance in preparing ITAM plan**	**12/22/2008**	**Ongoing plan near completion.**	**Reference Army/NGB guidance in preparing ITAM plan**	**12/8/2009**

TRI-LRAM

Section	INRMP Goal	Goal Created	2009 Objectives	Objective Created	Comments	2010 Update	Update Created
TRI	Provide military trainers and land managers with the necessary technical and analytical information for them to meet their requirements	1/1/2003	In 2009, the 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.	12/11/2008		In 2010, the 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.	12/8/2009
			Accommodate as appropriate 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.	12/11/2008		Accommodate as appropriate 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.	12/8/2009
TRI	Optimize training land management decisions by coordinating mission requirements and land maintenance activities with training and land carrying capacity	1/1/2003	Advise on the allocation of land to support current and projected training mission requirements.	12/11/2008		Advise on the allocation of land to support current and projected training mission requirements.	12/8/2009
			The TAC position will coordinate usage with external organizations, supporting agencies, tenant activities, and higher headquarters.	12/11/2008		The TAC position will coordinate usage with external organizations, supporting agencies, tenant activities, and higher headquarters.	12/8/2009
			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.	12/11/2008		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.	12/8/2009

TRI-LRAM							
Section	**INRMP Goal**	**Goal Created**	**2009 Objectives**	**Objective Created**	**Comments**	**2010 Update**	**Update Created**
			Implement management recommendations for the 23 sites identified in RTLA Assessment #2.	**12/11/2008**	**New Objective**	**In 2010 implement management recommendations for the 23 sites identified in RTLA Assessment #2.**	**12/8/2009**
			Implement management recommendations for the 94 sites identified in RTLA Assessment #1.	**12/11/2008**	**New Objective**	**In 2010 implement management recommendations for the 81 sites identified in RTLA Assessment #1.**	**12/8/2009**

SRA							
Section	**INRMP Goal**	**Goal Created**	**2009 Objectives**	**Objective Created**	**Comments**	**2010 Update**	**Update Created**
SRA	**Minimize resource damage by educating the land users of how their activities might impact the environment**	**1/1/2003**	**Continue to educate land users of their environmental stewardship responsibilities.**	**12/11/2008**		**Continue to educate land users of their environmental stewardship responsibilities.**	**12/8/2009**
			In 2009, re-assess educational materials such as the soldier field cards, leader handbooks, video and posters/photos.	**12/11/2008**		**In 2010, re-assess educational materials such as the soldier field cards, leader handbooks, video and posters/photos.**	**12/8/2009**
			Conduct Environmental Briefings (Pre-camp conferences, trainer workshops, Training Area Coordination Briefings, schools, and civilian organizations).	**12/11/2008**		**Conduct Environmental Briefings (Pre-camp conferences, trainer workshops, Training Area Coordination Briefings, schools, and civilian organizations).**	**12/8/2009**
			Promote compliance with Camp Ripley environmental regulations.	**12/11/2008**		**Promote compliance with Camp Ripley environmental regulations.**	**12/8/2009**

SRA							
Section	**INRMP Goal**	**Goal Created**	**2009 Objectives**	**Objective Created**	**Comments**	**2010 Update**	**Update Created**
SRA	**Instill a sense of pride and stewardship for those that use Camp Ripley natural and cultural resources**	**1/1/2003**	**Improve public relations through SRA by communicating our success at sustaining mission activities.**	**12/11/2008**		**Improve public relations through SRA by communicating our success at sustaining mission activities.**	**12/8/2009**
			Convey installation mission and training objectives to environmental professionals and the public.	**12/11/2008**		**Convey installation mission and training objectives to environmental professionals and the public.**	**12/8/2009**
			Continue to implement a public education program.	**12/11/2008**		**Continue to implement a public education program.**	**12/8/2009**
			Continue participation in national events such as NPLD, Arbor Day and Earth Day.	**12/11/2008**		**Continue participation in national events such as NPLD, Arbor Day and Earth Day.**	**12/8/2009**

Appendix B: Arden Hills Army Training Site Integrated Natural Resources Management Plan Updated Goals and Objectives.

ADMINISTRATION							
Section	**INRMP Goal**	**Goal Created**	**2009 Objectives**	**Objectives Created**	**Comments**	**2010 Update**	**Update Created**
INRMP	**Ensure adequate funding and resources to implement AHATS's INRMP**	**8/1/2007**	**Continue to implement the Conservation and ITAM Programs at AHATS**	**12/12/2008**		**Continue to implement the Conservation and ITAM Programs at AHATS**	**12/18/2009**
			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	**12/12/2008**		**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**	**12/18/2009**
			Maintain administration of the INRMP development, implementation, and updating through the Camp Ripley Environmental Office.	**12/12/2008**		**Maintain administration of the INRMP development, implementation, and updating through the Camp Ripley Environmental Office.**	**12/18/2009**
			Create an annual Conservation-INRMP update report. Update review and obtain signatures at annual meeting with MNDNR and USFWS	**12/12/2008**		**Create an annual Conservation-INRMP update report. Update review and obtain signatures at annual meeting with MNDNR and USFWS**	**12/18/2009**
			Participate in the Sustainable Range Program committee to annually integrate long-range natural resources planning with site development planning for the military mission	**12/12/2008**		**Participate in the Sustainable Range Program committee to annually integrate long-range natural resources planning with site development planning for the military mission**	**12/18/2009**

ADMINISTRATION							
Section	**INRMP Goal**	**Goal Created**	**2009 Objectives**	**Objectives Created**	**Comments**	**2010 Update**	**Update Created**
			Secure funding through the TCAAP Natural Resources Damage Assessment to supplement implementation of AHATS INRMP	**12/12/2008**		**Secure funding through the TCAAP Natural Resources Damage Assessment to supplement implementation of AHATS INRMP**	**12/18/2009**
			Develop and maintain a work plan of ITAM projects in the WAM that support the INRMP implementation	**12/12/2008**		**Develop and maintain a work plan of ITAM projects in the WAM that support the INRMP implementation**	**12/18/2009**
			Develop and maintain a work plan of environmental projects in the STEP that support the INRMP implementation	**12/12/2008**		**Develop and maintain a work plan of environmental projects in the STEP that support the INRMP implementation**	**12/18/2009**
			Develop and maintain a work plan of wild land fire projects in the Fire and Emergency Services Program that support the INRMP implementation	**12/12/2008**		**Develop and maintain a work plan of wild land fire projects in the Fire and Emergency Services Program that support the INRMP implementation**	**12/18/2009**

RTLA-GIS							
Section	**INRMP Goal**	**Goal Created**	**2009 Objectives**	**Objectives Created**	**Comments**	**2010 Update**	**Update Created**
RTLA	**Monitor floral resources on AHATS**	**8/1/2007**	**In 2009, re-assess monitoring protocol for vegetation.**	**12/12/2008**	**Moved to Vegetation Management**		

RTLA-GIS							
Section	**INRMP Goal**	**Goal Created**	**2009 Objectives**	**Objectives Created**	**Comments**	**2010 Update**	**Update Created**
RTLA	**Monitor faunal (Birds, Mammals, and Reptiles and Amphibians) resources on AHATS**	**8/1/2007**	**In 2009, re-assess monitoring protocol for mammals.**	**12/12/2008**	**Moved to Fish & Wildlife Mgmt (Mammals) Section**		
			In 2009, continue an annual monitoring program for birds on RTLA plots.	**12/12/2008**	**Moved to Fish & Wildlife Mgmt Section**		
			In 2009 re-assess monitoring protocol for reptiles and amphibians.	**12/12/2008**	**Moved to Fish & Wildlife Mgmt Section**		
RTLA	**Provide information to land managers about the status of natural and cultural resources on AHATS**	**8/1/2007**	**In 2009, reassess RTLA monitoring protocol.**	**12/12/2008**	**Not completed**	**In 2010, reassess RTLA monitoring protocol.**	**12/18/2009**
			In 2009 continue to implement RTLA assessment # 1	**12/12/2008**	**Ongoing**	**In 2010, continue to implement RTLA assessment # 1.**	**12/18/2009**
			In 2009, create an ITAM annual report which documents the accomplishments for the preceding year.	**12/12/2008**	**Not completed**	**In 2010, create an ITAM annual report which documents the accomplishments for that preceding year.**	**12/18/2009**
			In 2009, provide information to the AHATS SDP, INRMP, IPMP, ICRMP, and Range Regulations.	**12/12/2008**	**Ongoing**	**In 2010, provide information to the AHATS SDP, INRMP, IPMP, ICRMP, and Range Regulations.**	**12/18/2009**

RTLA-GIS							
Section	**INRMP Goal**	**Goal Created**	**2009 Objectives**	**Objectives Created**	**Comments**	**2010 Update**	**Update Created**
GIS	**Provide comprehensive GIS support for AHATS**	**8/1/2007**	**In 2009, conduct a GIS needs assessment to determine application, data, and equipment requirements to support environmental management at AHATS.**	**12/12/2008**	**Not complete**	**In 2010, conduct a GIS needs assessment to determine application, data, and equipment requirements to support environmental management at AHATS.**	**12/18/2009**
			In 2010, develop and provide access to applications, data and equipment identified in needs assessment.	**12/12/2008**	**Not complete**	**In 2010, develop and provide access to applications, data and equipment identified in needs assessment.**	**12/18/2009**
			In 2009, include GIS requirements for AHATS into a GIS Plan.	**12/12/2008**	**Not complete**	**In 2010, include GIS requirements for AHATS into a GIS Plan.**	**12/18/2009**
					New objective	**Provide AHATS staff GIS support as needed.**	**12/18/2009**

TRI-LRAM							
Section	**INRMP Goal**	**Goal Created**	**2009 Objectives**	**Objectives Created**	**Comments**	**2010 Update**	**Update Created**
TRI	**Provide military trainers and land managers with the necessary technical and analytical information for them to meet their requirements**	**8/1/2007**	**In 2009, the 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.**	**12/12/2008**		**In 2010, the 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.**	**12/11/2009**

TRI-LRAM							
Section	**INRMP Goal**	**Goal Created**	**2009 Objectives**	**Objectives Created**	**Comments**	**2010 Update**	**Update Created**
			Accommodate as appropriate 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.	**12/12/2008**		**Accommodate as appropriate 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.**	**12/11/2009**
TRI	**Optimize training land management decisions by coordinating mission requirements and land maintenance activities**	**8/1/2007**	**Advise on the allocation of land to support current and projected training mission requirements.**	**12/12/2008**		**Advise on the allocation of land to support current and projected training mission requirements.**	**12/11/2009**
			The TAC position will coordinate usage with external organizations, supporting agencies, tenant activities, and higher headquarters.	**12/12/2008**		**The TAC position will coordinate usage with external organizations, supporting agencies, tenant activities, and higher headquarters.**	**12/11/2009**
			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.	**12/12/2008**		**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.**	**12/11/2009**
TRI	**Ensure adequate staffing and resources to full manage and protect AHATS's natural resources**	**8/1/2007**	**Maintain Training Area Coordinator to provide full time support for TRI needs at AHATS.**	**12/12/2008**		**Maintain Training Area Coordinator to provide full time support for TRI needs at AHATS.**	**12/11/2009**
LRAM	**Sustain soil resources to ensure long-term military use**	**8/1/2007**	**Employ a Site Assessment type methodology to identify areas for redesign, rehabilitation, and/or repair by implementing RTLA assessment # 1.**	**12/12/2008**		**In 2010 continue to implement RTLA assessment # 1.**	**12/11/2009**

TRI-LRAM							
Section	**INRMP Goal**	**Goal Created**	**2009 Objectives**	**Objectives Created**	**Comments**	**2010 Update**	**Update Created**
			Implement management recommendations for 34 sites identified in RTLA Assessment #1.	**12/12/2008**		**In 2010 implement management recommendations for sites identified in RTLA Assessment #1.**	**12/11/2009**

SRA							
Section	**INRMP Goal**	**Goal Created**	**2009 Objectives**	**Objectives Created**	**Comments**	**2010 Update**	**Update Created**
SRA	**Minimize resource damage by educating the land users of how their activities might impact the environment.**	**8/1/2007**	**Continue to educate land users of their environmental stewardship responsibilities.**	**12/12/2008**		**Continue to educate land users of their environmental stewardship responsibilities.**	**12/11/2009**
			Conduct Environmental Briefings (Pre-camp conferences, trainer workshops, Training Area Coordination Briefings, schools, and civilian organizations).	**12/12/2008**		**Conduct Environmental Briefings (Pre-camp conferences, trainer workshops, Training Area Coordination Briefings, schools, and civilian organizations).**	**12/11/2009**
			Promote compliance with AHATS environmental regulations.	**12/12/2008**		**Promote compliance with AHATS environmental regulations.**	**12/11/2009**
SRA	**Instill a sense of pride and stewardship for those that use AHATS's natural and cultural resources**	**8/1/2007**	**Improve public relations through SRA by communicating our success at sustaining mission activities.**	**12/12/2008**		**Improve public relations through SRA by communicating our success at sustaining mission activities.**	**12/11/2009**

SRA							
Section	**INRMP Goal**	**Goal Created**	**2009 Objectives**	**Objectives Created**	**Comments**	**2010 Update**	**Update Created**
			Convey installation mission and training objectives to environmental professionals and the public.	**12/12/2008**		**Convey installation mission and training objectives to environmental professionals and the public.**	**12/11/2009**
			Continue to implement a public education program.	**12/12/2008**		**Continue to implement a public education program.**	**12/11/2009**

VEGETATION MANAGEMENT							
Section	**INRMP Goal**	**Goal Created**	**2009 Objectives**	**Objectives Created**	**Comments**	**2010 Update**	**Update Created**
Wetlands	**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**	**8/1/2007**	**Obtain all necessary permits required by the "Federal" Clean Water Act (CWA) and "State" Wetland Conservation Act (WCA) before project implementation.**	**12/12/2008**		**Obtain all necessary permits required by the "Federal" Clean Water Act (CWA) and "State" Wetland Conservation Act (WCA) before project implementation.**	**12/11/2009**
			In 2009 complete SCSU Study and 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.	**12/12/2008**		**In 2010, 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.**	**12/11/2009**
			Document wetland banking in annual accomplishment report	**12/22/2008**		**Document wetland banking in annual accomplishment report**	**12/11/2009**

VEGETATION MANAGEMENT

Section	INRMP Goal	Goal Created	2009 Objectives	Objectives Created	Comments	2010 Update	Update Created
Grasslands - Woodlands	Restore and manage the grassland and woodland communities for the purposes of military training, protection of native species, oak savannah restoration, and soil stabilization	8/1/2007	In 2009, start a process to implement NRDA projects if funding is received.	12/12/2008		In 2010, start a process to implement NRDA projects if funding is received.	12/11/2009
			In 2009, evaluate and prioritize the grassland compartments for management needs based on previous years assessments.	12/12/2008	Not Complete	In 2010, evaluate and prioritize the grassland compartments for management needs based on previous years assessments.	12/22/2009
			In 2009 complete SCSU Study and 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.	12/12/2008	Not Complete	In 2010, 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.	12/22/2009
			Ensure adequate fire breaks and other safety procedures are in place	12/12/2008	Completed	Ensure adequate fire breaks and other safety procedures are in place	12/22/2009
			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.	12/12/2008	Ongoing	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.	12/22/2009
	Monitor floral resources on AHATS	8/1/2007 (under RTLA)			Imported from RTLA section; Not completed, insufficient professional	In 2010, re-assess monitoring protocol for vegetation.	12/22/2009

VEGETATION MANAGEMENT							
Section	**INRMP Goal**	**Goal Created**	**2009 Objectives**	**Objectives Created**	**Comments**	**2010 Update**	**Update Created**
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PLANTED OR CULTIVATED VEGETATION NEAR BUILDINGS and BORDERS							
Section	**INRMP Goal**	**Goal Created**	**2009 Objectives**	**Objectives Created**	**Comments**	**2010 Update**	**Update Created**
Cantonment	**Protect and develop landscaped grounds for functional and aesthetic qualities in the urban area of AHATS**	**8/1/2007**	**In 2009, maintain a tree nursery to supply future landscaping needs.**	**12/12/2008**		**In 2010 maintain a tree nursery to supply future landscaping needs.**	**12/22/2009**
			In 2009, 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.	**12/12/2008**		**In 2010 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.**	**12/22/2009**

FISH AND WILDLIFE MANAGEMENT
(Mammals)

Section	INRMP Goal	Goal Created	2009 Objectives	Objectives Created	Comments	2010 Update	Update Created
White-tail Deer	Monitor and maintain a viable deer population	8/1/2007	In 2009, use information from past research, together with deer harvest data and aerial surveys, to provide a basis for determining management objectives.	12/12/2008	Ongoing	In 2010, use information from past research, together with deer harvest data and aerial surveys, to provide a basis for determining management objectives.	12/22/2009
			In 2009 conduct, two-two day, Youth archery deer hunts.	12/12/2008	Completed, see Outreach & Recreation Section	In 2010 conduct, two-two day, Youth archery deer hunts.	12/22/2009
			In 2009, conduct five (2-3 day), Deployed soldier archery deer hunts.	12/12/2008	Completed, see Outreach & Recreation Section	In 2010, conduct five (2-3 day), Deployed soldier archery deer hunts.	12/22/2009
			In 2009 conduct two, 3-day archery turkey hunts.	12/12/2008	Completed, see Outreach & Recreation Section	In 2010 conduct two, 3-day archery turkey hunts.	12/22/2009
			In 2009, conduct one three-day, "Volunteer" archery deer hunt.	12/12/2008	Completed, see Outreach & Recreation Section; Delete Objective		12/22/2009
					New objective	In 2010, conduct one three-day archery deer hunt for youth of MN Air and Army National Guard members.	12/22/2009

FISH AND WILDLIFE MANAGEMENT (Mammals)							
Section	**INRMP Goal**	**Goal Created**	**2009 Objectives**	**Objectives Created**	**Comments**	**2010 Update**	**Update Created**
Nuisance Animal Control	**Monitor and removal of nuisance and feral animals**	**8/1/2007**	**In 2009 conduct scent post surveys to track population levels as needed.**	**12/12/2008**	**Not completed, insufficient professional staff**	**In 2010 conduct scent post surveys to track population levels as needed.**	**12/22/2009**
			Annually record observations of nuisance and feral animal species.	**12/12/2008**	**Ongoing**	**Annually record observations of nuisance and feral animal species.**	**12/22/2009**
			Eliminate entry points for feral animals	**12/12/2008**	**Ongoing**	**Eliminate entry points for feral animals**	**12/22/2009**
			Remove nuisance and feral animals as needed	**12/12/2008**	**Ongoing**	**Remove nuisance and feral animals as needed**	**12/22/2009**
	Monitor faunal (Birds, Mammals, and Reptiles and Amphibians) resources on AHATS	**8/1/2007 (under RTLA)**			**Inserted from RTLA Section; Not completed, insufficient professional staff**	**In 2010, re-assess monitoring protocol for mammals.**	**12/22/2009**

FISH AND WILDLIFE MANAGEMENT (Birds-Herps-Inverts-Protected Species)							
Section	**INRMP Goal**	**Goal Created**	**2009 Objectives**	**Objectives Created**	**Comments**	**2010 Update**	**Update Created**
Birds (Nesting Structures)	**Continue to make nesting structures available**	**8/1/2007**	**In 2009, map and determine the number of existing nesting structures.**	**12/12/2008**	**Not completed, insufficient professional staff**	**In 2010, map and determine the number of existing nesting structures.**	**12/22/2009**

FISH AND WILDLIFE MANAGEMENT (Birds-Herps-Inverts-Protected Species)							
Section	**INRMP Goal**	**Goal Created**	**2009 Objectives**	**Objectives Created**	**Comments**	**2010 Update**	**Update Created**
			In 2009, repair, replace, or add nesting structures as necessary.	12/12/2008	Craig Andreson, volunteer - Ongoing	In 2010, repair, replace, or add nesting structures as necessary.	12/22/2009
			In 2009, enlist the help of volunteers for annual maintenance and monitoring of nesting structures.	12/12/2008	Craig Andreson, volunteer - Ongoing	In 2010, enlist the help of volunteers for annual maintenance and monitoring of nesting structures.	12/22/2009
Songbirds	Monitor songbird populations on AHATS	8/1/2007	Conduct annual surveys for songbirds on RTLA plots.	12/12/2008	Completed, see AHATS Bird Section	In 2010, conduct annual surveys for songbirds on INRMP plots.	12/22/2009
Reptiles and Amphibians	Continue to monitor the presence and abundance of reptiles and amphibians	8/1/2007	Continue to support an annual anuran survey through the MNDNR.	12/12/2008	John Moriarty, volunteer - Ongoing	In 2010, continue to support an annual anuran survey through the MNDNR.	12/22/2009
			In 2009, investigate new methods for monitoring reptiles and amphibians at AHATS.	12/12/2008	Not completed, insufficient professional staff	In 2010, investigate new methods for monitoring reptiles and amphibians at AHATS.	12/22/2009
Invertebrates	Continue to monitor the presence and abundance of terrestrial and aquatic invertebrates	8/1/2007	Continue to support the Audubon Society's July butterfly survey.	12/12/2008	Ongoing, see AHATS Insect Section	Continue to support the Audubon Society's July butterfly survey.	12/22/2009
			In 2009, investigate whether any invertebrate studies or inventories are needed.	12/12/2008	Not completed, insufficient professional staff	In 2010, investigate whether any invertebrate studies or inventories are needed.	12/22/2009

FISH AND WILDLIFE MANAGEMENT (Birds-Herps-Inverts-Protected Species)							
Section	**INRMP Goal**	**Goal Created**	**2009 Objectives**	**Objectives Created**	**Comments**	**2010 Update**	**Update Created**
T & E Species	**Manage and protect species that are listed as threatened or endangered by the federal government or the State of Minnesota**	**8/1/2007**			**NEW OBJECTIVE**	**In 2010, continue to monitor resident and transient threatened and endangered species that may be present at AHATS and implement management recommendations as noted in the Protected Species Management Plan (Dirks et al. 2009), as funding allows.**	**12/22/2009**
			In 2009, survey habitats inhabited by the plains pocket mouse and make management recommendations.	**12/12/2008**	**Completed see AHATS Mammals Section**	**Conduct habitat enhancement within existing habitat, and survey population in 2011 (Dirks et al. 2009)**	**12/22/2009**
			In 2009, monitor the presence and reproductive success of trumpeter swans.	**12/12/2008**	**Completed, see AHATS Birds Section**	**In 2009, monitor the presence and reproductive success of trumpeter swans (Dirks et al. 2009).**	**12/22/2009**
			Continue a monitoring program specifically for Blanding's Turtles	**12/12/2008**	**Not completed, insufficient professional staff**	**Continue a monitoring program specifically for Blanding's Turtles (Dirks et al. 2009).**	**12/22/2009**
			Annually monitor for the presence of bald eagles	**12/12/2008**	**None Present, Ongoing**	**Annually monitor for the presence of bald eagles (Dirks et al. 2009).**	**12/22/2009**
			In 2010, monitor for the presence of the Henslow's sparrow.	**12/12/2008**	**Completed, see AHATS Birds Section**	**In 2010, monitor for the presence of the Henslow's sparrow (Dirks et al. 2009).**	**12/22/2009**
					NEW OBJECTIVE	**Maintain suitable habitat for Henslow's sparrows (Dirks et al. 2009)**	**12/22/2009**

FISH AND WILDLIFE MANAGEMENT (Birds-Herps-Inverts-Protected Species)							
Section	**INRMP Goal**	**Goal Created**	**2009 Objectives**	**Objectives Created**	**Comments**	**2010 Update**	**Update Created**
	Monitor faunal (Birds, Mammals, and Reptiles and Amphibians) resources on AHATS	**8/1/2007**			**Inserted from RTLA Section; See 2009 report**	**In 2010, continue an annual monitoring program for birds on plots.**	**12/22/2009**
					Inserted from RTLA Section; Not completed, insufficient professional staff	**In 2010, re-assess monitoring protocol for reptiles and amphibians.**	**12/22/2009**

LAND USE							
Section	**INRMP Goal**	**Goal Created**	**2009 Objectives**	**Objectives Created**	**Comments**	**2010 Update**	**Update Created**
Land Use	**Identify and develop appropriate land use opportunities**	**8/1/2007**	**Continue to allow public access to AHATS for recreation and educational activities**	**12/12/2008**		**Continue to allow public access to AHATS for recreation and educational activities**	**12/22/2009**
		8/1/2007	**Continue to foster relationships with local interest groups that want to help maintain and develop AHATS natural resources.**	**12/12/2008**		**Continue to foster relationships with local interest groups that want to help maintain and develop AHATS natural resources.**	**12/22/2009**

Appendix C: Camp Ripley Interagency Agreement between Minnesota Department of Military Affairs and Minnesota Department of Natural Resources, 2009.

Cooperative Agreement
For Integrated Natural Resource Management
At Camp Ripley Military Reservation

This Cooperative Agreement for Natural Resources Management at Camp Ripley Military Reservation (hereinafter Camp Ripley) is made and entered into by and between the Department of Military Affairs of the State of Minnesota (hereinafter DMA) by the Adjutant General of the State of Minnesota and the Minnesota Department of Natural Resources (hereinafter DNR) by its Commissioner of Natural Resources.

WHEREAS, Camp Ripley is a military installation consisting of approximately 53,000 acres of land located in Morrison County, Minnesota; and

WHEREAS, Camp Ripley is operated for military training purposes by the Adjutant General pursuant to Minn. Stat. Chapter 190; and

WHEREAS, the Adjutant General is charged by law with the responsibility for the operation, protection, use and safety of Camp Ripley, and is authorized by law to sell timber and crops growing on Camp Ripley; and

WHEREAS, the Adjutant General desires to provide for the conservation, management, utilization and restoration of natural resources on Camp Ripley; and

WHEREAS, the DNR is charged by state law with the responsibility to conserve, manage, utilize and restore the natural resources of the State of Minnesota; and

WHEREAS, Camp Ripley is a statutory game refuge established pursuant to Minn. Stat. Sec. 97A.085; and

WHEREAS, DNR and DMA mutually acknowledge that they find it to be in accordance with their respective statutory authorities and in the best interests of the people of the State of Minnesota to enter into this Cooperative Agreement;

NOW, THEREFORE, DNR and DMA agree to the following terms and conditions:

1. The parties will enter into a Cooperative Agreement for managing the natural resources of Camp Ripley. This program will include a long-range integrated natural resource management plan, annual work plans and specific projects for program implementation. These plans and projects will, upon approval of DMA and DNR, be deemed incorporated into this Cooperative Agreement.

2. Under this program, DNR shall be allowed to undertake any natural resource management and enforcement activities required by and/or authorized by law, except that DMA may prohibit or limit any activities

which are not required by law and which in DMA's opinion will adversely affect Camp Ripley's security, military mission, or other resources.

3. The integrated natural resource management plan will include but is not limited to inventories, classifications, and management goals for the natural resources under management.

4. The integrated natural resource management plan will include consideration of the following program areas: Fisheries, Wildlife, Forestry, Vegetation Management, Recreation, Land Use, Waters, Law Enforcement and others. Annual work plans shall be developed by the DNR and DMA for each program area with proposed projects. Work plan proposals will be provided to each other no later than 31 January of each year and at least 60 days before plan implementation.

5. DNR and DMA shall submit to each other annual reports of all resource management activities that were undertaken by each agency at Camp Ripley relevant to this Cooperative Agreement during the preceding calendar year. This report will be furnished no later than 31 January and will provide information on the accomplishment of work plan activities in a format specified in the natural resource management plan. Representatives of DMA and DNR shall meet at least once annually to review annual work plans and reports and to review and, if necessary, revise the integrated natural resources management plan and activities undertaken pursuant to this Cooperative Agreement. The Camp Ripley Commander shall call and convene the annual meeting no later than 28 February of each year.

6. In performing resource management activities pursuant to this Cooperative Agreement, DNR employees are authorized to enter Camp Ripley in accordance with procedures established by the DMA. Other individuals or contractors performing resource management work as part of this Agreement shall consult with Camp Ripley Security about entry procedures and regulations and then cooperate with the Range Control office in all matters pertaining to authorized entry to Camp Ripley.

7. In furtherance of this Cooperative Agreement and any projects undertaken hereunder, DMA agrees to provide such personnel and equipment as it, in its sole discretion, deems feasible.

8. The parties expressly acknowledge that Camp Ripley is primarily a military training facility and that the military mission of Camp Ripley as determined by DMA shall take precedence over any resource management activity, subject only to limits imposed by law. DMA agrees that it will notify DNR of any conflicts between the military use of Camp Ripley and the operation of this Cooperative Agreement, the integrated natural resource

management plan, or annual work plans undertaken hereunder. The parties will promptly review and mutually assess such conflicts and determine whether the management plan or work plans must be modified or cancelled. In the event of disagreement, final determinations shall be made by DMA.

9. Each party hereto shall be responsible and liable for its own actions and the consequences of these actions to the extent provided by law, and shall not be responsible for the actions of the other party or for the consequences of these actions. The parties to this Agreement waive all claims against each other for any loss, damage, personal injury or death suffered by them, their agents, officers or employees in consequence of the performance of this Agreement to the extent permitted by law.

10. For purposes of worker's compensation, all military personnel involved in any of the activities contemplated by this agreement shall at all times be considered employees of the Department of Military Affairs: likewise, for purposes of worker's compensation, all DNR personnel, so serving, involved in such activities shall at all times be considered employees of the Department of Natural Resources.

11. This Agreement shall become effective on the last date listed below, and may be terminated by either party upon 90 days prior notice to the other party.

12. All work undertaken pursuant to this Agreement shall be subject to State Department of Administration rules and procedures and the laws of the State of Minnesota, and shall be subject to audit by the State.

13. Nothing in this Agreement shall be construed as obligating the State to expend money in excess of appropriations authorized by law and administratively allocated to this Agreement.

Dated: 1-6-2010

Department of Military Affairs

BY: _____

LARRY W. SHELLITO
The Adjutant General

Dated: 12-21-09

Department of Natural Resources

BY: _____

MARK HOLSTEN
Commissioner of Natural Resources

Appendix D: Arden Hills Army Training Site Interagency Agreement between Minnesota Department of Military Affairs and Minnesota Department of Natural Resources, 2009.

Cooperative Agreement
For Integrated Natural Resource Management
At Arden Hills Army Training Site (AHATS)

This Cooperative Agreement for Natural Resources Management at Arden Hills Army Training Site (hereinafter AHATS) is made and entered into by and between the Department of Military Affairs of the State of Minnesota (hereinafter DMA) by the Adjutant General of the State of Minnesota and the Minnesota Department of Natural Resources (hereinafter DNR) by its Commissioner of Natural Resources.

WHEREAS, AHATS is a military installation consisting of approximately 1,500 acres of land located in Ramsey County, Minnesota; and

WHEREAS, AHATS is operated for military training purposes by the Adjutant General pursuant to Minn. Stat. Chapter 190; and

WHEREAS, the Adjutant General is charged by law with the responsibility for the operation, protection, use and safety of AHATS; and

WHEREAS, the Adjutant General desires to provide for the conservation, management, utilization and restoration of natural resources on AHATS; and

WHEREAS, the DNR is charged by state law with the responsibility to conserve, manage, utilize and restore the natural resources of the State of Minnesota; and

WHEREAS, DNR and DMA mutually acknowledge that they find it to be in accordance with their respective statutory authorities and in the best interests of the people of the State of Minnesota to enter into this Cooperative Agreement;

NOW, THEREFORE, DNR and DMA agree to the following terms and conditions:

1. The parties will enter into a Cooperative Agreement for managing the natural resources of AHATS. This program will include a long-range integrated natural resource management plan, annual work plans and specific projects for program implementation. These plans and projects will, upon approval of DMA and DNR, be deemed incorporated into this Cooperative Agreement.

2. Under this program, DNR shall be allowed to undertake any natural resource management and enforcement activities required by and/or authorized by law, except that DMA may prohibit or limit any activities which are not required by law and which in DMA's opinion will adversely affect AHATS's security, military mission, or other resources.

3. The integrated natural resource management plan will include but is not limited to inventories, classifications, and management goals for the natural resources under management.

4. The integrated natural resource management plan will include consideration of the following program areas: Fisheries, Wildlife, Forestry, Vegetation Management, Recreation, Land Use, Waters, Law Enforcement and others. Annual work plans shall be developed by the DNR and DMA for each program area with proposed projects. Work plan proposals will be provided to each other no later than 31 January of each year and at least 60 days before plan implementation.

5. DNR and DMA shall submit to each other annual reports of all resource management activities that were undertaken by each agency at AHATS relevant to this Cooperative Agreement during the preceding calendar year. This report will be furnished no later than 31 January and will provide information on the accomplishment of work plan activities in a format specified in the natural resource management plan. Representatives of DMA and DNR shall meet at least once annually to review annual work plans and reports and to review and, if necessary, revise the integrated natural resources management plan and activities undertaken pursuant to this Cooperative Agreement. The Camp Ripley/AHATS Commander shall call and convene the annual meeting no later than 28 February of each year.

6. In performing resource management activities pursuant to this Cooperative Agreement, DNR employees are authorized to enter AHATS in accordance with procedures established by the DMA. Other individuals or contractors performing resource management work as part of this Agreement shall consult with AHATS's Security about entry procedures and regulations and then cooperate with the Training Area Coordinator in all matters pertaining to authorized entry to AHATS.

7. In furtherance of this Cooperative Agreement and any projects undertaken hereunder, DMA agrees to provide such personnel and equipment as it, in its sole discretion, deems feasible.

8. The parties expressly acknowledge that AHATS is primarily a military training facility and that the military mission of AHATS as determined by DMA shall take precedence over any resource management activity, subject only to limits imposed by law. DMA agrees that it will notify DNR of any conflicts between the military use of AHATS and the operation of this Cooperative Agreement, the integrated natural resource management plan, or annual work plans undertaken hereunder. The parties will promptly review and mutually assess such conflicts and

determine whether the management plan or work plans must be modified or cancelled. In the event of disagreement, final determinations shall be made by DMA.

9. Each party hereto shall be responsible and liable for its own actions and the consequences of these actions to the extent provided by law, and shall not be responsible for the actions of the other party or for the consequences of these actions. The parties to this Agreement waive all claims against each other for any loss, damage, personal injury or death suffered by them, their agents, officers or employees in consequence of the performance of this Agreement to the extent permitted by law.

10. For purposes of worker's compensation, all military personnel involved in any of the activities contemplated by this agreement shall at all times be considered employees of the Department of Military Affairs: likewise, for purposes of worker's compensation, all DNR personnel, so serving, involved in such activities shall at all times be considered employees of the Department of Natural Resources.

11. This Agreement shall become effective on the last date listed below, and may be terminated by either party upon 90 days prior notice to the other party.

12. All work undertaken pursuant to this Agreement shall be subject to State Department of Administration rules and procedures and the laws of the State of Minnesota, and shall be subject to audit by the State.

13. Nothing in this Agreement shall be construed as obligating the State to expend money in excess of appropriations authorized by law and administratively allocated to this Agreement.

Dated: 1-6-2010

Department of Military Affairs

BY: _____
LARRY W. SHELLITO
The Adjutant General

Dated: 12-21-09

Department of Natural Resources

BY: _____
MARK HOLSTEN
Commissioner of Natural Resources

Appendix E: Camp Ripley annual meeting minutes, 2009.

MEMORANDUM FOR RECORD 23 January 2009

SUBJECT: Minutes of the DMA, DNR and USFWS Annual Meeting, 22 January 2009

1. Introduction. COL Richard Weaver at 0905 22 January 2009, called the annual meeting of the DMA-DNR and USFWS Natural Resource Professionals to order. The meeting was held at room 1115 at Camp Ripley MN. Members present:

Department of Military Affairs:
COL Richard Weaver, Post Commander
MAJ Keith Ferdon, Training Area Coordinator
2LT Katie Arndt, Training Area Coordinator
SGM Dan Smith, Post Operations
Mr. Marty Skoglund, Environmental Supervisor
Mr. Bill Brown, Natural/Cultural Specialist
Mr. Jay Brezinka, Natural Resource Manager
Mr. Craig Erickson, GIS Manager

Department of Natural Resources:
Mr. Dirk Peterson, Regional Director "Acting" (St. Paul)
Mr. Wayne Damerow, Regional Forest Manager (St. Paul)
Mr. John Korzeniowski, Area Forest Supervisor (Little Falls)
Ms. Linda Gormanson, Program Forester (Little Falls)
Mr. Tod Tonsager, Wildlife Asst. Manager (Little Falls)
Mr. Eric Altena, Fisheries Supervisor (Little Falls)
Mr. Brian Dirks, Animal Survey Coordinator (Camp Ripley)
Ms. Nancy Dietz, Animal Survey Asst. (Camp Ripley)
Ms. Pam Perry, NR Supervisor, Ecological Services (Brainerd)
Mr. Paul Roth, Manager Crow-Wing Park
Mr. Mark Hauck, Community Assistance Specialist (St. Cloud)
Mr. Rob Haberman, Enforcement (Little Falls)

United States Fish & Wildlife Service:
Mr. Nick Rowse, Biologist (Bloomington)

The Nature Conservancy:
Mr. Todd Holman, Regional Director (Cushing)
Mr. Tim Notch, Land Steward (Cushing)

Board of Water and Soil Resources:
Mr. John Jaschke, Executive Director (St Paul)

Morrison County Soil and Water Conservation District:
Ms. Helen McLennan, District Manager (Little Falls)
Mr. Lance Chisholm, District Technician (Little Falls)

2. Opening Remarks.

COL Weaver welcomed everyone to Camp Ripley and provided a brief history of his involvement with the natural resource programs on Camp Ripley. COL Weaver thanked all of those present for their commitment and hard work in helping implement the natural resource programs and ACUB initiative for the MNARNG. COL Weaver also expressed his gratitude towards the successful partnerships, which allowed the MNARNG to receive the 2008 Conservation Award for large installations. The objectives of the meeting were to discuss 2008 accomplishments and 2009 work plans.

3. Discussion.

A presentation by MAJ Ferdon regarding the future direction on range use and development kicked off the meeting. A presentation was then given by Mr. Brezinka, which summarized the 2008 accomplishments for both the ITAM and Conservation programs and briefly explained the 2009 work plans. An update was then given by Mr. Jaschke, Ms. McLennan, Mr. Skoglund and Mr. Hauck on the ACUB program; an open comment and discussion period then followed. Listed below are some of the key issues, highlights, and projects for natural resource management on Camp Ripley.

Natural Resources:

1. From a planning stand point, this is our second 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. Within the conservation report are also the updated goals and objectives for all the conservation and ITAM programs for Camp Ripley and AHATS.
2. A wild land fire plan and ITAM plan to be completed in 2009.
3 From an administration or budgeting perspective for 2010, the budgets are projected to decrease for both program areas (Conservation 15-30%, ITAM 40%).

Wildlife: (Fauna)

1. All hunts were very successful. Harvest on Camp Ripley was 549 White-tailed Deer.
2. A turkey hunt for deployed soldiers will be implemented for the first time on Camp Ripley and AHATS in 2009.
3. The fisher study is in its second year, two are radio collared.
4. Continue to implement fauna surveys (songbird, anuran, osprey, owls, bear, etc).
5. Continue to monitor federal threatened and endangered species and species of greatest conservation need. Coordinate efforts with State Wildlife Action Plan (SWAP).

Vegetation: (Flora)

1. Re-inventory approx. 4500 acres of forest in 2009. To date (16,365 acres have been re-inventoried).
2. Six timber cuts planned for 2009, 2010-2011 cut list under review.
3. Continue to implement prescribed fire program at Camp Ripley.
4. Land fund was approved in 2008, bylaws were created. Land fund projects will begin implementation in 2009. Staffs are working on project lists.
5. Continue to implement the maneuver trail project in Maneuver Area K1.
6. Continue to implement the Invasive Species Project with SCSU.
7. Several RTLA assessments will be implemented in 2009.

Fisheries:

1. Harvested 14,340 walleyes and 853 Muskie's in 2008 from Camp Ripley.
2. Operated, Coon Stump, Long, Muskrat for walleye rearing and Frog, and Miller for Muskies.
3. Lake Assessment on Lake Alott, Ferrell and Fosdick Lakes to be completed in 2009.
4. Create new access into Fosdick Lake in 2009.

ACUB:

1. $10,731,500 to date in federal funding (2004-2008) $3,349,000 DNR $7,382,500 BWSR.
2. 205 interested landowners represent 28,290 acres.
3. Interest in easements (91%) and acquisition (9%).
4. 42 land transactions representing 9,114 acres completed or underway.
5. Crow-Wing State Park has acquired, through there Paul Bunyan Trail Project 552 acres providing a trail route from Lake Bemidji to Crow-Wing State Park. This project also protected 3 miles of shoreline along the Mississippi River. The ACUB program helped acquire one of the land deals.
6. DNR submitted a two year proposal to the Lessard Heritage Fund for a cash match in fee title acquisition projects in the ACUB buffer.

Cultural Resources:

1. Complete the Phase II evaluation of 7 protected cultural sites located on the MPRC, ISBC and Maneuver lanes range development areas.
2. Continue to meet and discuss the proposed language for a programmatic agreement with the 11 participating federally-recognized Indian Tribes in the Nation to Nation federal Consultation. Will attempt to meet formally again before year's end.
3. Complete the five year update and revision of the Integrated Cultural Resource Management Plan (ICRMP).

4. Fifteen of the most hazardous farmstead sites were cleared-filled and capped for soldier safety. More to be filled in 2009.
5. Continue to complete the Phase I evaluation on sites as deemed by Range complex master plan.

Meeting was adjourned at 13:32 pm.

Minutes Submitted By:
Jay Brezinka, Natural Resource Manager

Appendix F: Arden Hills Army Training Site annual meeting minutes, 2009.

MEMORANDUM FOR RECORD 4 March 09

SUBJECT: Minutes of the DMA, DNR and USFWS Annual Meeting, 3 March 2009

1. Introduction. Mr. Dave Hamernick at 1005, 3 March 2009, called the annual meeting of the Natural Resource committee to order. The meeting was held at the Arden Hills City Hall. Members present:

Department of Military Affairs:
SGM Daniel Smith, Operation SGM
Mr. Jim Krousey, Operations
Mr. Dave Hamernick, AHATS Program Manager
Mt. Tom Rothleutner, Roads and Rails Supervisor
Mr. Todd Hendricks, Department of Public Works
Mr. Jay Brezinka, Natural Resource Manager
Department of Natural Resources:
Mr. Brian Dirks, Animal Survey Coordinator, (Camp Ripley)
Mr. Jim LaBarre, Wildlife (Metro)
Mr. Craig Wills, Area Hydrologist
United States Fish and Wildlife Service:
Mr. Dave Warburton, Biologist
Mr. Nick Rowse, Biologist
Ramsey County:
Mr. John Moriarty, Natural Resource Manager
Natural Resource Restoration Inc:
Mr. Craig Andresen (Pres/Owner)

2. Opening Remarks.

Mr. Hamernick welcomed everyone to Arden Hills Army Training Site (AHATS) and provided a brief history of his involvement with the natural resource programs. Mr. Hamernick thanked all of those present for their commitment and hard work in helping implement the natural resource programs at AHATS. The objectives of the meeting were to discuss 2008 accomplishments and 2009 work plans for the AHATS Integrated Natural Resources Management Plan (INRMP).

3. Discussion.

A discussion by Mr. Hamernick regarding the status on range use and development kicked off the meeting. A presentation was given by Mr. Brezinka regarding DMA's natural resource involvement on the site. A presentation was presented by Mr. Moriarty and Mr. Andresen. Comments were given by the DNR and USFWS partners. Listed below are some of the key issues, highlights, and projects regarding natural resource management on AHATS.

Natural Resources:

There was an informative discussion regarding the Natural Resources Damage Assessment and how the AHATS INRMP can play a critical role in helping guide and implement wildlife restoration projects on AHATS. The NRDA trustees are considering a Conservation Easement on the AHATS property, excluding the 300 acre proposed cantonment area site.

Wildlife: (Fauna)

6. All hunts were very successful. Harvest on AHATS was 47 White-tailed Deer.
7. The DMA will continue to implement the hunting programs at AHATS (2 Youth Hunts, 5 Deployed Soldier Hunts, and 1 Volunteer Hunt) to increase the deer harvest.
8. The DMA will establish two Spring Archery Turkey hunts this year (April 15-17 and 20-22, 2009) (601A and 601B)
9. A 2009 winter aerial survey identified 104 White-tailed deer.
10. Bird and small mammal surveys were completed in 2008.
11. Important Bird Area Dedication (IBA) 4 May, 2008.
12. 388 Bluebird boxes fledged 240 young, and 9 kestrel boxes fledged 20 kestrels.
13. Recommendations were made regarding the implementation of purple martin nest boxes on site.

Vegetation: (Flora)

A lot of discussion involved updating the vegetation management portion of the AHATS INRMP; to include identifying potential vegetation restoration projects throughout AHATS. Topics that were discussed include:

1. 5 NRDA Projects were proposed and inputted in 2008 Conservation report.
2. Vegetation screening on the West and North Boundary of AHATS.
3. Updating the vegetation management goals and objectives to include establishing restoration projects for the INRMP.
4. Projects were underway in 2008 to eradicate black, clammy and bristly locus and eliminate Siberian elm and cotton woods.
5. A project is being implemented in March 2009 to chip up all down wood debris as bio-fuels for alternative energy.

Cultural Resources:

Complete the Phase II evaluation of 4 protected cultural sites located on AHATS. One site is prehistoric and the other three are historic farmsteads.

General Maintenance:

1. Continue to maintain and repair roads and trails on AHATS.
2. Continue to remove interior fence and railroad tracks.

Meeting was adjourned at 11:45 am.

Minutes Submitted By:
Jay Brezinka, Natural Resource Manager

Appendix G: Camp Ripley and Deployed Soldier Fuelwood Policy, 2009.

STATE OF MINNESOTA, DEPARTMENT OF MILITARY AFFAIRS
MINNESOTA ARMY NATIONAL GUARD

OFFICE OF THE POST COMMANDER
15000 Highway 115, Camp Ripley
LITTLE FALLS, MINNESOTA 56345-4173

JFMN-CRC-Z 18 March 2009

MEMORANDUM All Camp Ripley Employees

SUBJECT: Camp Ripley Fuel Wood Cut

1. Reference Camp Ripley Fuel Wood Cut Policy No. 09-02, attached herein.

2. All Minnesota active/ retired National Guard members and State/ Federal Department of Military Affairs employees have the opportunity to purchase and cut fuel wood on the Camp Ripley Military Reservation.

3. Permits for 5 or 10 cords of fuel wood are available at a cost of $5.00/cord to remove dead, diseased, downed, or marked trees. **Please note that for those employees that are cutting wood during work hours, the wood is not available under their personal fuel wood permit**. Instead, the wood will be hauled to the Deployed Soldier fuel wood storage site located in the cantonment area.

4. The attached policy outlines the conditions and instructions for obtaining a permit. This policy differs from previous policies regarding fuel wood in that the policy requires all permit holders to present a copy of the fuel wood permit to personnel at the main gate when entering and when departing from Camp Ripley. Each load of fuel wood will be recorded and tracked by personnel at the main gate.

5. If you have any questions regarding this policy please contact Marty Skoglund, Camp Ripley Environmental Supervisor, at (320) 616-2722.

RICHARD A. WEAVER
COL, SC, MN ARNG
Post Commander

ARNG TRAINING SITE POLICY FILE

DATE: 17 March 2009

SUBJECT: Fuel Wood Cut - Camp Ripley

NUMBER: 09-02

BRIEF (If extra space is necessary, attach blank sheets of paper):

1. The Adjutant General, for the State of Minnesota, hereby authorizes all Minnesota active and retired National Guard members, State and Federal Department of Military Affairs employees the opportunity to purchase and cut fuel wood on the Camp Ripley Military Reservation.

2. Fuel wood is available throughout Camp Ripley. A total of 40 permits will be for either five or ten cords at the cost of $5 per cord.

3. Rules governing the fuel wood cut are:

a. An application for a cut must be prepared and submitted along with proof of eligibility (i.e. Military ID) to the Camp Ripley Range Control Office located in Building 24-199 during the hours of 0800-1630, Monday through Friday. The approved application must then be taken to the DNR Foresters at the DNR Office in Little Falls who will issue the actual permit. Enclosure No. 1 is a copy of the fuel wood cut application.

b. Permits are valid from 1 April through 31 March. Permits can be purchased at any time during the year. Cutting will be allowed during daylight hours and no cutting will be permitted when field training or firing closes the wood cut areas. Cutting will not be allowed on specific days including New Years Eve/Day, Memorial Day, July 4th, Labor Day, DAV deer hunt, DNR archery hunt, and Christmas Eve/Day.

c. Each permit holder is authorized any number of helpers. The permit holder must accompany the helper(s) at all times. POV passes will be issued by Range Control.

d. Fuel wood cut permit holders are only authorized to remove dead, diseased, downed, or marked trees. If the permit holder is not sure of the status of the wood in the permit area, they should contact the Training Area Coordinator for clarification as well as areas where they will be allowed to cut. Telephone is (320) 616-3135.

e. Prior permission from Range Control must be obtained daily prior to cutting. Woodcutters must check in with the Range Control Shift Sergeant when entering and exiting the field training areas.

f. When accessing Camp Ripley for fuel wood and when departing Camp Ripley with a load of fuel wood, permit holders must present their permit to personnel at the main gate. Main gate personnel will record the volume of fuel wood that is removed for each load.

g. Training by military units during the months of June, July, and August will reduce the number of areas where woodcutting will be allowed. Cutters are advised to plan accordingly.

h. **FUEL WOOD IS FOR PERSONAL USE ONLY AND IS NOT FOR SALE. VIOLATORS WILL BE DENIED FUELWOOD PERMITS IN THE FUTURE AND ARE SUBJECT TO PROSECUTION.**

REMINDER

DUDS WILL KILL – DO NOT TOUCH !!!!!!
DO NOT GO BEYOND RANGE BARRIERS !!!!!!

1 Enclosure:
Application for Fuel Wood Cut Permit - Camp Ripley

Submitted By: Marty Skoglund, JFMN-CRC-SE

DATE POLICY ESTABLISHED:

9 Sep 93

APPROVED:

//////////signed//////////
RICHARD A. WEAVER
COL, SC, MN ARNG
Post Commander

ATS Form 42 (Revised 17 March 2009)

DATE:_____

APPLICATION FOR
FUEL WOOD CUT PERMIT - CAMP RIPLEY

NAME: _____

ADDRESS: _____

_____

TELEPHONE: Home:_____

Work:_____

Cut Size: _____ 5 Cords or _____ 10 Cords (Check One)

Primary Wood Hauling Vehicle Information

Make:_____

Model:_____

Year: _____

Lic Plate:_____

NAMES OF HELPERS:	TELEPHONE:
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

I hereby certify that I will comply with policies set forth in ARNG Training Site Policy, subject: Fuel Wood Cut - Camp Ripley.

_____ _____
(Signature of Applicant) (Date)

I hereby certify that this application for a Camp Ripley fuel wood cut permit is complete and complies with the policies set forth in ARNG Training Site Policy, subject: Fuel Wood Cut - Camp Ripley.

_____ _____
(Training Area Coordinator) (Date)

Mail or Deliver to: Post Headquarters
ATTN: JFMN-CRC-O
15000 Highway 115, Camp Ripley
Little Falls MN 56345-4173

ARNG TRAINING SITE POLICY FILE

DATE: 17 March 2009

SUBJECT: Deployed Soldier Firewood

NUMBER: 09-01

BRIEF (If extra space is necessary, attach blank sheets of paper):

1. The Adjutant General, for the State of Minnesota, hereby authorizes the availability of firewood from the Camp Ripley Military Reservation for families of all Minnesota Soldiers that are currently deployed (including pre-deployment and post-deployment) in support of the Global War on Terrorism.

2. The firewood is stockpiled at a designated location within the cantonment area of Camp Ripley. Families are entitled to 2 full cords of wood per year.

3. A permit must be obtained from the Family Assistance Center before accessing the firewood. The Family Assistance Center is located in Building 15-1 (old Armory next to the main gate) during the hours of 0800-1630, Monday through Friday. Call in advance to ensure that representative from the Family Assistance Center is available to not only issue the permit but also advise on the availability of stockpiled firewood.

4. Before departing Camp Ripley with the firewood, the permits must be returned to the main gate. This will enable the Family Assistance Center to track users.

5. Each permit holder is authorized any number of helpers for loading the firewood.

6. Firewood is for personal use and is not for sale.

6. Questions regarding the Deployed Soldier firewood program should be directed to Ms. Yvonne Zappa form the Family Assistance Center Telephone: (320) 616-3119.

1 Enclosure:
Firewood permit that will be issued by the Family Assistance Center.

Submitted By: Marty Skoglund, JFMN-CRC-SE

DATE POLICY ESTABLISHED: 17 March 2009

APPROVED:
//////////signed//////////
RICHARD A. WEAVER
COL, SC, MN ARNG
Post Commander

Enclosure No. 1 – Deployed Soldier Firewood Permit

This permit allows

_____

To pick up wood from Camp Ripley on _____ 2009

Approved for _____ loads

Approved by _____

Please turn in permit to the gate guards for approval before departure.

DATE:_____

Appendix H: Camp Ripley Land Fund Legislation

2008 Minnesota Statutes

190.25 LANDS FOR TRAINING ARMED FORCES.

Subdivision 1.**Acquisition.**

The adjutant general is hereby authorized to acquire in the name of the state by purchase, lease, gift, or condemnation, and is authorized to lease all lands which the adjutant general may deem necessary, including lands already devoted to a public use, for military training purposes, adjacent to or in the vicinity of the Military Field Training Center at Camp Ripley, or at any other suitable place in this state, subject to the limitations of funds appropriated and available.

Subd. 2. **Condemnation.**

The adjutant general may, except as to lands already devoted to a public use, at any time after the filing of a petition for the condemnation of any lands authorized by this section take possession of it. Proceedings for the condemnation of lands authorized herein shall be governed by chapter 117.

Subd. 3.**Sale; use of funds.**

The adjutant general is authorized to sell in the manner provided by law any or all

(1) land, and

(2) growing crops, buildings, and other improvements, if any, situated upon the land, acquired under the authority of subdivision 1 or which may hereafter comprise the Camp Ripley Military Field Training Center and not needed for military training purposes. The proceeds of any sales shall be deposited in the general fund.

The adjutant general may use funds that are directly appropriated for the acquisition of land, the payment of expenses of forest management on land forming the Camp Ripley Military Reservation, and the provision of an Enlisted Person's Service Center. If amounts that are directly appropriated for these purposes in either year of a biennium are insufficient, the appropriation for the other year of the biennium is available.

Subd. 3a.**Timber sales; use of funds.**

The adjutant general is authorized to sell in the manner provided by law any or all timber on land acquired under the authority of subdivision 1 or which may hereafter comprise the Camp Ripley Military Field Training Center. The proceeds of any sales of timber under this subdivision must be deposited in an account in the special revenue fund and are appropriated to the adjutant general to be used to manage the timber resources of Camp Ripley in a manner consistent with the camp's purpose as lands for training armed forces.

Subd. 4. **Closing roads or highways.**

The adjutant general is authorized, whenever military training purposes require, to close and obliterate any and all public roads or highways established over and upon any of the lands acquired under the authority of this section. In order to accomplish prescribed military training at the Camp Ripley Military Reservation, the adjutant general may temporarily close any road or highway adjacent to the Camp Ripley Military Reservation with the concurrence of the road authorities. Prior to closing any road or highway the adjutant general shall erect suitable signs and barriers in ample time so as to minimize any inconvenience to the traveling public.

History: *1951 c 511 s 1; 1953 c 642 s 1,2; 1961 c 653 s 1,3; 1980 c 407 s 1; 1981 c 46 s 1; 1986 c 444; 1989 c 335 art 4 s 65; 1990 c 594 art 1 s 61; 1991 c 139 s 1; 1997 c 24 s 6; 2008 c 363 art 9 s 5,6*

Appendix I: Camp Ripley Land Fund Bylaws

BYLAWS

OF

LAND FUND

ARTICLE 1

Name of Non-Appropriated Fund

The name of the fund shall be "LAND". The location of the principal office of the fund shall be Camp Ripley, MN. The purpose of the LAND Fund shall be as set forth in the Articles of these Bylaws.

ARTICLE II

Purposes and General Nature of Business

The purpose of the LAND Fund is to provide an account to deposit proceeds from timber sales as set forth in Minnesota Statutes 2008, section 190.25 subd. 3a to be appropriated by the Adjutant General for the payment of expenses incurred for the management of forest resources on Camp Ripley consistent with the camp's purpose of training armed forces.

ARTICLE III

No Pecuniary Gain or Personal Liability to Members

This LAND Fund does not and will not afford pecuniary gain, incidentally or otherwise, to its members. No part of the property of the income of the Land Fund and other pecuniary gain of profit shall be issued to any member of the LAND Fund Council except that reasonable compensation may be paid for services rendered to or for LAND Fund and for goods received for the use of LAND Fund business.

ARTICLE IV

Membership

The members of the LAND Fund Council will consist of six (6) members: (1) Post Commander (President); (2) Deputy Post Commander (Vice President); (3) Environmental Office Supervisor (Member); (4) Training Area Coordinator (Member); (5) Program Analyst (Fund Manager); (6) Budget Assistant (Recorder). The council members will be listed by name on a Duty Appointment and filed per MNGR 230-65.

ARTICLE V

Meeting and Voting

Section 1 – Place: All meetings of the membership shall be held at the principal office of the Council (Camp Ripley) or at such other place as may be designated in the Notice of Meeting by the LAND Fund.

Section 2 – Annual Meeting: An annual meeting of the members of the council shall be held in the month of January. The LAND Fund Council may designate an alternate day as needed.

Section 3 – Special Meetings: The Post Commander unless otherwise prescribed by statute, may call Special meetings of the membership for any purpose or purposes at any time. Special meetings can be written or verbal with purpose stated.

Section 4 – Notice of Meetings: Notice of the annual meeting will be sent out via email through Microsoft Outlook.

Section 5 – Quorum: If notice of meeting has been properly given, a quorum shall be four (4) voting members.

Section 6 – Voting: Voting can be in writing or cast at meeting. Each individual casts only one vote.

Section 7 – Order of Business: The LAND Fund Council may from time to time determine the order of business at their meetings. The usual order of business at such meetings shall be as follows:

Meeting called to order by President

a. Roll call
b. Approval of previous minutes
c. Fund Manager's report

d. Old business
e. New business
f. Adjournment

Section 8 – Responsibilities: The LAND Fund Council shall strive to uphold Article II of Council and shall attend the meetings of the council.

Section 9 – Expenditures to LAND Fund: All expenditures must be for supplies or services for forest management purposes consistent with the annual budget as approved by the LAND Fund Council. Invoices submitted by the MNDNR Area Forest Supervisor or Environmental Office Supervisor as approved by the Environmental Office Supervisor should be sent to CRC-RM to be used for auditing purposes. All expenditures will have prior written approval of the CRC Environmental Office Supervisor. The President will approve in writing all expenditures over approved budgeted amounts. Receipts for purchases will be forwarded to CRC-RM as soon as possible.

Forest management purposes shall include or be allied with; timber marking for sale, site preparation for reforestation, purchase of trees for reforestation, cost of trees for replacement on the Training Site or Cantonment, cone and seed collection for nursery production, labor costs for reforestation, timber stand improvement costs, protection or control costs for insect and disease infestation, protection from herbivory or other animal damage, prescribed burning for encouraging natural regeneration and /or timber stand improvement, forest inventory and limited costs associated with maintaining access for forest management purposes.

ARTICLE VI

Officers

Section 1 – Election Qualifications/Terms of Office: The LAND Fund Council is the (1) Post Commander (President); (2) Deputy Post Commander (Vice President); (3) Environmental Office Supervisor (Member); (4) Training Area Coordinator (Member); (5) Program Analyst (Fund Manager); (6) Budget Assistant (Recorder). New duty appointments will be issued to reflect changes in full time staff.

Section 2 – President: The President shall be the principal executive officer of the council and subject to the control of the LAND Fund Council.

Section 3 – Vice President: The Vice President act on the behalf of the President in his/her absence.

Section 4 – Fund Manager: The Fund manager shall have the care and custody of the council funds and shall keep full and accurate account of receipts and disbursements in books belonging to the council, per MNGR 230-65.

Section 5 – Recorder: The recorder shall set up annual meeting, prepare annual meeting agenda and keep accurate meeting minutes.

Section 6 – Members at Large: The Environmental Office Supervisor and Training Area Coordinator (TAC) are members at large.

ARTICLE VII

Miscellaneous (1)

Amendment of Bylaws: Members may amend Bylaws at any meeting of the Billet Fund Council.

JFMN-CRC-Z	Concur/Nonconcur _____	Date: _____
JFMN-CRC-Z (Deputy)	Concur/Nonconcur _____	Date: _____
JFMN-CRC-RM	Concur/Nonconcur _____	Date: _____
JFMN-CRC-RM (Assistant)	Concur/Nonconcur _____	Date: _____
JFMN-CRC-ENV	Concur/Nonconcur _____	Date: _____
JFMN-CRC-TAC	Concur/Nonconcur _____	Date: _____

Miscellaneous (2)

The budget and annual accomplishment report for forest management activities will be submitted to and approved by the Sustainable Range Program (SRP) Committee. The annual meeting of the LAND Fund Council will provide an opportunity for the SRP committee to present the proposed annual budget for the LAND Fund to the Council for approval and to share the annual accomplishment report. Project documentation will occur in the annual Conservation Program Report.

Appendix J: Occurrences of Species in Greatest Conservation Need by Ecological Classification System Subsection on Camp Ripley and AHATS, Minnesota.

# of ECS subsections	Tax	Scientific Name	Common Name	Ecological Classification System Subsection			Camp Ripley Record	AHATS Record	State Status	Federal Status
				Anoka Sand Plain	Pine Moraines & Outwash Plains	St. Paul-Baldwin Plains				
Numbers in columns indicate number of occurrences since 1990 based on the MNDNR Natural Heritage Database, MNDNR Fisheries Database, Minnesota County Biological Survey data, or the Statewide Mussel Surveys. An "X" indicates that the species either was found in that subsection prior to 1990 or is expected to occur based on other information. Record Code: P=Presence. Status Code: END=Endangered, THR=Threatened, SPC=Special Concern, CAND=Candidate species for listing, and NL=Not listed.										
5	Ma	*Myotis septentrionalis*	Northern Myotis	X		X	P		SPC	NL
7	Ma	*Pipistrellus subflavus*	Eastern Pipistrelle			X	P	P	SPC	NL
23	Ma	*Spermophilus franklinii*	Franklin's Ground Squirrel	X	X	X	P		NL	NL
5	Ma	*Perognathus flavescens*	Plains Pocket Mouse	7				P	SPC	NL
10	Ma	*Reithrodontomys megalotis*	Western Harvest Mouse	X		X			SPC	NL
12	Ma	*Microtus ochrogaster*	Prairie Vole	2	11	X	P		SPC	NL
12	Ma	*Mustela nivalis*	Least Weasel	X		X			SPC	NL
14	Ma	*Canis lupus*	Gray Wolf		X		P		SPC	THR
24	Ma	*Taxidea taxus*	American Badger	1	X	X	P		NL	NL
19	Ma	*Spilogale putorius*	Eastern Spotted Skunk	X	X	X			THR	NL
	Ma	*Puma concolor*	Cougar **(Not SGCN)**						SPC	NL
10	Ma	*Lynx canadensis*	Canada Lynx				P		SPC	END
				Mammal Subtotal			7	**2**		
14	Bi	*Cygnus buccinator*	Trumpeter Swan	X	16	X	P	P	THR	NL
9	Bi	*Anas acuta*	Northern Pintail	X		X	P		NL	NL
4	Bi	*Tympanuchus cupido*	Greater Prairie-chicken		55				SPC	NL
9	Bi	*Tympanuchus phasianellus*	Sharp-tailed Grouse		X				NL	NL
18	Bi	*Gavia immer*	Common Loon	13	38	X	P	P	NL	NL
17	Bi	*Podiceps grisegena*	Red-necked Grebe	X	X	X	P		NL	NL
16	Bi	*Ixobrychus exilis*	Least Bittern	3	X	1	P		NL	NL
21	Bi	*Botaurus lentiginosus*	American Bittern	18	12	X	P	P	NL	NL
8	Bi	*Nycticorax nycticorax*	Black-crowned Night-heron	3		4		P	NL	NL
4	Bi	*Pelecanus erythrorhynchos*	American White Pelican		4		P		SPC	NL
21	Bi	*Haliaeetus leucocephalus*	Bald Eagle	55	171	35	P		SPC	NL
13	Bi	*Accipiter gentilis*	Northern Goshawk		7				NL	NL
25	Bi	*Circus cyaneus*	Northern Harrier	4	2	X	P	P	NL	NL
12	Bi	*Buteo lineatus*	Red-shouldered Hawk	31	117	15	P	P	SPC	NL
25	Bi	*Stelgidopteryx serripennis*	N. Rough-winged Swallow	4	2	6	P	P	NL	NL
6	Bi	*Falco peregrinus*	Peregrine Falcon	10		10			THR	NL
10	Bi	*Coturnicops noveboracensis*	Yellow Rail		16		P		SPC	NL
23	Bi	*Rallus limicola*	Virginia Rail	2	X	X	P	P	NL	NL
7	Bi	*Gallinula chloropus*	Common Moorhen	2		1			SPC	NL
24	Bi	*Pluvialis dominica*	American Golden-plover	X	X	X			NL	NL
16	Bi	*Recurvirostra americana*	American Avocet	X	X	X			NL	NL
25	Bi	*Tringa melanoleuca*	Greater Yellowlegs	X	X	X	P	P	NL	NL
19	Bi	*Bartramia longicauda*	Upland Sandpiper	7	2	1	P		NL	NL
13	Bi	*Numenius phaeopus*	Whimbrel	X	X				NL	NL
18	Bi	*Limosa haemastica*	Hudsonian Godwit	X	X	X			NL	NL
20	Bi	*Arenaria interpres*	Ruddy Turnstone	X	X	X			NL	NL
25	Bi	*Calidris pusilla*	Semipalmated Sandpiper	X	X	X	P		NL	NL
20	Bi	*Calidris fuscicollis*	White-rumped Sandpiper	X	X	X			NL	NL
24	Bi	*Calidris alpina*	Dunlin	X	X	X		P	NL	NL
23	Bi	*Tryngites subruficollis*	Buff-breasted Sandpiper	X	X	X	P		NL	NL
22	Bi	*Limnodromus griseus*	Short-billed Dowitcher	X	X	X	P		NL	NL
22	Bi	*Scolopax minor*	American Woodcock	28	95	X	P		NL	NL
9	Bi	*Phalaropus tricolor*	Wilson's Phalarope	4	2		P	P	THR	NL
18	Bi	*Chlidonias niger*	Black Tern	21	X	2		P	NL	NL
4	Bi	*Sterna hirundo*	Common Tern		5			P	THR	NL

# of ECS subsections	Tax	Scientific Name	Common Name	Ecological Classification System Subsection			Camp Ripley Record	AHATS Record	State Status	Federal Status
				Anoka Sand Plain	Pine Moraines & Outwash Plains	St. Paul-Baldwin Plains				
Numbers in columns indicate number of occurrences since 1990 based on the MNDNR Natural Heritage Database, MNDNR Fisheries Database, Minnesota County Biological Survey data, or the Statewide Mussel Surveys. An "X" indicates that the species either was found in that subsection prior to 1990 or is expected to occur based on other information. Record Code: P=Presence. Status Code: END=Endangered, THR=Threatened, SPC=Special Concern, CAND=Candidate species for listing, and NL=Not listed.										
11	Bi	*Sterna forsteri*	Forester's Tern			3	P	P	SPC	NL
25	Bi	*Coccyzus erythropthalmus*	Black-billed Cuckoo	15	10	5	P		NL	NL
11	Bi	*Asio flammeus*	Short-eared Owl		X				SPC	NL
25	Bi	*Chordeiles minor*	Common Nighthawk	2	6	X	P		NL	NL
21	Bi	*Caprimulgus vociferus*	Whip-poor-will	X	1	X	P		NL	NL
22	Bi	*Melanerpes erythrocephalus*	Red-headed Woodpecker	1	2	1	P	P	NL	NL
23	Bi	*Sphyrapicus varius*	Yellow-bellied Sapsucker	1	27	1	P	P	NL	NL
6	Bi	*Empidonax virescens*	Acadian Flycatcher			9			SPC	NL
13	Bi	*Empidonax traillii*	Willow Flycatcher	11		14	P	P	NL	NL
25	Bi	*Empidonax minimus*	Least Flycatcher	15	67	6	P	P	NL	NL
25	Bi	*Contopus virens*	Eastern Wood-pewee	54	2	44	P	P	NL	NL
10	Bi	*Lanius ludovicianus*	Loggerhead Shrike	11		1			THR	NL
6	Bi	*Vireo bellii*	Bell's Vireo			2			NL	NL
18	Bi	*Troglodytes troglodytes*	Winter Wren		8	3	P	P	NL	NL
25	Bi	*Cistothorus platensis*	Sedge Wren	39	30	9	P	P	NL	NL
20	Bi	*Cistothorus palustris*	Marsh Wren	18	8	9	P	P	NL	NL
22	Bi	*Catharus fuscescens*	Veery	44	86	6	P	P	NL	NL
20	Bi	*Hylocichla mustelina*	Wood Thrush	5	7	11	P		NL	NL
25	Bi	*Toxostoma rufum*	Brown Thrasher	6	4	6	P	P	NL	NL
6	Bi	*Vermivora pinus*	Blue-winged Warbler	X		2			NL	NL
14	Bi	*Vermivora chrysoptera*	Golden-winged Warbler		28		P	P	NL	NL
10	Bi	*Dendroica tigrina*	Cape May Warbler				P	P	NL	NL
10	Bi	*Dendroica cerulea*	Cerulean Warbler	2	4	11	P		SPC	NL
6	Bi	*Protonotaria citrea*	Prothonotary Warbler			5			NL	NL
22	Bi	*Seiurus aurocapillus*	Ovenbird	28	95	24	P	P	NL	NL
5	Bi	*Seiurus motacilla*	Louisiana Waterthrush	4		8			SPC	NL
14	Bi	*Oporornis agilis*	Connecticut Warbler		4		P	P	NL	NL
2	Bi	*Wilsonia citrina*	Hooded Warbler		1	9	P		SPC	NL
13	Bi	*Wilsonia canadensis*	Canada Warbler		2		P		NL	NL
13	Bi	*Spizella pusilla*	Field Sparrow	48	17	10	P	P	NL	NL
14	Bi	*Ammodramus savannarum*	Grasshopper Sparrow	28	2	3	P	P	NL	NL
7	Bi	*Ammodramus henslowii*	Henslow's Sparrow			1		P	END	NL
17	Bi	*Ammodramus leconteii*	Le Conte's Sparrow	X	9		P		NL	NL
9	Bi	*Ammodramus nelsoni*	Nelson's Sharp-tailed Sparrow		3				SPC	NL
25	Bi	*Melospiza georgiana*	Swamp Sparrow	57	28	16	P	P	NL	NL
15	Bi	*Zonotrichia albicollis*	White-throated Sparrow		9		P	P	NL	NL
25	Bi	*Pheucticus ludovicianus*	Rose-breasted Grosbeak	26	36	29	P	P	NL	NL
11	Bi	*Spiza americana*	Dickcissel	X		X	P		NL	NL
25	Bi	*Dolichonyx oryzivorus*	Bobolink	13	4	3	P	P	NL	NL
20	Bi	*Sturnella magna*	Eastern Meadowlark	16	1	2	P	P	NL	NL
						Birds Subtotal	**51**	**36**		
4	Am	*Hemidactylium scutatum*	Four-toed Salamander			X			SPC	NL
13	Am	*Plethodon cinereus*	Eastern Red-backed		X				NL	NL
14	Am	*Necturus maculosus*	Common Mudpuppy	X		X			NL	NL
6	Am	*Acris crepitans*	Northern Cricket Frog			1			END	NL
						Amphibians Subtotal	**0**	**0**		
25	Re	*Chelydra serpentina*	Common Snapping Turtle	15	3	14	P		SPC	NL
11	Re	*Clemmys insculpta*	Wood Turtle	2		4			THR	NL

# of ECS subsections	Tax	Scientific Name	Common Name	Ecological Classification System Subsection			Camp Ripley Record	AHATS Record	State Status	Federal Status
				Anoka Sand Plain	Pine Moraines & Outwash Plains	St. Paul-Baldwin Plains				
Numbers in columns indicate number of occurrences since 1990 based on the MNDNR Natural Heritage Database, MNDNR Fisheries Database, Minnesota County Biological Survey data, or the Statewide Mussel Surveys. An "X" indicates that the species either was found in that subsection prior to 1990 or is expected to occur based on other information. Record Code: P=Presence. Status Code: END=Endangered, THR=Threatened, SPC=Special Concern, CAND=Candidate species for listing, and NL=Not listed.										
13	Re	*Emydoidea blandingii*	Blanding's Turtle	207	155	83	P	P	THR	NL
3	Re	*Apalone mutica*	Smooth Softshell			2			SPC	NL
3	Re	*Cnemidophorus sexlineatus*	Six-lined Racerunner			X			NL	NL
3	Re	*Eumeces fasciatus*	Five-lined Skink			X			SPC	NL
9	Re	*Heterodon nasicus*	Western Hognose Snake	9		X	P		SPC	NL
6	Re	*Heterodon platirhinos*	Eastern Hognose Snake	2	1	2	P		NL	NL
15	Re	*Liochlorophis vernalis*	Smooth Green Snake	X	X	X	P		NL	NL
5	Re	*Coluber constrictor*	Eastern Racer			1			SPC	NL
9	Re	*Elaphe vulpina*	Eastern Fox Snake	1		7			SPC	NL
7	Re	*Pituophis catenifer*	Gopher Snake	3		1			NL	NL
6	Re	*Lampropeltis triangulum*	Milk Snake			X			NL	NL
3	Re	*Crotalus horridus*	Timber Rattlesnake			X			THR	NL
						Reptile Subtotal	**5**	**1**		
2	Fi	*Ichthyomyzon gagei*	Southern Brook Lamprey			4			SPC	NL
7	Fi	*Lampetra appendix*	American Brook Lamprey			13			NL	NL
14	Fi	*Acipenser fulvescens*	Lake Sturgeon	1		15			SPC	NL
4	Fi	*Scaphirhynchus platorynchus*	Shovelnose Sturgeon			6			NL	NL
3	Fi	*Polyodon spathula*	Paddlefish			11			THR	NL
3	Fi	*Anguilla rostrata*	American Eel			9			NL	NL
4	Fi	*Alosa chrysochloris*	Skipjack Herring			X			SPC	NL
2	Fi	*Hybognathus nuchalis*	Mississippi Silvery Minnow			X			NL	NL
2	Fi	*Notropis amnis*	Pallid Shiner			X			SPC	NL
5	Fi	*Macrhybopsis aestivalis*	Speckled Chub			X			NL	NL
9	Fi	*Notropis anogenus*	Pugnose Shiner	X	26	X			SPC	NL
2	Fi	*Opsopoeodus emiliae*	Pugnose Minnow			5			NL	NL
3	Fi	*Cycleptus elongatus*	Blue Sucker			28			SPC	NL
3	Fi	*Ictiobus niger*	Black Buffalo			2			SPC	NL
3	Fi	*Moxostoma carinatum*	River Redhourse			26			NL	NL
11	Fi	*Moxostoma valenciennesi*	Greater Redhorse	28	32	1	P		NL	NL
2	Fi	*Aphredoderus sayanus*	Pirate Perch			X			SPC	NL
2	Fi	*Lepomis gulosus*	Warmouth			X			NL	NL
6	Fi	*Lepomis megalotis*	Longear Sunfish		26	X			NL	NL
3	Fi	*Ammorcrypta clara*	Western Sand Darter			18			NL	NL
3	Fi	*Ammorcrypa asprella*	Crystal Darter			X			SPC	NL
3	Fi	*Etheostoma asprigene*	Mud Darter			2			NL	NL
2	Fi	*Etheostoma chlorosoma*	Bluntnose Darter			X			NL	NL
9	Fi	*Etheostoma microperca*	Least Darter		116				SPC	NL
2	Fi	*Percina evides*	Gilt Darter			11			SPC	NL
5	Fi	*Campostoma oligolepis*	Largescale Stoneroller			X			NL	NL
						Fish Subtotal	**1**	**0**		
6	Sp	*Marpissa grata*	A Jumping Spider			1			SPC	NL
4	Sp	*Metaphidippus arizonensis*	A Jumping Spider	1		1			SPC	NL
5	Sp	*Paradamoetas fontana*	A Jumping Spider	X		X	P		SPC	NL
1	Sp	*Tutelina formicaria*	A Jumping Spider	X					SPC	NL
						Spider Subtotal	**1**	**0**		
10	In	*Afexia rubranura*	Red Tailed Prairie Leafhopper			1			SPC	NL
1	In	*Asynarchus rossi*	A Caddisfly			2			SPC	NL
2	In	*Agapetus tomus*	A Caddisfly	1					SPC	NL

# of ECS subsections	Tax	Scientific Name	Common Name	Ecological Classification System Subsection			Camp Ripley Record	AHATS Record	State Status	Federal Status
				Anoka Sand Plain	Pine Moraines & Outwash Plains	St. Paul-Baldwin Plains				
Numbers in columns indicate number of occurrences since 1990 based on the MNDNR Natural Heritage Database, MNDNR Fisheries Database, Minnesota County Biological Survey data, or the Statewide Mussel Surveys. An "X" indicates that the species either was found in that subsection prior to 1990 or is expected to occur based on other information. Record Code: P=Presence. Status Code: END=Endangered, THR=Threatened, SPC=Special Concern, CAND=Candidate species for listing, and NL=Not listed.										
9	In	*Atrytone arogos*	Arogos Skipper			X			SPC	NL
3	In	*Ceraclea vertreesi*	Vertrees's Ceraclean Caddisfly		X				SPC	NL
1	In	*Chilostigma itascae*	Headwater Chilostigman Caddisfly		X				END	NL
2	In	*Cicindela lepida*	Little White Tiger Beetle				P		THR	NL
5	In	*Cicindela patruela patruela*	A Tiger Beetle	2	4	X	P		SPC	NL
13	In	*Epidemia epixanthe michiganensis*	Bog Copper	X	X	X			NL	NL
5	In	*Erynnis persius*	Persius Duskywing	X	X	X			END	NL
7	In	*Euphyes bimacula illinois*	Two-spotted Skipper	X	X	X			NL	NL
2	In	*Gomphus viridifrons*	Green-faced Clubtail			X			NL	NL
7	In	*Hesperia leonardus leonardus*	Leonard's Skipper	1	3	X			SPC	NL
2	In	*Hesperia uncas*	Uncas Skipper	X					END	NL
3	In	*Lycaeides melissa samuelis*	Karner Blue	X					END	END
11	In	*Oeneis macounii*	Macoun's Arctic		X				NL	NL
2	In	*Ophiogomphus susbehcha*	St. Croix Snaketail			1			SPC	NL
3	In	*Oxyethira ecornuta*	A Caddisfly		1				SPC	NL
6	In	*Oxyethira itascae*	A Caddisfly		X				SPC	NL
9	In	*Papaipema beeriana*	Blazing Star Stem Borer			X			NL	NL
12	In	*Phyciodes batesii*	Tawny Crescent		X				NL	NL
2	In	*Polycentropus milaca*	A Caddisfly		1				SPC	NL
11	In	*Speyeria idalia*	Regal Fritillary	X		X			SPC	NL
						Insect Subtotal	**2**	**0**		
3	Mo	*Cumberlandia monodonta*	Spectaclecase			8			THR	CAND
5	Mo	*Cyclonaias tuberculata*	Purple Wartyback	1		16			THR	NL
3	Mo	*Elliptio crassidens*	Elephant-ear			13			END	NL
10	Mo	*Elliptio dilatata*	Spike	5		45			SPC	NL
4	Mo	*Fusconaia ebena*	Ebonyshell			26			END	NL
3	Mo	*Megalonaias nervosa*	Washboard			3			THR	NL
4	Mo	*Plethobasus cyphyus*	Sheepnose			9			END	CAND
6	Mo	*Pleurobema coccineum*	Round Pigtoe			50			THR	NL
4	Mo	*Quadrula fragosa*	Winged Mapleleaf			4			END	END
10	Mo	*Quadrula metanevra*	Monkeyface	X		42			THR	NL
5	Mo	*Quadrula nodulata*	Wartyback	20		102			END	NL
5	Mo	*Tritogonia verrucosa*	Pistolgrip			27			THR	NL
7	Mo	*Alasmidonta marginata*	Elktoe	3		X			THR	NL
3	Mo	*Arcidens confragosus*	Rock Pocketbook			24			END	NL
24	Mo	*Lasmigona compressa*	Creek Heel splitter	39	52		P		SPC	NL
12	Mo	*Lasmigona costata*	Fluted-shell			11			SPC	NL
4	Mo	*Simpsonaias ambigua*	Salamander Mussel			3			THR	NL
11	Mo	*Actinonaias ligamentina*	Mucket mussel	4		X			THR	NL
4	Mo	*Ellipsaria lineolata*	Butterfly			20			THR	NL
3	Mo	*Epioblasma triquetra*	Snuffbox			45			THR	NL
4	Mo	*Lampsilis higginsi*	Higgins Eye			22			END	END
3	Mo	*Lampsilis teres*	Yellow Sandshell			2			END	NL
25	Mo	*Ligumia recta*	Black Sandshell	112	35	44	P		SPC	NL
5	Mo	*Obovaria olivaria*	Hickorynut			9			SPC	NL
5	Mo	*Truncilla donaciformis*	Fawnsfoot	13		8			NL	NL

# of ECS subsections	Tax	Scientific Name	Common Name	Ecological Classification System Subsection			Camp Ripley Record	AHATS Record	State Status	Federal Status
				Anoka Sand Plain	Pine Moraines & Outwash Plains	St. Paul-Baldwin Plains				
Numbers in columns indicate number of occurrences since 1990 based on the MNDNR Natural Heritage Database, MNDNR Fisheries Database, Minnesota County Biological Survey data, or the Statewide Mussel Surveys. An "X" indicates that the species either was found in that subsection prior to 1990 or is expected to occur based on other information. Record Code: P=Presence. Status Code: END=Endangered, THR=Threatened, SPC=Special Concern, CAND=Candidate species for listing, and NL=Not listed.										
8	Mo	*Venustaconcha ellipsiformis*	Ellispe			1			THR	NL
Mussel Subtotal							**2**	**0**		
Species in Greatest Conservation Need TOTAL							**69**	**38**		

Appendix K. Winter food habits of wild turkeys in northern Minnesota, Phase II, 2010.

Winter food habits of wild turkeys in northern Minnesota

Eric M. Dunton, Minnesota Department of Natural Resources, Farmland Wildlife Populations Group, 35365 800th Ave., Madelia, MN, 56062 (507) 642-8478 eric.dunton@dnr.state.mn.us

Background and Justification

The current range of the eastern wild turkey (*Meleagris gallopavo silvestris*) extends far north of what was identified by Schorger (1966) as the ancestral wild turkey range. Wild turkey range in Minnesota and throughout the northeastern United States and southeastern Canada is currently expanding northward beyond agricultural areas (Kimmel and Krueger 2007). It is unknown how far turkeys will expand outside of mixed forest-agriculture areas into northern forest areas, and if expansion does occur, what their diet will consist of. Understanding winter diet selection of turkeys on the northern periphery of their range and the interaction of agriculture, snow conditions, and food habits will provide management tools to enhance turkey survival outside of an agriculturally dominated landscape.

The eastern wild turkey is a food generalist with winter diet ranging from >20 species (Korschgen 1967) to a restricted diet of just corn (Porter et al. 1980). As wild turkey range expanded north through the mixed forest-agricultural habitats, Porter (2007) stated. "Looking back at the field studies of the 1970s, it is clear that they were telling us more than we realized: snow and cold are not the issue, the key is food." However, in a review of 603 references of turkey food habits, growth, and reproduction: Gluesing and Field (1986) found that few turkey food habits studies corresponded to the critical winter season.

Wild turkeys are ground feeders, a feeding strategy that can be limited by snow depth and snow condition. Powder snow at 15-20cm hinders mobility, and >30cm can prevent movement (Austin and DeGraff 1975, Healy 1992). Porter (1977) demonstrated that snow >25cm limited mobility and restricted turkeys to 25ha, < 10% of their normal range. Deep persistent snow cover can ultimately result in starvation. In Pennsylvania starvation occurred when snow depth was >30cm for >2 weeks (Wunz and Hayden 1975), 49 days in Wisconsin (Wright et al. 1996), and 40-59 days in New York (Roberts et al. 1995).

The northern expansion of eastern wild turkey range beyond historical limits has been closely associated with availability of agricultural and livestock feed lots (Wunz 1992, Wunz and Pack 1992, Kubisiak et al. 2001). Although, adequate information is available on turkey foraging behavior and survival in northern turkey habitats with access to agricultural foods (Porter et al. 1980, Vander Haegen et al. 1989, Kassube 2005, Kane et al. 2007), there is no information available on turkey food habits in northern areas in which turkeys have limited access to anthropogenic food.

To meet thermoregulatory demands associated with northern winters, turkeys must increase food consumption, reduce energy expenditure, or use energy reserves (Pekins 2007). When snow limits availability of ground forage (e.g., corn and acorns) or agricultural foods are unavailable, turkeys are forced to use foods of lower nutritional value and energy content (Pekins 2007). In diet characterized by negative energy balance, juvenile hens are the first to succumb (because they have the smallest energy reserves), followed by adult hens (Porter et al. 1983, Roberts and Porter 1996, Pekins 2007).

In this study, I will evaluate wild turkey food habits during winter on the northern fringe of their range in Minnesota. I will specifically investigate the association of agriculture and snow conditions with food habits and body condition.

Objectives

1. Determine winter foods used by wild turkeys on the northern fringe of their range in Minnesota.
2. Describe diet as a function of agriculture and snow conditions.
3. Compare body condition of wild turkeys with access to high-energy diets to those without.

Study Areas

This study will be conducted north of Minnesota's ancestral wild turkey range (Leopold 1931) where wild turkey populations have been recently established (Minnesota Department of Natural Resources 2006). This region is located within the Western Superior Uplands (WSU) and Northern Minnesota Drift and Lake Plain (MDL) Ecological Sections of the Laurentian Mixed Forest Ecological Province (Minnesota Department of Natural Resources 2003). The 25,959 km^2 study area is comprised of 35% upland deciduous forest, 31% crop/grass, 16% aquatic environment, 10% shrubland, 4% upland conifer forest, 2% lowland conifer forest, 2% lowland deciduous forest, 1% non-vegetated (GAP Land Cover Minnesota Department of Natural Resources 2008). This area includes the following counties; Becker, Clearwater, Mahnomen, Hubbard, Ottertail, Wadena, Cass, Crow Wing, Morrison, Todd, Benton, Aitkin, Mille Lacs, Kanabec, Isanti, Carlton, Pine, and Chisago.

The mean annual snowfall for this region from 1971-2000 ranged from 100 to 127 cm per year, and averaged 40 days per year with snowfall accumulations of 30 cm or greater. The mean winter temperature (December – February) from 1971 – 2000 was –12 °C (Minnesota Climatology Working Group 2008).

Methods

I will evaluate food habits in relation to snow condition and habitat type by examining crop and gizzard contents of wild turkeys collected during 2 winters (December 2008 – March 2009 and December 2009 – March 2010). Using a fixed wing aircraft, I will locate wild turkey flocks using a random sampling strategy that will be stratified by presence/absence of agricultural foods and presence/absence of snow conditions that limit mobility. A small number of birds (e.g., 1 – 5 turkeys) from each flock will be collected in late afternoon or early evening, when crops are most likely to be full (Hillerman et al. 1953), by shooting. Date, snow depth, snow condition (e.g., crusted vs. powder snow), temperature, habitat class, and geographic coordinates will be recorded at each collection site.

I will determine frequency of occurrence and volume of food items present in the crops and gizzards according to the methods of Korschgen (1967). Although, Hurst (1992) considered crop content analysis the best technique for evaluating wild turkey food habits, it is negatively biased toward succulent foods and soft-bodied invertebrates, which are digested more rapidly than hard and fibrous food items. In this study, bias should be minimal because few succulent foods are available during winter. I will compare foods consumed between habitats with and without agricultural foods present and between snow conditions that limit turkey mobility. I plan to collect 75-100 turkeys per winter, for a total of 150-200 turkeys over the 2-year study to capture temporal shifts in food consumption and provide adequate sample size.

Decker et al. (1991) described 3 classes of winter diet available to wild turkeys based on forage availability and snow conditions: (1) complete access to ground forage (e.g., acorn/corn dominated diets); (2) moderate access to ground forage (e.g., fruiting shrub dominated diet); (3) and restricted access to ground forage (e.g., tree/seep dominated). I will classify the diet of each collected turkey according to the Decker et al. (1991) system, and relate diet to presence of agricultural food and snow conditions using appropriate regression analyses (e.g., multinomial logit models for dominant food types, mixed effects models or generalized estimating equations for modeling volume or presence-absence of multiple food types; McCullagh and Nelder 1989, Pinheiro and Bates 2000). I will evaluate body condition of each collected turkey based on deviation from normal body weight (Pekin 2007), and visual keel fat measurements. Finally, I will attempt to describe the direct and indirect (mediated by diet) effects of agricultural food (presence/absence) and snow conditions on body condition.

Activity Schedule

Activity/Year	J	F	M	A	M	J	J	A	S	O	N	D
Aerial survey 2008 – 2010	x	x	x									x
Collect turkeys 2008-2010	x	x	x									x
Food habit analysis 2008 - 2010	x	x	x	x								x
Data Summary 2009 -2010				x	x	x	x	x	x	x		
Final Report 2010											x	x

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Appendix L. Camp Ripley fisher project graduate student proposal, 2008-2009.

Principal Investigator: Dr. John Krenz
Co-author: Lucas Wandrie
Project: Fisher Ecology

Introduction:

The Fisher:

The fisher (*Martes pennanti*) is a medium sized animal that belongs to the Family Mustelidae. Fisher are an important furbearing species in Minnesota and in other areas where harvest is still legal. In 2007 and 2008, pelts from legally harvested fisher sold for a combined total of more than $80,000 (Abraham and Dexter 2008). The average price per pelt in 2007 and 2008 was about $72.00 (Abraham and Dexter 2008). It is important to note that these were peak prices and fisher pelts typically sell for $25 to $30.

Fisher are sexually dimorphic with adult males being significantly heavier and longer than adult females (Powell 1993). Males typically weigh between 3.5 and 5.5 kg and range from 90 to 120 cm in length. Females weigh between 2.0 and 2.5 kg and range from 75 to 95 cm long (Powell 1993).

Historical Background:

Fisher populations were nearly extirpated throughout their historic range in Minnesota and the rest the United States due to over-harvesting and habitat loss (Powell 1981). No protective measures were in place in Minnesota before 1917, when fisher harvest was first prohibited from the first of March to the fifteenth of October. In 1918 and 1923 trapping seasons were shortened by two additional weeks (Balser and Longley 1966). From 1933 to 1977, the harvest of fisher at any time was prohibited (Balser and Longley 1966, John Erb, unpublished data). Minnesota's fisher population is known to have increased rapidly from the 1940's until the early 1960's; however, population trends after the mid-1960's are relatively unknown. (Balser and Longley 1966). Within the last seven years, fisher have begun to re-establish in the historic part of their range in Minnesota (Erb 2008).

Current Survey Method:

Track surveys and radiotelemetry have both been used to estimate population density of fisher. Until the winter of 2007, the Minnesota Department of Natural Resources (MNDNR) used track surveys (John Erb, unpublished data). The track method requires adequate snowfall and quality, ability to identify tracks, and access to fisher habitats (i.e., plowed roads) (Beauvais and Buskirk 1999, John Erb, unpublished data). Track methods can have widely varied results ranging from one fisher every 10-800 km^2 (Arthur et al, 1989). Due to the problems associated with tracking surveys the MNDNR now uses radiotelemetry to estimate population density. Radiotelemetry is a more accurate means to delineate home-range size, with means ranging from 2.1-51.8 km^2 (Koen et al 2004, Arthur et al 1989, Self and Kerns 2001, Zielinski et al 2004, Joel Sauder, personal communication). Therefore, it is suggested to use radiotelemetry to determine home range sizes with precision. Mean home range size can be used to determine density of fisher within a given area; this can be denoted as (number of individuals/ 100 km^2) (Fuller et al 2001, Koen et al 2007). As fisher are intrasexually territorial and not intersexually territorial, adding the number of males and females per 100 km^2 can be used to calculate density.

Habitat Use:

Fisher are known to be one of the most habitat specialized mammals in North America (Weir and Harestad 2003). Fisher prefer an extensive canopy and will avoid open areas (Powell

1981). Other preferred features are large trees (>25 cm diameter breast height (dbh)) and abundant coarse woody debris (CWD) that are used by adult male and female fisher to den and rest (Zielinski et al 2004). The branches of large trees are used as resting platforms and large cavities are used for natal den sites. Males use resting platforms more frequently than females, while females use cavities more than males (Zielinski et al 2004). Common natal den sites are branch hole cavities at heights up to approximately 26 m (Arthur and Krohn 1991, Weir and Harestad 2003). Other sites used for rearing young and resting include old beaver (*Castor canadensis)* lodges, underground burrows, brush piles, and rock piles (Arthur et al 1989, Arthur and Krohn 1991). Understanding the fisher's habitat requirements in Minnesota may be useful in developing better land management practices geared towards sustaining Minnesota's fisher population.

Dietary Analysis:

Fishers are opportunistic feeders that will kill and eat anything they are able to. Fisher are most notable for their ability to kill and eat porcupines (*Erethizon dorsatum*). In Minnesota, porcupines constituted less than one percent of fisher diet in winter (Kuehn 1989). Other studies have found that porcupines constitute less than 20 percent of the fisher's diet (Arthur et al 1989, Powell 1994). Depending on the location, the importance of porcupine in the fisher's diet varies as the fisher's distribution expands beyond that of the porcupine (Giuliano et al 1989, Zielinski et al 1999). In areas that the fisher and porcupine do not coexist, porcupine would be of no dietary value.

The most common methods to determine the diet of carnivore species is to analyze contents of gastrointestinal tracts (GI tracts) and scat (Powell 1993). These data can be used to determine the frequency of occurrence and the total volume of each prey species (Arthur et al 1989, Powell 1993). These data are qualitative and should only be used as an index, as proposed by Powell (1993).

Known prey species of fisher in Minnesota include the snowshoe hare (*Lepus americanus*), red squirrel (*Tamiasciurus hudsonicus*), gray squirrel (*Sciurus carolinesis*), eastern cottontail (*Sylvilagus floridanus*), various small mammals (deer mice [*Peromyscus* spp.], voles [*Microtus* spp., *Clethrionomys gapperi*], lemmings [*Synaptomys* spp.], shrews [*Sorex cinereus*, *Blarina brevicauda*], moles [*Chondylura cristata*]) and porcupine (Kuehn 1989). Other food items include various reptiles, amphibians, birds, deer carrion (*Odocoileus virginianus*) and fruits (Kuehn 1989). Kuehn (1989) found that snowshoe hares were the primary prey of fisher when snowshoe hares are at high density. When snowshoes were at low-density fisher diet primarily consisted of small mammals (i.e. mice, lemmings, shrews, and voles).

An analysis of fisher diet in the southern part of their range in Minnesota is needed to determine if there is a difference in diet between the northern counties and southern counties. Diets of fisher can differ in various parts of their range, based on what food sources are available to them (Zielinski et al 1999, Kuehn 1989, Golightly et al 2006). Information on the primary diet of fisher from different regions can be used to manage land to promote prey species (small scale), when it is not possible to manage land for the fisher itself (large scale). Gehring and Swihart (2004) found that long-tailed weasels (*Mustela frenata*) traveled through and foraged in forest patches and corridors. Fisher could use habitat fragments with abundant prey populations in place of continuous habitat areas; provided there are corridors connecting the patches.

Research Objectives:

1. Determine mean home range size of adult male and female fisher in Camp Ripley and the surrounding buffer zone (≤5 miles).
2. Locate and describe natal den sites used by adult female fisher.

3. Determine characteristics used by adult female fishers to select den sites.
4. Determine the frequency of occurrence and total volume of prey found in the gastrointestinal tracts of fisher legally harvested in the southern part of their range in Minnesota and compare findings to fisher from northern Minnesota.
5. Use light detection and ranging information to determine vegetative habitat structure within predetermined home range boundaries and within a 50 meter radius of natal den sites.

Materials and Methods:

Trapping:

Fisher will be trapped in and around the Camp Ripley military base and training area (Fig. 1). Fisher will be captured using baited live-traps (Tomahawk Model #108, Tomahawk Live Trap Co., Tomahawk, WI) during the months of mid-August to March in 2008-2009 and September to March in 2009-2010. Traps will be baited using fish, turkey (*Meleagris gallopovo*), or beaver as well as commercial lure. Traps set between 1 November and 31 March will be covered with plastic or a cloth sack to protect trapped animals from harsh weather. Traps will be fitted with radio-collars from previous studies (white-tailed deer and gray wolves (*Canis lupus*)) so that when the trap is tripped it produces a signal (Arthur 1988, Benevides et al 2006). Trap collars have metal mirror clamps attached with epoxy so a magnet can connect to it. Magnets are attached to the trap door with 20 lb. fishing line. When the door closes the magnet is pulled off of the mirror clamp starting the collar signal (*need figure*). Fisher will not be live-trapped during the months of April through August to avoid interrupting the breeding cycle and rearing of offspring. Twenty-five live-traps will be set within the confines of Camp Ripley military base located in central Minnesota (Figure 1). All traps will be checked once daily and any non-target species will be released immediately.

Captured fisher will be immobilized (under the supervision of Brian Dirks, Camp Ripley Animal Survey Coordinator) with 33 mg/kg of a 10:1 ratio of Ketamine:Xylazine via an 18 gage hypodermic needle and syringe (Arthur 1988, Zielinski et al 2004, Koen et al 2007, Weir and Corbould 2007). The use of a ketamine-xylazine combination for fisher has been found to be safe (Mitcheltree et al 1999). To prevent injury to the animal and to avoid administering improper doses, individuals will be restrained using live-trap dividers (Thomasma and Peterson 1998). Trap dividers are similar in appearance to hair combs. The metal “teeth” are slid through the mesh of the cage so the fisher cannot maneuver around inside the trap. Anesthetized individuals will be weighed, have standard body measurements taken, and have a hair sample removed for DNA analysis. After measurements have been taken, each animal will be fitted with standard VHF radio-collar (radio transmitter, Model #M1930, Advanced Telemetry Systems, Isanti, MN) and ear tags (National Wing Bands Style 893, National Band and Tag Co. Newport, KY). Radio-collars and ear tags have non-duplicated numbers so that the individual can be identified by them.

The radio-collars are designed to last two years. They are active for 16 hours and inactive for 8 hours. Radio-collars have been effectively used on fisher in other studies (Powell 1979, Arthur 1988, Arthur et al 1989, Arthur and Krohn 1991, Weir and Harestad 2003, Zielinski et al 2004, Koen et al 2007, Weir and Corbould 2007). Animals will then be placed into an animal carrier until they regain dexterity, whereupon they will be released at the site of their capture (Animal Care and Use Committee 1998).

Currently, an inadequate number of individuals have been fitted with collars (n=4). To increase sample size local fur-bearing trappers (≤5 miles of the Camp Ripley border) will be offered monetary reimbursement ($100) for each successful live-captured fisher fitted with a radiotransmitter. Trappers are required to use cage traps or padded leg-holds. Brian Dirks and Lucas Wandrie will process animals captured by outside trappers.

Hair Snaring:

Hair samples have been used to identify species, individuals, presence, and population demographics. Hair-snaring devices for fisher have been used successfully in Michigan, California, and Idaho (Belant 2003, Zielinski et al 2004, Joel Sauder, personal communication). Hair-snaring devices have incorporated the use of live-stock currycombs, barb-wire, glue-traps, and gun brushes (Belant 2003, Pauli et al 2007, Zielinski et al 2006).

For this study, currycombs were used following the procedures of Belant (2003). Samples can be used to identify presence or absence of fisher and to distinguish between individuals. From July to mid August 2008 traps were modified into hair-snares. Each trap had a currycomb (4 circular steel bands, 10.6 cm external diameter) attached to the door with three zip-ties (Belant 2003). The currycomb was oriented so that the large-toothed side collected the hair sample. Zip-ties allowed the door to open and close as normal but did not allow it to lock; this is achieved by looping each zip-tie around both sections of the door. This enabled the safe departure of the animal as well as safely gathering a single hair sample. After the animal exited, the door remained shut eliminating the possibility of contaminating the sample from another animal. As hair-snaring failed to produce the desired results in 2008 it will be excised from the project for the year of 2009.

Radiotelemetry:

A minimum of two point locations per fisher per month will be gathered by triangulating from the ground or via small aircraft (Arthur et al 1989). Points taken on consecutive days will be taken at least 16 hours apart (Arthur et al 1989). Compass bearings and UTM coordinates are entered into Triangulate a component of ArcMap (Fig. 3).

Using a minimum of 25 triangulated points, home range size will be determined using fixed kernel analysis (CALHOME). Home range size has been found to range from 2.1 km^2 in eastern Ontario (Koen et al 2007) to 51.8 km^2 in Idaho (Joel Sauder, personal communication). Adult male fisher have significantly larger mean home range size, this is attributed to the polygynous breeding system (Zielinski et al 2004, Arthur et al 1989, Koen et al 2007). Zielinski et al (2004) found that in California mean home range size differed depending on geographic location.

Radiotelemetry will also be used to locate collared females during the reproductive season to locate and describe den sites. This will be done by gathering radiolocations every 2 to 3 days, if the location of the female has not changed after 3 consecutive radio locations her exact location will be determined by homing in on her signal (John Erb, unpublished methods). Dens will be inspected with video probes to determine litter size and to describe the structure of the natal den. If it is not possible (i.e., unable to safely climb a den tree or high den complexity) to inspect dens with video probes, remote cameras will be set up around the area (John Erb, unpublished methods).

Gastrointestinal Analysis:

Gastrointestinal tract contents from fisher legally harvested in Aitkin, Cass, Crow Wing, Mille Lacs, Morrison, and Todd counties will be compared to GI tract contents from Kuehn's (1989) study area (Fig. 2). Because trappers are only required to bring in pelts from harvested fisher to the DNR, letters will be sent to trappers within the aforementioned counties requesting that they also bring in carcasses. This will be done strictly on a volunteer basis. As some trappers trap outside of their county of residence, any fisher taken from counties not previously stated will not be used in analysis.

Fisher GI tract contents will be analyzed according to weight, sex, and age (Giuliano et al 1989). Fisher carcasses will be weighed using a 50kg digital scale, and live weights will be

calculated following Kuehn (1985). The upper left canine will be removed and sent to Matson's Lab (Milltown, MT) to be cut into radiographs. Fisher will be aged by counting cementum annuli rings this is similar to counting the rings of a tree (Jenks and Bowyer 1984).

Contents from Gi tracts will be removed and gently rinsed over a strainer. Hair, bone, and tissue samples will be identified to species if possible. Hair samples will be identified using Adorjan and Kolenosky's (1969) key. (*Working on bone, feather, and tissue keys*)

Vegetation Structure:

Existing aerial LIght Detection And Ranging (Lidar) information will be used to estimate vegetation structure within delineated home ranges and around den sites to determine habitat usage (*awaiting on above information to see if programs are compatible*). Lidar is a remote sensing technology that can create a three dimensional measurement of the canopy and sub-canopy (Lefsky et al 2002). Lidar information in Camp Ripley was done to a resolution of ten meters (Craig Erickson, personal communication).

This data can be used to map topographic features such as plant height and cover (Lefsky et al 2002). Also it has been used to accurately classify wooded land types and age forest communities (i.e., young or mature) (Lefsky et al 2002, Antonarakis 2008). Of greater interest is the use of Lidar in determining density and occurrence of avian species, as it may be possible to do the same with fisher (Clawges et al 2007). Canopy cover will be divided into four classes following Zielinski et al (2004) sparse 10-24%, open 25-39%, moderate 40-59%, and dense 60-100%.

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Appendix M: Arden Hills Army Training Site Natural Resources Damage Assessments

Natural Resources Restoration Projects

Arden Hills Army Training Site

Ramsey County, Minnesota

June 1, 2008

Project Title: AHATS Hydrology Study

Challenge: Past Industrial Land Use and Cleanup efforts on the Twin Cities Army Ammunition Plant (TCAAP) have disturbed a majority of the soil layers and have changed the topography of the site. Management of the surface and ground water will be an issue in the future. A current hydrologic plan does not exist for the facility.

Management Goal: To develop an AHATS hydrologic model to be used as a planning tool for the management of surface and ground water resources.

Management Objective: Restore the natural hydrologic functions of AHATS.

Proposed Methodology: Hire a consultant to create the Hydrologic Plan.

Project	**Start Date**	**End Date**	**Estimated Cost**
Develop an Hydrologic Model	2009	2010	$175,000
		Total:	**$175,000**

Principal Point of Contact:

Dave Hamernick; Arden Hills City Hall, 1245 W County Rd. 96, St. Paul, MN 55112.
Work: 651-634-5229; Cell 651-775-5017

Project Title: Training Area 4 Native Vegetation Restoration Project

Challenge: Past Industrial Land Use and Cleanup efforts on the Twin Cities Army Ammunition Plant (TCAAP) have disturbed a majority of the soil layers. This disturbance in turn has caused a dramatic change in the natural vegetation which has caused an increase in the amount of invasive species on the facility. Studies conducted by Saint Cloud State University in 2000-2007 first determined the presence and then extent of the problem. The study identified the areas disturbed as referenced in the site description section.

Management Goal: Convert and restore Training Area 4 into an oak savanna-native grassland habitat type.

Management Objectives:

- Concrete and building removal
- Railroad track removal – convert to trail
- Above ground utility pole and fence removal
- Boundary road (fire break construction)
- Convert to oak savanna and native prairie
- Invasive species control (Vegetation)

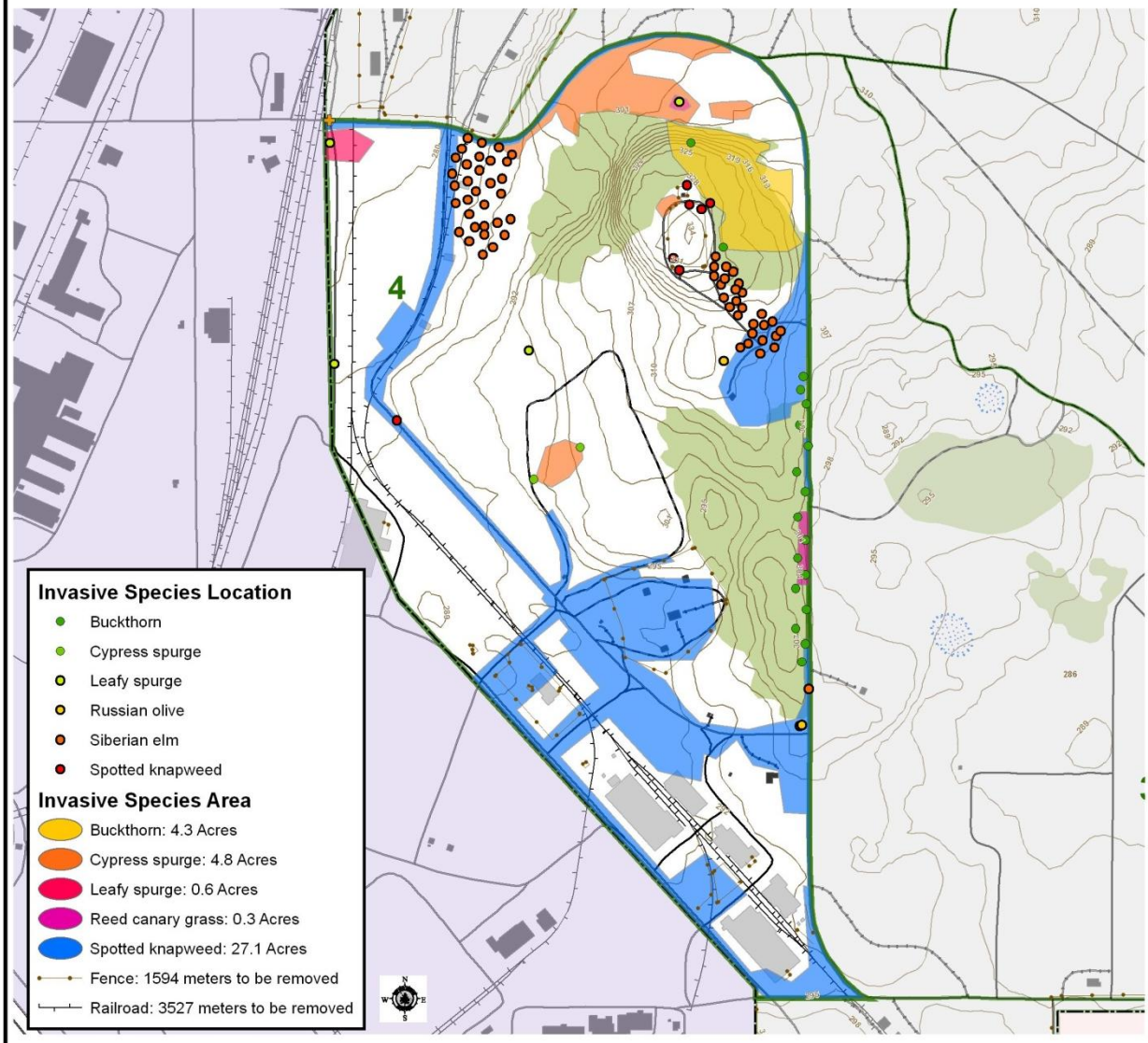
Proposed Methodology: MNARNG staff will perform an assessment of Training Area 4 to determine all significant hazards to troops in training such as, utility poles, railroad tracks, above ground concrete obstacles, buildings, fences etc. Projects will be implemented to remove those hazards. Once all hazards are removed a vegetation management plan will be created for the Training Area in conjunction with MNDNR and USFWS recommendations. The area will then be revegetated and a maintenance plan to control invasive species will be implemented.

Sustainability: The value of this project is immeasurable; the MNARNG will be able to provide a safe and realistic training environment for our soldiers while providing multi-use benefits to the community. The environmental enhancements benefit the local flora and fauna, and the community will be able to live near and enjoy a more pristine environment.

Projects	**Start Date**	**End Date**	**Estimated Costs**
Concrete and building removal	April 2010	August 2011	$150,000
Railroad track removal – convert to trail	April 2010	August 2011	$60,000
Above ground utility pole and fence removal	April 2010	August 2011	$15,000
Boundary road (Rx firebreak construction)	June 2011	August 2012	$15,000
Convert to oak savanna and native prairie	April 2012	August 2013	$120,000
Invasive species control (Vegetation) annually	2012	2020	$20,000
			Total: $540,000

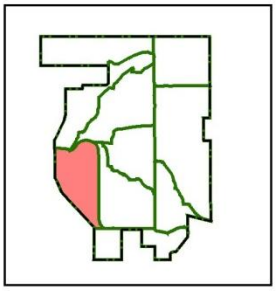
Principal Point of Contact:
Dave Hamernick; Arden Hills City Hall, 1245 W County Rd. 96, St. Paul, MN 55112.
Work: 651-634-5229; Cell 651-775-5017
Site Description: Map found on next page.

Training Area 4
141 Acres



Land Cover	Acres
Impervious Surface *	18.8
Grassland	75.1
Shrubland	8.2
Woodland/Forested	39.1

- Entrance Gate
- Existing Structure
- Demolished Structure or Foundation
- Installation Boundary
- Training Area Boundary
- Army OSC
- Ramsey County
- Wetlands
- Woodland
- Contour - 3m Interval
- Secondary, all weather, hard surface road
- Light duty, all weather, hard or improved surface road
- Fair or dry weather, unimproved surface road
- Trail
- Fire break



* Impervious surfaces include buildings, roads, building foundations

Project Title: Training Area 8 Borrow Pit Restoration Project.

Challenge: As part of the cleanup practices on the TCAAP facility, millions of tons of black dirt and gravel were borrowed from the kame area in Training Area 8. This borrow pit needs to be restored to prevent any further erosion and habitat enhancement necessitates a vegetation plan for the site.

Management Goal: To prevent erosion and restore the disturbed land back to a native plant community.

Management Objectives:

- Stabilize the slopes of the borrow pit area
- Apply black dirt to approximately 40 acres
- Re-vegetate approximately 40 acres
- Invasive species control (Vegetation)

Proposed Methodology: MNARNG staff will perform an assessment of Training Area 8 using the hydrologic study to determine the extent of change of the borrow pit area. The borrow pit area will be contoured to help prevent future erosion. A vegetation management plan will be created for the Training Area in conjunction with MNDNR and USFWS recommendations. The area will then be re-vegetated and a maintenance plan to control invasive species will be implemented.

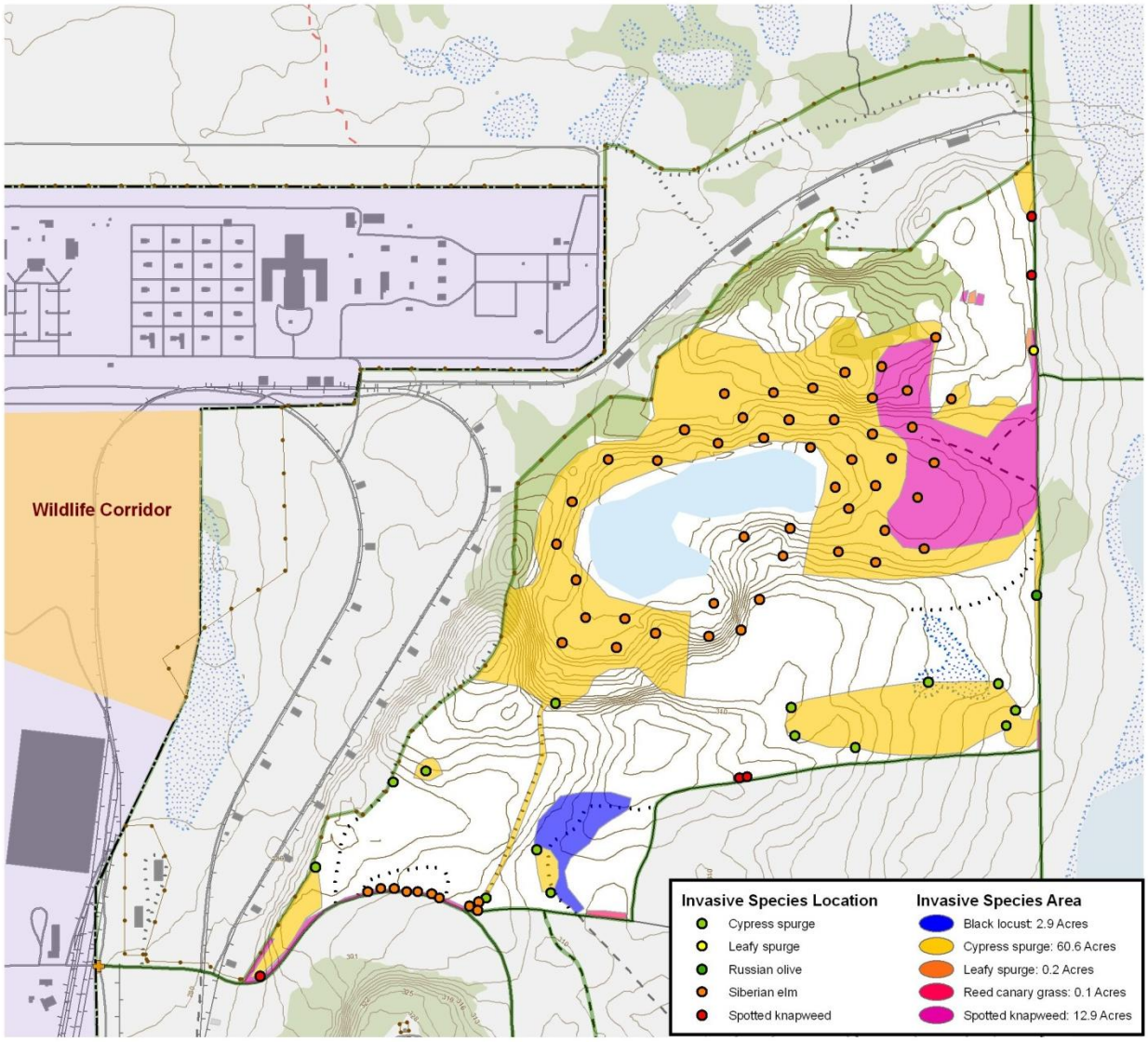
Project	Start Date	End Date	Estimated Costs
Stabilize the slopes of the borrow pit area	2012	2014	$750,000
Apply black dirt to approximately 40 acres	2012	2014	$1,750,000
Re-vegetate approximately 40 acres	2012	2014	$500,000
Invasive species control (Vegetation)	2014	2022	$15,000 annually
			Total: $3,135,000

Principal Point of Contact:

Dave Hamernick; Arden Hills City Hall, 1245 W County Rd. 96, St. Paul, MN 55112.
Work: 651-634-5229; Cell 651-775-5017

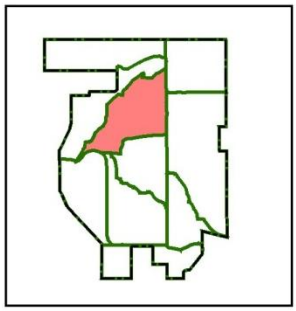
Site Description: Map found on next page.

Training Area 8
172 Acres



Land Cover	Acres
Impervious Surface *	43.4
Grassland	34.2
Woodland/Forested	78.7
Shrubland	5.7
Open Water	10.6

- Entrance Gate
- Existing Structure
- Demolished Structure or Foundation
- Installation Boundary
- Training Area Boundary
- Wildlife Corridor
- Army OSC
- Wetlands
- Woodland
- Contour - 3m Interval
- Fence
- Secondary, all weather, hard surface road
- Light duty, all weather, hard or improved surface road
- Fair or dry weather, unimproved surface road
- Trail
- Fire break
- Railroad



* Impervious surfaces include buildings, roads, building foundations, gravel pit

Project Title: Training Area 9 Wildlife Enhancement Project

Challenge: Past Industrial Land Use and Cleanup efforts on the Twin Cities Army Ammunition Plant (TCAAP) have disturbed a majority of the soil layers. This disturbance in turn has caused a dramatic change in the natural vegetation which has caused an increase in the amount of invasive species on the facility. Currently Training Area 9 is an important area to manage habitat for the Henslow sparrow, Blanding's turtle, and sand hill cranes. This area is comprised of small wetlands which are being threatened by invasive species.

Management Goal: Convert and restore Training Area 9 into an oak savanna-native grassland habitat type for Species in Greatest Conservation Need.

Management Objectives:

- Vegetation planting
- Prairie restoration
- Maintain a healthy wetland community
- Invasive species control (Vegetation)

Proposed Methodology: MNARNG staff will perform an assessment of Training Area 9 to determine all significant hazards to troops in training such as, utility poles, railroad tracks, above ground concrete obstacles, buildings, fences etc. Projects will be implemented to remove those hazards. Once all hazards are removed a vegetation management plan will be created for the Training Area in conjunction with MNDNR and USFWS recommendations. The area will then be revegetated and a maintenance plan to control invasive species will be implemented.

Sustainability: The value of this project is immeasurable; the MNARNG will be able to provide a safe and realistic training environment for our soldiers while providing multi-use benefits to the community. The environmental enhancements benefit the local flora and fauna, and the community will be able to live near and enjoy a more pristine environment.

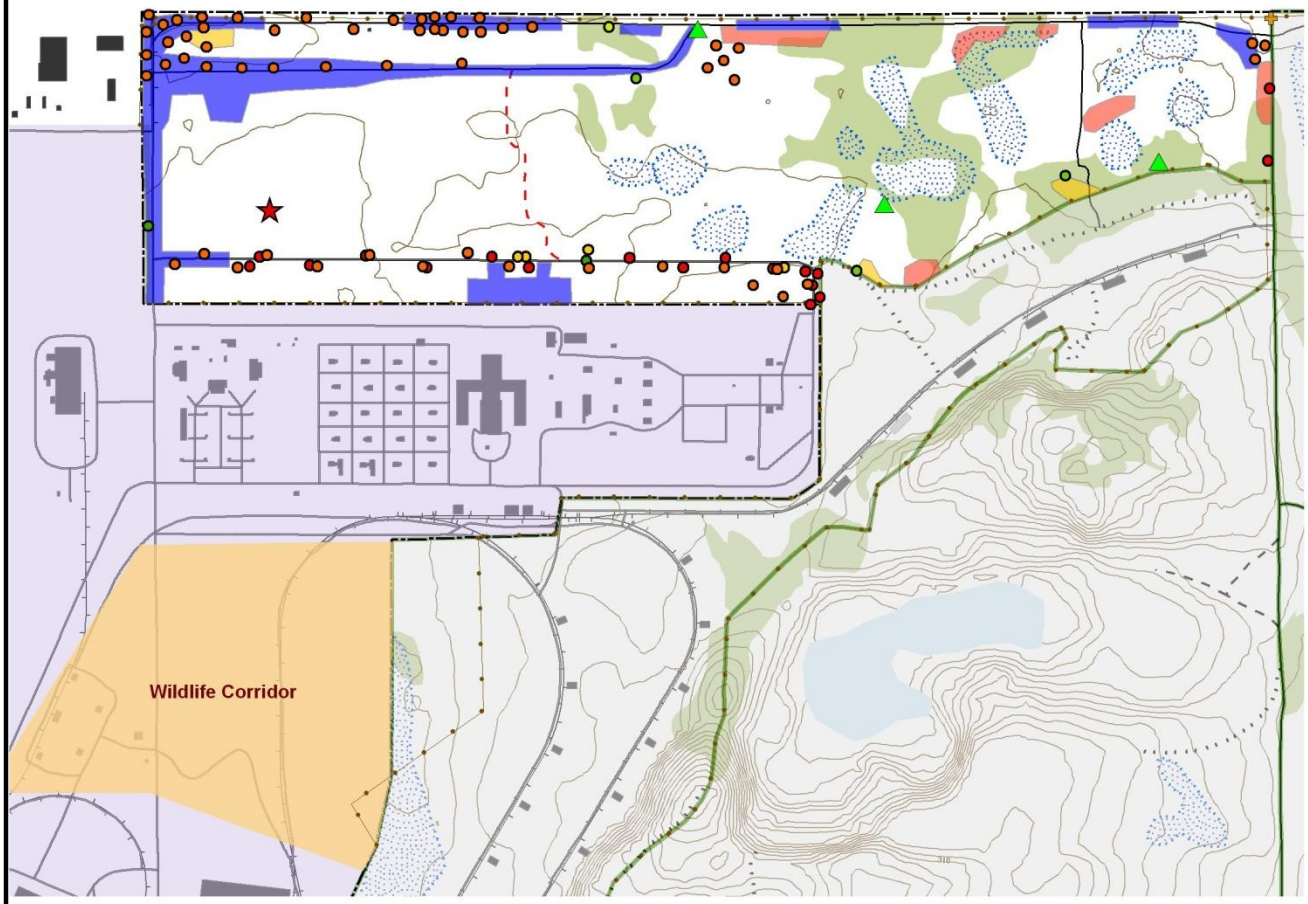
Projects	Start Date	End Date	Estimated Costs
Vegetation planting	April 2011	August 2012	$15,000
Prairie restoration	April 2011	August 2012	$65,000
Maintain a healthy wetland community	April 2012	August 2012	$15,000
Invasive species control (Vegetation)	2012	2020	$15,000 annually
			Total: $230,000

Principal Point of Contact:

Dave Hamernick; Arden Hills City Hall, 1245 W County Rd. 96, St. Paul, MN 55112.
Work: 651-634-5229; Cell 651-775-5017

Site Description: Map found on next page.

Training Area 9
140 Acres



- Blanding's Turtle Locations
- Henslow Sparrow Location

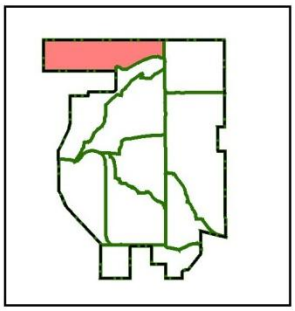
Invasive Species Location

- Cypress spurge
- Leafy spurge
- Reed canary grass
- Russian olive
- Siberian elm
- Spotted knapweed

Invasive Species Area

- Cypress spurge: 1 Acres
- Reed canary grass: 2.9 Acres
- Spotted knapweed: 15.0 Acres
- Railroad: 163 meters to be removed
- Fence: 2567 meters to be removed

Land Cover	Acres
Impervious Surface *	71.5
Grassland	40.2
Woodland/Forested	27.5



- Entrance Gate
- Existing Structure
- Demolished Structure or Foundation
- Installation Boundary
- Training Area Boundary
- Wildlife Corridor
- Army OSC
- Wetlands
- Woodland
- Contour - 3m Interval
- Secondary, all weather, hard surface road
- Light duty, all weather, hard or improved surface road
- Fair or dry weather, unimproved surface road
- Trail
- Fire break

* Impervious surfaces include buildings, roads, building foundations

Project Title: Training Area 10 Wildlife Corridor Enhancement Project

Challenge: Past Industrial Land Use and Cleanup efforts on the Twin Cities Army Ammunition Plant (TCAAP) have disturbed a majority of the soil layers. This disturbance in turn has caused a dramatic change in the natural vegetation which has caused an increase in the amount of invasive species on the facility. Since this area is an integral part of the Rice Creek Wildlife Cooridor and Important Bird Area; enhancements are needed to maintain and protect the natural functions of this area.

Management Goal: Convert and restore Training Area 10 into an oak savanna-native grassland habitat type.

Management Objectives:

- Fence removal - wildlife impediment
- Railroad track removal - convert to trail
- Above ground utilities removal
- Establish fire break
- Vegetation restoration
- Invasive species control (Vegetation)

Proposed Methodology: MNARNG staff will perform an assessment of Training Area 10 to determine all significant hazards to troops in training such as, utility poles, railroad tracks, above ground concrete obstacles, buildings, fences etc. Projects will be implemented to remove those hazards. Once all hazards are removed a vegetation management plan will be created for the Training Area in conjunction with MNDNR and USFWS recommendations. The area will then be revegetated and a maintenance plan to control invasive species will be implemented.

Sustainability: The value of this project is immeasurable; the MNARNG will be able to provide a safe and realistic training environment for our soldiers while providing multi-use benefits to the community. The environmental enhancements benefit the local flora and fauna, and the community will be able to live near and enjoy a more pristine environment.

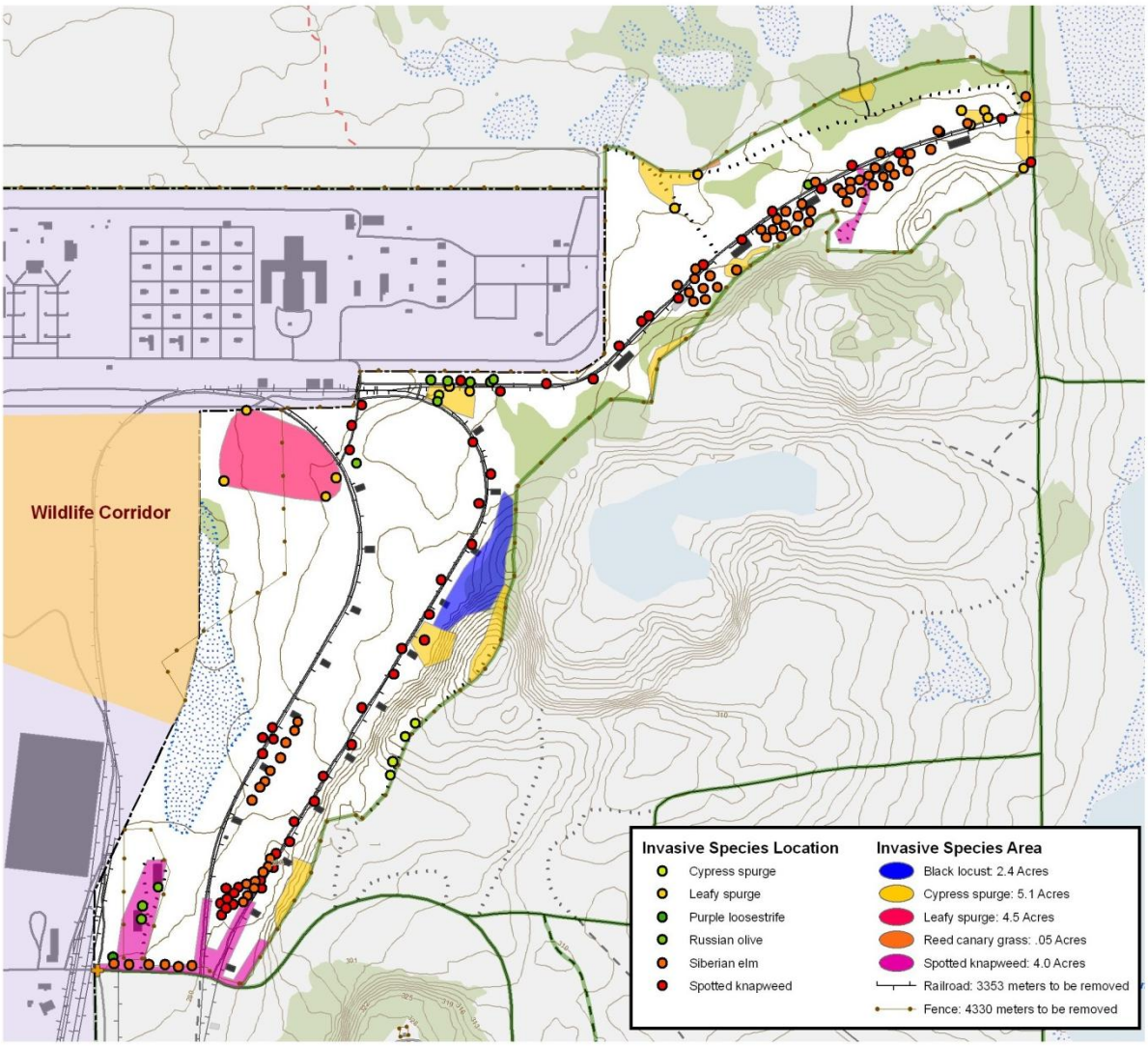
Projects	Start Date	End Date	Estimated Costs
Fence removal - wildlife impediment	April 2010	August 2011	$30,000
Railroad track removal - convert to trail	April 2010	August 2011	$85,000
Above ground utilities removal	April 2010	August 2011	$15,000
Establish fire break	April 2010	August 2011	$15,000
Vegetation restoration	April 2010	August 2011	$80,000
Invasive species control (Vegetation) annually	2012	2020	$15,000
			Total: $360,000

Principal Point of Contact:

Dave Hamernick; Arden Hills City Hall, 1245 W County Rd. 96, St. Paul, MN 55112.
Work: 651-634-5229; Cell 651-775-5017

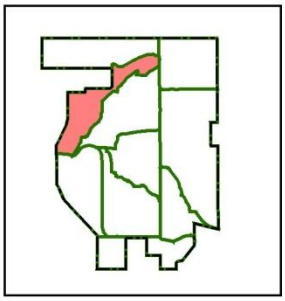
Site Description: Map found on next page.

Training Area 10
130 Acres



Land Cover	Acres
Impervious Surface *	23.4
Grassland	58.9
Woodland/Forested	47.2

Entrance Gate
Existing Structure
Demolished Structure or Foundation
Installation Boundary
Training Area Boundary
Wildlife Corridor
Army OSC
Wetlands
Woodland
Contour - 3m Interval
Secondary, all weather, hard surface road
Light duty, all weather, hard or improved surface road
Fair or dry weather, unimproved surface road
Trail
Fire break



* Impervious surfaces include buildings, roads, building foundations

Listed below is a summery table that includes all the projects listed in the attachment. Again, these are projects that will restore the productivity of habitats or species diversity that were injured by past practices or replace them with substitute flora consistent with MNDNR and USFWS recommendations. It is the MNARNG intent to convert the previous TCAAP into a multi-use facility to meet the triple bottom line of sustaining the mission, environment and community.

Proposed NRDA Projects

Projects	**Start Date**	**End Date**	**Estimated Cost**
AHATS Hydrology Study.	2009	2010	$175,000
Training Area 4 Native Vegetation Restoration Project.	2010	2020	$540,000
Training Area 8 Borrow Pit Restoration Project.	2012	2022	$3,135,000
Training Area 9 Wildlife Enhancement Project.	2011	2020	$230,000
Training Area 10 Wildlife Corridor Enhancement Project	2010	2020	$360,000

Total: $4,440,000

Appendix N. GIS Data Layer Updates, 2009.

The following GIS data layers have been updated in 2009.

auditory
- noise_abatement_area

boundary
- jurisdiction_county_area
- jurisdiction_municipal_area
- jurisdiction_municipal_point

buildings
- structure_existing_area
- structure_existing_point
- tower_point

cadastre
- dod_rpi_area
- easement_right_of_way_area
- installation_area

common
- coordinate_grid_line
- coordinate_grid_area

cultural
- cultural_restricted_area
- cultural_survey_area
- cultural_survey_point

fauna
- fauna_special_species_area
- fauna_special_species_point
- gov_wildlife_management_area
- nesting_point

flora
- flora_pres_burn_area
- flora_special_species_area
- flora_special_species_point
- forest_management_area
- forest_stand_area
- land_vegetation_area
- timber_harvest_area

future_projects
- future_projects_area
- future_projects_landuse_area
- future_projects_line
- future_projects_point

geodetic
- ngs_control_point

hydrography
- surface_water_body_area
- surface_water_course_area
- surf_wat_course_centerline
- wetland_area

improvement_general
- fence_line
- general_improvement_feat_point
- gate_point

improvement_recreation
- recreation_trail_centerline

land_status
- cemetary_area
- open_pit_mine_point

landform
- elevation_contour_line
- elevation_area
- spot_elevation_point

military_operations
- ammunition_storage_area
- dudded_impact_area
- firing_point
- firing_line
- forward_arming_refueling_point
- military_access_point
- military_drop_zone_area
- military_landing_zone_point
- military_observation_point
- mil_qty_distance_arc_area
- military_range_area
- military_range_point
- mil_restricted_access_area
- military_safety_marker_point
- mil_surface_danger_zone_area
- military_target_line
- military_target_point
- training_point

transportation_air
- airfield_surface_area

airfield_surface_point
airspace_obstruction_navaid_point

transportation_rroad
railroad_centerline

transportation_vehicle
road_centerline
road_feature_point
road_bridge_centerline

utilities_electrical
electrical_substation_area
electrical_cable_line

utilities_storm
storm_culvert_point