Monarch

Common tansy

Blanding's turtle

CAMP RIPLEY AND ARDEN HILLS MINNESOTA ARMY NATIONAL GUARD TRAINING SITES

CONSERVATION PROGRAM REPORT

2008 ANNUAL REPORT

Cover Photography: Upper, monarch (*Danaus plexippus*) courtesy John J. Mosesso, public domain, National Biological Information Infrastructure at < http://images.nbii.gov/insects/nbii_t00455.jpg >, accessed 26 November, 2008; Center, common tansy (*Centaurea maculosa*), courtesy of Michael Shephard, USDA Forest Service, Bugwood.org, accessed 26 November, 2008; Lower, Blanding's turtle (*Emys blandingii*) courtesy of Jeremy Maslowski, Camp Ripley Intern, June 2008.

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

2008 Annual Report

January 1 – December 31, 2008

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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. 18

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Signature Page for Camp Ripley and AHATS INRMP updates.

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2008 Conservation Report	Richard A. Weaver, Colonel Camp Ripley Post Commander Minnesota National Guard **Signature:** **Date:** 1/8/09
Approval: Mr. Joseph M. Kurcinka Regional Director MN-DNR Central Region **Signature** **Date** 1/6/09	**Approval:** Tony Sullins, Field Supervisor USFWS , Twin Cities Field Office **Signature:** **Date:** 1/7/09

Update/Review Requirements:

The 2008 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, 2008. 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.

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

Document History

Document	Effective Date	Update Summary
Camp Ripley INRMP	Jan 1998	2008 Conservation Report
AHATS INRMP	Oct 2001	2008 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 2008 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, 2008; 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, land use management, outreach and recreation.

In 2008, four pending cultural resources projects on Camp Ripley and AHATS were submitted to the State Historic Preservation Office (SHPO) for their concurrence. In November, the MNARNG met with representatives from the 23 Tribes indigenous to Minnesota for the third annual Nation to Nation Consultation.

Four Nature Conservancy staff again assisted with the re-inventory of Camp Ripley forest stands. During the year, the crew completed re-inventory of 5,088 acres of forest stands which meets the goal of completing ten percent of the forest inventory database annually. A total of 19,344 acres have been completed from 2003 to 2008. In 2008, six tracts of timber totaling 640 acres were offered for harvest at the sealed bid auction on Camp Ripley. Thirty-four individuals acquired fuelwood permits from Range Control and MNDNR, Division of Forestry, in 2008. 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 AHATS in the nursery on the west side of the installation. Similarly, tree planting on Camp Ripley occurred in a buffer area between Kodiak and Morrison County Highway # 1 and on the south side of Camp along Highway 115. A variety of forest insect and disease pests were monitored or treated on Camp Ripley including jack pine budworm, pine bark beetle, two-lined chestnut borer, and gypsy moths. 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.

Prescribed fire was implemented on Camp Ripley for hazard reduction (10,000 to 12,000 acres) and ecological (639 acres) burns. The D-Range Upgrade allowed restoration of a small wetland area that was impacted by the original development of the range. In 2008, the Department of Biological Sciences at St. Cloud State University continued to monitor and test control methods for invasive plant species at Camp Ripley and AHATS, recommendations for control of invasive plant species, are provided in this report. The water quality trend analysis program report for Camp Ripley indicates that overall the water quality of the aquatic systems monitored is good when compared to other systems and patterns found in central Minnesota. Data for all surface waters were examined in

an effort to evaluate whether trends in nutrient loading are the result of training activities or other factors.

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 Environmental staff once again participated in the Pillager area Christmas Bird Count. Songbird surveys were conducted from on 89 Range Training Land Assessment (RTLA) plots; a total of 975 birds of 70 different species were counted. Additional bird species were monitored including bluebirds, bald eagles, ruffed grouse and wild turkeys.

In March, four wolves were captured via helicopter and radio-collared. Two packs of gray wolves continue to inhabit Camp Ripley, and were monitored through radio-telemetry throughout 2008. Pack sizes were estimated to be six to ten wolves. An aerial deer survey was also conducted in March; analysis of the survey data provided an estimate of 28 deer per square mile on Camp Ripley.

Ground and aerial radio tracking were used to monitor reproductive success, movements and mortality of ten collared black bears on Camp Ripley through 2008. To assist in estimating the statewide black bear population, Camp Ripley participated in the MNDNR's tetracycline survey. A scent post survey was conducted n Camp Ripley to track population trends of major furbearer-predator species. Six scent stations were used to detect lynx, cougars, and bobcats in 2008. A graduate student began research as part of the fisher project; two radio-collared fishers were 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, thirty-three Blanding's turtles were observed and five nests were protected. Fish surveys were conducted on seven Camp Ripley lakes and game fish were harvested from seven lakes for stocking. Nine zebra mussel samplers were placed in the Mississippi and Crow Wing rivers, but no zebra mussels were detected.

At AHATS songbird surveys were conducted on 13 RTLA plots; state listed Henslow's sparrows were not documented for the first time in four years. Trumpeter swans raised six cygnets during 2008. Eighty-seven deer were counted during the AHATS aerial deer survey. A butterfly survey was conducted by the Saint Paul Audubon Society on June 29, 2008, and three new species were observed.

To date, 200 willing landowners have enrolled in Camp Ripley's Army Compatible Use Buffer program. These landowners represent about 27,500 acres of land. Over 90 percent of the interested landowners desire permanent conservation easements rather than acquisition. ACUB accomplishments through 2008 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 2008, the environmental team gave presentations or tours to 113 groups totaling 4,112 people. Also, in 2008, Camp Ripley hosted the fourth annual Disabled American Veterans (DAV) turkey hunt and the seventh annual youth archery hunt. Camp Ripley also held the third annual deployed soldier's archery deer hunt in conjunction with the seventeenth 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 2008. At AHATS, two youth archery deer hunts and the third 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). 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 and implementation 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 2006), 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).

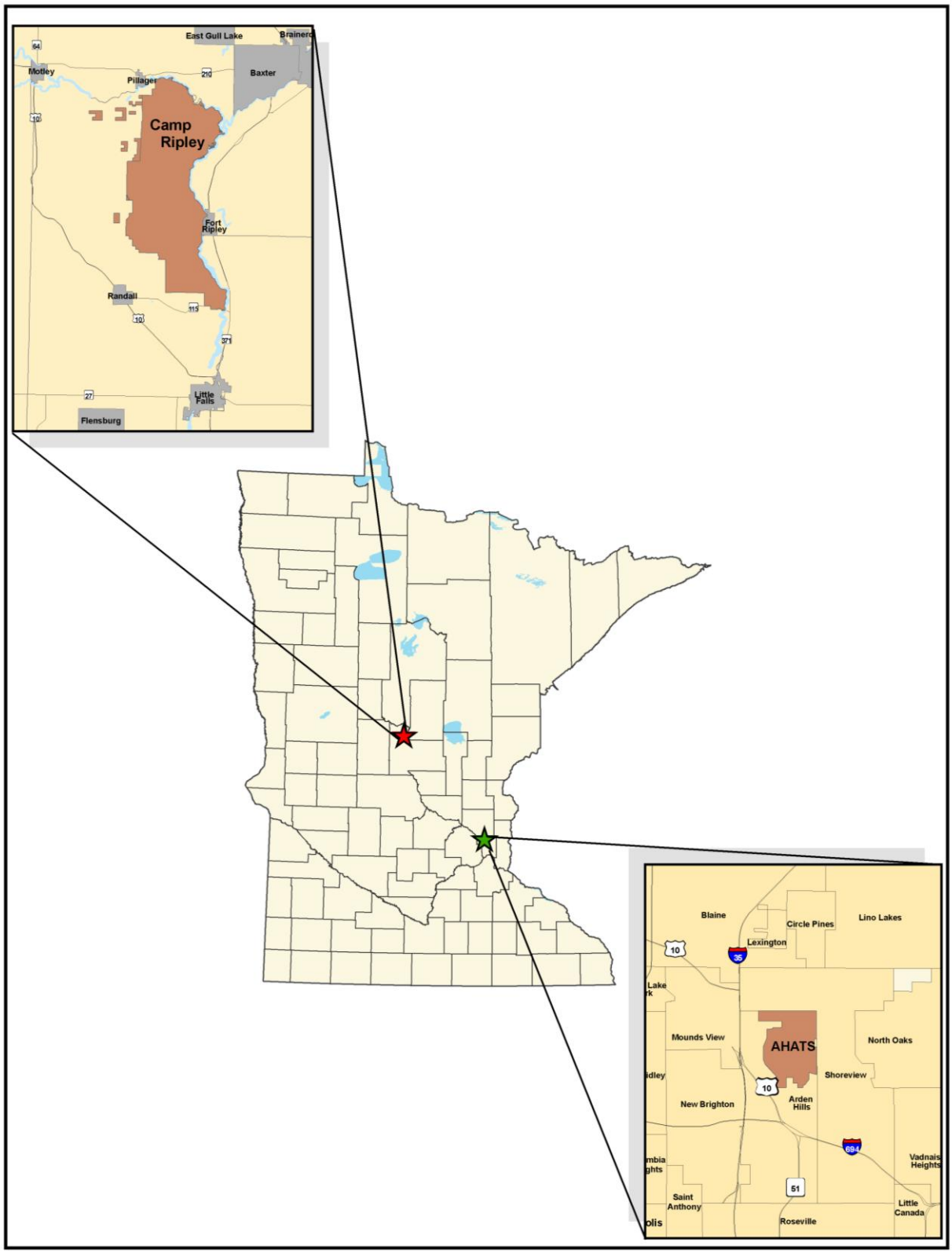
CAMP RIPLEY TRAINING SITE

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 a gross area of 52,758 acres (approximately 82 sq. miles) within Morrison County. 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.

Camp Ripley supports the state mission for military reserve 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

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



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 natural resources and training mission.

The Range Training Land Assessment (RTLA) (formerly Land Condition – Trend Analysis) program was initiated at Camp Ripley in 1991. RTLA is a program that provides for inventory and monitoring of biological and physical resource data as a means of quantifying the condition of the land. Under this system, permanent study plots were established to inventory the flora and fauna of Camp Ripley. In addition, RTLA methods have been established to evaluate the land condition as it relates to military training exercises.

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 beginning in 2007 (Dirks et al. 2007) and 2008 (Appendix A). The data obtained will be used to help manage the natural resources on Camp Ripley. Fifty-one mammal species, 202 bird species, 23 reptiles and amphibians, 56 species of fish, and over 600 plant species have been identified at the training site.

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 lays 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 studies of 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. 2007) and 2008 (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 Commander-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, 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 MNARNGs Conservation Programs statewide. Environmental personnel who work directly for the Facilities Management Office (FMO) have statewide responsibility for MNARNGs Compliance, Restoration, and Pollution Prevention Programs.

PARTNERSHIPS

In the interest of sound conservation, the MNARNG has developed partnerships with a variety of organizations and resource agencies. Some of these partnerships have resulted in formal interagency agreements with the Minnesota Department of Natural Resources (MNDNR), Division of Ecological Resources (Appendices C and D), 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. Partners that have made significant contributions include MNDNR, 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, Board of Water and Soil Resources, 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 2008, the Conservation Program of the MNARNG will be divided into the following program areas: cultural resources, land use management, outreach and recreation, and natural resources including forestry, pest management, water resources, vegetation management, fisheries, and wildlife.

Cultural Resources

During 2008, four pending projects on Camp Ripley and AHATS were submitted to the State Historic Preservation Office (SHPO) for their concurrence. On Camp Ripley, the cultural survey for the remainder of Training Area # 10 was submitted but after review by the Tribes that represented the

23 participating federally recognized Tribes indigenous to Minnesota, an addendum was written to address their concerns and resubmitted to the SHPO, receiving their concurrence. The final report for the cultural survey of the proposed Multi-purpose Range Complex was submitted to the Tribes and to the SHPO and received concurrence. On AHATS, the cultural survey of the non-disturbed soils and the remainder of unevaluated farmsteads was completed and the final report submitted to the SPHO for concurrence. The response from the SHPO is pending. The Cold War Evaluation of buildings attaining age 50 by 2010 statewide was also submitted to the SHPO for concurrence but received questions to be addressed by the Army Corps of Engineers' contractor and remains pending.

During the summer of 2008, 15 Camp Ripley farmsteads (Figure 2) that contained hazards to soldiers during military training were mitigated to remove the hazard and capped with soil fill. Those sites will ultimately be seeded and returned to available training land.

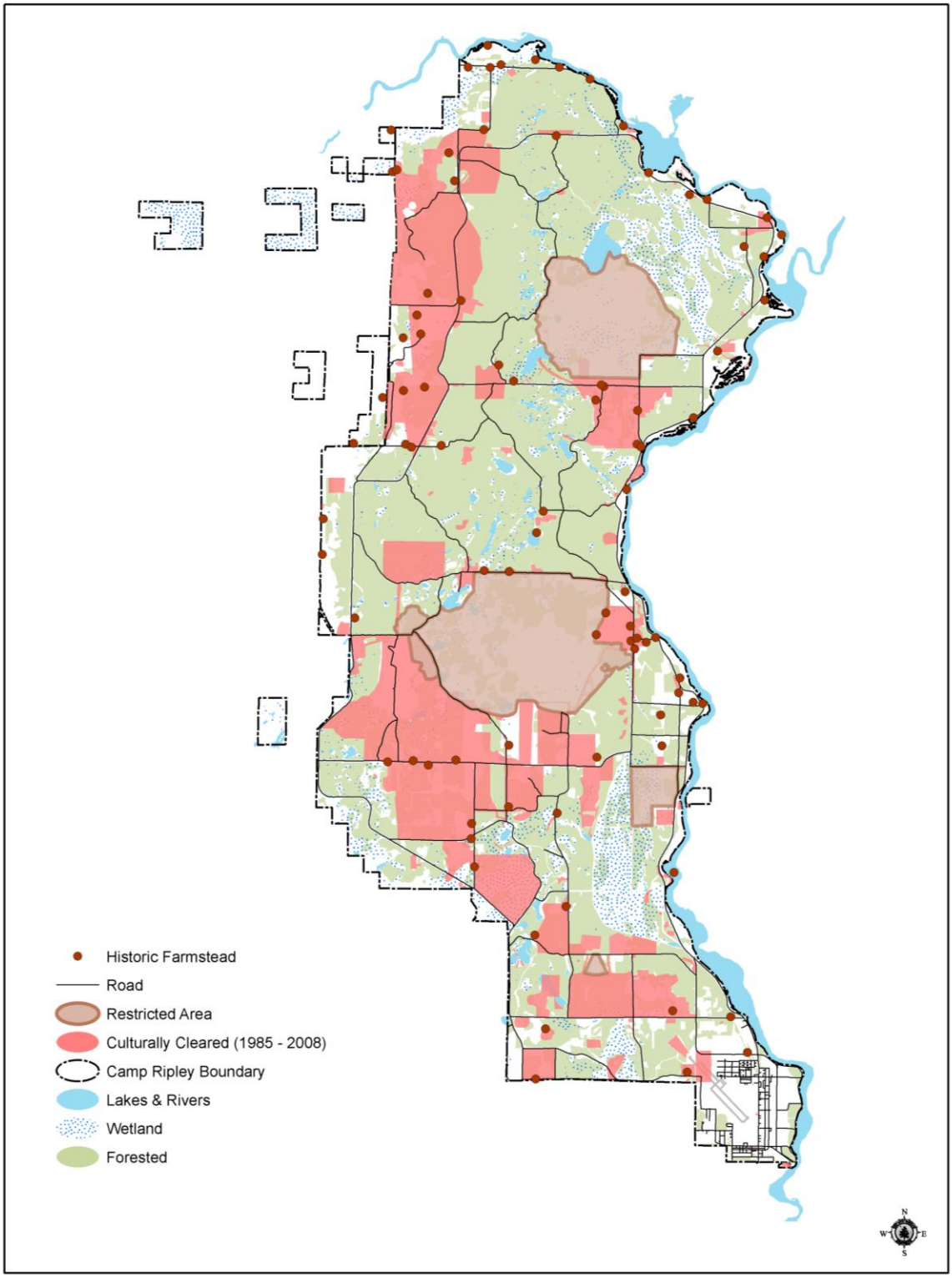
Contracts were awarded to archaeological firms by the Army Corps of Engineers in September to complete the Phase I evaluation of Camp Ripley's Training Area # 1 and to complete the Phase II evaluation of nine Camp Ripley prehistoric sites identified during previous Phase I evaluations. That field work was completed before freeze-up in November.

A private lessee on Camp Ripley, British Aerospace Electronics (BAE), completed a Phase I evaluation of a sixteen acre site, proposed for their relocation for testing weapon systems under their development. BAE utilized a private engineering firm who subcontracted with Heritage Sites, the Leech Lake Band of Ojibwe's archaeological company. Because Tribal people conducted the Phase I evaluation, the process of site clearance was expedited.

As of the end of October 2008, 14,646.41 acres on Camp Ripley had been evaluated for prehistoric and historic sites. 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.

In November, the MNARNG again met with representatives from the 23 Tribes indigenous to Minnesota for the third annual Nation to Nation Consultation. The meeting was hosted by the White Earth Band of Ojibwe at their Shooting Star Casino in Mahnomen, Minnesota. Progress was made in finalizing the language in the draft Programmatic Agreement covering the archaeological work being done on Camp Ripley as well as Standard Operating Procedures for inadvertent discovery to comply with Federal and State laws.

Figure 2. Culturally evaluated areas with concurrence of no adverse effect and farmstead locations at Camp Ripley, 1985-2008.



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, the 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 that adequately address the issues and concerns that are raised by all stakeholders. 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 2008 Camp Ripley and AHATS annual meeting minutes.

FORESTRY

Forest Inventory

Beginning in January of 2007, The Nature Conservancy hired four staff to assist their Land Steward, Tim Notch, with the back-log of forest stands re-inventory. During 2008, the crew completed re-inventory of 5,088 acres of forest stands for a total for 2003 to 2008 of 19,344 acres completed (Figure 3). The amount re-inventoried in 2008 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 was established, and one sample point is measured within each hexagon. The state of Minnesota is supporting an intensification of the plot grid to one plot per 3,000 acres of land. In any given year, one-fifth of the plots, called a 'panel' are measured (Table 1 and Figure 4).

Table 1. 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

Figure 3. Forest stands re-inventoried at Camp Ripley, 2003-2008.

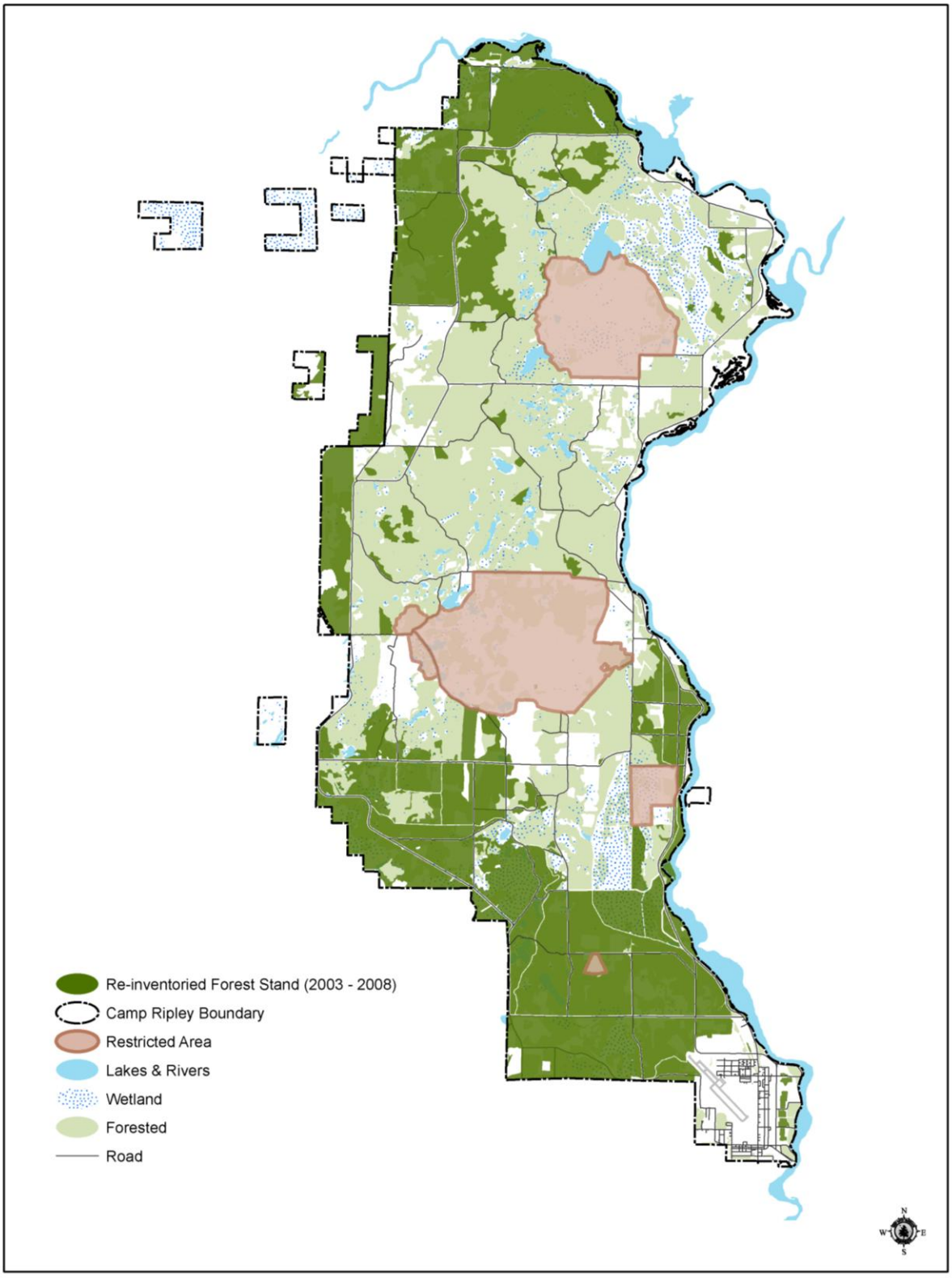
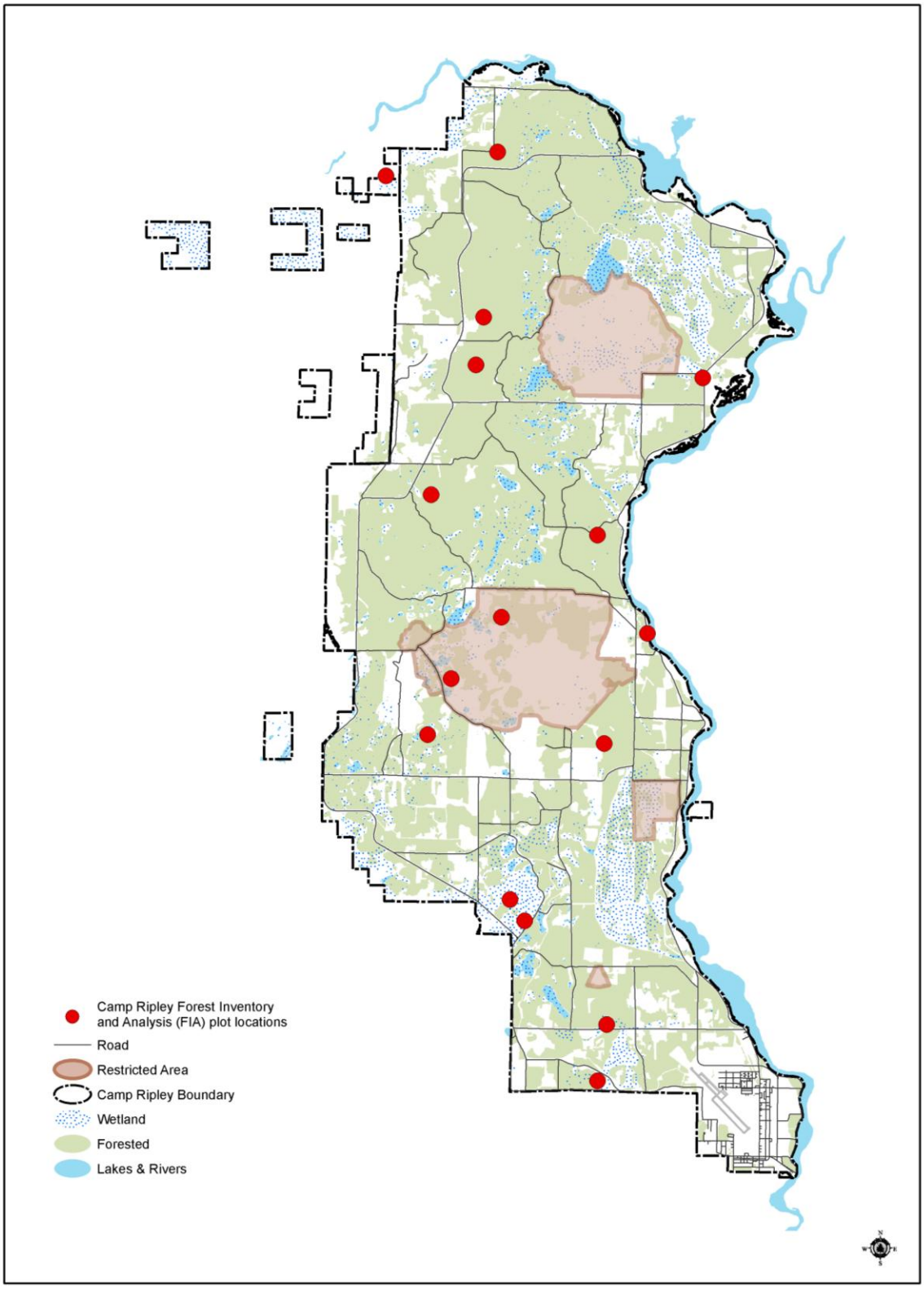


Figure 4. Forest Inventory and Analysis plot locations at Camp Ripley.



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. There is approximately one Phase 3 plot for every 16 Phase 2 plots, or one Phase 3 plot for every 96,000 acres. These attributes include tree crown condition, understory vegetation, down woody materials, and soil attributes. Additionally, soil samples are collected, sent to a laboratory for chemical analysis, and then completely destroyed.

Timber Sales

During the first quarter of 2007, permit #2376 to Petty and Sons was closed as completed with the cutting occurring just prior to the end of 2006. Permit #2676 to Weyerhaeuser (Trus Joist) was also closed as completed with the harvesting completed during the fall of 2006.

In September 2008, six tracts of timber were offered for sale at the sealed bid auction on Camp Ripley (Table 2 and Figure 5). Four of the sales were offered on Intermediate auction, available to loggers only, and two sales were offered on the Regular auction, available to all bidders including those with 20 or more employees. The areas offered totaled 641 acres (Table 3). Three of the offerings were sales originally purchased by Weyerhaeuser (Trus Joist) but were defaulted when they shut down. The remaining three offerings, were sale areas designed for Range development for military training.

Table 2. Camp Ripley timber sales, 2008.

Permit #	Acres	Cords/Species	Revenue	Successful Bidder
X011138	29	75 Paper birch 660 Aspen	$17,532.00	Great Northern Logging
X011139	34	107 Paper birch 578 Aspen	$15,231.78	Bill Madsen
X011140	43	235 Jack pine 43 Maple Sp. 115 Paper birch 640 Aspen	$16,894.50	Edin Logging Inc.
X011141	70	75 Paper birch 25 Red maple 75 Jack pine 25 Northern Hdwds. 1,155 Aspen	$23,440.00	Sawyer Timber Co.
B010655	272	220 Maple sp. 1,700 Paper birch 3,060 Aspen	$154,155.00	SAPPI Fine Paper
B010656	192	2,640 Aspen 1,180 Jack pine 285 Paper birch	$152,916.00	SAPPI Fine Paper
2008 TOTAL	**640**	**12,893 cords**	**$380,169.28**	

Figure 5. Location of timber sales at Camp Ripley, 2008.

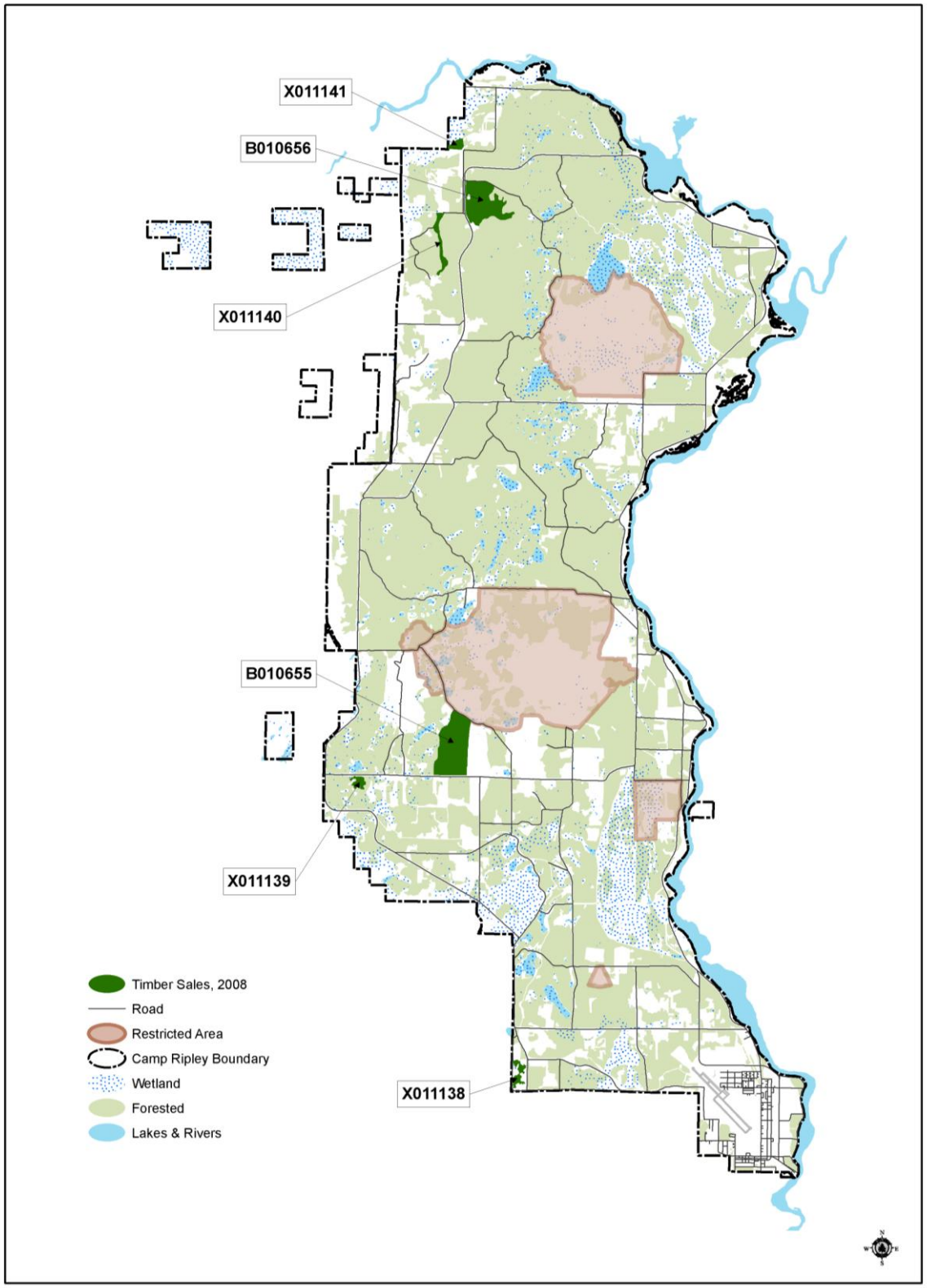


Table 3. Timber sale summary at Camp Ripley, 2002-2008.

Year	2002	2004	2005	2006	2007	2008
Acres	189	218.5	217	139	188	**641**
Volume	1500 cds.	4040 cds.	4412 cds.	3140 cds.	3624 cds.	**12,893 cds.**
Appraised Value	$25,357.50	$86,943.00	$114,123.00	$85,705.00	$67,140.00	**$206,326.00**
Sold Value	$52,632.00	$230,140.00	$413,321.30	$133,740.00	$125,483.56	**$406.703.38**
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.)**

Fuelwood Permits

For the permit period from April 1, 2008 through March 31, 2009, there were 34 individuals that acquired fuelwood permits from Range Control and MNDNR, Forestry Division.

In September 2008, the Sentence to Serve crew leaders returned to Camp Ripley for their annual chainsaw training. The area selected this year was on a future range development area for the multi-purpose range complex scheduled for Center Range. Over 100 individuals participated in the week long training exercise, and cut down nearly 300 trees.

Tree Planting

Tree planting during 2008 was accomplished at AHATS in the nursery on the west side of the installation with a fall planting. The 140 trees in #10 pots were planted in the buffer and consisted of

35 pin oak *(Quercus ellipsoidalis,)* 35 northern red oak *(Quercus rubra),* 35 bur oak (*Quercus macrocarpa),* and 35 white oak (*Quercus alba)* trees with a one inch stem caliper. In addition, one hundred #2 pots of eastern red-cedar *(Juniperus virginiana)* were swapped for 27 additional oak saplings of equal value.

Similarly, planting on Camp Ripley was in the buffer area between Kodiak and Morrison County Highway #1 equidistant north and south of Normandy Road. In total, 535 potted trees were planted consisting of 200 black hills spruce (*Picea mariana*) and 335 conservation grade white spruce (*Picea glauca*). In the Norway pine buffer along Highway #1 in Training Area # 52, 240 white spruce were under planted to provide continuity to the visual buffer.

On the southwest side of Cantonment, 260 potted conservation grade white and black hills spruce, a few white pine (*Pinus strobes*), and a few balsam fir (*Abies balsamea*) were under planted along the armor trail and buffer just north of Highway # 115. In addition, the DPW crew planted nearly 260 black hills spruce from #10 pots, along the fence just north of Highway #115 in what is called "the old bone yard".

Insects and Disease

Insects and disease problems were noted during 2005 when an infestation of jack pine budworm (*Choristoneura pinus pinus*) defoliated nearly 600 acres of jack pine (*Pinus banksiana*) in the northwest part of Camp Ripley. Due to the damage and the potential of severe fire hazard, Camp Ripley personnel conducted an aerial application of *Bacillus thuringiensis*, a selective bio-control agent. That application occurred during May 2006 on 677 acres of jack pine stands in the north part of Camp Ripley (Figure 6).

The treatment was effective and no budworm activity was detected in the area sprayed. However, during 2007 the trees weakened by the previous defoliation became more vulnerable to infestation from pine bark beetle (*Ips pini*). Consequently, tree and branch mortality throughout the affected pine stands became apparent. Some budworm activity was detected south of Argonne Road but damage did not become significant.

The dry weather during the summer of 2008 created stress on many trees throughout Camp Ripley including the Cantonment Area. The pine bark beetle, as well as other pests, caused sporadic tree and branch mortality in all of the conifer plantings. The impacts on hardwood trees resulted primarily from the two-lined chestnut borer (*Agrilus bilineatus*).

The Minnesota Department of Agriculture again placed gypsy moth (*Lymantria dispar*) traps throughout Camp Ripley (Figure 7). The traps were checked once in August and again when the traps were pulled at the end of the season. No moths were found as has been the status since 1999, when monitoring began.

Figure 6. Jack pine budworm treatment areas at Camp Ripley, 2006.

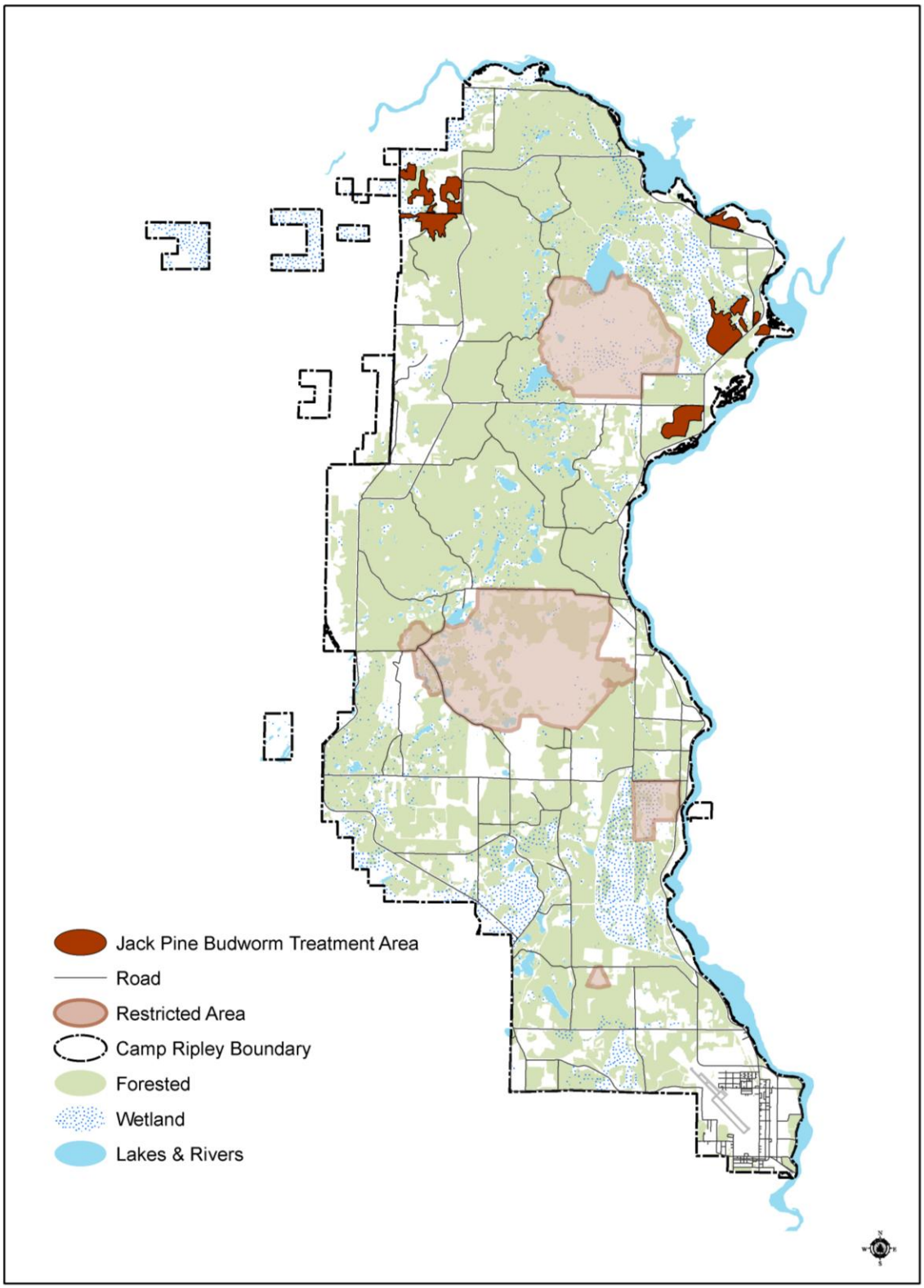
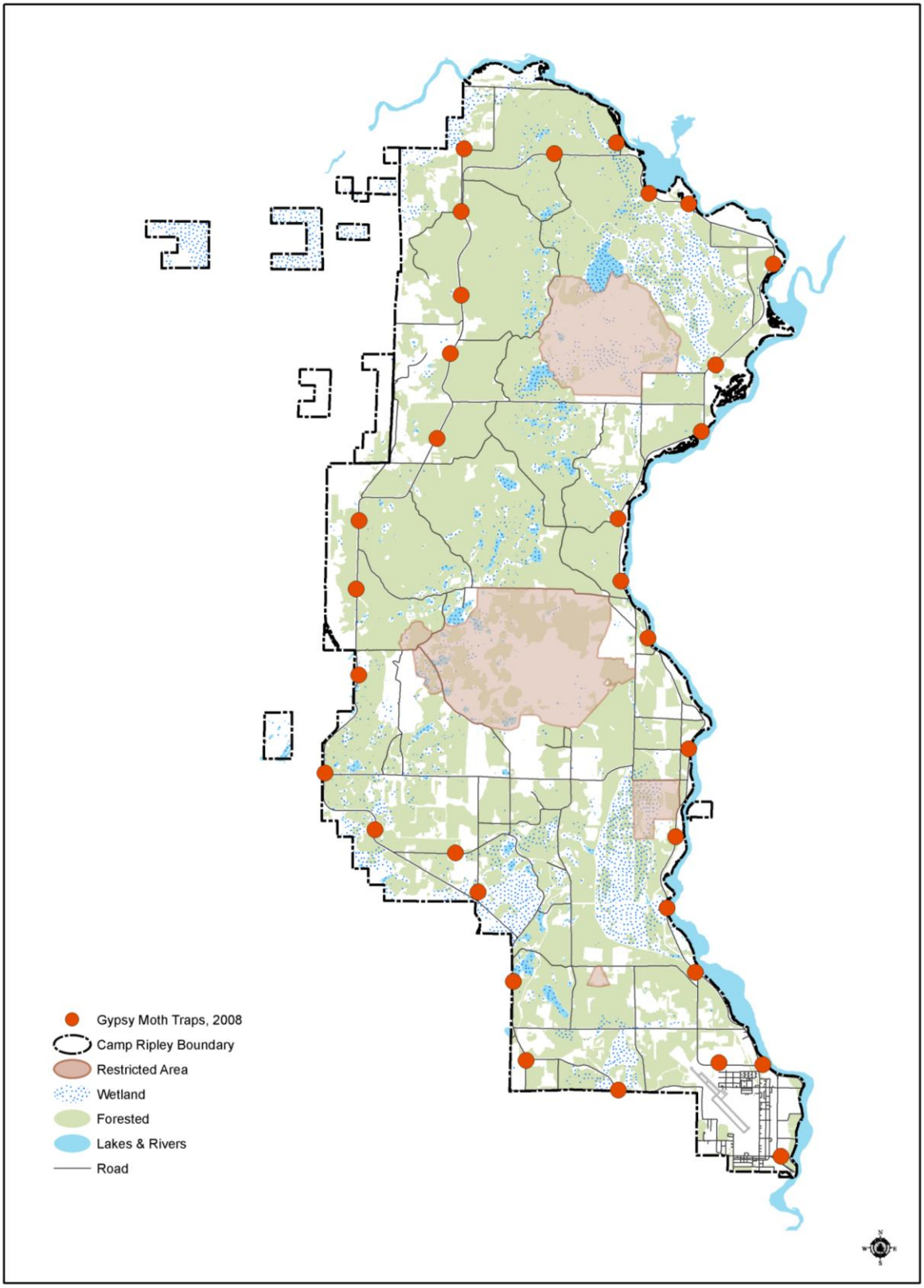


Figure 7. Gypsy moth trap locations at Camp Ripley, 2008.



Land Fund

During the 2008 session, the Minnesota Legislature enacted legislation (MS 190.25 subd. 3A; Appendix G) 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 was created as no other funding source existed to cover the costs of forest development resulting from timber harvests of mature and old aged trees on Camp Ripley.

In response to the legislation, by-laws (Appendix H) for a special revenue fund committee were developed similar to other special revenue funds administered by the Camp Ripley budget office. The by-laws outlined the process for annual budget development and approval as well as the constraints to be followed for the expenditure of the funds.

VEGETATION MANAGEMENT

Prescribed Fire

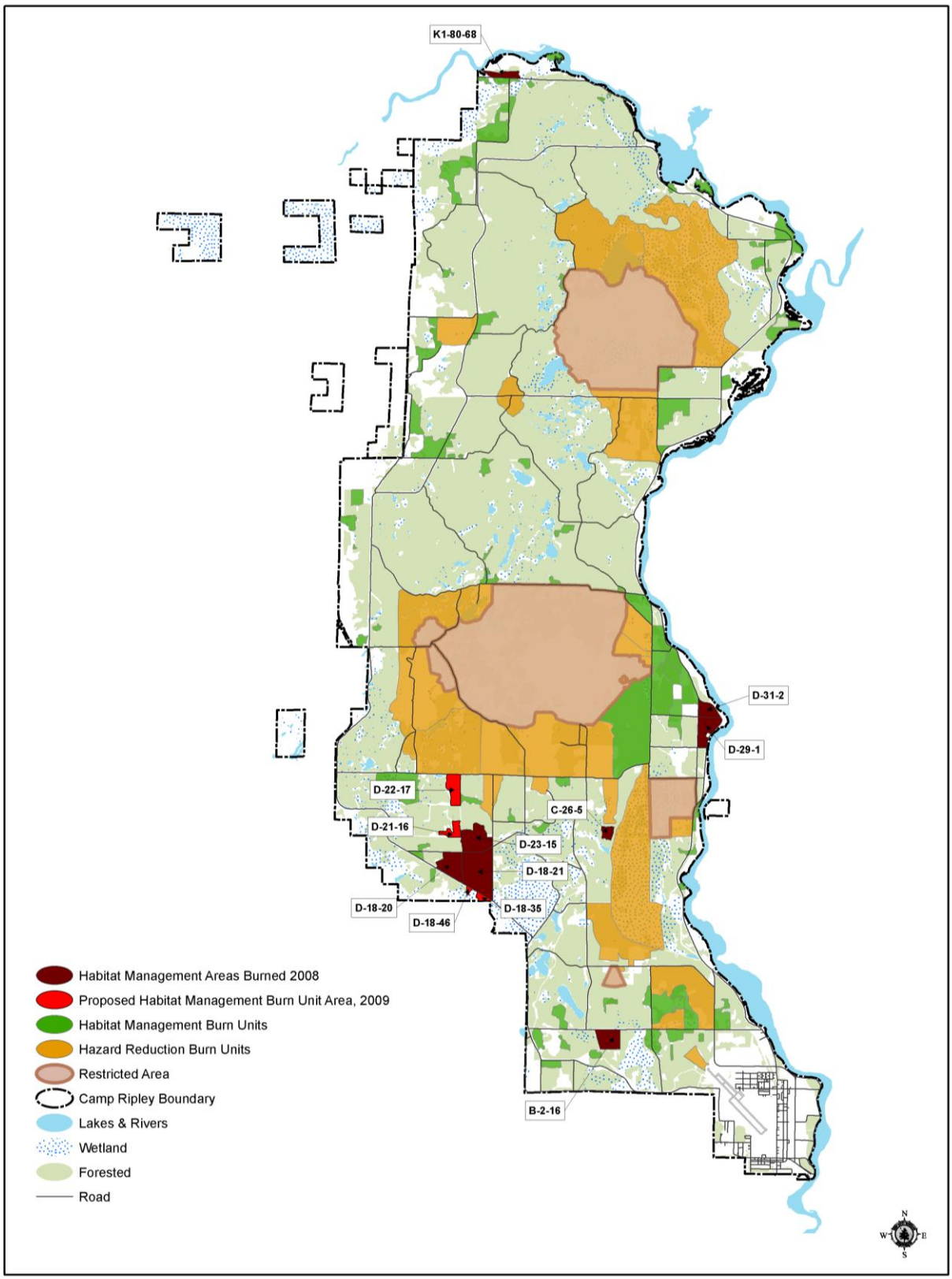
Camp Ripley uses prescribed fire as a management tool to enhance the military training environment (also known as mission-scape) and for ecological purposes. Prescribed fire target areas include native prairie grass enhancement, woody encroachment, seed production, brush control, fuel-hazard reduction, 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 (Figure 8).

Burn plans are carefully written for each burn unit and reviewed by 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 2008 consisted of 11 units that totaled 719 acres. Eight of these plans were units from fall of 2007 that had not been completed. In February, the new plans were submitted to the roads and grounds supervisor for review and comment. Measurable objectives for all units were achieved and described in the plans, they are: 1) burn and consume 90 percent of fine

Figure 8. Fire units burned for habitat management at Camp Ripley, 2008.



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 2 is measured after sufficient green up is attained to quantify percent kill on hazel.

Spring burn units C-26-5, D-31-2, D-29-1, D-18-20, D-18-21, and D-23-15 (Figure 8) totaled 538 acres. Fall burn units B-2-16, K1-80-68 (Figure 8) totaled 101 acres. All goals and objectives were achieved on all spring burn units which demonstrates the effectiveness of phenological timing of the burn events**.** The following proposed burn units were not completed in 2008, they are: B-2-16, C-26-5, D-18-35, D-18-46, D-21-16, D-18-20, D-18-21, D-22-17, D-23-15, D-29-1, and D-31-2. All of the ecological burn units were completed by The Nature Conservancy prescribed fire crew under the direction of the RxB2 burn boss Tom Rothleutner, DPW Supervisor.

Camp Ripley and Arden Hills Army Training Site 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 the 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 4).

Table 4. Invasive plant species of Camp Ripley and Arden Hills Army Training (AHATS) Sites (Babski 2002).

Family	Scientific Name	Common Name	Camp Ripley	AHATS
Brassicaeae	*Berteroa incana*	Hoary alyssm	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

Table 4. Invasive plant species of Camp Ripley and Arden Hills Army Training (AHATS) Sites (Babski 2002).

Family	Scientific Name	Common Name	Camp Ripley	AHATS
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

The Department of Biological Sciences at SCSU has 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 minimum environmental damage to native communities. Following are the 2008 accomplishments and 2009 work plan submitted by Joseph Carlyon and Jorge Arriagada, St. Cloud State University.

Chemical Herbicide Recommendations

After the completion of four years of testing various controls we have quantifiable evidence, in the form of percentage cover, of which treatments and treatment combinations provide the greatest reduction for each of the invasive plant species found at two Minnesota military training sites. For the purpose of conciseness, the top three invasive species at these training sites and the pertinent chemical controls are summarized.

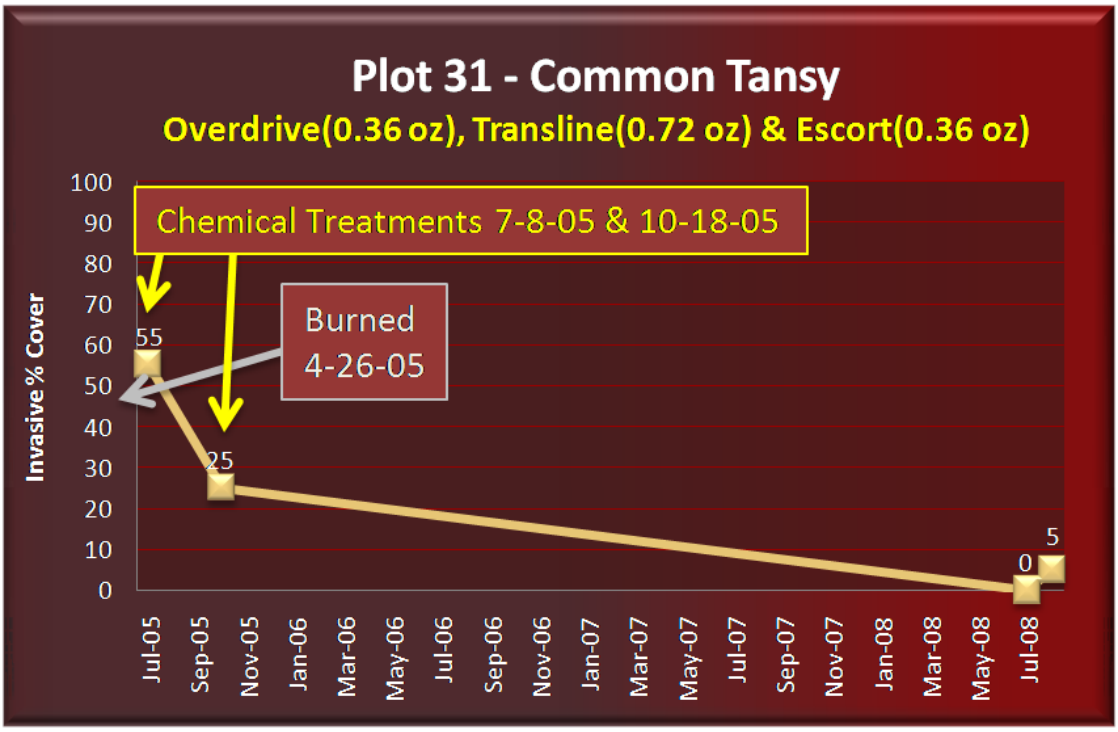
For spotted knapweed (*Centaurea maculosa*), all the chemical combinations with Overdrive®, (Sodium Diflufenzopyr, Dicamba, and Crystalline Silica) from the BASF chemical company, provided the greatest control. The most cost effective chemical combination with Overdrive® was the Overdrive® and 2, 4D mix. The common tansy ***(****Tanacetum vulgare)* data also has compelling evidence that greatest control can be achieved through use of a specific chemical, Escort® (Metsulfuron Methyl) from the DuPont Chemical Company. Again, the most cost effective mix which provides the greatest control was the Escort and 2, 4D mix. And finally, evidence for leafy spurge (*Euphorbia esula*) indicates chemical combinations that contain Plateau® (Imazapic Ammonium Salt) from the BASF Chemical Company provide effective control. Again, the most cost effective chemical combination was a Plateau® and 2, 4D mix. Each of these chemical combinations are recommended for any future chemical treatments at the two military training sites.

Controlling Common Tansy: Integration of Prescribed Burn and Chemical Herbicide

A two year experiment was completed in the fall of 2008. The experiment tested herbicide treatment versus an integrated technique of using prescribed burning followed by an herbicide treatment. The data has shown some significant differences in how each treatment affects tansy

infested areas. Analysis of the results, including a formal write up, will be completed in the winter of 2008-2009. In 2005, common tansy permanent plots were set up to test the effects of integration of prescribed burning and chemical herbicide application. Results of these treatments with 2008 updates are displayed below (Figure 9 and 10) with full plot information available on the project website* (*website information in later section; web.stcloudstate.edu).

Figure 9. Response of common tansy to burning and herbicide application, Camp Ripley plot 31, 2005-2008.

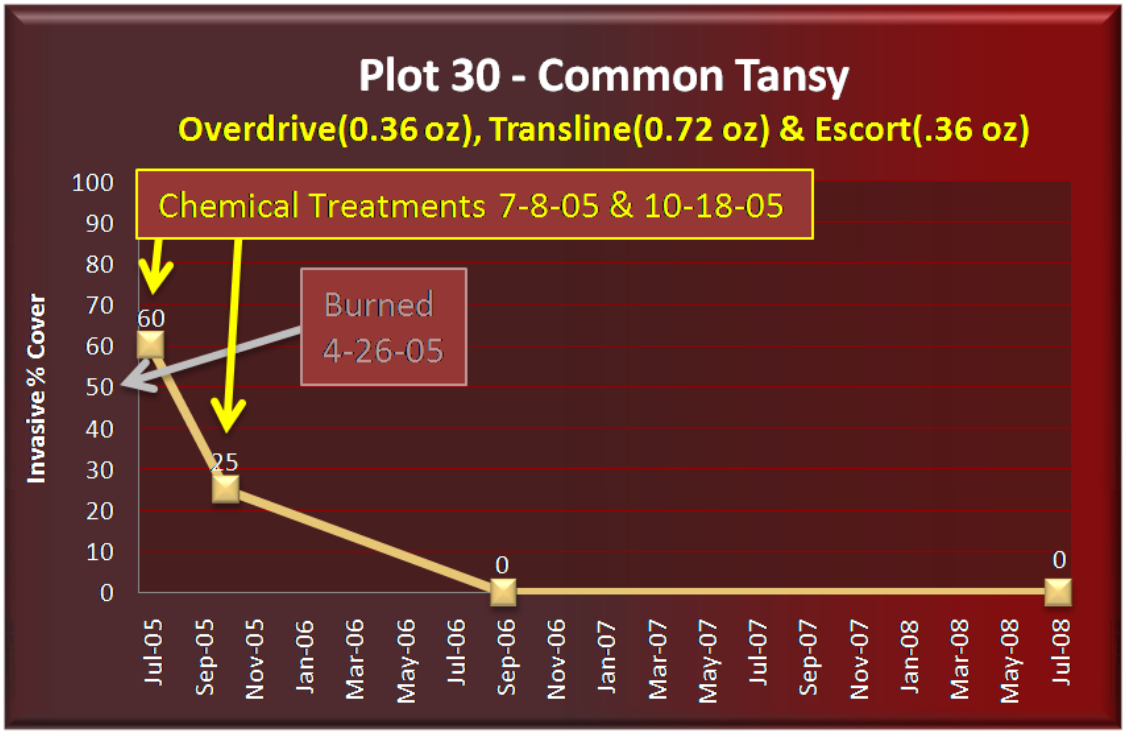


Results from testing this integrated treatment on common tansy conclude:

1. The integrated technique provides better control of common tansy than chemical herbicide alone and reduces the amount of retreatment, having environmental and financial benefits.
2. The integrated technique reduces the amount of chemical herbicide needed per area of common tansy, also having environmental and financial benefits.
3. Prescribed burning of common tansy without a chemical herbicide treatment actually increases common tansy's density and dominance. For this reason common tansy should be marked for treatment in areas designated for prescribed burning.

For specific timing on the integrated treatment or any other questions contact SCSU through the Camp Ripley Environmental Office.

Figure 10. Response of common tansy to burning and herbicide application, Camp Ripley plot 30, 2005-2008.



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 (Figure 11) 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 the 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 (Figure 12).

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 three hundred *Cyphocleonus*

Figure 11. Invasive plant biological control locations at Camp Ripley, 2003-2008.

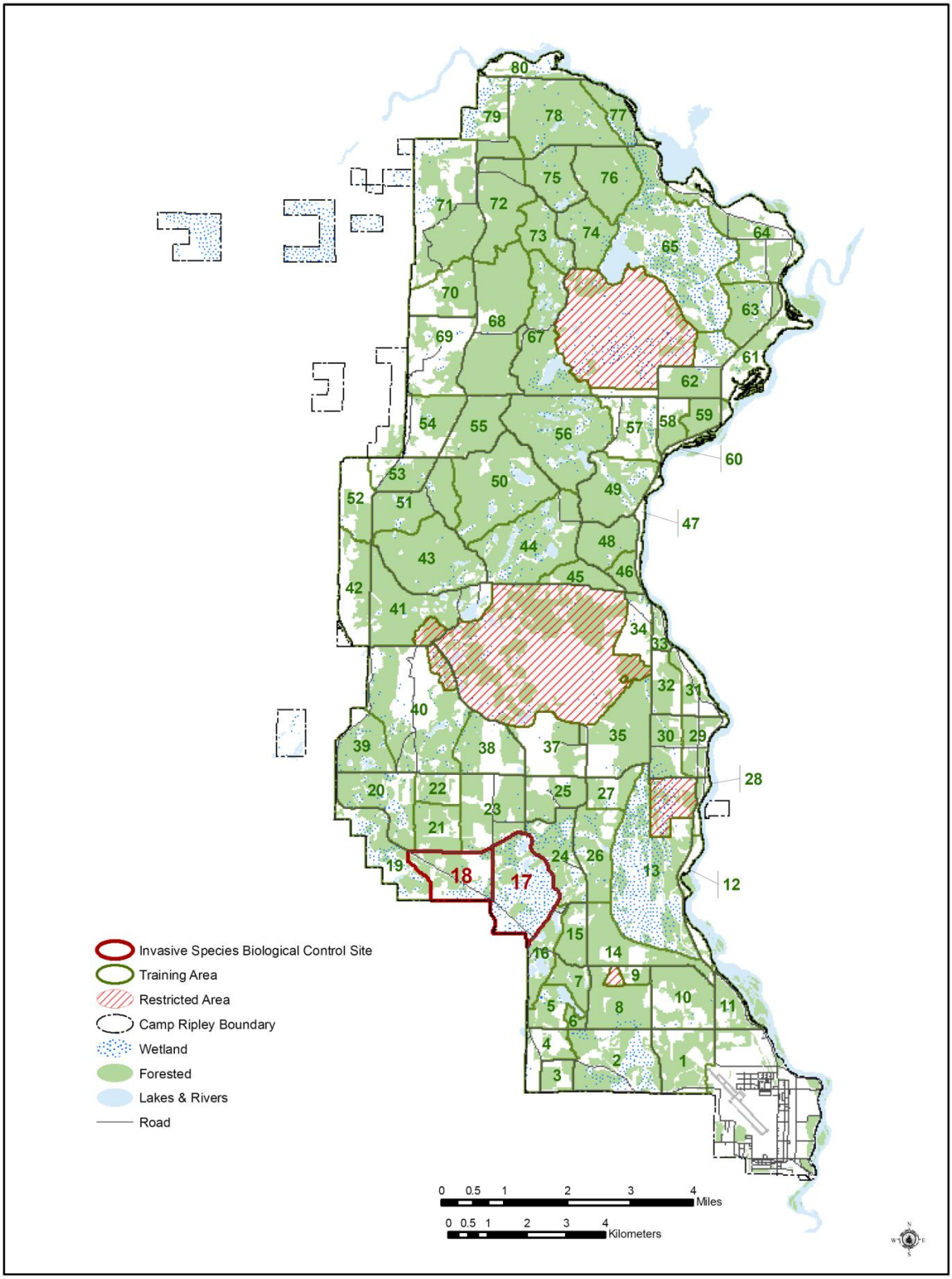


Figure 12. Biological control sites in the Camp Ripley cantonment area.

achates where 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 (Figures

11 and 13) 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 (Figures 11 and 13). 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. Biological control of spotted knapweed at Camp Ripley is a great example.

There has been a reduction in density of spotted knapweed in many of the fields of Camp Ripley, especially around the biological control release sites. This reduction could be in large part because of the biological control. But spotted knapweed remains problematic at the training site, largely because of its niche. Spotted knapweed likes sandy dry soil and disturbed areas, like roadsides. So even though there may be a reduction of the total biomass of spotted knapweed, new infestations are constantly popping up and spreading in disturbed areas. An herbicide regiment to control these "source" areas, roadsides and other vehicular disturbed areas, may be helpful in curtailing the spotted knapweed problem.

Another positive sign on the biological control front is leafy spurge biological control at AHATS. Although there has been a slight increase in the amount of leafy spurge since 2004, especially along the road sides, the larger field infestations have been kept in check. Also at AHATS, whenever an area of leafy spurge of any significant size was found, the Aphthona beetles (released biological controls) were also found. The same technique of controlling the frequently disturbed and roadside infestations of leafy spurge may help to keep this plant in check.

Website

A website summarizing the SCSU and DMA collaborative project has just been completed. This website spans the entire project from initial species inventories and distributions, to the testing of different techniques, to current 2008 updates and information. This website summarizes all the past data, could be a source of 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. For all the up to date information on the invasive plant species project visit <web.stcloudstate.edu>.

Figure 13. Biological control sites training area 17 and 18 at Camp Ripley.

Future Plans

Currently researchers at SCSU are developing a five year plan to start large scale control of the invasive plants at Camp Ripley. This plan will involve direction on which areas to start treating, which treatments should be implemented, and developing case study areas where data can be collected to quantify the effects of the treatments. This plan will be available before the 2009 growing season so any necessary chemicals or equipment can be prepared. The plan will be available in hard copy, electronic format and shared on the website to keep all parties involved up to date.

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 I).

WATER RESOURCES

Wetland Permits

During 2008, wetland activities involved one particular project known as the D-Range Upgrade. The intent of this project is to make D-Range a usable facility with value added capabilities for the customers of Camp Ripley. This has been accomplished by repositioning the existing firing line to enable customers to fire multiple small arms systems up to 5.56 mm with little impact on

infrastructure. This also allowed Camp Ripley to restore 1.35 acres of wetlands that were impacted by the initial development of the D-Range in 1985 (Figure 14). The restoration involved the removal of 40,000 yards of soil from the initial wetland area that was lost when the D-Range was constructed. The soil material has since been repositioned as a new berm outside of the delineated wetland area within the D-Range complex (Figure15).

Water Quality Trend Analysis Program (WQTAP)

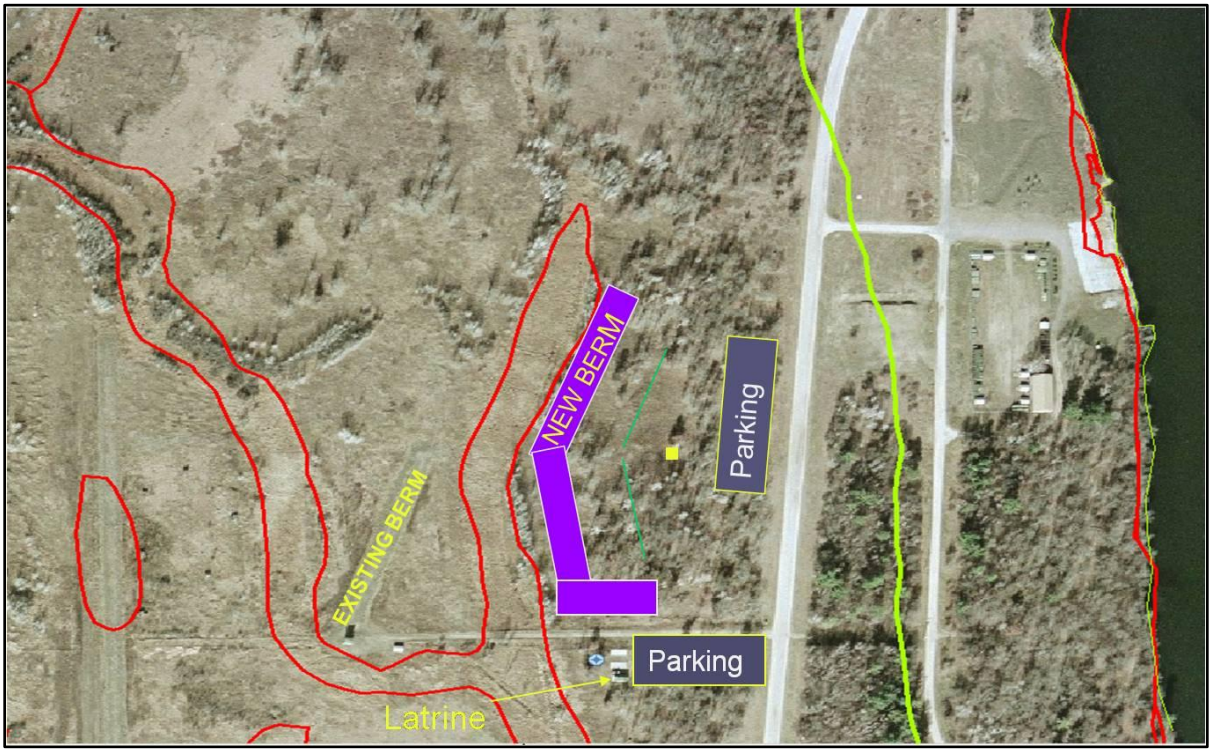
Introduction

From July 2001 to April 2002, the University of Minnesota-Duluth (UMN) performed an inventory on the aquatic systems located within the approximately 21,450 hectares encompassed by Camp Ripley. Objectives of this study included the documentation of current water quality, the potential effect of military training on water quality, and the development of protocols for long term monitoring of aquatic systems. The UMN efforts identified that the overall water quality of aquatic systems within Camp Ripley was generally good, but that the potential existed for military training activities to negatively impact water quality. To ensure that this potential risk is minimized the Water Quality Trend Analysis Program (WQTAP) was developed. The WQTAP protocols recommended "monitoring year" surveys (less intensive) of water quality for four years and "inventory year" monitoring (more intensive) every fifth year. This allows for the development of base line datasets revealing trends in water quality with a periodic intensive study to verify and address potential problems in these water quality trends. During 2002, the UMN group worked with Aqua Tech (Little Falls, MN) in an effort to train and implement the WQTAP protocols. These efforts represented the first WQTAP "monitoring year".

In 2003, SCSU continued the implementation of WQTAP. Correspondence and guidance was provided by the UMN group and Aqua Tech was maintained as a paid consultant. SCSU supervision of WQTAP is part of a larger effort by Camp Ripley and SCSU to develop collaborative efforts concerning environmental monitoring, education, and research outlined in a 13-December-2003 Memorandum of Understanding. Production of a relevant water quality dataset documenting Camp Ripley's stewardship and concern for environmental integrity remains paramount in WQTAP. However, development of environmental outreach and education activities and generalized biological research are now ancillary components in WQTAP. Annual goals for WQTAP are inclusive of the original guidelines presented by the UMN group and the Camp Ripley/ SCSU MOU.

Figure 14. Camp Ripley D Range wetland restoration, 2008.

Figure 15. Camp Ripley Range-D improvements, 2008.



These include:

- Measurement of key water quality parameters in "inventory year" aquatic systems.
- Evaluate water quality and health of aquatic ecosystems in terms of anthropogenic impacts.
- Develop and implement long-term research projects of mutual interest to Camp Ripley and SCSU.
- Expand environmental education and outreach opportunities of mutual interest to Camp Ripley and SCSU.

These efforts have continued through 2008. Data presented in this document represent the eighth monitoring year of the project.

Monitoring Year Sampling Locations

Sampling locations for the 2008 monitoring year were in accord with the sites recommended in the WQTAP protocols. Aquatic systems sampled included eight lakes, nine streams, four wetlands, and 15 wells (Table 5 and Figure 16). Parameters measured in each of these systems also followed the guidelines provided by the WQTAP protocols. Previous reports identified nitrogen, phosphorus, and manganese as variables of interest in ongoing monitoring efforts. Values for all measured parameters for each monitored system can be found in the EQUIS Database maintained by Camp Ripley. Summary and interpretation of data for each system are detailed below.

Table 5. Water Quality Trend Analysis Program monitoring sample locations and results, Camp Ripley, 2008.

Lakes (8)	Streams (9)	Wetlands (4)	Monitoring Wells (15)
Cody Lake	**Perrenial Streams (4)**	Cockburn Marsh	466287
Crescent Lake	Anzio Stream	Hole in Day Marsh	482900
Ferrel Lake	Broken Bow Creek	Plot 39 Marsh	530012
Lake Alott	North Hendrickson Stream	Plumly Marsh	536837
Mallard Lake	Stream 362		536838
Miller Lake	**Intermittent Streams (5)**		536839
Mud Lake	Frog Lake Stream		536840
Rapoon Lake	Leach Stream		536841
	South Elk Tributary		536843
	Sylvan Stream		536844
	Yalu Stream		536845
			536846
			578602
			671610

Lakes

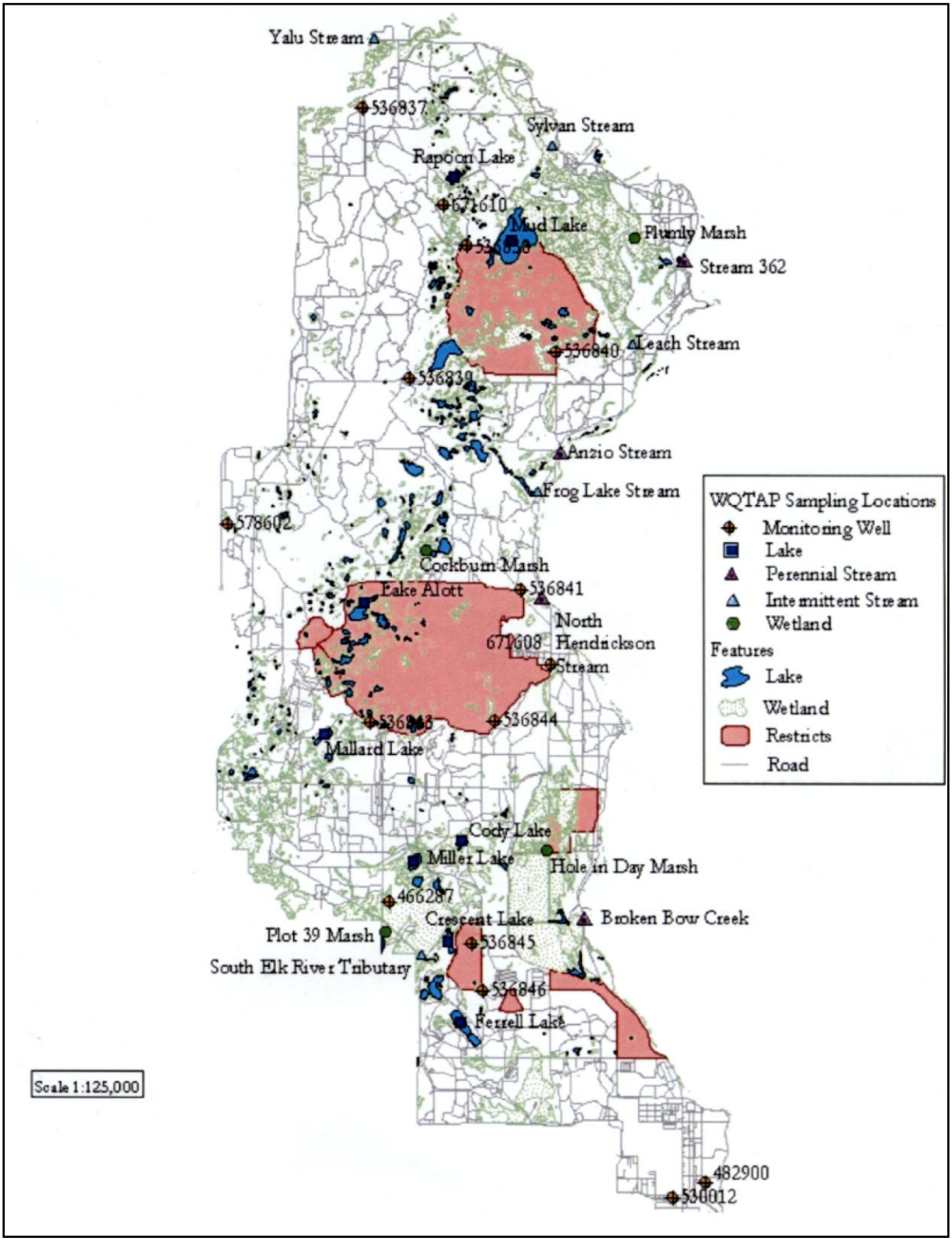
The 2002 WQTAP Annual Water Quality Report separated Camp Ripley's lakes into four vulnerability levels (low, moderately low, moderately high, and high) and it was recommended that two lakes from each category be sampled during monitoring years. Core variables serve as the basis for the Lake Action Levels Reference Standard developed in the WQTAP protocols.
These include Total Phosphorus, Total Nitrogen, Total Organic Carbon, and Secchi Disk Transparency. Using these variables the lake systems are characterized as oligotrophic, mesotrophic, eutrophic, hypertrophic, or dystrophic. Evaluations of the eight Camp Ripley Systems are as follows:

• **Cody Lake** has a maximum depth of 1.2m and a 0.03 km^2 surface area. The lake as categorized was a **High Vulnerability** system in the 2002 WQTAP Annual Water Quality Report. This system is best classified as **eutrophic/ mesotrophic** based upon the combination of the trophic state index variables.

• **Crescent Lake** has a maximum depth of 2.1 m and a 0.07 km^2 surface area. The lake was categorized as a **Moderately Low Vulnerability** system in the 2002 WQTAP Annual Water Quality Report. This system is best classified as **eutrophic** based upon the combination of the trophic state index variables.

• **Ferrel Lake** has a maximum depth of 3.7 m and a 0.19 km^2 surface area. The lake was categorized as a **Moderately High Vulnerability** system in the 2002 WQTAP Annual Water Quality Report. This system is best classified as **mesotrophic** based upon the combination of the trophic state index variables.

Figure 16. Water Quality Trend Analysis Program Camp Ripley sample locations, 2008.



• **Lake Alott** has a maximum depth of 4.6 m and a 0.14 km^2 surface area. The lake was categorized as a **Low Vulnerability** system in the 2002 WQTAP Annual Water Quality Report. This system is best classified as **eutrophic/ mesotrophic** based upon the combination of the trophic state index variables.

• **Mallard Lake** has a maximum depth of 1.5 m and a 0.05 km^2 surface area. The lake was categorized as a **Moderately Low** Vulnerability system in the 2002 WQTAP Annual Water Quality Report. This system is best classified as **eutrophic/ mesotrophic** based upon the combination of the trophic state index variables.

• **Miller Lake** has a maximum depth of 1.8 m and a 0.08 km^2 surface area. The lake was categorized as a **High Vulnerability** system in the 2002 WQTAP Annual Water Quality Report. This system is best classified as **eutrophic/ mesotrophic** based upon the combination of the trophic state index variables.

• **Mud Lake** has a maximum depth of 1.8 m and a 0.70 km^2 surface area. The lake was categorized as a **Moderately High Vulnerability** system in the 2002 WQTAP Annual Water Quality Report. This system is best classified as **mesotropic** based upon the combination of the trophic state index variables.

• **Rapoon Lake** has a maximum depth of 8.2 m and a 0.06 km^2 surface area. The lake was categorized as a **Low Vulnerability** system in the 2002 WQTAP Annual Water Quality Report. This system is best classified as **eutrophic/mesotrophic** based upon the combination of the trophic state index variables.

The trophic states identified in 2008 for each of the lakes, is comparable to that reported in prior WQTAP years.

Streams

As with the lakes, the values for measured parameters were comparable to those reported in previous years. Measured values have been below the "Action Levels" for streams established in the WQTAP protocols for each parameter except Total Nitrogen in all monitoring years. In previous WQTAP Annual Water Quality Reports, six of the nine monitored stream systems were identified with Total Nitrogen values exceeding the reference threshold during the spring turnover sampling event. During the 2007 sampling year Total Nitrogen levels diminished greatly, indicating that runoff from surrounding areas was likely the cause of elevated levels. During 2008 values for the variable were comparable to sampling years other than 2007. This is consistent as runoff activities returned to "normal" during 2008. The increases in Total Nitrogen loads do correlate well with storm event activities, and this is consistent with previous conclusions that elevated Nitrogen in the stream systems correspond to natural runoff rather than anthropogenic impacts caused by training activities.

Wetlands

The values for measured parameters were comparable to those reported in previous WQTAP Annual Water Quality Reports. Elevated Total Nitrogen and Total Phosphorus values were again identified in Plumly Marsh and Plot 39 Marsh. These values are comparable to the Total Nitrogen and Total Phosphorus Pattern described in previous WQTAP Annual Water Quality Reports. As stated in those documents, these values may represent the normal state for Camp Ripley rather than indicating a decrease in environmental quality.

Wells (Groundwater)

Values for measured parameters were comparable to those reported in previous WQTAP Annual Water Quality Reports.

Extended Data Interpretation and Conclusions

Overall the water quality of the aquatic systems monitored in this study is good when compared to other systems in and patterns in central Minnesota and it does not appear that training activities at Camp Ripley are impacting aquatic ecosystem health at a level greater than change seen in surrounding systems. However, aquatic systems in the southern portion of the training area and near impact zones do express elevated Total Nitrogen levels at a greater frequency than others. This may be related to activities that enhance erosion increasing particulate runoff. It is recommended that periodic observation be made in an effort to minimize this and preempt activity that may diminish surface water quality beyond acceptable limits.

WILDLIFE

Species in Greatest Conservation Need

Species in greatest conservation need 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 (SGCN) 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. 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 (Appendix J). AHATS also provides habitat to 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 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. The northwest portion of Camp Ripley is within one of these circles (Figure 17). 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 2008 CBC occurred on January 1, 2008, and was conducted by Bill Brown, Camp Ripley Environmental Office, and a volunteer, Terri Botz. The count began at 11:00 a.m. and concluded at 3:00 p.m. The skies were clear, temperatures were zero to five degrees Fahrenheit, with winds northwest at 20 miles per hour (USDC and NOAA 2008). Most of the river was frozen in 2008, concentrating the few waterfowl in a short stretch of open water below Sylvan Dam. The total number of birds counted this year was similar to 2007 (Table 6) but lower than previous years, and the diversity of species counted was the lowest since 2002. Trumpeter swans (*Cygnus buccinator*) were present in the highest numbers since 2002. The increase in trumpeter swans was likely due to the Crow Wing River conditions, as the river was only open near the base of the dam. The decrease in species diversity and low number of birds observed in 2008 was likely due to bitter cold and wind chills, decreased access to roadways because of snow conditions, and potentially fewer observer teams.

Table 6. Christmas bird count data from Camp Ripley, 2002-2008.

Species	2002	2003	2004	2005	2006	2007	2008
Canada goose	6	344	110	81	2	4	**11**
Trumpeter swan	0	3	20	28	26	49	**60**
Mallard	0	1	70	0	20	0	**0**
Common merganser	0	0	10	0	4	12	**0**
Ruffed grouse	1	1	3	2	0	0	**0**
Wild turkey	0	25	10	5	0	0	**0**
Bald eagle	6	2	13	3	4	11	**0**
Northern goshawk	0	0	0	2	0	0	**0**
Red-tailed hawk	0	0	0	1	0	0	**0**
Rough-legged hawk	2	3	1	0	0	0	**0**
Golden eagle	0	0	1	1	0	0	**0**
Barred owl	1	0	0	0	0	0	**0**
Belted kingfisher	0	0	1	1	0	0	**0**
Red-bellied woodpecker	0	1	0	0	0	0	**0**

Table 6. Christmas bird count data from Camp Ripley, 2002-2008.

Species	2002	2003	2004	2005	2006	2007	2008
Downy woodpecker	2	1	1	0	1	0	**0**
Hairy woodpecker	0	1	0	0	0	0	**0**
Pileated woodpecker	1	5	0	0	1	0	**0**
Northern shrike	3	0	1	1	0	0	**0**
Blue jay	4	20	8	1	3	0	**0**
American crow	4	2	13	3	2	3	**3**
Common raven	1	4	0	0	0	0	**0**
Black-capped chickadee	11	9	6	9	12	1	**1**
Red-breasted nuthatch	6	0	1	3	1	0	**0**
White-breasted nuthatch	1	4	5	0	3	0	**0**
Bohemian waxwing	0	30	0	0	0	0	**0**
Cedar waxwing	0	3	0	0	0	0	**0**
American tree sparrow	0	20	0	0	0	0	**0**
Dark-eyed junco	0	1	0	0	0	0	**0**
Northern cardinal	1	0	0	0	0	0	**0**
Common redpoll	0	0	0	32	0	0	**0**
# Observers	5	3	Unk.	3	4	3	**2**
TOTAL # INDIVIDUALS	52	480	274	171	79	80	**75**
TOTAL # SPECIES	15	20	17	15	12	6	**4**

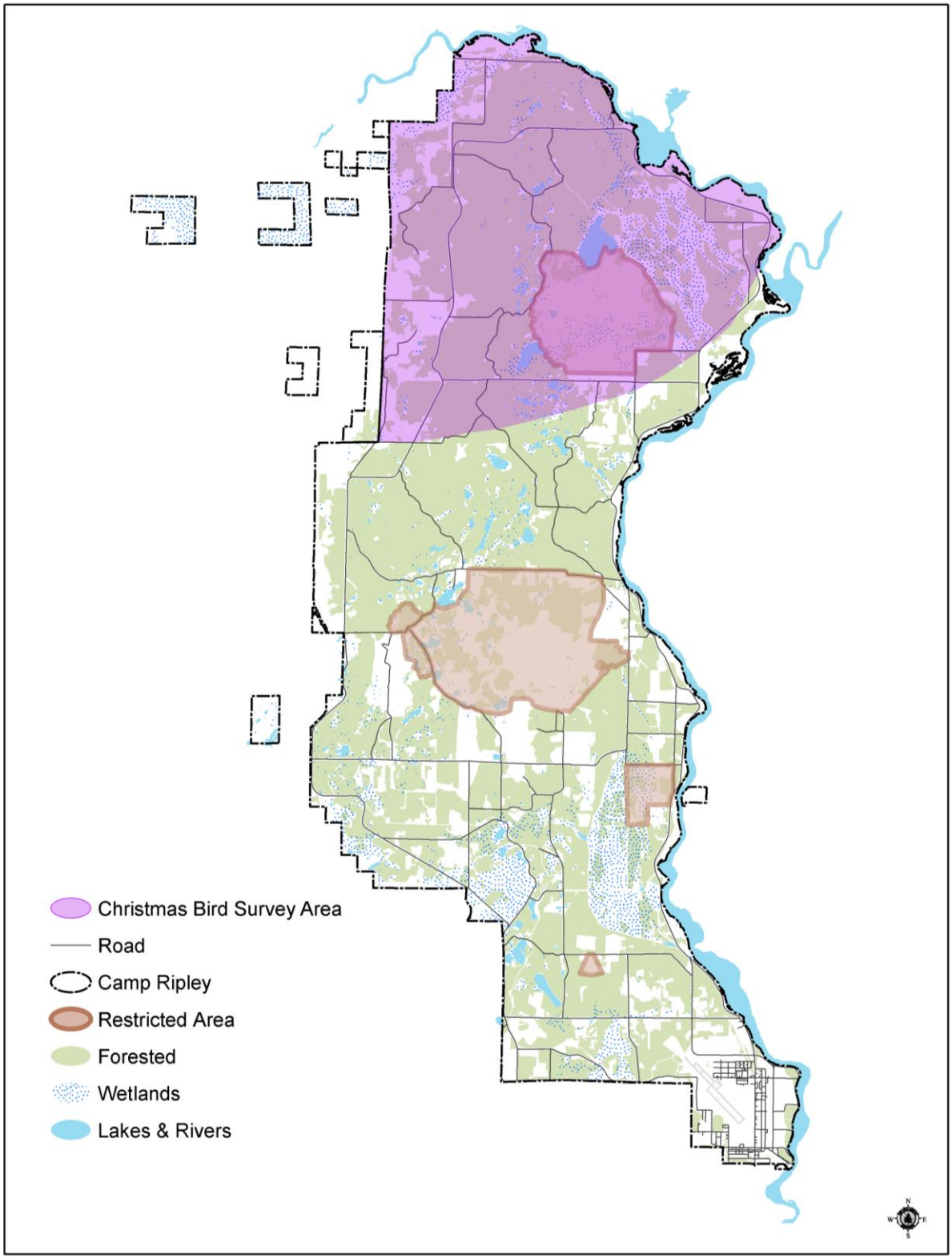
Songbirds

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 Range Training Land Assessment (RTLA) (formerly, Land Condition-Trend Analysis) (Tazik et al. 1992) plots 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

Figure 17. Christmas bird count area within Camp Ripley.



songbirds are known to breed on Camp. Of the 14 SGCN songbirds that have been documented during past point count surveys, 12 were recorded this year.

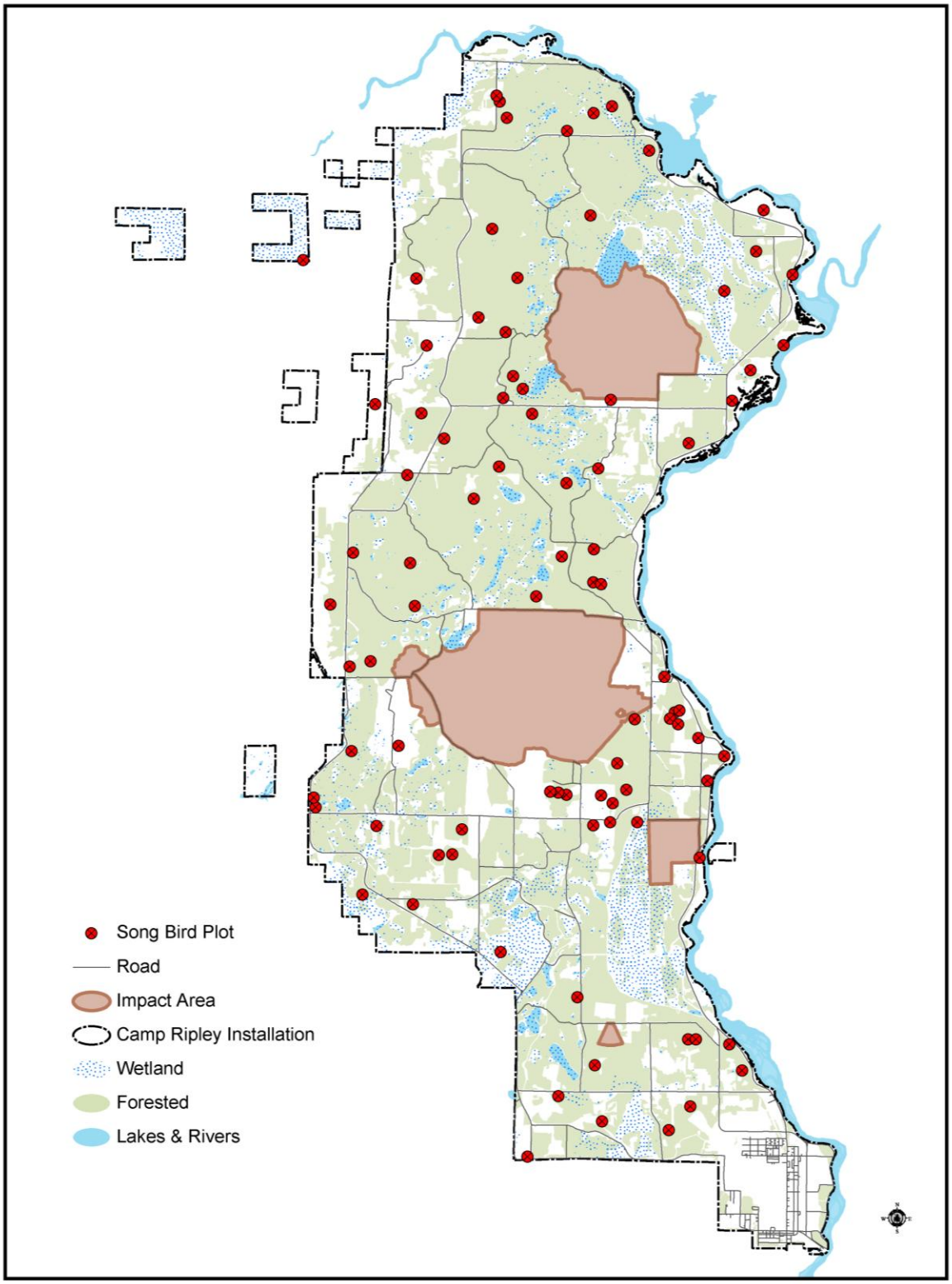
Songbird surveys were conducted between June 14 and July 3, 2008 on 89 RTLA plots (Figure 18). A total of 975 birds of 70 different species were counted. However, 19 species made up 72 percent of the total number of birds recorded. The average number of birds per plot was 9.83 and the average number of species per plot was 6.60 (Table 7). Similar to past years, the most common birds documented on plots were red-eyed vireo (*Vireo olivaceus*), ovenbird (*Seiurus aurocapillus*), American redstart (*Setophaga ruticilla*), veery (*Catharus fuscescens*), eastern wood-pewee (*Contopus virens*), and least flycatcher (*Empidonax minimus*). Red-eyed vireo, ovenbird, and American redstart accounted for 37 percent of the total birds counted on all plots.

Table 7. Songbird survey data Camp Ripley, 2000-2008.

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**

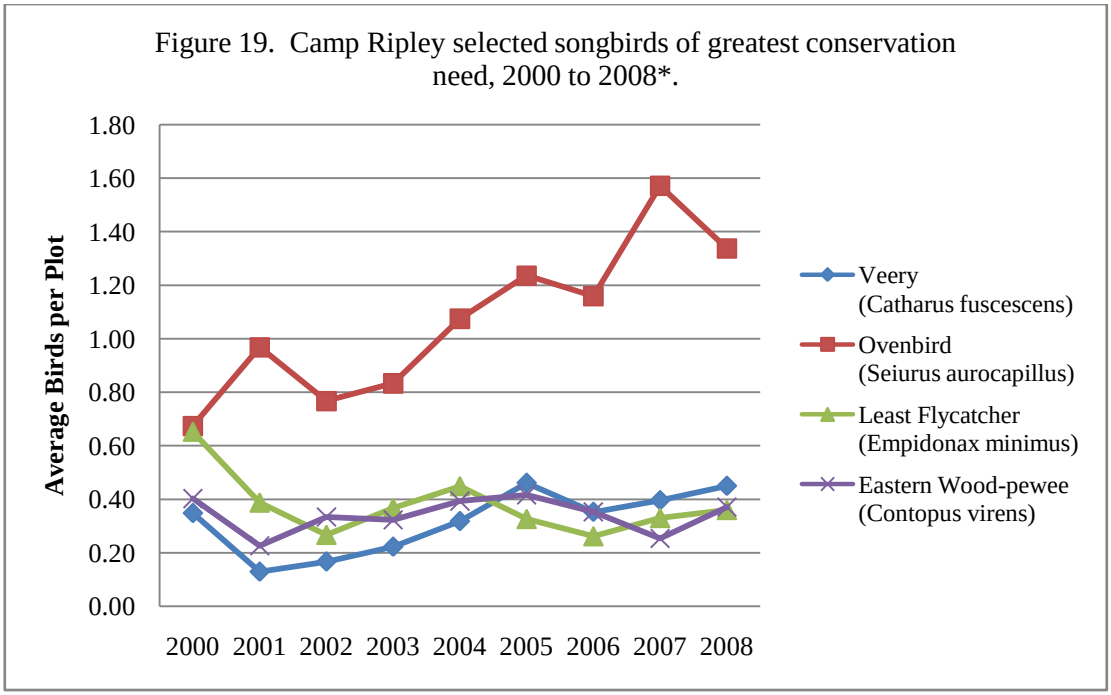
On Camp Ripley, the average number of species surveyed per plot and the average number of birds on each plot has remained relatively constant since 2000. The ovenbird, one of the most common forest bird species on Camp Ripley, and a species in greatest conservation need, has shown an increasing trend since 2000. In fact, the average number of ovenbirds per plot and total number of ovenbirds counted had more than doubled by 2007 (Figure 19) and continue to be high in 2008. The Breeding Bird Survey trend for ovenbirds has been increasing in the state, within the Great Lakes

Figure 18. Range Training Land Assessment songbird survey plot locations at Camp Ripley, 2008.



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.

Figure 19. Camp Ripley selected songbirds of greatest conservation need, 2000 to 2008*.



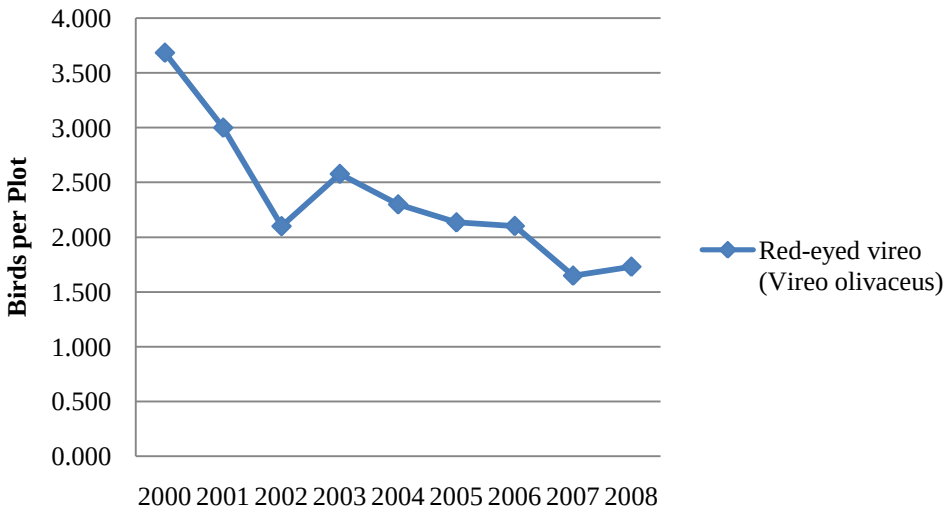
*In 2001 and 2002 only 31 and 30 plots were surveyed respectively.

Ovenbirds have a broad tolerance for breeding in different plant communities. 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.

Red-eyed vireos are the most common 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 50 percent since 2000 (Figure 20). This decrease is not known to occur in other surveys in the state, region and country. The reason for this decline is unknown. 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 would 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. In addition, in recent years prescribed fire and mechanical removal

of subcanopy woody plant species to improve conditions for military training on Camp may also be increasing nesting habitat for ovenbirds and decreasing habitat for red-eyed vireos.

Figure 20. Red-eyed vireo (*Vireo olivaceus*) average birds per plot, Camp Ripley, 2000-2008*.



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

Eastern Bluebird (*Sialis sialis*) Nest Box Route

Eastern bluebird populations had decline 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 Minnesota Veteran Cemetery. In addition, the nest boxes at the Minnesota Veterans Cemetery provide visitors viewing opportunities. Bluebird nest boxes were also established along the Camp Ripley cantonment fence in 2007.

During 2008, twenty-eight bluebird nesting boxes were monitored at the Minnesota Veterans Cemetery (n=13), located across the Mississippi River from Camp Ripley, and along the State Highway 115 (n=15) fence just outside the cantonment area. The boxes were monitored regularly during the breeding season (April 15 to August 15) by DeAnna Gehant, Camp Ripley volunteer.

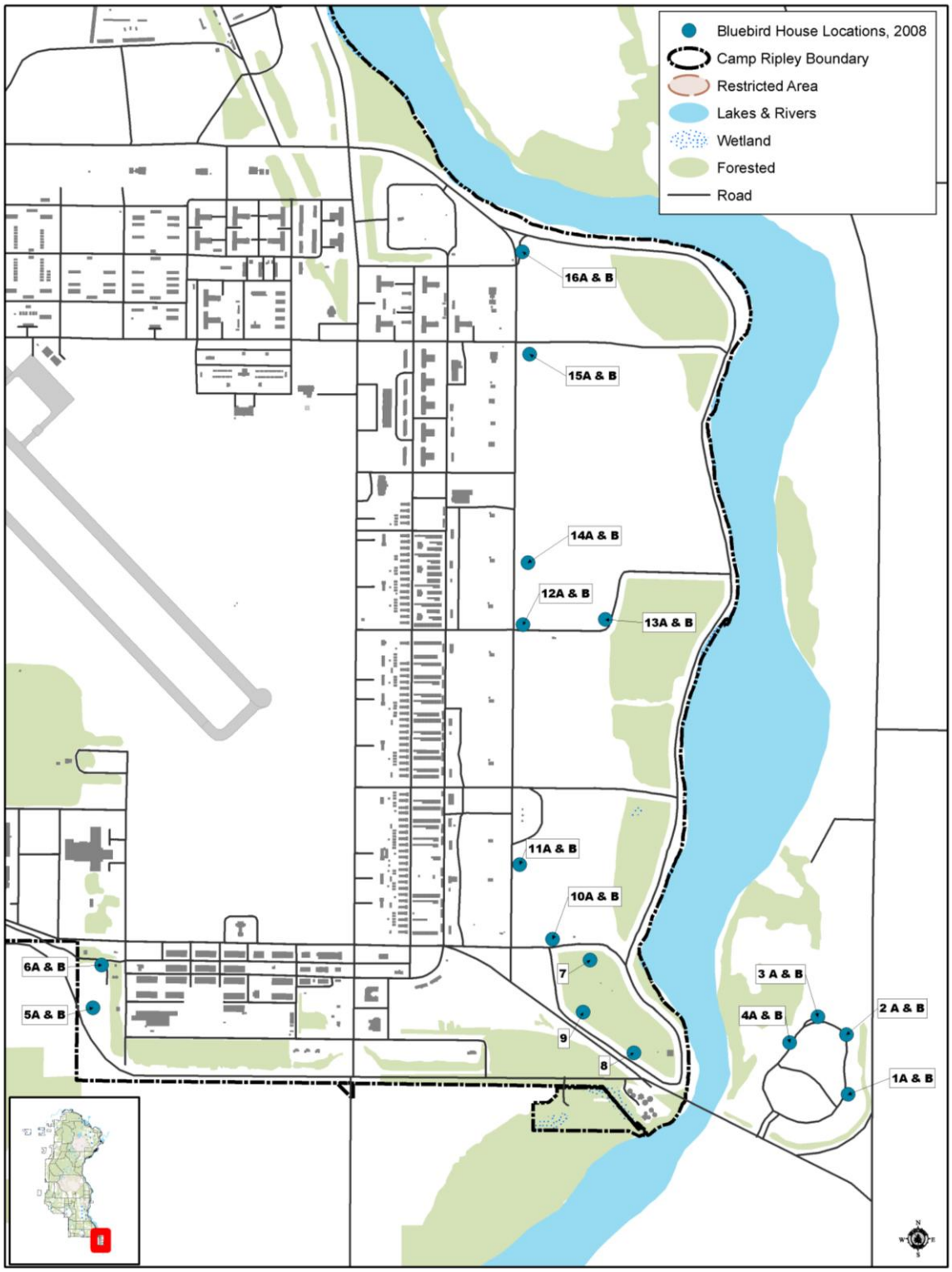
Eastern bluebird (*Sialis sialis*) nestlings were first observed in nest boxes on May 8, 2008. Eight boxes were used to raise bluebirds, six boxes were used to raise house wrens (*Troglodytes aedon*), and five were used to raise tree swallows (*Tachycineta bicolor*). Several attempts to nest were made by invasive house sparrows (*Passer domesticus*), but their nests were removed. Twenty bluebirds fledged from the nest boxes at the Veterans Cemetery and 14 fledged from nest boxes along Highway 115. The production of bluebird fledglings was up significantly from the nine birds produced at the Minnesota Veteran Cemetery in 2007, this can be attributed to regular maintenance and monitoring which greatly improves the success of bluebird houses. Additionally, 29 house wrens and 16 tree swallows successfully fledged.

In August 2008, the coordinator of the Bluebird Recovery Program of Minnesota evaluated the current 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 in early October at the Minnesota Veterans Cemetery (3 pairs), DeParc Woods (3 single boxes) and Camp Ripley cantonment (9 pairs) (Figure 21). Bluebird nest box pairs were located in open areas close to scattered trees, and at least 300 feet from brush, and more than 500 feet apart. Placing boxes away from brush areas will minimize nest box use by house wrens. The existing wooden bluebird houses were removed and donated to organizations in the 2007 flood ravaged area of southeast Minnesota for reestablishment of their bluebird routes.

Wood Duck (*Aix sponsa*) Nest Box Route

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 increase in beaver ponds have helped increase the wood duck population (Ducks Unlimited, Inc. 2008 and MNDNR 2007). Camp Ripley established 41 artificial wood duck boxes in 1994 as part of the Wood Duck Initiative sponsored by the Mississippi and Atlantic Flyway states and the U.S. Fish and Wildlife Service (Camp Ripley Environmental Office 1994) to increase wood duck populations. The box locations were established taking into consideration the aircraft approach paths. These wood duck nest boxes were checked sporadically over the years. In the summer of 2008, Camp Ripley interns attempted to locate all the wood duck nest box locations to determine to condition and use of nest boxes. However, few nest boxes were found and those that were found were in poor condition and removed. In addition, wood duck boxes were difficult to monitor due to the height of the nest box placement on trees and the use of ladders to check boxes. Because of the condition of the wood duck boxes and the challenges of monitoring, a new wood duck nesting box route was established during 2008.

Figure 21. Location of new eastern bluebird houses at Camp Ripley Veterans Cemetery and Camp Ripley cantonment area, 2008.



Thirty-five wood duck houses were placed on eight foot steel sign posts with metal predator guards, based on recommendations from the Wood Duck Society (Wood Duck Society 2008). Nest box location was adjacent to Ferrell Lake, Round Lake, Goose Lake, the Mississippi River, and other water bodies in the southern portion of Camp Ripley (Figure 22). The new design and placement of nest boxes on sign posts will help simplify monitoring of nest box use from the ground. A volunteer will be recruited for the 2009 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. Minnesota is the state with the most nesting pairs at approximately 1,312 in the lower 48 states. 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 (Appendix K), Bald and Golden Eagle Protection Act (USFWS 2008a), and Bald Eagle Management Guidelines (USFWS 2007).

Table 8. Bald Eagle nests and fledglings at Camp Ripley, 1991-2008.

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**

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

Bald eagles are closely monitored at Camp Ripley. Since 1991, between two and six nests have been active within Camp Ripley, fledging from one to nine young annually (Table 8). The bald eagle nesting season in 2008 was not as productive as 2007. Bald eagle pairs were found on five of eight nests throughout Camp Ripley (Figure 23). The Yalu and North Range nests were confirmed to have two chicks each, and the Mud Lake nest had one chick. The Lake Alott and Prentice Pond nests were confirmed inactive. Two new eagle nests were

Figure 22. Wood duck nesting box locations at Camp Ripley, 2008.

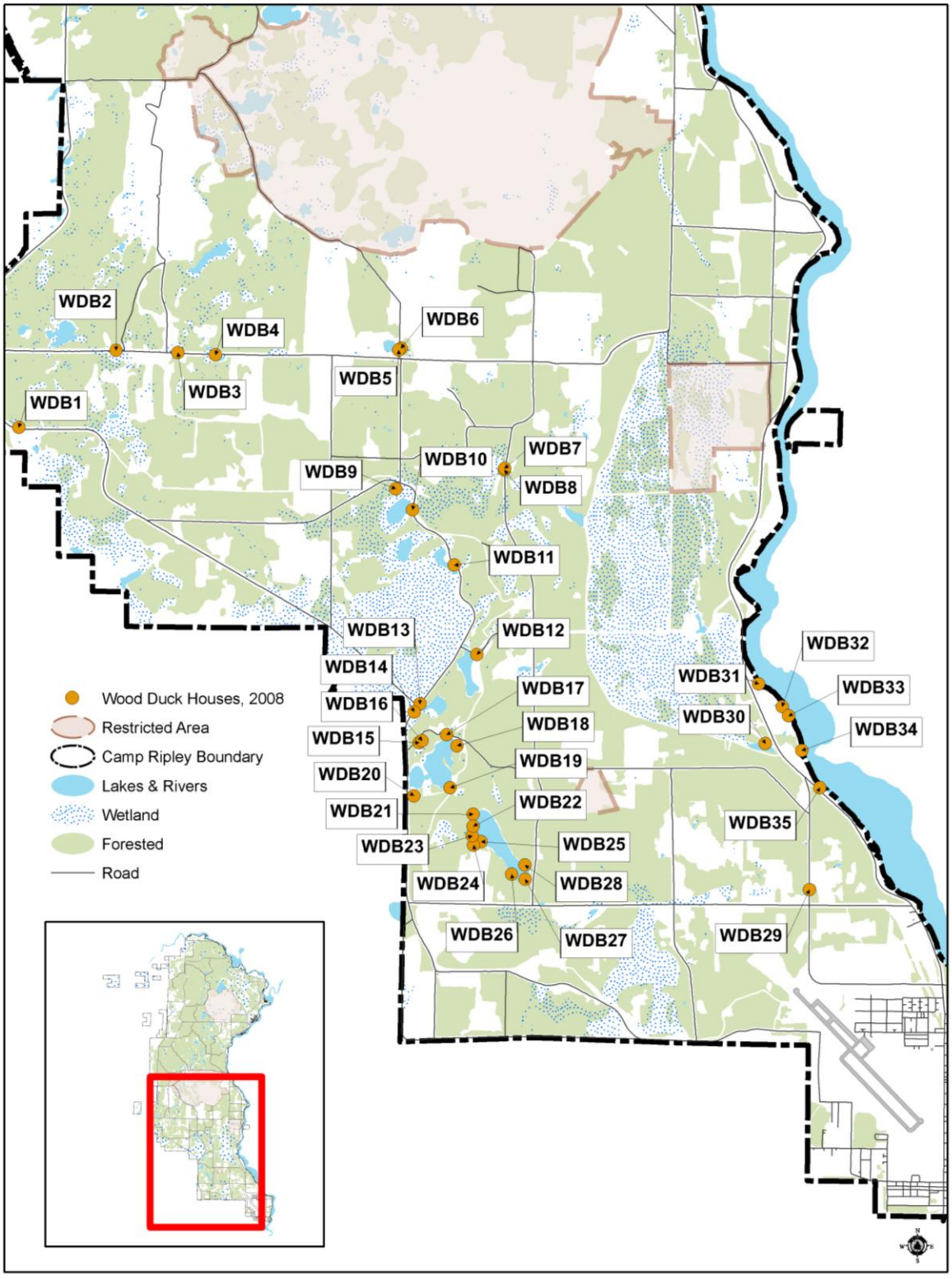
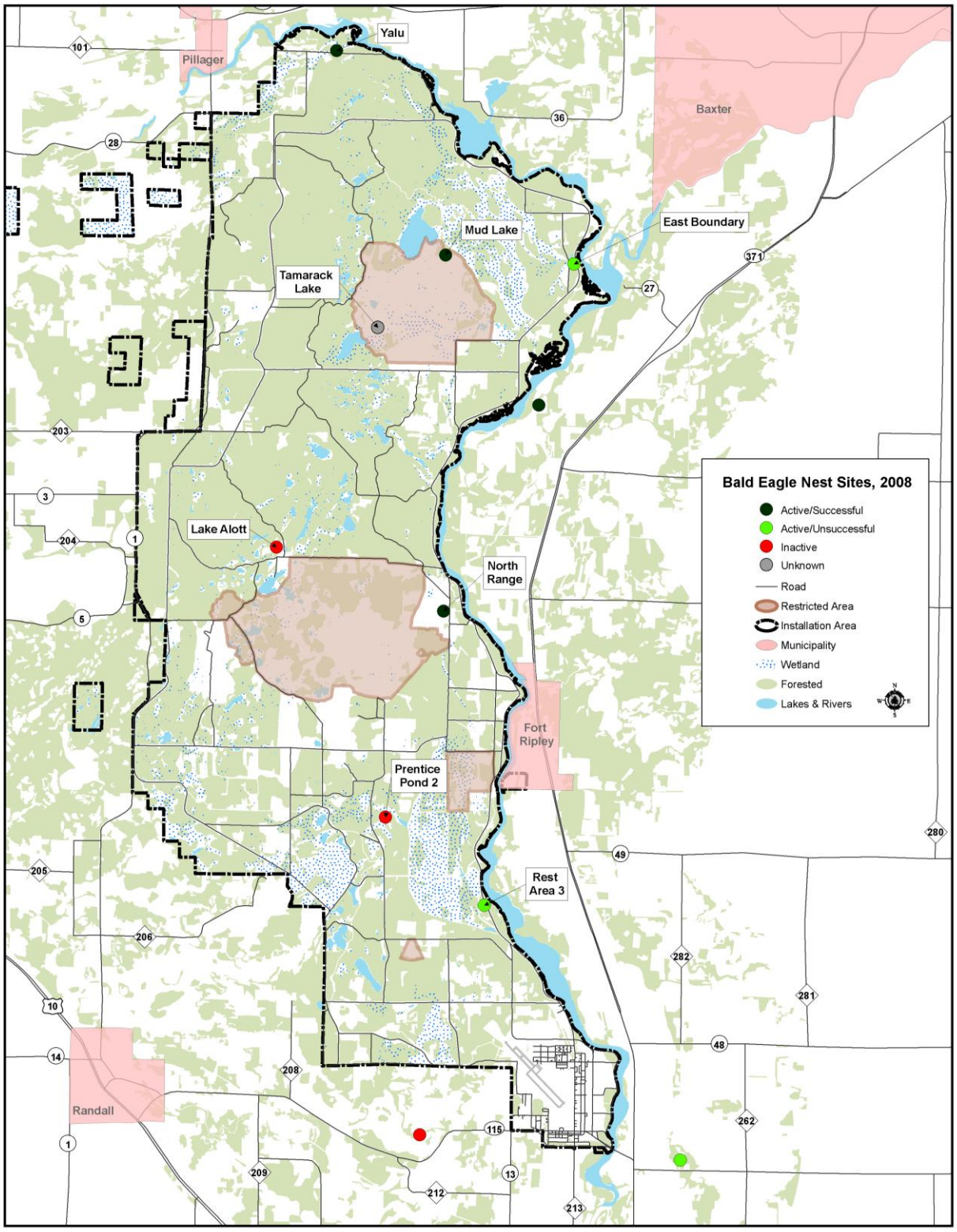


Figure 23. Bald eagle nests at and near Camp Ripley, 2008.



discovered, one near Tamarack Lake and one near Rest Area 3; however, the status of the Tamarack Lake nest was undetermined due to military training preventing access to the area. The Rest Area 3 nest was active but unsuccessful.

Three eagle nests within one mile of the Camp Ripley boundary are also monitored. Two of the nests were occupied in 2008, one nest was active but unsuccessful and the other nest fledged two chicks.

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 chicks were fledged at this nest.

Ruffed Grouse (*Bonasa umbellus*)

Two ruffed grouse drumming survey routes (#38 and #39) were conducted 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 has been run since 1979, the official MNDNR survey route. Route #39 was added by Camp personnel in 1998 (Figure 24). Drumming counts are conducted for four minutes at ten points along each route. In order to allow local high school students to participate, the ruffed grouse drumming counts were conducted several times in 2008.

The official count for route #38 occurred on April 22, 2008. Because part of the route was inaccessible because of military training, only six of ten stops were counted. Nine drums were heard which is an increase from last year even though only six stops were counted (Figure 25). It appears that Camp Ripley's ruffed grouse population had been decreasing since 2003 but began to increase in 2008, which is similar to other routes in the Little Falls area (Figures 25 and 26). This is similar to the higher ruffed grouse populations found throughout most of Minnesota during 2008 (Figure 27). Two grouse were heard drumming on ten stops along route #39, also surveyed on April 22, 2008. Counts on this route have been low since 2001 but increased substantially in 2007, and fell again during 2008 (Figure 25).

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 24. Ruffed grouse spring drumming survey route at Camp Ripley.

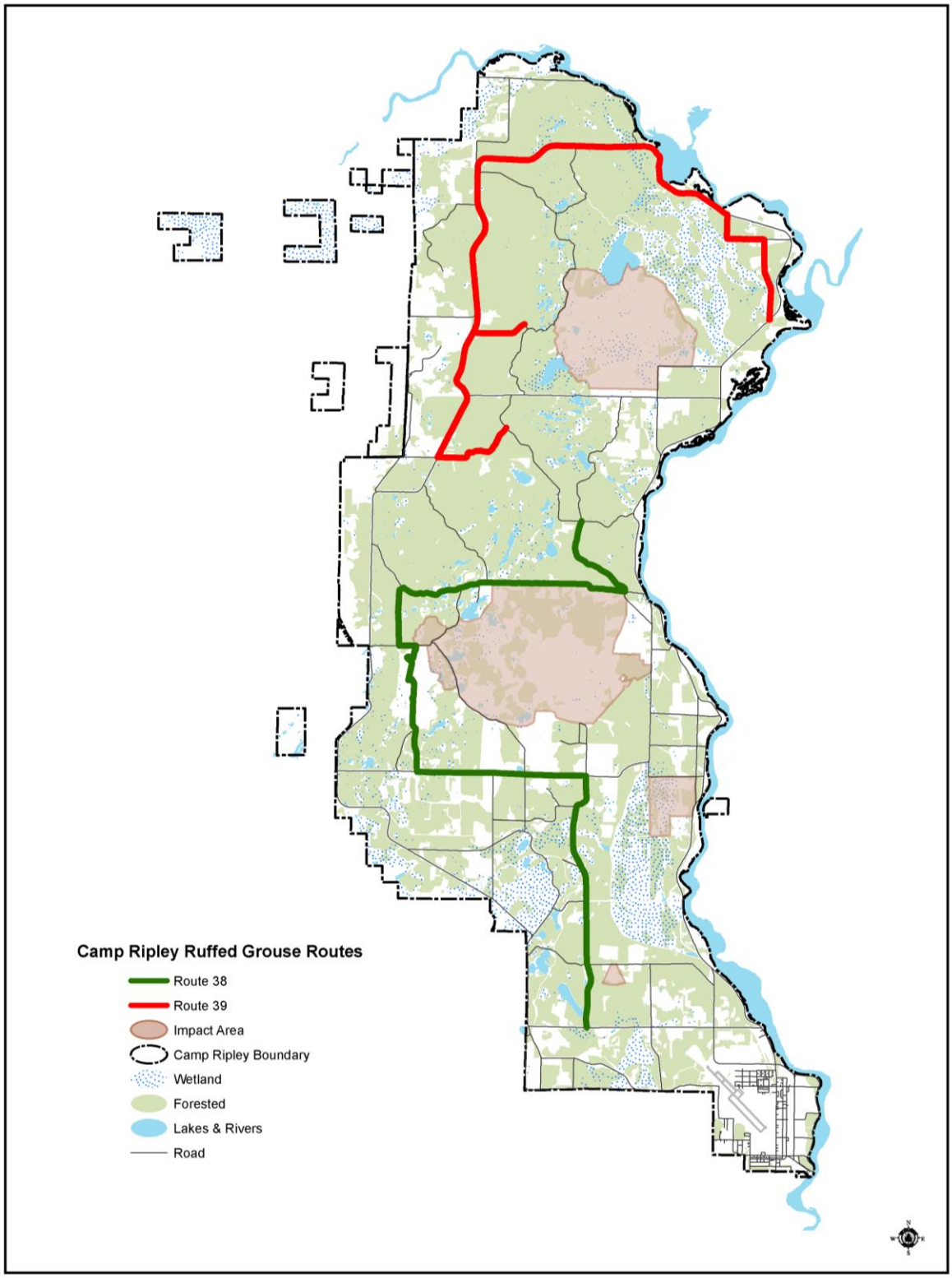


Figure 25. Ruffed grouse surveys at Camp Ripley, 1979-2008. Gaps in the graph indicate years when the survey was not conducted. Route #38 had only six stops in 2008.

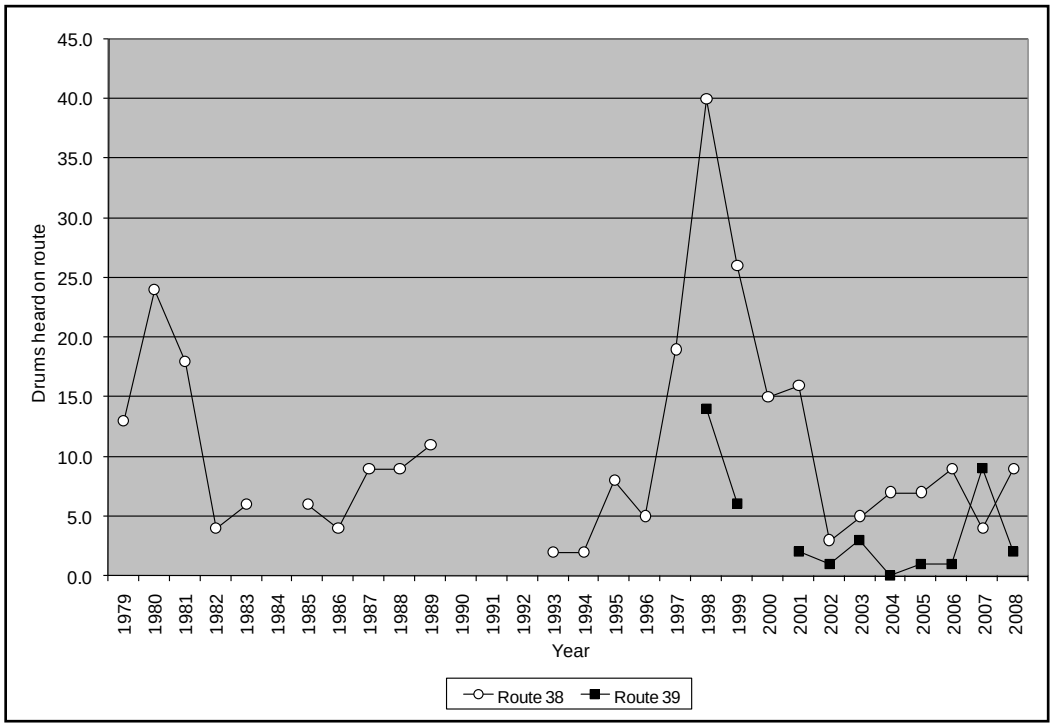


Figure 26. Ruffed grouse drumming surveys in Little Falls Area, 1979-2008. Gaps in the graph indicate years when the survey was not conducted.

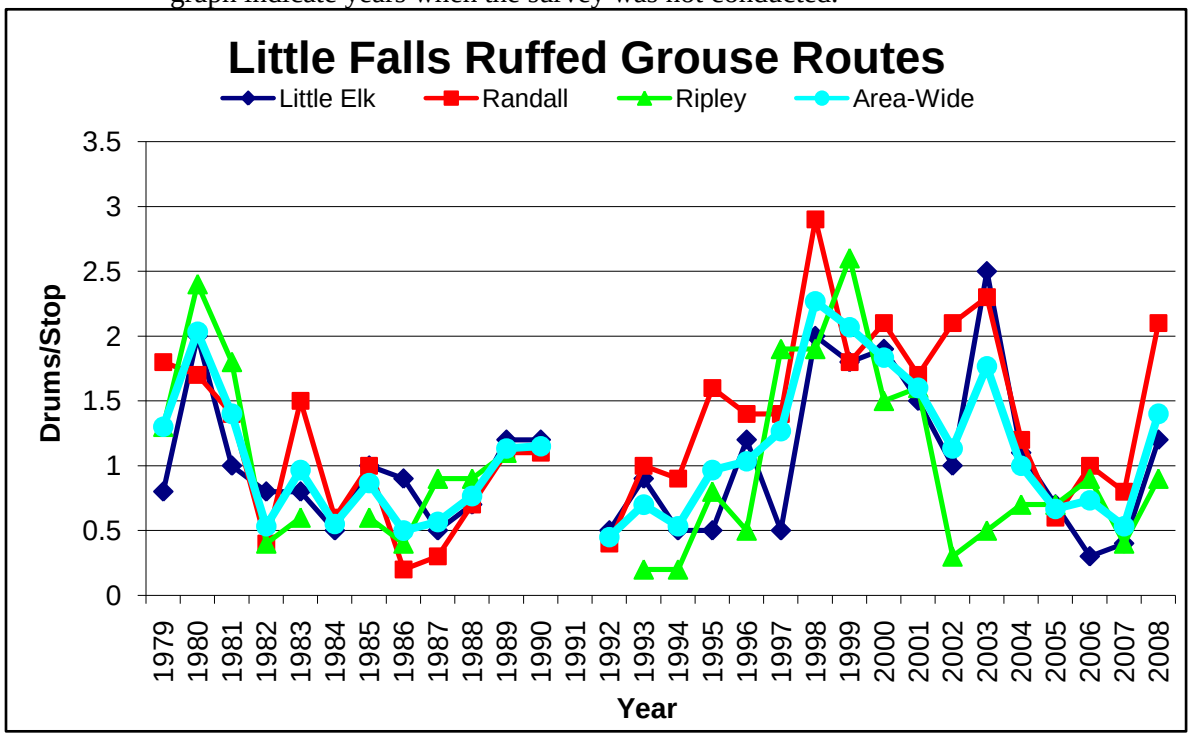
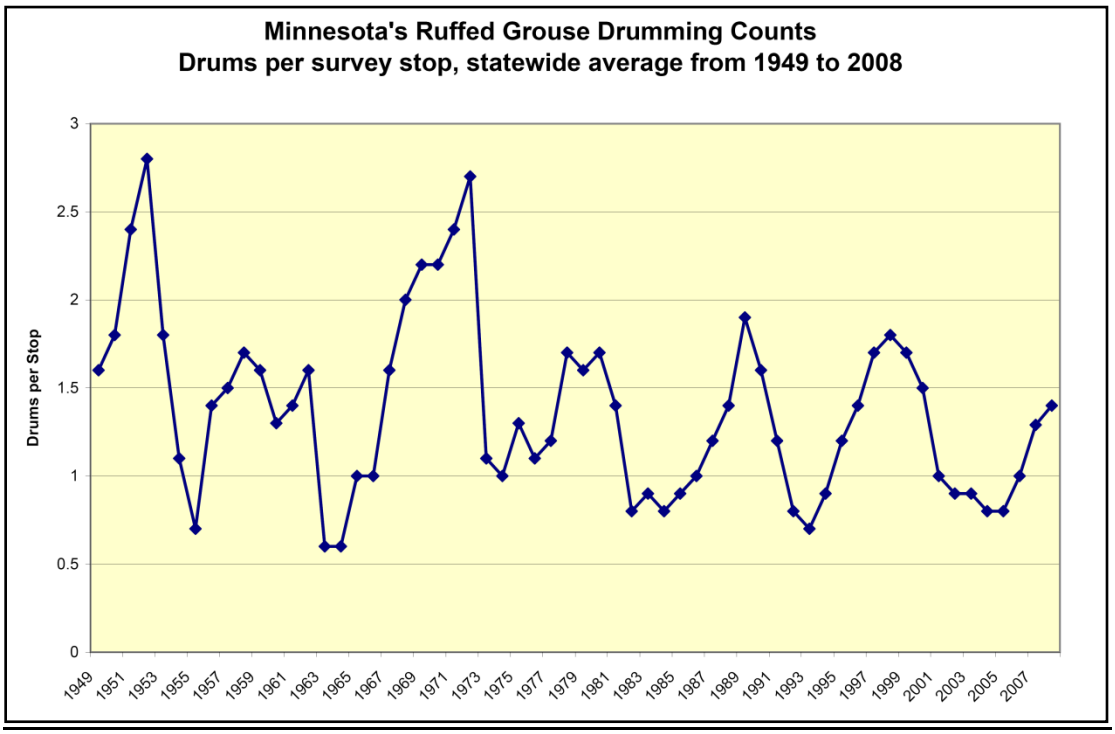


Chart courtesy of Beau Liddell, MNDNR, Division of Fish and Wildlife, Little Falls, MN.

Figure 27. Minnesota's ruffed grouse drumming counts, 1949-2008.

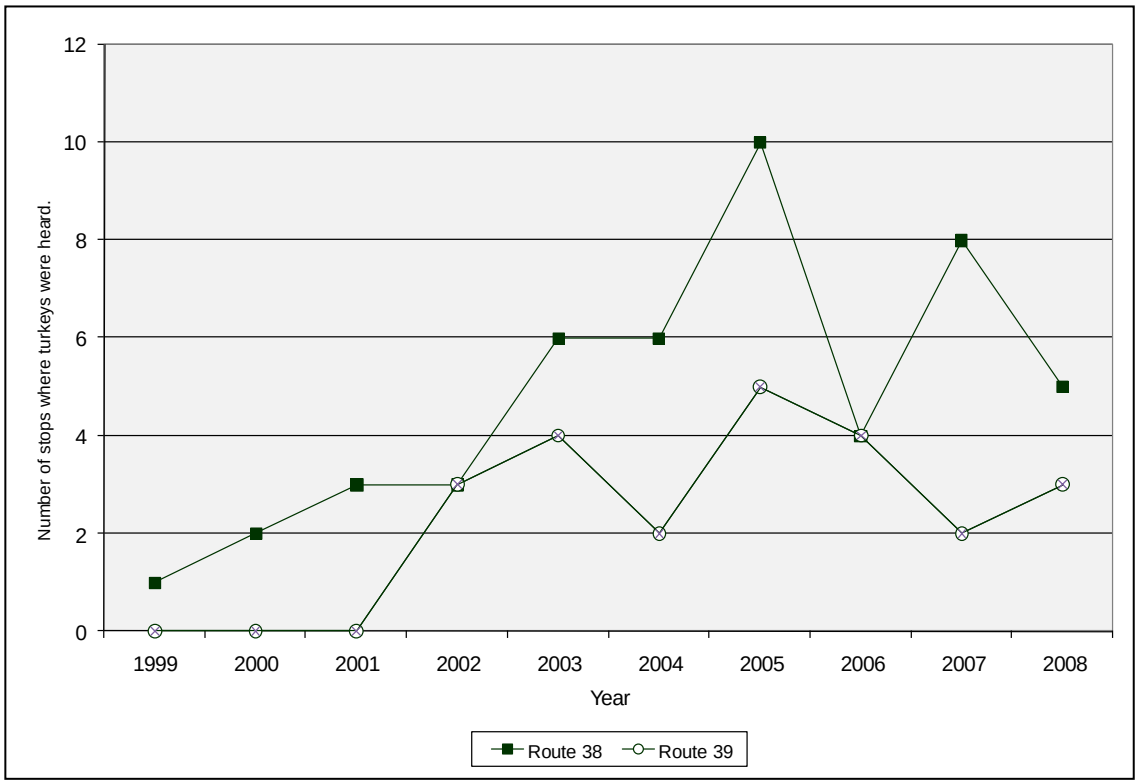


Wild Turkey (*Meleagris gallopavo*)

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 2008 wild turkeys were observed throughout Camp Ripley. During ruffed grouse counts in April, turkeys were documented on five of six stops on survey route #38 and three of 10 stops on route #39 (Figure 28). Figure 28 indicates that fewer turkeys were recorded at stops along route #38; however, because of restricted access due to military training, only six of ten stops were visited during the survey. 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.

In 2009, Camp Ripley will participate in a wild turkey winter food habits study in northern Minnesota conducted by the MNDNR Farmland Wildlife Population Group. 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. The MNDNR will collect approximately 15 to 20 turkeys on Camp Ripley from January through March in 2009 and 2010.

Figure 28. Wild turkeys heard on ruffed grouse spring drumming routes at Camp Ripley, 1999-2008. In 2008, only six stops were visited on route #38.



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).

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) protections. The status of the gray wolves in Minnesota is once again threatened under the Endangered Species Act.

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.

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).

Camp Ripley Wolves

Wolves were first documented on Camp Ripley in 1993. Since that time there have been very few occasions when the Camp Ripley Environmental Office has been contacted by local landowners because of concerns or problems with wolves and livestock or domestic pets. In 2008, a local MNDNR Conservation Officer confirmed that a landowner had lost a large dog to wolves west of Camp and had more wolf activity near his home. USDA Wildlife Services was contacted and responded by trapping eight wolves from the area. Camp Ripley's north pack wolves had historically traveled west of Camp, but were not located in that area this year. Apparently, a new wolf pack had established itself in this area. Other reports of wolf sightings in or near The Nature Conservancy's Lake Alexander Preserve west of Camp, also suggests that additional packs may have developed in the area. This is consistent with the MNDNR's most recent statewide wolf surveys, which indicate that wolf numbers increased since the late 1990's by increasing the number of wolf packs without increasing wolf range in the state (Erb 2008). Territory size of the north pack has also been reduced by an increase in the area of Camp that the south pack uses. Until 2007, the territory boundary between the north and south packs was Normandy Road, in 2007 that boundary moved north and is now along the north edge of the Hendrickson Range roughly following Lake Allot Road (Figures 29, 30, and 31).

Besides serving as a National Guard training facility, Camp Ripley is also a Minnesota Statutory Game Refuge. Camp Ripley provides good quality habitat for wolves on the southern edge of the Minnesota gray wolf range. In the past fifteen years, thirty-four 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 9). Pack numbers and occupied territories in Camp Ripley have fluctuated during this time between one and two 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 wolves that move off Camp are moving into a

Figure 29. Locations for wolf #28, #29, and #34 at Camp Ripley, 2008.

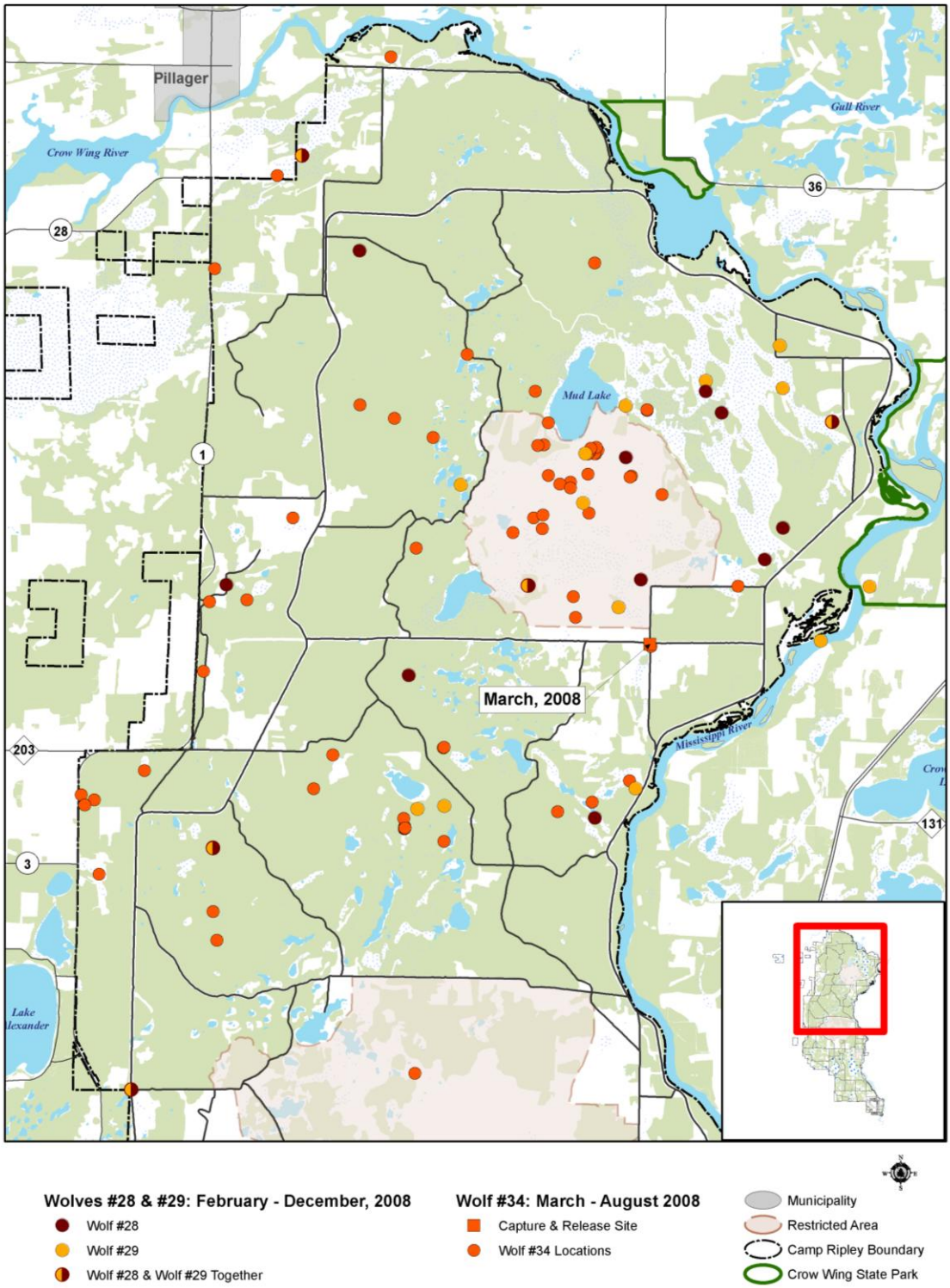


Figure 30. Locations for wolf #26, #30, and #31 at Camp Ripley, 2006-2008.

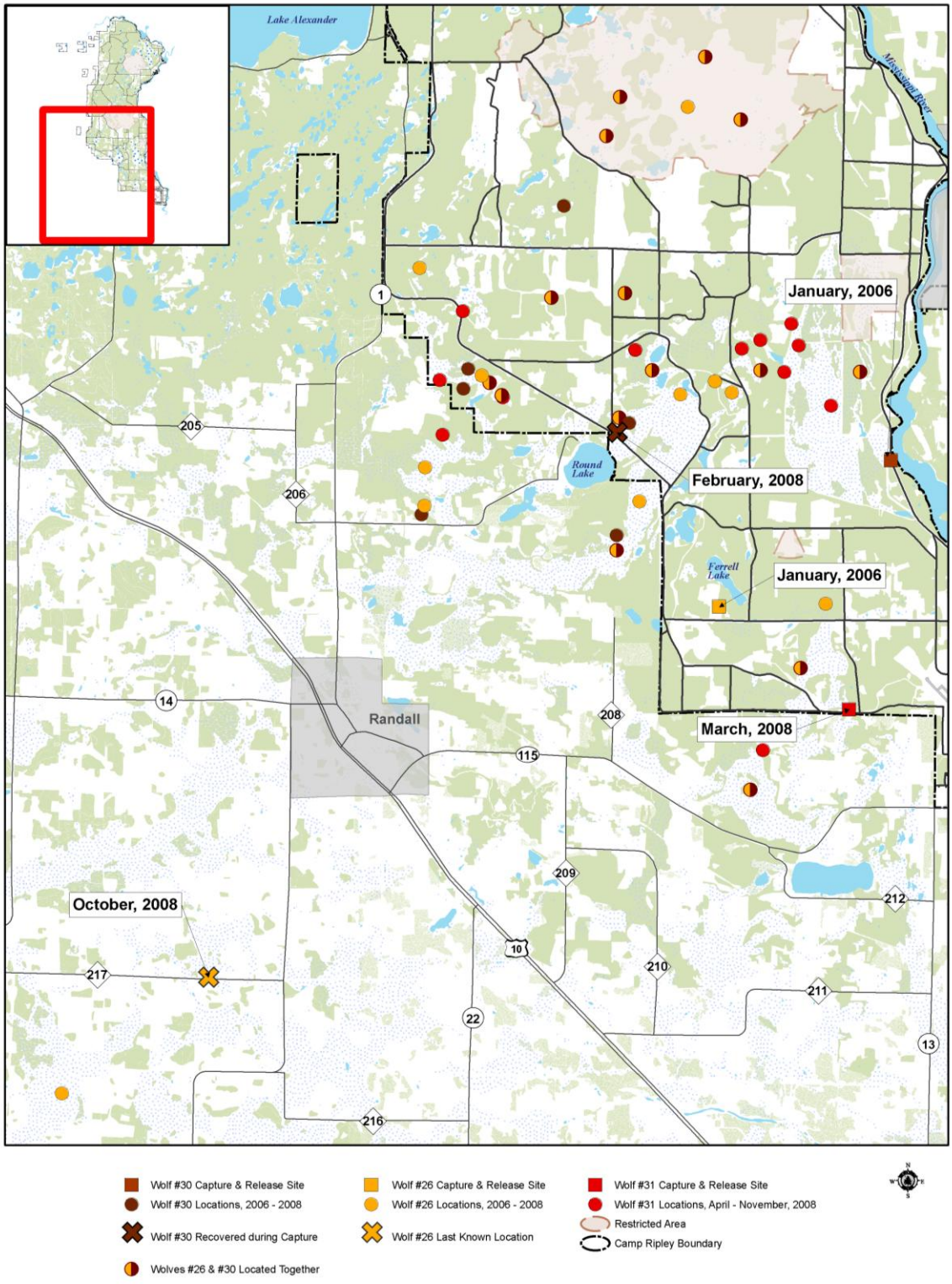


Figure 31. Locations for wolf #32 at Camp Ripley, 2008.

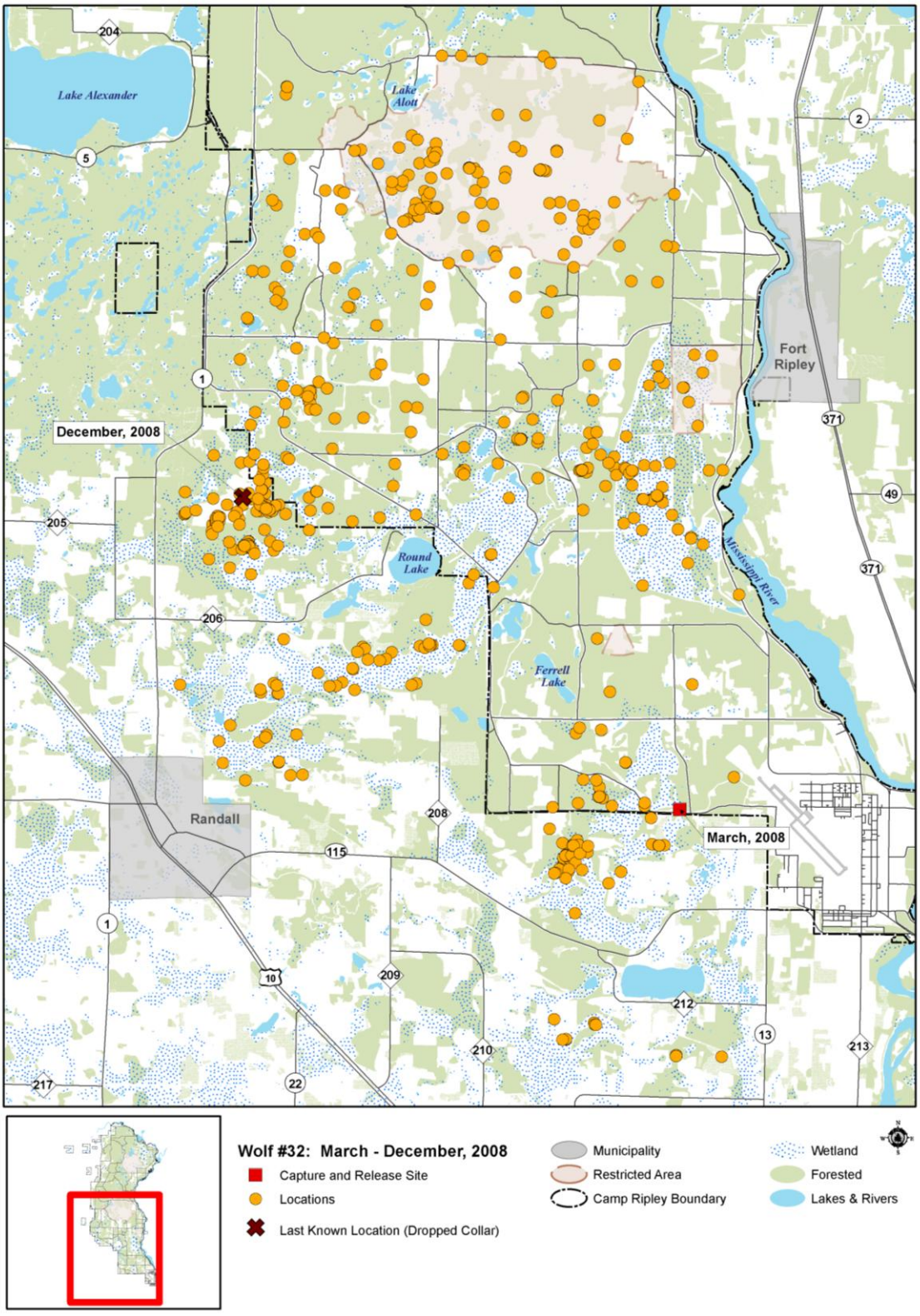


Table 9. Gray wolves captured at Camp Ripley since 1996.

Wolf #	Sex	# of Captures	Age at 1st Capture	Date of 1st Capture	Date of Last Capture	Weight (lbs) at Last	Ear Tag Color & Number (Right/Left)	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	Unknown, found dead (7/01)
16	F	1	1-2 years	1/18/01	1/18/01	65		dead	Found dead in Michigan- shot (9/02)
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
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 (8/07)
21	F	1	1-2 years	2/25/03	2/25/03	68		dead	Found dead in cornfield
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)
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)
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 2/Orange 4**	**ALIVE**	**North pack – Alpha Male**
29	**F**	**1**	**2 years**	**1/30/2006**	**1/30/2006**	**67**	**Blue 11/Orange 1**	**ALIVE**	**North pack**
30	F	1	3 years	1/31/2006	1/31/2006	85		dead	Dead – found during helicopter capture (2/08)

Table 9. 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	Ear Tag Color & Number (Right/Left)	Fate	Comments
31	**M**	**1**	**4-5 years**	**3/22/08**	**3/22/08**	**93**	**Blue 10/Yellow 47**	**ALIVE**	**South pack**
32	**F**	**1**	**2-3 years**	**3/22/08**	**3/22/08**	**84**	**Orange 21/Yellow 38**	**ALIVE**	**South pack, GPS collar failed – 2008**
33	F	1	2 years	3/22/08	3/22/08	76		dead July 2008	Killed by depredation trapper in Manitoba, Canada
34	**M**	**1**	**4-5 years**	**3/22/08**	**3/22/08**	**92**	**Yellow 36/Yellow 44**	**ALIVE**	**North pack, GPS/Satellite collar failed -2008**

more hostile environment where they die from illegal and accidental killing by humans. For example, wolf (#26) was part of the south pack when he was captured in January, 2006. Within the next year he began to travel west of Camp and would disappear for months at a time. During this time he was rarely found on Camp. In the summer of 2008 he could be found more regularly southwest of Camp usually south or west of Randall, Minnesota. He was last located southwest of Randall on October 15, 2008 and plans were in place to search this area this winter to determine if he was part of a newly formed pack. Unfortunately, he was shot during the firearms deer season (Figure 30).

Helicopter Capture and Wolf Movements

At the beginning of 2008 two packs of wolves were known to use Camp Ripley as part of their territories. A helicopter capture crew was brought to Camp Ripley to capture wolves on February 23, 2008. Two radio-collared wolves remained from the south pack; however, one of these (#26) had moved southwest of Camp and was no longer associated with the south pack. The other was the alpha female (wolf #30). An airplane was dispatched to track down the alpha female and locate the rest of the pack. Unfortunately, wolf #30 was found dead in the southwest corner of Marne marsh near round lake (Figure 30). The south end of Camp was searched for the rest of the pack but no wolves were located. The MNDNR airplane was used to locate wolves on the north end of Camp but as the helicopter crew began to pursue the first wolf, it was forced to land because of mechanical failure. Needed repairs delayed the capture until March 22, 2008. The goal was to capture uncollared wolves in each pack. An extensive ground and air search through the southern portion of Camp Ripley led to the sighting of three wolves from the south pack. One of these wolves was not pursued because it appeared to be suffering from mange and had extensive fur loss. The other two wolves were captured; male wolf #31 and a young female (#32). Wolf #31 was collared with a conventional VHF collar (Figure 30) and #32 was collared with an Advanced Telemetry Systems GPS collar. The GPS collar was designed to collect locations every 11 hours for 1.5 years. Unfortunately, it malfunctioned shortly after deployment making it difficult to locate. The collar dropped off the wolf in early December, and was recovered in early 2009. Locations from wolf #32 depict the territory of Camp Ripley's south pack (Figure 31).

Radio-telemetry was used to locate the north pack and capture two uncollared wolves, #33 a young (2-3 year old) female, and #34 an adult male. One (#33) was collared with a conventional ARGOS satellite collar, the other (#34) was collared with a North Star Science and Technology, Globalstar GPS collar. The ARGOS satellite collar worked during testing but did not function properly when on the wolf. Because the VHF signal could still be heard, wolf #33 was located on Camp several times until she disappeared in June. On July 22, 2008 we were informed that wolf #33 had been caught and killed by a depredation trapper at Sylvan-Dale community pasture north of Winnipeg Manitoba, approximately 375 miles straight line distance from Camp Ripley. Unfortunately, all locations in between were lost due to collar failure.

Wolf #34 was collared with a Globalstar satellite collar that is designed to collect GPS locations and transmit them from the field to the internet via the Globalstar satellite system. This collar worked perfectly until late July when it failed (Figure 29) North Star discovered a design flaw, corrected the problem and replaced the collar. Because the GPS locations are much more accurate than traditional ARGOS satellite systems and can still be remotely accessed; if successful, there is great potential for using this type of collar to more accurately track local movements and long-range dispersals of Camp Ripley wolves.

White-tailed Deer (*Odocoileus virginianus*)

White-tailed Deer Survey

In March 2006 a helicopter survey of white-tailed deer was conducted within the boundaries of Camp Ripley, MN. The goal was to produce a population estimate that was within ±25% of the true population size. Secondarily, investigators wanted information on the spatial distribution of deer within Camp Ripley and potential habitat associations. An aerial deer survey was conducted on February 28, and March 3 and 10, 2008. Camp Ripley was divided into 277 1 km^2 quadrats and 81 of these plots were systematically selected to be surveyed (Figure 32). The sampling frame was expanded from 57 plots surveyed in 2006 to include plots adjacent to Camp Ripley that were considered potential wintering areas in past surveys (Figure 32) (Appendix L).

Quadrats to be surveyed were plotted using ARCMAP, and loaded into a Global Positioning System (GPS) unit attached to the helicopter. This allowed the pilot to monitor his flight path, and to determine whether deer were observed within quadrats. Real-time data capture allowed researchers to pinpoint deer locations on a laptop while ARCMAP was running. The helicopter's GPS unit was set up to communicate the location of the aircraft to the computer, which displayed an aerial photo and the location of the aircraft on the screen. The pilot flew transects through each quadrat while two observers and the pilot counted deer.

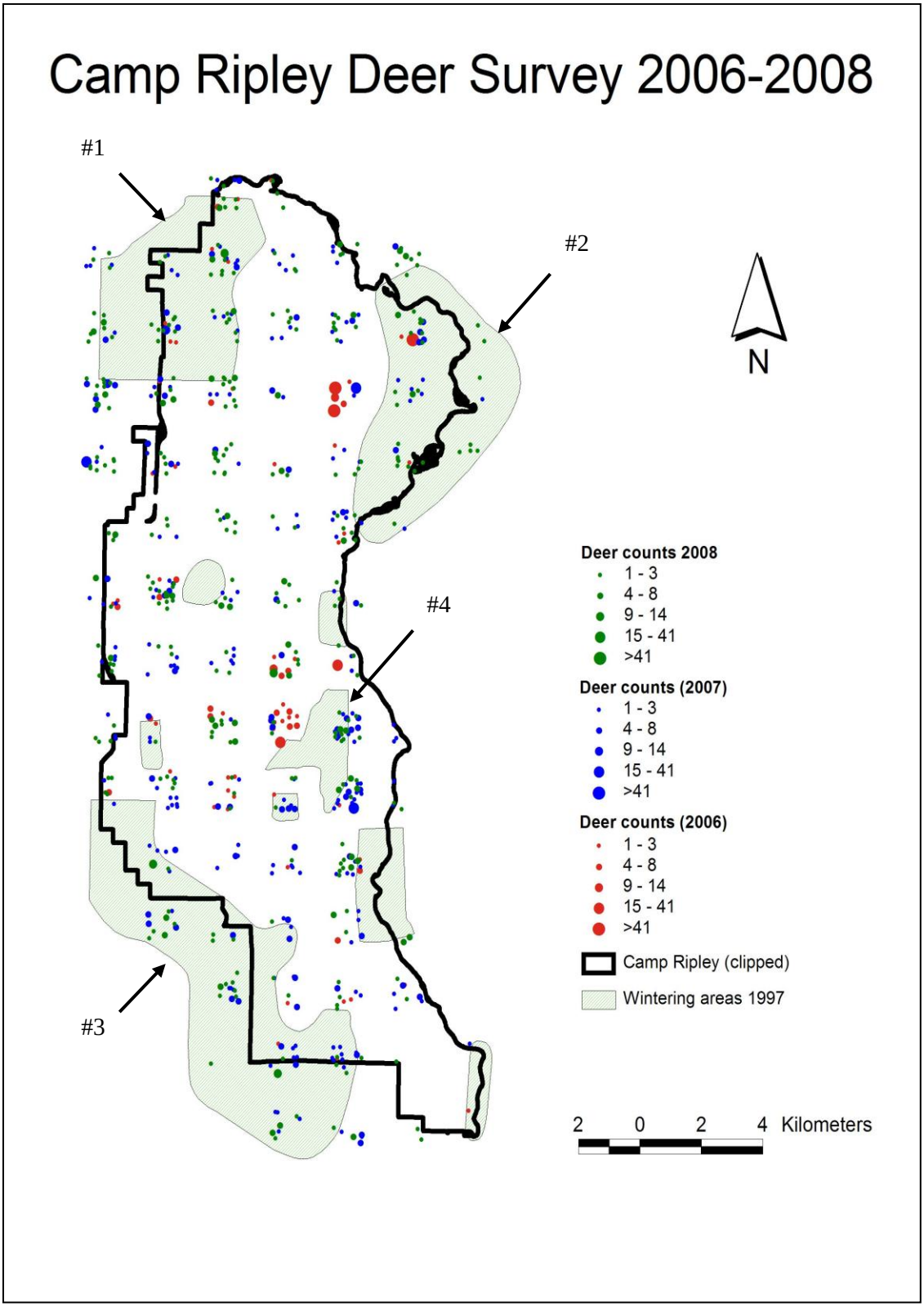
Analysis of 2008 data provided an estimate of 28 deer per square mile (90% CI: 24–31) (Table 10 and Appendix L). The 2006 survey was relatively imprecise (CV=34%), but provided good baseline data on deer and habitat distribution within Camp Ripley. The 2007 and 2008 population estimates were precise (CV = 8%), especially when compared to the poor precision in 2006. Deer were more evenly dispersed and group sizes were smaller in 2007 and 2008 than in 2006 (Figure 32). Deer distributions in 2007 and 2008 were not correlated with major wintering areas identified in 1997 (DelGiudice 1997), whereas 75 percent of deer observations in 2006 were in or near wintering area #2 and #4 (Figure 32 and Appendix L). The dramatically improved precision in 2007 & 2008 was primarily due to a more even distribution of deer counts among sample plots (no extreme counts) and a larger sample size (81 vs. 59 plots). However, always be cognizant of the distinction between the statistical and biological populations. Movement and distribution of deer in and around Camp Ripley (the biological population) may vary substantially within and among years (Appendix L).

Table 10. Camp Ripley white-tailed deer survey results, 2006-2008.

	2006	2007	2008
Sample plots	59	81	81
Total plots	228	277	277
Sampling rate	0.26	0.29	0.29
Groups detected	76	288	337
Mean group size	5.0	2.9	2.6
Range (group size)	1-68	1-26	1-13
Total deer detected	458	827	860
Mean deer/plot	7.8	10.2	10.6
SE (mean deer/plot)[a]	2.68	0.80	0.74
Range (deer/plot)	0-143	0-55	0-35
Geary's C (<1 = positive spatial correlation)	1.20	0.80	0.95
Population estimate ($\hat{\tau}$)	1,770[b]	2,828	2,941
$\hat{Var}(\hat{\tau})$ adjusted for spatial correlation	374,318	48,830	42,375
$\hat{Var}(\hat{\tau})$ | simple random sampling	312,115	60,973	44,432
90% CI (population total)	747 - 2,791	2,460 - 3,198	2,598 - 3,284
CV (%)	34.6	7.8	7.0
Relative error of CI bound (%)	57.7	13.1	11.7
Estimated density (deer/mi^2)	22	26	28
90% CI (deer/mi^2)	9 - 34	23 - 30	24 - 31

[a]Adjusted for estimated spatial correlation (D'Orazio 2003).
[b]The population estimate in 2006 is not directly comparable with estimates in 2007-2008 because the sampling frame was expanded in 2007.

Figure 32. Distribution of white-tailed deer observed (total per plot) in Camp Ripley aerial surveys, 2006-2008.



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 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.

Future project goals include monitoring black bears on the edge of their range in Minnesota. The MNDNR Forest Wildlife Populations and Research Group has initiated a new 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 the range and collared bears at Camp Ripley, along the southern edge of the range (Garshelis et al. 2007).

Mortalities and Reproduction

Ground and aerial tracking were used to monitor reproductive success, movements and survival of ten collared female black bears through 2008 (Table 11). Bear #2063 had one cub last year (2007), and an orphaned cub was placed with her during the March 2007 den visit, both cubs survived to den in December 2007. These cubs (#2112 and #2610 orphan) were both females and were collared with expandable collars in March 2008. In July, 2008, bear 2112 moved across the Crow Wing River and spent the summer in a less populated area of southwest Baxter, Minnesota. In September, she was hit by a vehicle and killed on Highway 210 on the west edge of Baxter (Figure 33). Bear #2079 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 to den in December (Figure 34). Bear #2081 gave birth to three cubs during 2008; although all three survived to den in December their weights varied widely (31, 45 and 65 lbs). Bear #2105 had three very small cubs in 2007, but none survived; in 2008, she had two small cubs. She was last located in late November, 2008 in Training Area 51; but in December her radio signal could not be heard and as a result her den has not yet been located. Bear #2092 was active throughout the winter of 2007-08 and was located in several above ground open dens. Several attempts were made to approach her but each time she moved away before she could be observed. However, she was successfully captured via helicopter during the wolf capture

in March. Adult females #2063, #2079, and possibly #2092 (four years old in Jan. 2009) could produce cubs in 2009.

Table 11. Black bears monitored at Camp Ripley, 2008.

Bear ID	Sex	Current Age	Date of First Capture	Age at First Capture	Weight at Last Capture (lbs)	Ear Tag Color & Number (Right/Left)	Status
2063	F	8	2001	2 months	161 (3/08)	Red 134/Orange 40	Alive
2076	M	13	2003	7 years	397 (3/07)	Orange 140/Lt. Blue 64	Alive - Dropped collar August 2007, observed west of Camp in 2008
2079	F	7	2004	2 years	193 (3/08)	Orange 132/Yellow 108	Alive
2081	F	10	2004	5 years	174(3/08)	Yellow ?/Blue 59	Alive
2086	M	6	2004	1 year	66 (3/05)	Green 157/Orange 38	Missing – two sightings in 2007, none in 2008
2092	F	4	2005	2 months	Unknown	Blue 63/Green 164	Alive (79's cub)
2105	F	Unknown	2006	Unknown	124 (3/08)	Purple 89/Orange 142	Alive
2107	F	2	2007	2 months	37 (3/08)	Green 174/Green 175	Alive (#79's cub)
2108	F	2	2007	2 months	50 (3/08)	Lt. Blue 73/Yellow 121	Alive (#79's cub)
2112	F	2	2007	2 months	43 (3/08)		Dead – hit by car on Hwy 210 in Baxter 9/08 (#63's cub)
2610	F	2	2007	2 months	53 (3/08)	Orange 39/Blue 75	Alive - orphaned cub placed with #63 in 2007
2611	F	2	2007	2 months	59 (3/08)	Yellow 120/Purple 93	Alive - orphaned cub placed with #79 in 2007

Figure 33. Locations for black bear 2063, 2112, and 2610 at Camp Ripley, 2008.

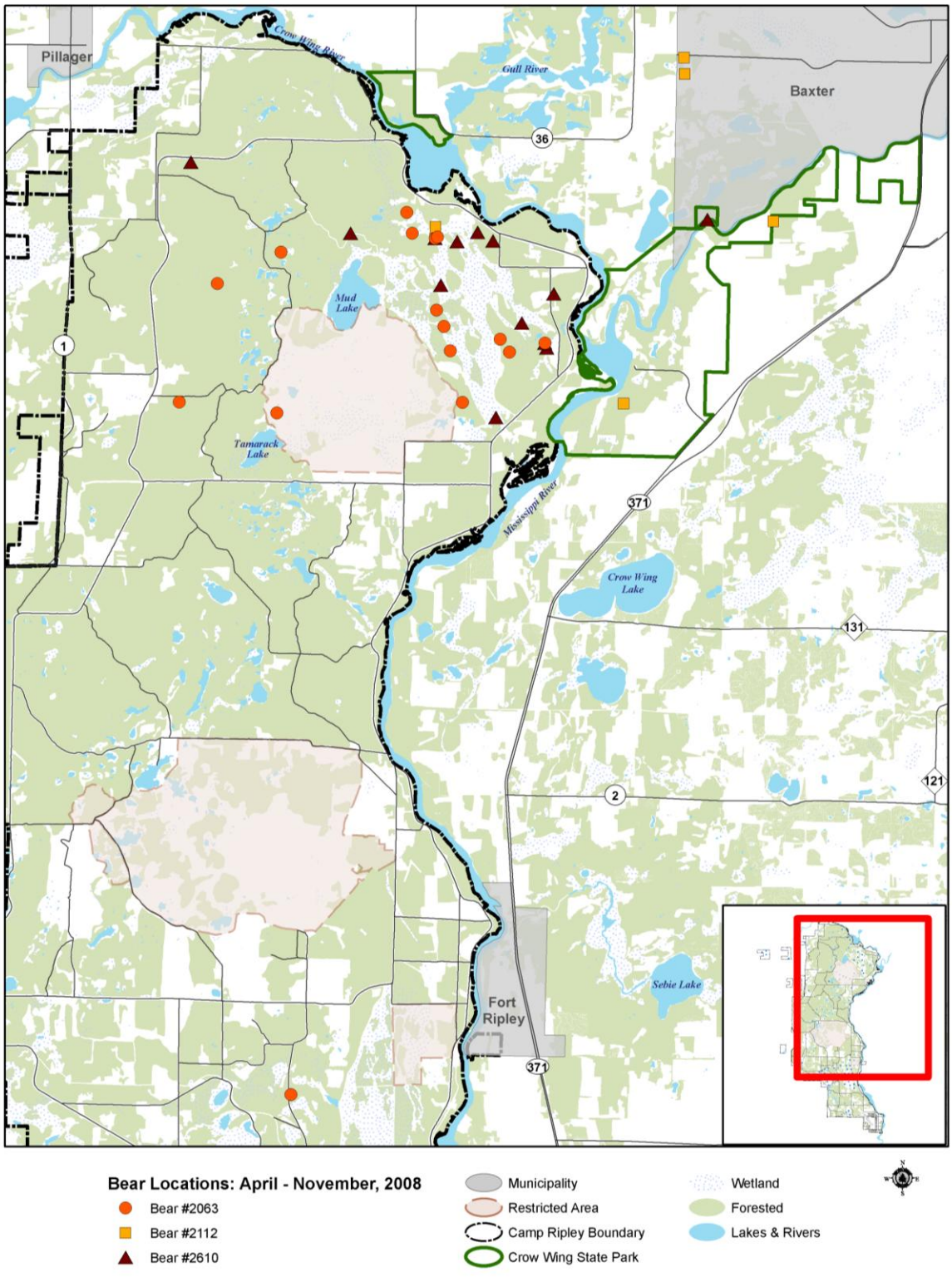
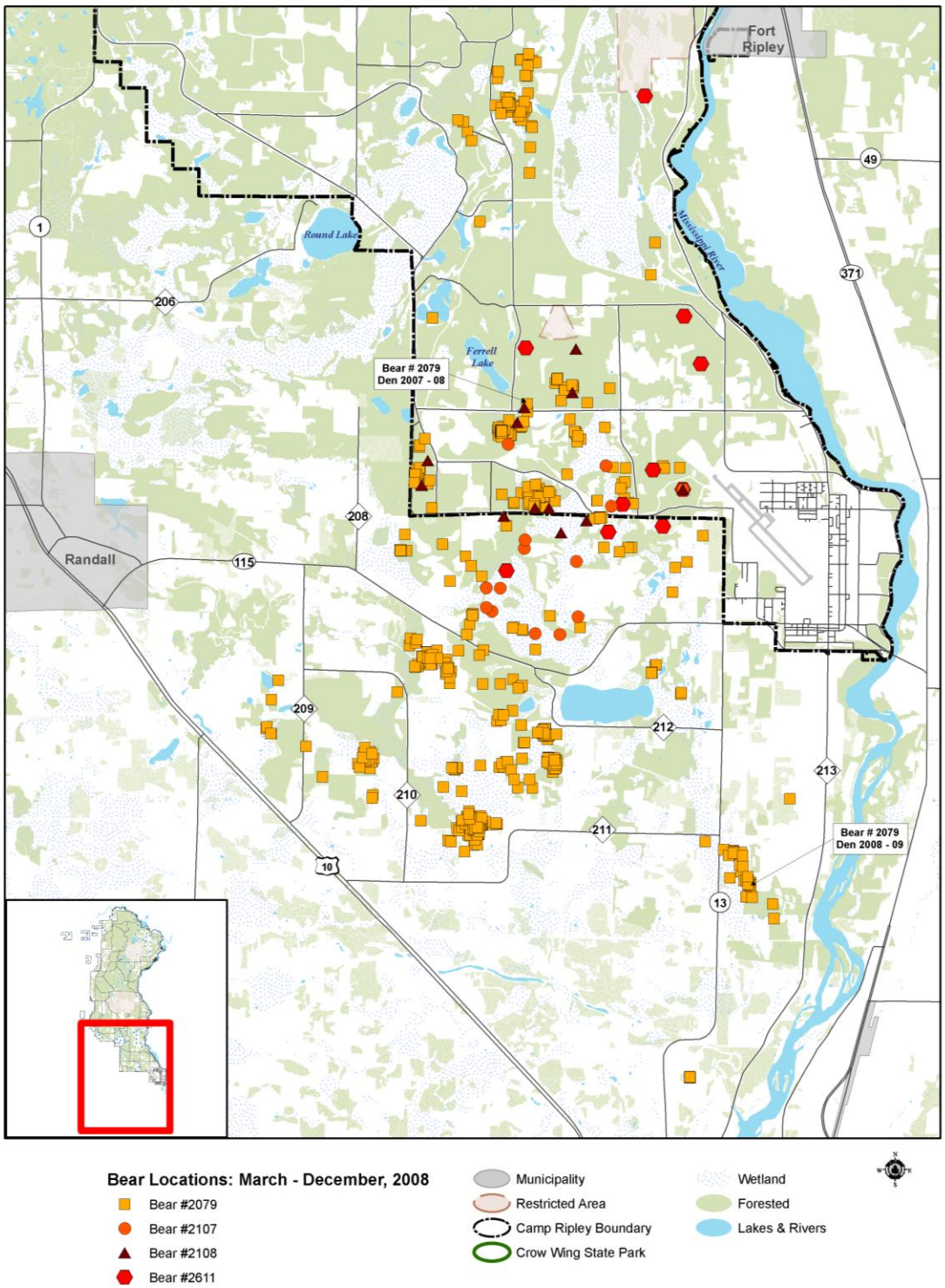


Figure 34. Locations for black bears 2079 and yearlings 2107, 2108, and 2611 at Camp Ripley, 2008.



Black Bear Tetracycline Survey

In an effort to estimate statewide black bear population numbers, the MNDNR places tetracycline-laced baits throughout known Minnesota bear range, every five years. This is the fourth time the MNDNR has used tetracycline marking for bears. The last tetracycline survey was conducted on Camp Ripley in 2002.

Figure 35. Black bear tetracycline bait box, 2008.

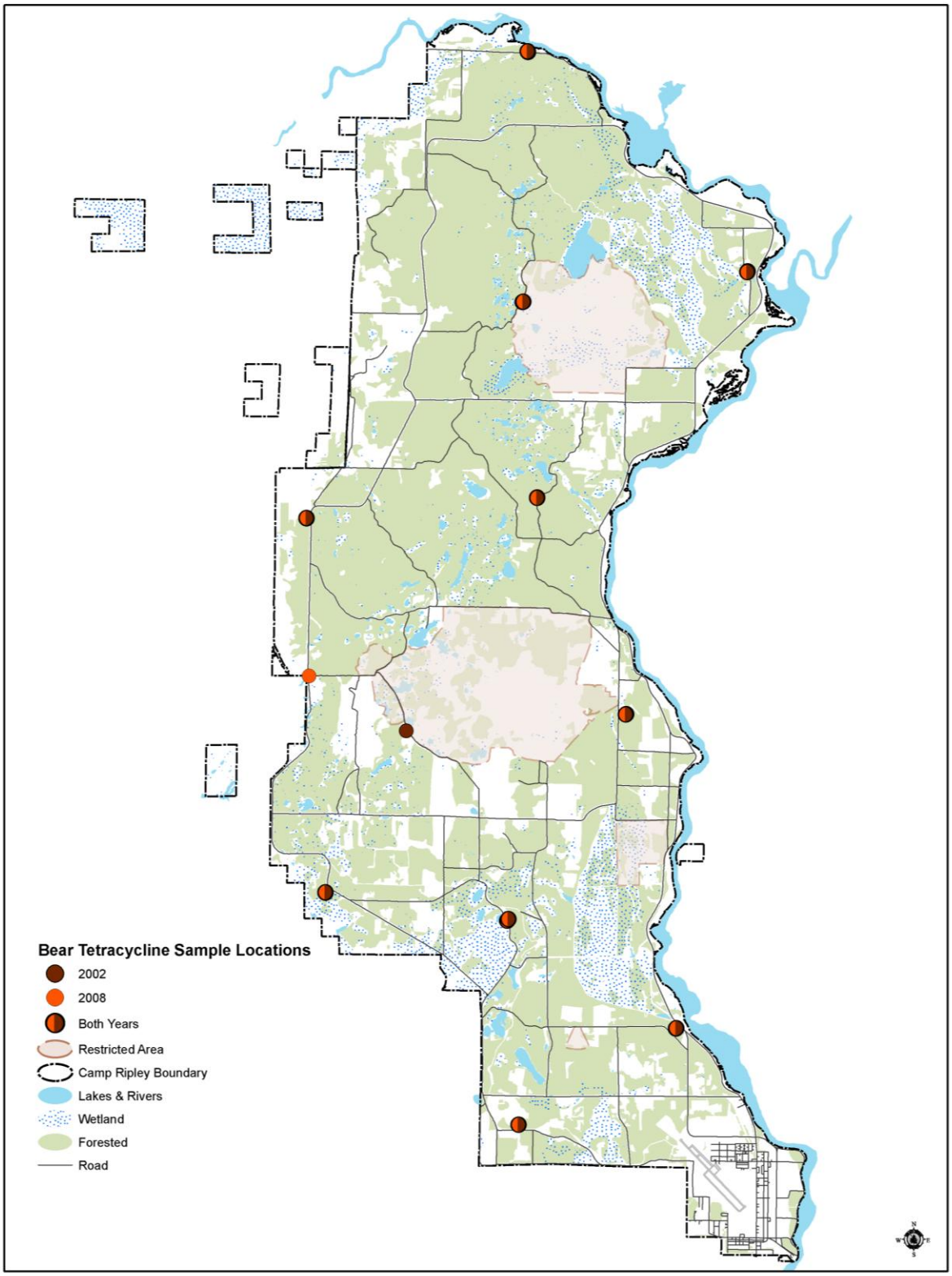
Figure 36. Measuring the width of carnivore claw marks, 2008.

Tetracycline tablets are wrapped in bacon or a combination of ground beaver and bacon, and placed in a bait box. Pork grease is also smeared on the tree as an attractant. Bear bait boxes were installed and baited from June 10 to 13 (Figure 35), and checked several times before being removed on July 28. Trees were examined for evidence of carnivore claw marks. If claw marks were found, their width was measured to determine if a bear had climbed the tree to remove the bait box (Figure 36).

Once a bear consumes the tablets, the tetracycline is absorbed into newly growing bone or tooth material. Later the tetracycline shows up as a florescent mark when examined under ultraviolet light. When a bear is harvested during the hunting season, a bone sample is removed at registration and checked under ultraviolet lights for signs of tetracycline. The number of marked bears is added to a mathematical modeling program, and used to estimate population numbers for the state.

For the second time, Camp Ripley was used as an additional sampling area. Eleven baits were attached to aspen or birch trees throughout Camp (Figure 37). In 2008, five of eleven baits were clearly taken by bears (45.4%), 4 baits were left undisturbed, one bait was attempted to be taken by a bear, and another was attempted to be taken by another carnivore. The numbers of baits taken by bear was similar to 2002 when 54.4 percent of baits were taken.

Figure 37. Black bear tetracycline bait locations, Camp Ripley, 2002 and 2008.



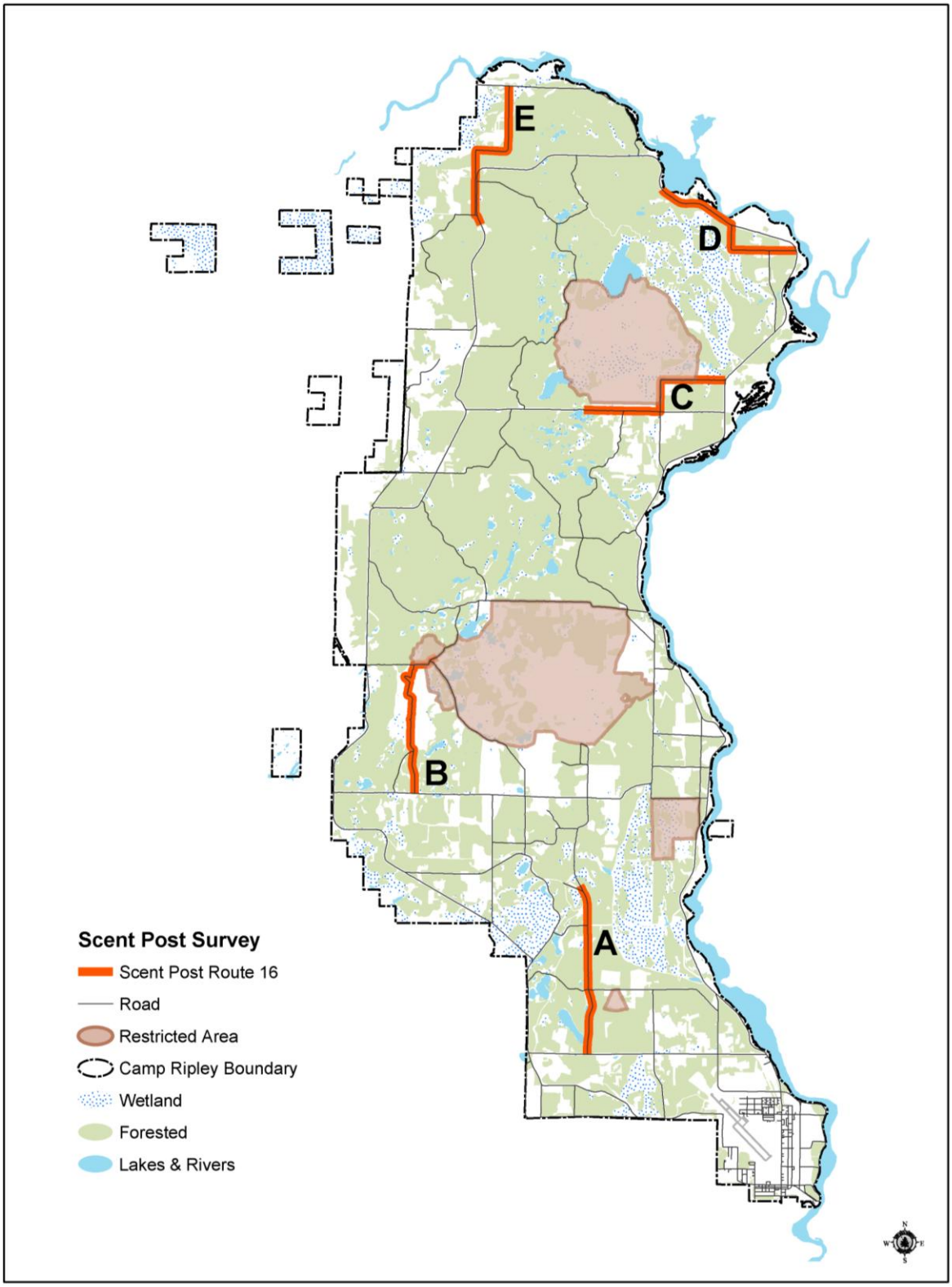
Scent Post Survey

The MNDNR has conducted scent post surveys throughout the state for the past 33 years in order to track 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 38). 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. Segments C, D, and E were set on September 5, and checked on September 6. Segments B was set on September 9, and checked on September 10. The survey was not conducted on segment A due to military training activities frequently occurring along portions of the route.

The most common animals to leave tracks through survey plots during 2008 were gray fox (*Urocyon cinereoargenteus*) and common raccoon (*Procyon lotor*). Other species that were documented this year were wild turkey, American crow (*Corvus brachyrhynchos*), opossum (*Didelphis virginiana*), bear, and a gray wolf. During 2008, more gray fox were observed along the route than in previous years when red fox were predominant. Gray fox and red fox tracks are easily confused; however, survey observers were careful to measure tracks to determine the difference between red and gray fox. Opossum tracks were noted for the first time in 2008; however, opossum have been noted on Camp Ripley since 2007.

Statewide, route visitation rates (% of routes with detection) were highest for red fox (*Vulpes vulpes*) (39%), followed by skunk (*Mephitis mephitis*) (37%), domestic cat (35%), raccoon (34%), coyote (*Canis latrans)* (26%), and dog (19%). 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. For example, few wolf tracks were observed in survey plots this year, 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 38. 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.

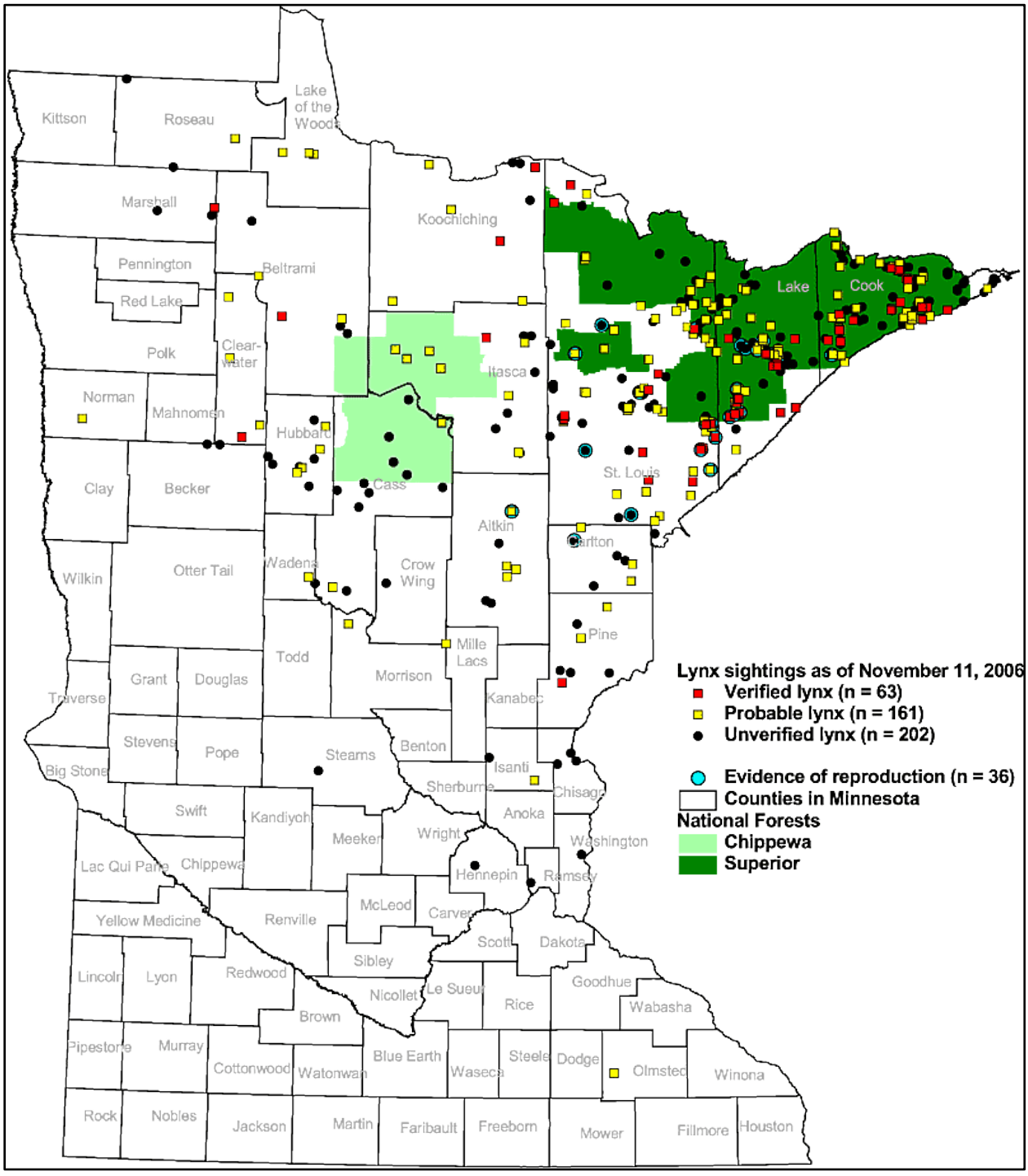
Minnesota historically supported the largest lynx population in the Great Lakes region. Studies are currently underway to understand their distribution, abundance, persistence, and habitat use in and near the Superior National Forest in northeastern Minnesota. This research indicates that Canada lynx 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 40).

Figure 39. Camp Ripley cougar and Canada lynx detection survey, 2007-2008. 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.

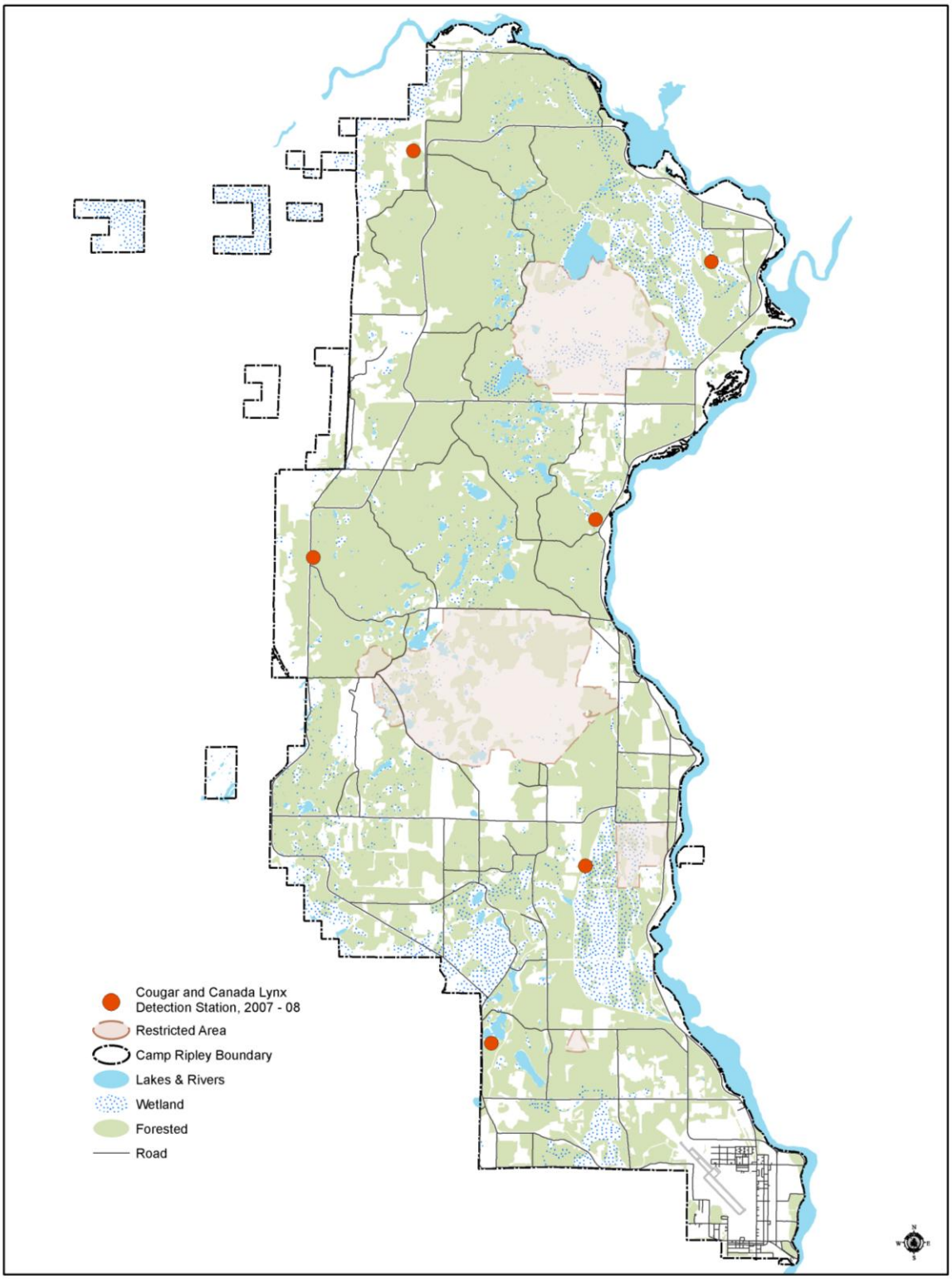
To further assess the presence of large cats on Camp Ripley, scent stations were established that can be used to detect lynx, cougars, and bobcats. Six Envirotel cougar detection systems (Envirotel Inc. 2007) were installed throughout Camp (Figures 39 and 41) in 2007. The detection system consists of a perforated plastic pipe installed over a 7 foot fence post. The base of 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 lure (either cougar urine or catnip

Figure 40. Canada lynx sightings, Minnesota, thru November 11, 2006.



Map courtesy of MNDNR (MNDNR 2007).

Figure 41. Cougar and Canada lynx detection survey locations, since 2007.



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 sights are checked by Jim May, Camp Ripley volunteer, every 4 to 8 weeks, as permitted by training activities. During these visits hair samples are removed from the barbed wire and center pole hook fasteners, and the center pole is sprayed with cougar lure. More than twenty hair samples have been collected since late November 2007, and will be analyzed during 2009 to determine the species of mammals visiting the stations.

Fisher (*Martes pennanti*)

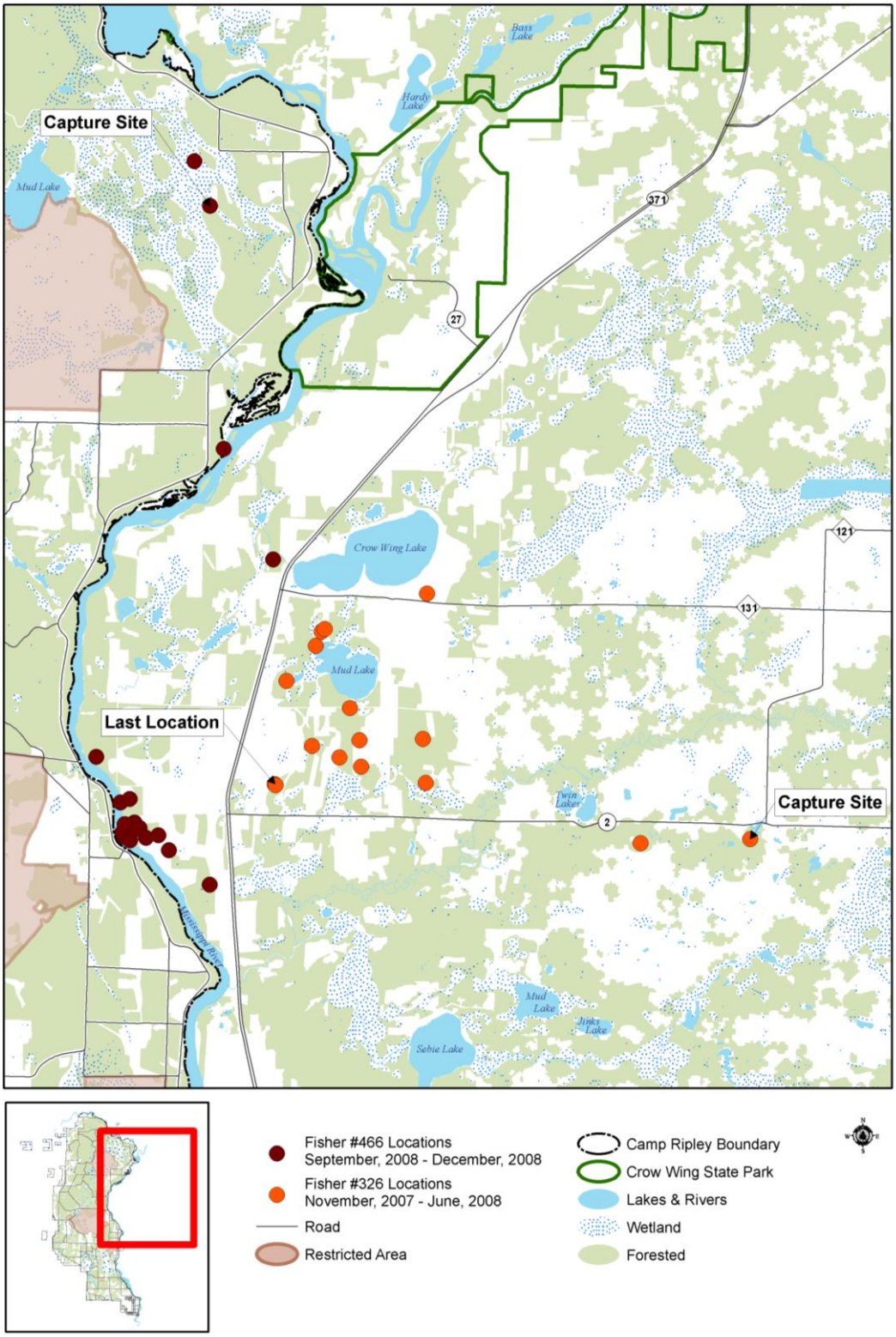
During 2007, Camp Ripley began to participate in a statewide research project by the MNDNR designed to examine fisher and marten ecology in Minnesota. The primary objectives of this study are to: 1) estimate survival rates and causes of mortality for fisher and marten, 2) describe and quantify features 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; Appendix M). 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.

During the winter of 2007-2008, the primary goal was to radio collar a sample of animals to evaluate field methods. Fisher trapping on Camp Ripley occurred from late November 2007 to March 2008. Although live trapping fisher on Camp Ripley was not successful, one female fisher (F07-326) was incidentally caught by a local trapper just outside of Camp Ripley on November 14, 2007. This fisher was radio collared using an Advanced Telemetry System M1565 small zip-tie collar. This fisher was located on numerous occasions during 2007-2008 (Figure 42); however, the radio collar was recovered on June 6, 2008 when the zip-tie broke.

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 N. The graduate project was designed to integrate with the MNDNR statewide project needs.

Fisher trapping resumed on Camp Ripley on September 5, 2008. A female fisher (F08-466) was captured on September 22, 2008 in Training Area 64 (Figure 42). This fisher was radio collared using an Advanced Telemetry System M1930 with a vinyl strap collar. Fisher trapping will continue in 2009 until ten fishers have been trapped and radio collared. Camp Ripley staff and graduate student will continue to obtain weekly radio locations on radio collared fisher in 2009.

Figure 42. Locations of fisher #326 and #466, Morrison and Crow Wing counties, Minnesota, 2007-2008.



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. During 2008, 32 beaver were removed from problem areas. 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.

Beaver ponds throughout Camp Ripley provide habitat for Blanding's and other turtles as well as 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 in order to install these devices. Installation should occur after a temporary draw down, or during natural low-water levels. Research in east-central Minnesota investigated the effects of a draw down on turtle populations. The incidence of mortality was high after the draw down 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 2008. Porcupines were taken only on problem areas identified by Range Control. Fifty-nine nuisance porcupines were taken under the MNDNR permit in 2008.

Camp Ripley Blanding's Turtles (*Emys blandingii*)

The Blanding's turtle is listed as a state threatened species by the MNDNR and is also a species in greatest conservation need. Camp Ripley also is part of a 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 243 hours on traditional and exploratory routes from June 4 through July 1, 2008 (Table 12). Thirty-three Blanding's turtles were observed this year (Figures 44 and 45). To aid in future identification, notches are filed into turtle scutes and each turtle is given a unique alpha code. Eighteen turtles had been previously marked, five were newly marked this year, nine had unknown markings, 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. The standard protocol is to watch a turtle until it completes nesting, then capture and it and identify it.

Five Blanding's turtle (BDJ, OT, ACW, ACY, ACJ) nests were protected and monitored through October (Figures 44 and 45). Nests were monitored and where no evidence of hatching was observed these nests were excavated on October 15, 2008. Three Blanding's turtle nests hatched (ACY; BDJ; OT), and based upon estimates of egg cap remains, a minimum of 29 turtles were produced. Two turtle nests (ACJ and ACW) were excavated. In the top layer of eggs, turtle nest (ACJ) had 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 will be left to overwinter and will be rechecked in the spring of 2009.

The other nest excavated (ACW) had 17 eggs in the nest chamber that failed to hatch. This nest chamber was covered with a white mold/fungi substance and several eggs had one small hole with no egg contents remaining (Figure 43), the likely culprit is an insect (insect larvae, ants or beetle). Nonpredatory fly larvae infestation in a northern map turtle (*Graptemys geographica*) nest chamber have been noted in Ontario (Saumure et al. 2006), and larvae of certain flies have scavenged wood turtle eggs (Wood Turtle.com 2008). In this case, it's unknown if the insect was the cause of egg destruction or if the eggs were infertile and the insects were feeding on the decaying eggs. The insect infestation likely occurred early in egg development as two eggs within the nest chamber had yolk contents remaining. The location of the nest may have also contributed to its failure as the nest site received a maximum of 4-5 hours of direct sunlight each day due to adjacent trees and its juxtaposition on an

Figure 43. Blanding's turtle (ACW) egg with hole, 2008.

east facing slope. The potential causes of nest failure include insufficient sun exposure, competition from the mold/fungi for resources (i.e., moisture), insect infestation, and/or the eggs were infertile.

The first Blanding's turtle was observed on June 18, 2008. Historically, turtles have been observed between June 2 and July 2. Spring air temperatures seem to affect the number of Blanding's turtles that will be observed in June (Figures 46 and 47, U.S. Department of Commerce 2008). Higher average temperatures during survey periods also correlate with an increase in turtle observations (Table 12). 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 47) or during the survey period (Figure 48) does not seem to affect the number of Blanding's observed.

Table 12. Summary of Blanding's turtle nest search surveys at Camp Ripley, 2000-2008.

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**

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

Figure 44. Observations and nest locations of Blanding's and snapping turtles in the north portion of Camp Ripley, 2008.

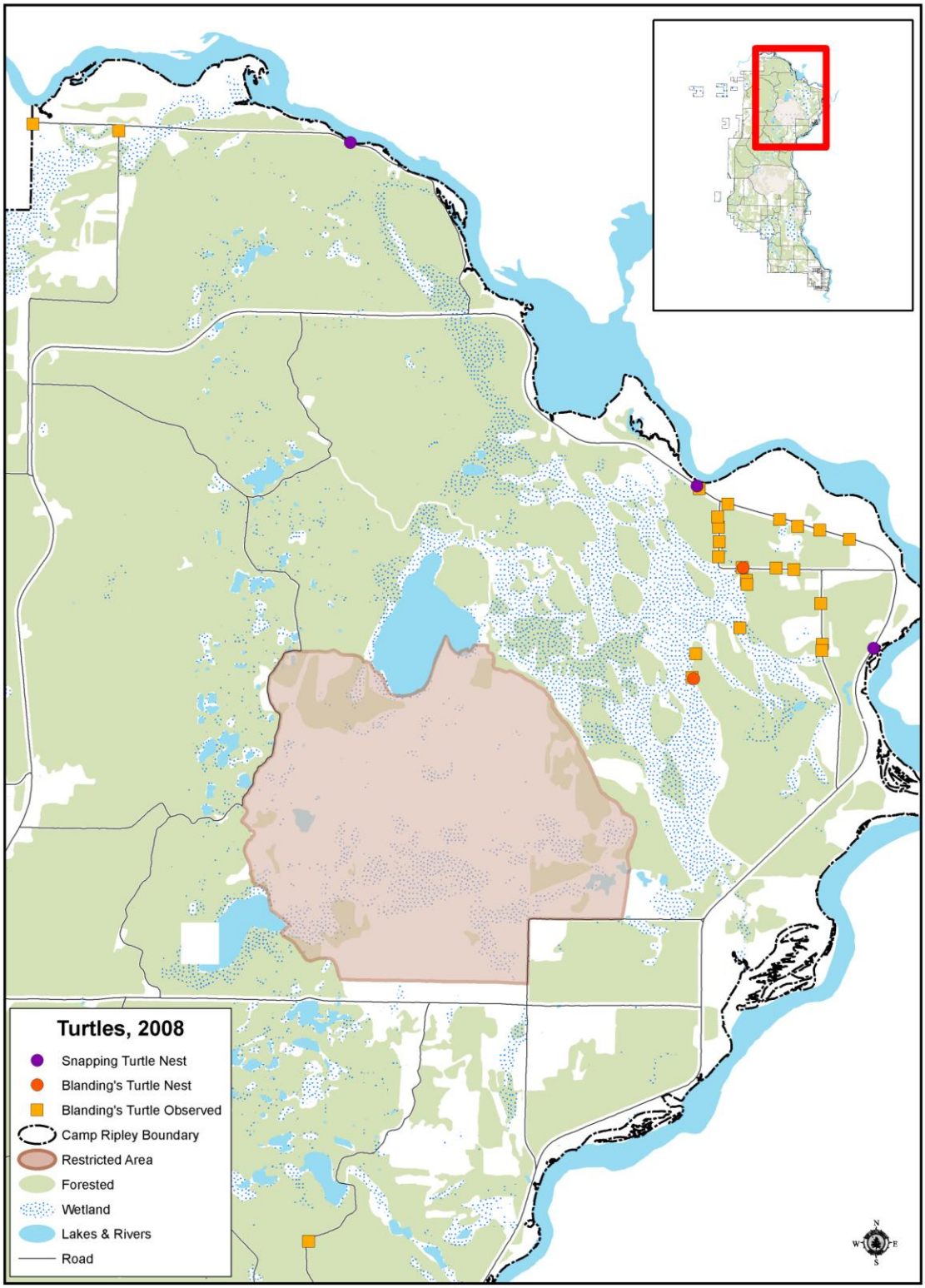


Figure 45. Observations and nest locations of Blanding's and snapping turtles in the south portion of Camp Ripley, 2008.

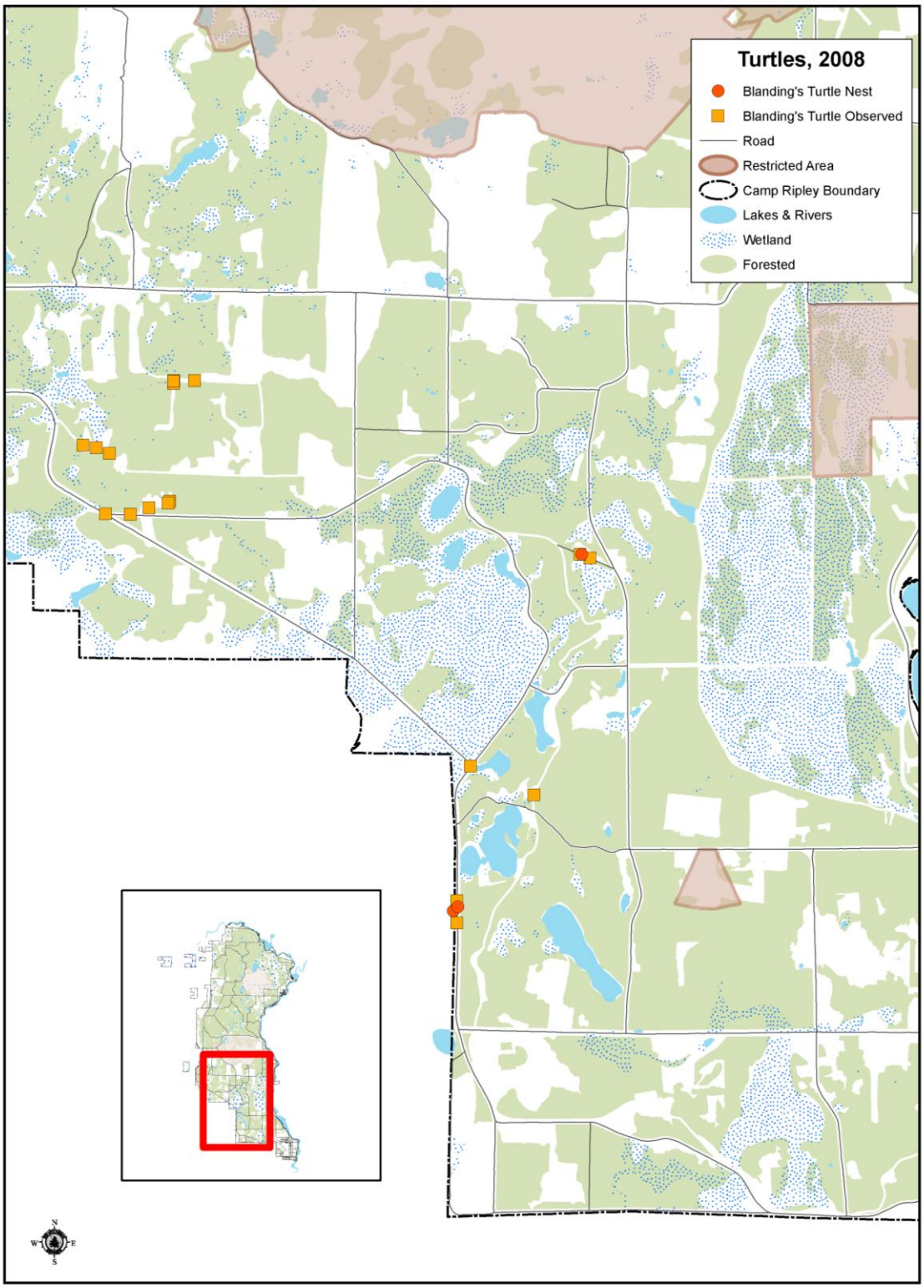


Figure 46.

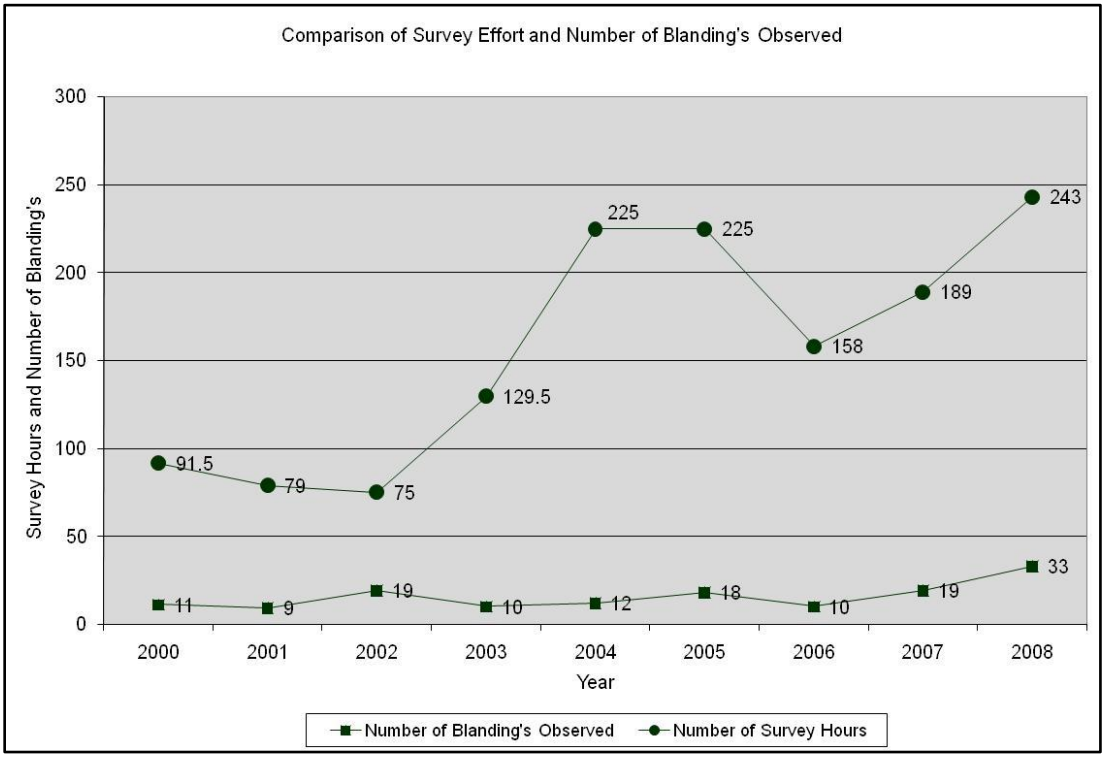


Figure 47.

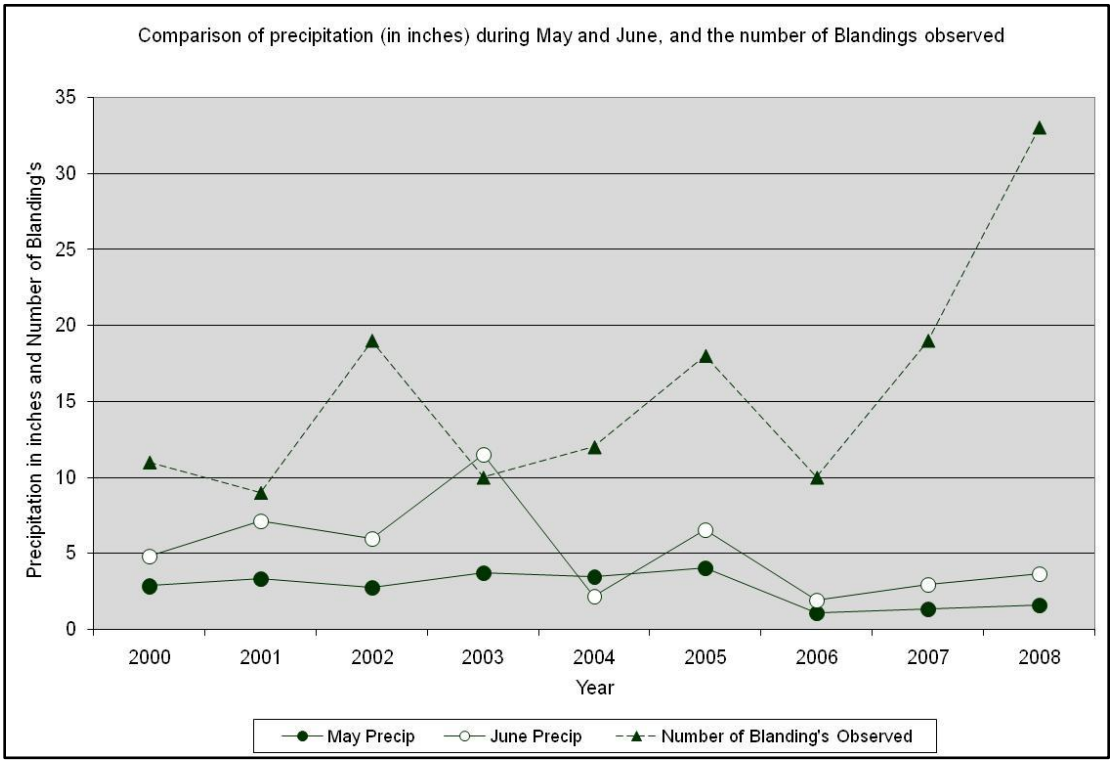
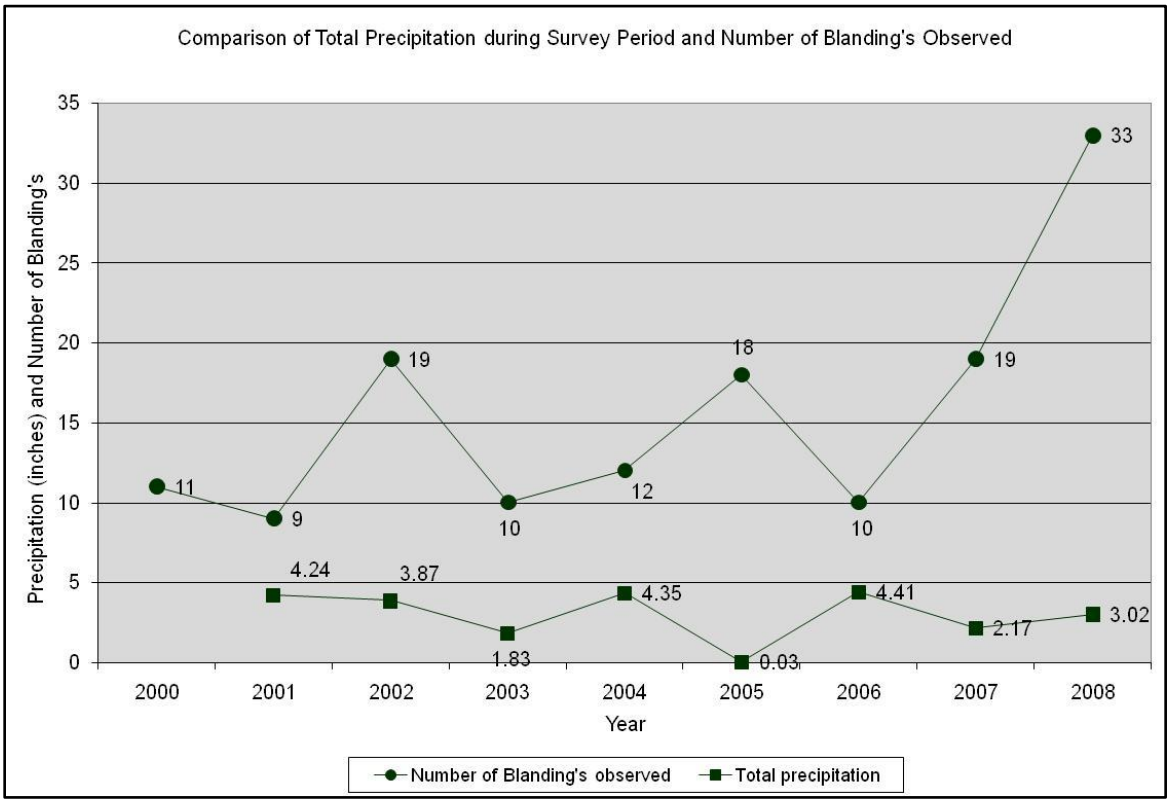


Figure 48.



Camp Ripley Zebra Mussels (*Dreissena polymorpha*)

Zebra mussels are native to Eastern Europe and Western Russia. They were first discovered in the Great Lakes in 1988. They are small barnacle-like animals that attach themselves as adults to surfaces such as boats, nets and other fishing equipment. Each female zebra mussel can produce as many as one million eggs per year. Zebra mussels are considered a serious invasive species that can "foul beaches, interfere with food webs, smother native mussels, clog water intakes, and are linked to fish and wildlife die-offs" (MNDNR 2007). Zebra mussels were first located in 2005, north of Camp Ripley in Rice Lake, a reservoir of the Mississippi River in Brainerd. Since then, the Mississippi River from its confluence with the Pine River north of Brainerd, down to the Iowa border has been placed on the state list of infested waters (Figure 49).

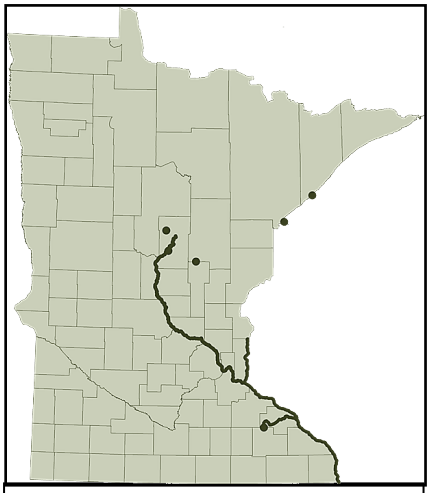


Figure 49. Zebra mussel infestation in Minnesota (MNDNR 2007). Courtesy of MNDNR.

Mussels in the microscopic veliger stage could easily float down the Mississippi to the Camp Ripley area.

Nine zebra mussel samplers were placed on June 27, 2008 in the Crow Wing River and Mississippi River (Figure 50) to track expansion of zebra mussels. Four samplers (#4-#7) were removed due to low water levels on July 18, 2008. Samplers were examined on August 12, 2008 for evidence of zebra mussels; however, no zebra mussels were detected. But, in 2008, Luke Skinner, MNDNR Invasive Species Biologist, reported zebra mussel presence on Mississippi River docks in Little Falls and Sartell, Minnesota.

Camp Ripley is bordered by the Mississippi River on its east side. Since zebra mussels have been found north and south of Camp Ripley within the Mississippi River steps need to be taken to prevent transfer of veliger stage organisms to Camp Ripley's interior lakes. To aid in minimizing transfer risk, all Mississippi River boat access sites are permanently signed to alert users to the potential for zebra mussel contamination of their boats. In addition, a risk assessment should be conducted to determine potential for Mississippi River water transfer to interior lakes due to military or fire training, or fisheries activities. Zebra mussel samplers will continue to be used to identify the presence of these mussels in the Mississippi and Crow Wing rivers, and docks on interior lakes will be examined for zebra mussel presence.

AHATS Birds

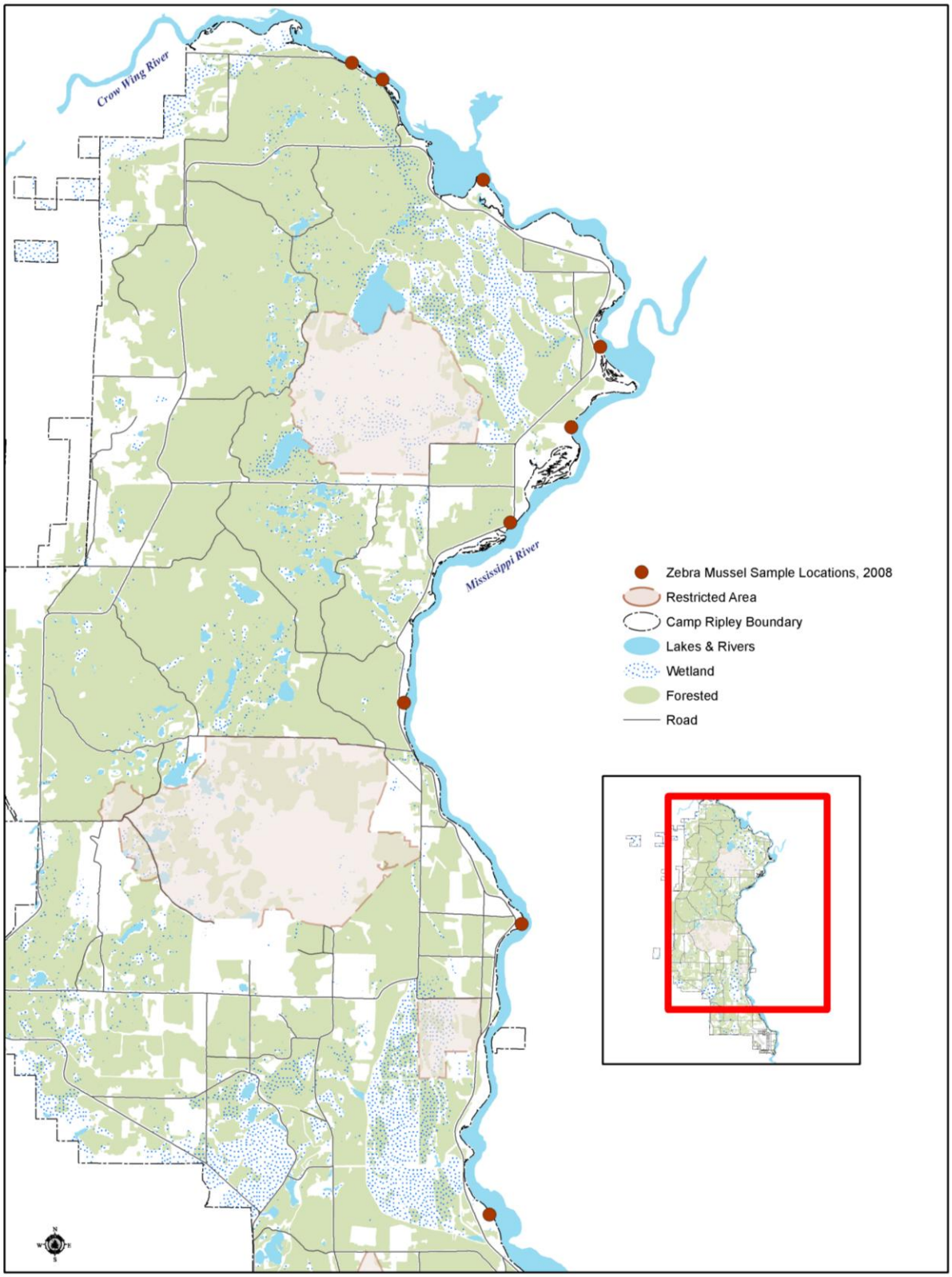
During 2008, AHATS along with the adjacent Rice Creek, was designated an Important Bird Area (IBA) by the Audubon Minnesota, the state office of the National Audubon Society, and the MNDNR Nongame Program. Important Bird Areas are sites that provide essential habitat for breeding, wintering, and/or migrating birds. The Important Bird Area program vision is to identify, conserve, and monitor the most important bird habitats in the state while connecting to other Important Bird Area sites throughout the United States and the world. 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.

Songbirds

As a natural oasis in a mostly metropolitan area, AHATS also provides important breeding and migratory habitat for SGCN birds. Thirty-six SGCN birds have been identified on AHATS; which includes both breeding and transient species (Appendix J). Nineteen SGCN birds including waterbirds, raptors, and songbirds are known to breed on AHATS; eight were recorded during point count surveys this year.

Songbird surveys were conducted on 13 RTLA plots (Figure 51) on July 9, 2008. Surveys have been conducted on these plots since 2001. A total of 109 birds consisting of 27 species were recorded. The average number of birds per plot was 8.38 and the average number of species per plot was 2.1 (Table 13 and Figure 52). More than 25 species in greatest conservation

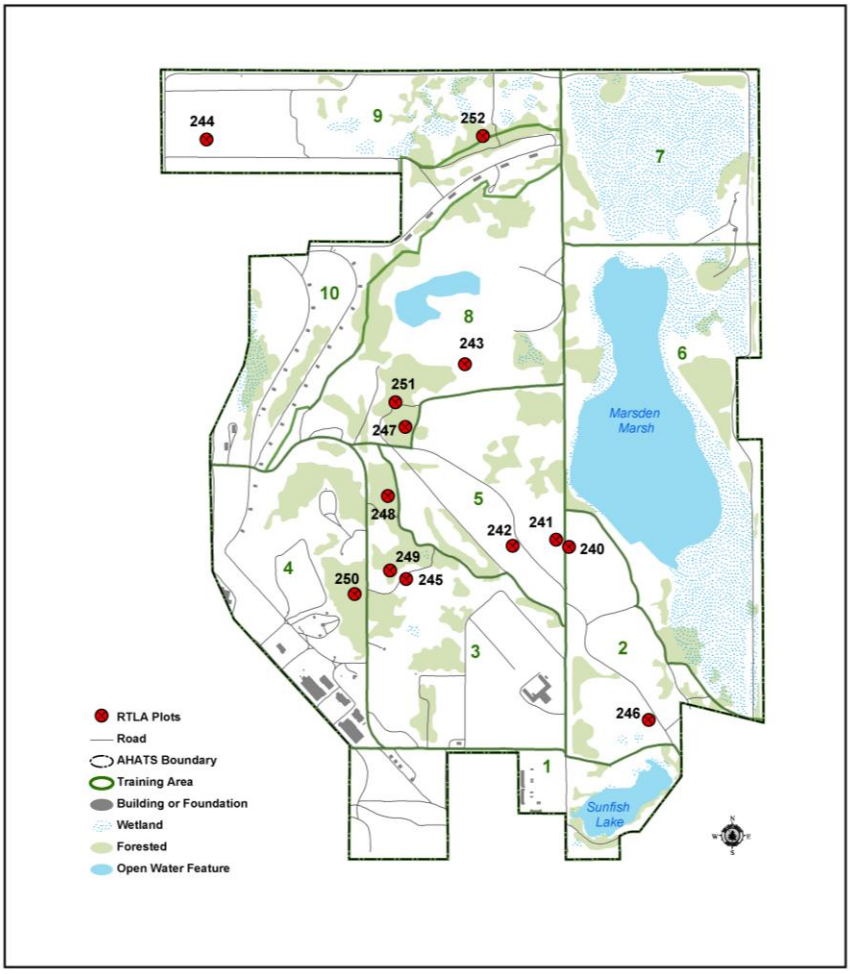
Figure 50. Locations of zebra mussel samplers at Camp Ripley, 2008.



need (SGCN), including 20 bird species, have been identified on AHATS (MNDNR 2006). Trends of three grassland songbirds that are SGCN are presented in Figure 53.

Grassland plots (*n*=7) contained 26 bird species and 45 total birds. The average number of birds found on grassland plots was 6.4 and the average number of species per plot was 3.7 (Table 13 and Figure 52). Five of the past eight years, clay colored sparrows (*Spizella pallida*) were the most abundant species recorded on grassland plots (Table 13). Grassland management at AHATS in recent years has involved prescribed burning and tree 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 51. Songbird survey Range Training Land Assessment (RTLA) plots at Arden Hills Army Training Site.



Woodland plots (*n*=6) contained 25 species and 64 total birds. The average number of birds found on woodland plots was 10.6 and the average number of species per plot was 4.16 (Table 13 and Figure 52). The most abundant birds on woodland plots in 2008 were blue jays (*Cyanocitta cristata*), white-breasted nuthatches (*Sitta carolinensis*), song sparrows (*Melospiza melodia*), and American robins (*Turdus migratorius*) (Table 14). Because of the cold, wet spring in 2008 songbird surveys were delayed until early July. Surveys in 2001 and 2002 were also conducted in early July. These three surveys resulted in the lowest average number of bird species recorded on woodland plots. In the future, AHATS songbird points will be surveyed in late May or June.

Table 13. Summary of songbird surveys at Arden Hills Army Training Site, 2001-2008.

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	3.57
2002	Dirks	7	78	28	11.14	4.00
2003	Dirks	6	84	31	14.00	5.16
2004	Dirks	6	88	36	14.66	6.00
2005	Dirks	6	73	28	12.12	4.66
2006	Dirks	6	74	32	12.13	5.33
2007	Dirks	6	90	34	15.00	5.66
2008	**Dirks**	**6**	**64**	**25**	**10.66**	**4.16**
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	2.57
2002	DeJong	7	62	22	8.86	3.14
2003	DeJong	7	39	17	5.57	2.43
2004	Burggraff	7	41	19	5.86	2.71
2005	DeJong	7	67	23	9.57	3.28
2006	DeJong	7	75	20	10.71	2.86
2007	DeJong	7	66	21	9.43	3.00
2008	**Dirks**	**7**	**45**	**26**	**6.42**	**3.71**

Figure 52. AHATS average number of songbird species per plot, 2001 to 2008.

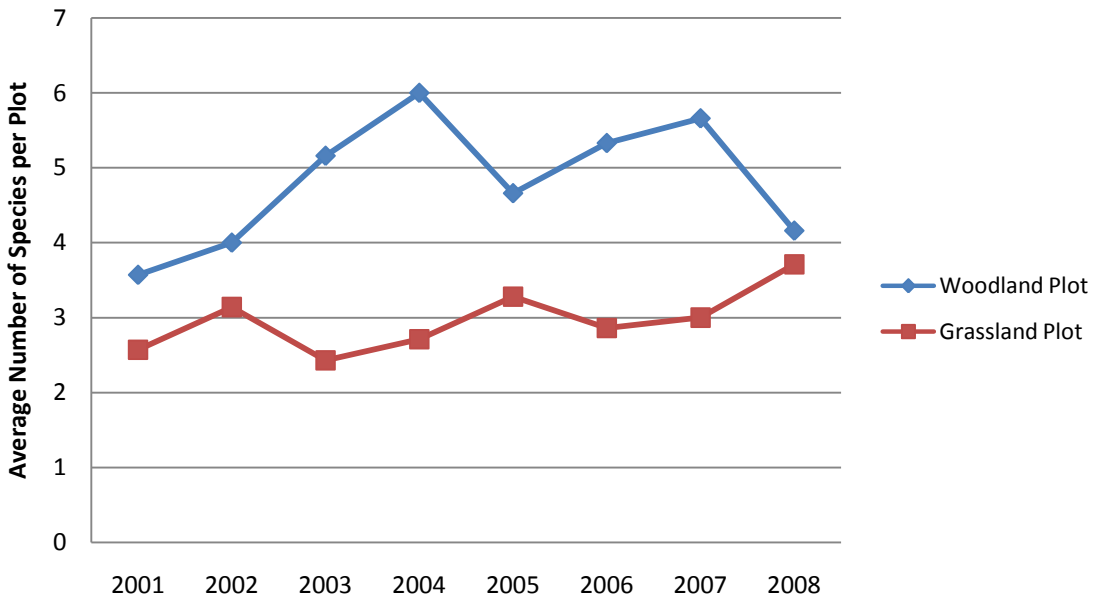


Figure 53. Selected grassland songbirds in greatest conservation need at Arden Hills Army Training Site, 2001 to 2008.

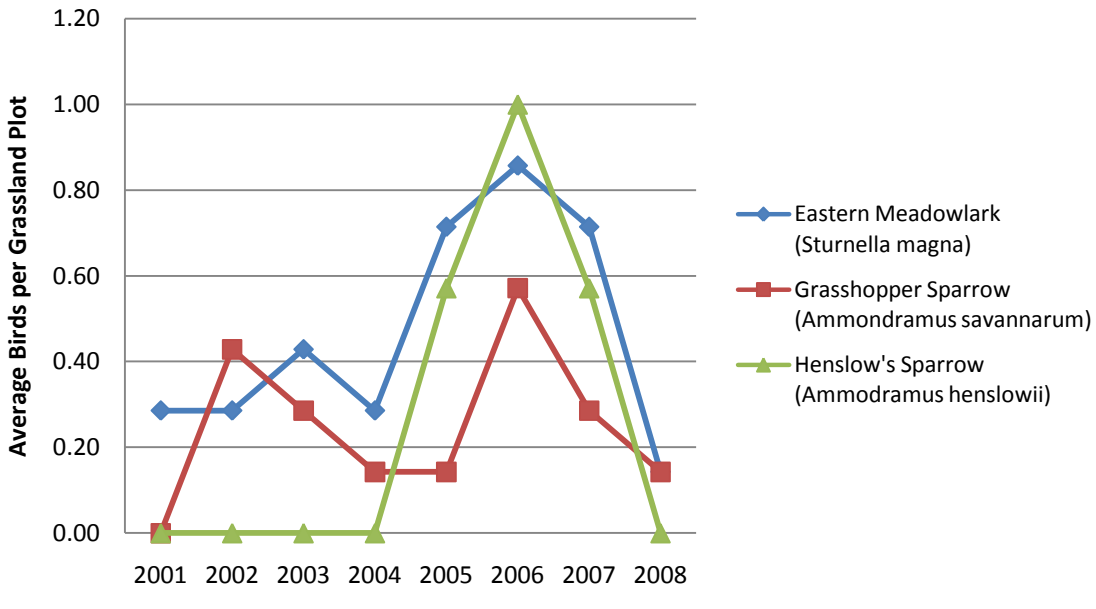


Table 14. Most abundant songbirds observed on plots at Arden Hills Army Training Site, 2001-2008. The number of birds documented is indicated in columns.

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**
Mourning dove	*Zenaida macroura*								**2**
Eastern kingbird	*Tyrannus tyrannus*				6			5	**2**
American crow	*Corvus brachyrhynchos*					10			
Tree Swallow	*Tachycineta bicolor*						5		
Black-capped chickadee	*Poecile atricapillus*				3				
House wren	*Troglodytes aedon*	3							**4**
Sedge wren	*Cistothorus platensis*	5				6			
Eastern bluebird	*Sialia sialis*							5	**4**
Gray catbird	*Dumetella carolinensis*								**2**
Clay-colored sparrow	*Spizella pallida*	6	5	7		5	8	11	**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	
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**
Mourning dove	*Zenaida macroura*						4		
Eastern wood-pewee	*Contopus virens*		6		7	6	6	4	**3**
Great crested flycatcher	*Myiarchus crinitus*							4	**3**
Red-eyed vireo	*Vireo olivaceus*					6			
Blue jay	*Cyanocitta cristata*								**6**
Black-capped chickadee	*Poecile atricapillus*		7	6				7	
White-breasted nuthatch	*Sitta carolinensis*								**5**
House wren	*Troglodytes aedon*	11	7	7	5	8	5	11	
American robin	*Turdus migratorius*	6	6	7	6	5	7		**5**
Gray catbird	*Dumetella carolinensis*								**3**
Eastern towhee	*Pipilo erythrophthalmus*	6							**3**
Song sparrow	*Melospiza melodia*								**5**
Northern cardinal	*Cardinalis cardinalis*						4	4	**3**
Indigo bunting	*Passerina cyanea*								**3**
Red-winged blackbird	*Agelaius phoeniceus*						4	5	**4**
Brown-headed cowbird	*Molothrus ater*								**3**
American goldfinch	*Carduelis tristis*	10		6	9			4	

Henslow's sparrow (*Ammodramus henslowii*)

Henslow's sparrows were observed for three years at AHATS during RTLA surveys. However, no Henslow's sparrows were recorded in 2008. 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 53). 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.

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 grasslands 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. Habitat requirements and management for Henslow's sparrows will be included in the development of future habitat restoration plans.

Trumpeter Swans (*Cygnus buccinator*)

A pair of trumpeter swans with six cygnets was observed on Marsden Lake during June 2008 (Figure 51); however, only five cygnets survived into the fall. Trumpeter swans are listed as a threatened species in Minnesota and have been monitored each year at Marsden Lake for presence and reproduction (Table 15). 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 birds.

Table 15. 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*
Total	**43**

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 2008, 388 bluebird nest boxes fledged 240 bluebirds and an unknown number of tree swallow, house wrens, and chickadees. In addition, nine American kestrel (*Falco sparverius*) nest boxes are located at AHATS, and fledged 20 American kestrels.

AHATS Mammals

White-tailed Deer 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. 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 years' survey was conducted at the AHATS and Twin Cities Army Ammunition Plant properties on February 20, 2008. Eighty-seven deer were counted during the survey (Table 16), which may indicate that increased hunting pressure has started to reduce the deer population.

Table 16. Aerial surveys of White-tailed deer at the Twin Cities Army Ammunition Plant and Arden Hills Army Training Site, 1999-2008.

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

AHATS Insects

Butterfly Survey

The Saint Paul Audubon Society conducted their annual survey for butterflies at AHATS on Sunday, June 29, 2008. The survey day was cool, windy and overcast. Three new species were observed, the white admiral (*Limenitis arthemis arthemis*), red-spotted purple (*Limenitis arthemis astyanax*), and Peck's skipper (*Polites peckius (=coras)*) (Table 17). More European skippers (*Thymelicus lineola*) were observed this year than in the previous four years, but significantly fewer common wood nymphs (*Cercyonis pegala*) were observed than in previous years. Eighteen species were recorded for a total of 66 individuals. The number of species observed is similar to 2006; however, there were considerably fewer individuals. The 2008 count was unusually low, and is likely related to the wet spring weather conditions and the weather conditions on the survey date.

Table 17. Number of butterflies at Arden Hills Army Training Site, St. Paul Audubon Society, 2001-2008.

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
Black swallowtail	*Papilio polyxenes*	1				1	1	**1**	
Eastern tiger swallowtail	*Papilio glaucus*	4				2			**2**
Swallowtail species	*species undetermined*	1		1					
Checkered white	*Pontia protodica*	3							
Cabbage white	*Pieris rapae*		5			1		**1**	**5**
"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**

Table 17. Number of butterflies at Arden Hills Army Training Site, St. Paul Audubon Society, 2001-2008.

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
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					
Striped hairstreak	*Satyrium liparops*	1						**1**	
Hairstreak species	*species undetermined*			2					
Eastern tailed-blue	*Everes comyntas*	5	100's	4		6	32	**34**	
'Summer' spring azure	*Celastrina ladon neglecta*	4	1	3					
Variegated fritillary	*Euptoieta claudia*	1		1					
Great spangled fritillary	*Speyeria cybele*	12	11	40	9	16	5	**13**	**2**
Aphrodite fritillary	*Speyeria aphrodite*	4	4	dozen	19	10	14	**2**	**2**
Regal fritillary	*Speyeria idalia*								
Silver-bordered fritillary	*Boloria selene*								
Fritillary species	*species undetermined*	32	10	14	14+		14	**28**	
Silvery checkerspot	*Chlosyne nycteis*				1				
Pearl crescent	*Phyciodes tharos*	11			1				
Northern crescent	*Phyciodes selenis*			7	2		1		
Northern pearl crescent	*Phyciodes selenis/tharos*					1	1	**7**	**2**
Crescent species	*species undetermined*		2	4					
Baltimore checkerspot	*Euphydryas phaeton*	15		6	13	5	4	**10**	**1**
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**
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**
Red-spotted purple	***(Limenitis a . astyanax)***								**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**
Common ringlet	*Coenonympha tullia*	4							**6**
Common wood nymph	*Cercyonis pegala*	dozen	dozens	100-	100+	36	104	**173**	
Monarch	*Danaus plexippus*	11	10	11	1	17	64	**38**	**4**
Silver-spotted skipper	*Epargyeus clarus*	2	2	1	1	1	2	**2**	
Least skipper	*Ancyloxypha numitor*								
European skipper	*Thymelicus lineola*	6		dozen	2	1		**5**	**23**
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**	

Table 17. Number of butterflies at Arden Hills Army Training Site, St. Paul Audubon Society, 2001-2008.

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
Black dash	*Euphyes conspicua*							**3**	
Dun skipper	*Euphyes vestris*	1		3			8	**4**	
Skipper species					1		4	**2**	**2**

AHATS Other Wildlife Observations

Table 18. Bird species observed at Arden Hills Army Training Site, during St. Paul Audubon Society's annual butterfly survey, June 29, 2008.

Family	Scientific Name	Common Name
Gruidae	*Grus canadensis*	Sand hill crane and 3 chicks
Ardeidae	*Ardea herodias*	Great blue heron
	Casmerodius albus	Great egret
Anatidae	*Cygnus buccinator*	Trumpeter swan and 5 cygnets
Accipitridae	*Pandion haliaetus*	Osprey
	Buteo jamaicensis	Red-tailed hawk
Cathartidae	***Cathartes aura***	Turkey vulture
Columbidae	*Zenaida macroura*	Mourning dove
Picidae	*Picoides pubescens*	Downy woodpecker
	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
Troglodytidae	*Troglodytes aedon*	House wren
Turdidae	*Sialia Sialis*	Eastern bluebird
	Turdus migratorius	American robin
Mimidae	*Dumetella carolinensis*	Gray catbird
	Toxostoma rufum	Brown thrasher
Parulidae	*Dendroica petechia*	Yellow warbler
	Geothlypis trichas	Common yellowthroat
Emberizidae	*Spizella passerina*	Chipping sparrow
	Spizella arborea	American tree sparrow
	Melospiza melodia	Song sparrow
Icteridae	*Agelaius phoeniceus*	Red-winged blackbird
	Icterus galbula	Baltimore oriole
	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 (Table 19). Two test nets were used in each basin.

Table 19. Spring fish presence on selected lakes at Camp Ripley, 2008.

Lake Name	Fish Present
Miller Pond	2 quarts of bullheads, mud minnows (saw about 25 dead muskies floating)
Frog Lake	1 quart of minnows (red dace, mud minnows)
Muskrat Lake	Nothing
Long Lake	Nothing
Coon Stump Lake	Nothing

Two lakes (Cockburn and Rapoon) showed evidence of walleye fingerlings. Those lakes were then harvested (Table 20).

Table 20. Spring walleye harvest at Camp Ripley, 2008.

Lake Name	Harvest Amount	Rate	Stocking Location
Cockburn Lake	206 fingerlings	8/lb (25.75 lbs)	Lake Alott
Rapoon Lake	30 fingerlings	4/lb (7.5 lbs)	Lake Alott
TOTAL		**33.35 lbs**	

Spring walleye stocking occurred on three lakes, they are: Coon Stump (50,000 fry), Long (100,000 fry), and Muskrat (100,000 fry). Spring muskie stocking took place on Frog Lake (5,100 muskie transplants) and Miller Pond (4,034 muskie transplants).

Fall Harvest

Three lakes (Coon Stump, Long and Muskrat) were harvested by MNDNR for walleye fingerlings, and two lakes were harvested for muskie (Frog and Miller) (Table 21).

Table 21. Fall harvest of walleye and muskie, Camp Ripley, 2008.

Lake Name	Harvest Amount	Rate (pounds)	% Return
Coon Stump Lake	544 walleye Fingerlings	34 lbs. @ 16/lb	1%
Long Lake	13,560 walleye fingerlings	113 lbs. @ 120/lb	14% (+391 adult walleye (79 lbs))
Muskrat Lake	396 walleye fingerlings	36 lbs. @ 11/lb	<1%
Frog Lake	76 muskie transplants	9.5 lbs. @ 8/lb	1%
Miller Pond	777 muskie transplants	194.25 lbs. @ 4/lb	19%

Lake management plans were created for 3 lakes on Camp Ripley (Appendix O). They include Ferrell Lake, Fosdick Lake and Lake Alott. These management plans will provide future management recommendations for these lake basins.

Land Use Management

CAMP RIPLEY ARMY COMPATIBLE USE BUFFER (ACUB)

Introduction

Section 2811 of the Fiscal Year Department of Defense Authorization Act, passed 2 December 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 19 May 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 program, known locally as "*Central Minnesota Prairie to Pines Partnership…preserving our heritage"*, is to create and enhance a natural 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 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, 200 willing landowners have enrolled in ACUB. These landowners represent about 27,500 acres of land. Over 91 percent of the interested landowners desire permanent conservation easements rather than acquisition.

- Federal funding in the amount of $10,731,500 has been awarded to the Camp Ripley ACUB since 2004.

- Funding decisions relative to specific parcels is based on ranking criteria that are weighted for military considerations (77%) and ecological considerations (23%).

- The ACUB accomplishments from fiscal year 2004 (start) through 2008 for MNDNR and BWSR are presented below.

Minnesota Department of Natural Resources Past Actions

Upon receiving Army approval of the Camp Ripley ACUB on 3 May 2004, the Minnesota National Guard designated MNDNR to serve as its primary partner. National Guard Bureau (NGB) and the State of Minnesota, acting by and through MNDNR, entered into a cooperative agreement to implement the Camp Ripley ACUB. This agreement (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 16 August 2004, included $500,000 from NGB to execute the first year of the Camp Ripley ACUB. This 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. The 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**

Since the inception of the Camp Ripley ACUB program, MNDNR has completed 10 land transactions totaling 1,334 acres. The completed land transactions have resulted in an expenditure of $1,892,365 in federal funding and have leveraged $3,798,830 in other contributions as match. Although the MNDNR had $1,456,635 in federal funds remaining to be encumbered during fiscal year 2008, unexpected circumstances with land transactions prevented MNDNR from completing any land deals in fiscal year 2008 but considerable progress was made toward closure on six land deals totaling 368 acres. Please see Figure 54 for the location of MNDNR transactions that are pending as near term projects.

Minnesota Department of Natural Resources Fiscal Year 2008 Accomplishments

Due to unexpected circumstances with two land deals that were in process last fiscal year, the MNDNR was not able to secure enrollment and subsequently withdrew both parcels by resolution. The parcels are known as the Monahan tract and the Peterson tract.

Minnesota Department of Natural Resources Near Term Targets

Although the MNDNR was unable to close land deals in fiscal year 2008, the MNDNR has made considerable progress toward closure on 6 land deals totaling 368 acres and therefore is prepared to close on these land deals in fiscal year 2009. Please see Figure 54 for the location of MNDNR transactions are pending as near term projects.

Minnesota Board of Water and Soil Resources Past Actions

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. This agreement (AGREEMENT NO. W9133N-06-2-3056) establishes the terms and conditions applicable to the contribution of Federal funds to assist BWSR's acquisition of long-term interest in or title to parcels of land adjacent to Camp Ripley in accordance with the approved ACUB proposal.

The initial cooperative agreement with BWSR, which became effective on 30 June 2006, included $500,000 from the Department of Defense (DOD). The agreement has subsequently

been modified seven times to accommodate supplemental funds in the amount of $6,882,500 for a total of $7,382,500:

	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	
TOTAL	**$2,340,000**	**+**	**$5,042,500**	**=$7,382,500**

Since BWSR's involvement with the Camp Ripley ACUB program in FISCAL YEAR 2006, BWSR has completed and recorded 12 land transactions totaling 1,951 acres. The completed land transactions have resulted in an expenditure of $1,850,482 in federal funding and have leveraged $1,999,017 in other contributions as match.

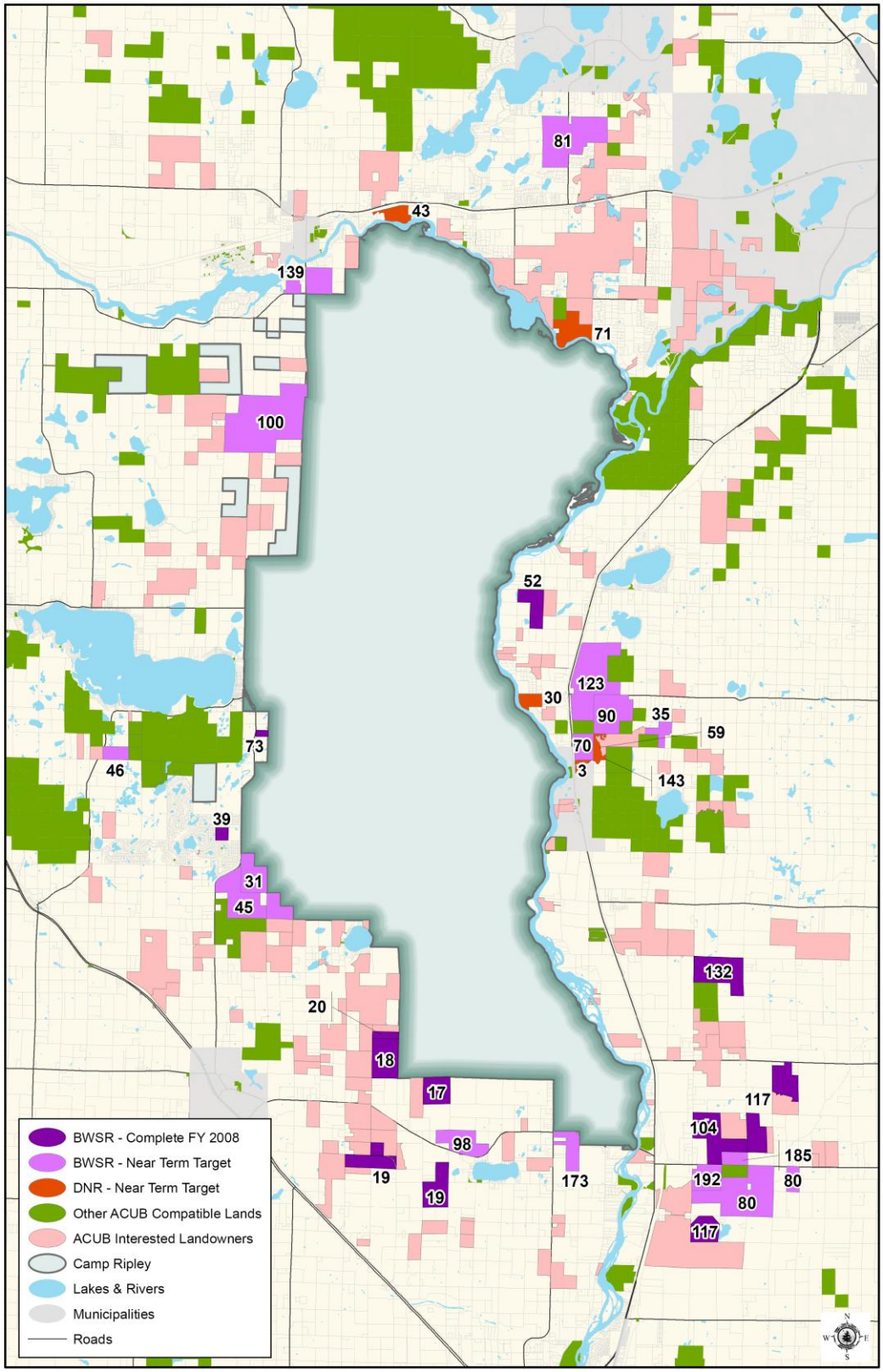
Minnesota Board of Water and Soil Resources Fiscal Year 2008 Accomplishments

BWSR completed and recorded ten land transactions in fiscal year 2008 totaling 1,822.8 acres. In order to be considered complete for the purposes of this annual report, the land transactions must be recorded and documented in the Planning Resource for Infrastructure Development and Evaluation database.

Minnesota Board of Water and Soil Resources Near Term Targets

BWSR has also initiated action on 16 additional land transactions that represent near term targets totaling 4,484 acres. These transactions will be completed and recorded in fiscal year 2009 using fiscal year 2008 funding that has already been awarded. 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. Please see Figure 54 for the location of all BWSR transactions including those that have been completed to date, accomplishments in fiscal year 2008, and the pending near term target land transactions.

Figure 54. Status of Camp Ripley ACUB through fiscal year 2008.



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 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 2008, trail and firebreak conditions were evaluated on the northern portion of Camp Ripley and at AHATS. This assessment generated 93 sites at Camp Ripley and 35 sites at AHATS. These sites will be rehabilitated in 2009 under the LRAM program. Realistic artillery training requires firing points to be at least 15 acres of open area, each having >300m 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. The first phase of maneuver trail creation was conducted on 70 acres in the northwest corner of Camp Ripley. This work consisted of clearing, grubbing, and reseeding the land to accommodate heavy vehicle maneuvers within a tactical concealment area. Camp Ripley's B-5 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 2008, 15 of the farmstead sites were closed. Assessment 8 was conducted for the entire training area at Camp Ripley. Table 22 details the monitoring schedule for these assessments.

Table 22. Assessment Monitoring Schedule, 2008-2014.

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=22)	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 2008, the LRAM program rehabilitated and improved over 76 sites at Camp Ripley and 21 sites at AHATS.

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 2008, the ITAM work plan was updated for 2009-2014.

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.

Geographic Information System (GIS)

Geographic Information System is a computer-based program developed to assist in resolving complex land management problems. Data depicting a variety of environmental attributes can be prepared, displayed, and analyzed to guide land use decisions. The success of the Camp Ripley's ITAM program is greatly dependent on GIS. GIS allows for the development and implementation of computer based technology tools whereby spatial/geographic data about Camp Ripley is stored, manipulated, analyzed, and displayed. MNARNG manages a centralized GIS using Arc-Info and Arc-View software.

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 has been active in such activities as the Morrison County Water Festival, Earth Day, National Public Lands Day, and Habitat Day.

Camp Ripley's environmental team has also been very 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 2008, the environmental team gave presentations or tours to 113 groups totaling 4,112 people and 462 man hours. A majority of these presentations occur in the Environmental Learning Center at Camp Ripley.

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 fisher, osprey, and great blue heron were salvaged for educational purposes in 2008.

HUNTING PROGRAMS

Camp Ripley has had an active hunting program since 1954. The hunting results for the 2008 hunting season are in the table below.

Camp Ripley Disabled American Veteran Firearms Wild Turkey Hunt

Camp Ripley hosted the fourth annual Disabled American Veterans (DAV) turkey hunt on April 22-24, 2008. The hunt was organized and conducted by the Veterans Administration and Minnesota Chapter of the National Wild Turkey Federation with support from Camp Ripley staff and MNDNR. Thirty-six hunters participated in this year's turkey hunt. Twenty-seven hunters were successful, for a 75 percent success rate (Table 23).

Table 23. Disabled American Veterans wild turkey hunts at Camp Ripley, 2005-2008.

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**
Total	**65**		**119**	**109**		
Avg.	**16**	**58%**	**30**	**27**		

Camp Ripley Disabled American Veterans Firearms Deer Hunt

The seventeenth annual Disabled American Veterans firearms deer hunt on Camp Ripley was held October 8-9, 2008. This year 53 hunters participated in the hunt. The weather was warm, with some precipitation. Nine deer were killed (Table 24). The largest deer taken was a 180 pound buck.

Table 24. Disabled American Veterans firearms white-tailed deer hunt at Camp Ripley, 1992-2008.

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**
Total	**178**		**57**	**82**	**39**		**700**		
Avg.	**10**	**26%**	**3**	**5**	**2**		**41**		**151**

Camp Ripley Deployed Soldiers Archery Deer Hunt

The third 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, 123 hunters applied and 56 hunters participated in this year's hunt. Fourteen deer were taken, for a success rate of 25 percent (Table 25).

Table 25. Deployed soldier's archery deer hunt at Camp Ripley, 2006-2008.

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**
Total	30		8	15	7		152		
Avg.	**10**	**19.4%**	**3**	**5**	**2**		**51**		**136**

Camp Ripley Youth Archery Deer Hunt

The seventh annual youth archery hunt was held October 11-12, 2008. 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 124 hunters participating in 2008 (Table 26). Youth hunters harvested 10 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 26. Youth archery white-tailed deer hunt at Camp Ripley, 2002-2008.

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**
Total	**94**		**32**	**43**	**19**	**1002**	**1632**	**871**		
Avg.	**13**	**11.1**								

AHATS Youth Archery Deer Hunt

Fifty-four hunters participated in the two youth archery deer hunts at Arden Hills. The hunts were held October 16 to 17, and October 18 to 19, 2008. Thirty youth hunters were allowed for each 2-day hunt. During the two, 2-day hunts, four deer were harvested (Table 27).

Table 27. Youth archery white-tailed deer hunt at Arden Hills Army Training Site, 2003-2008.

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**

The hunt runs smoothly due to Minnesota Deer Hunters Association and Minnesota State Archery Association volunteers. Volunteers that assisted with the youth hunts were allowed access to hunt deer at AHATS November 28 to 30, 2008. Twenty-two deer were harvested during the volunteer hunt (Table 28).

Table 28. Volunteer archery white-tailed deer hunt at Arden Hills Training Site, 2003-2008.

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**

AHATS Deployed Soldiers Deer Hunt

In 2008, the third annual deployed soldiers archery deer hunt was held on October 8 to 10, October 10 to 12, October 13 to 15, October 27 to 29, and December 5 to 7. 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 124 applicants for either the Camp Ripley or the AHATS deployed soldier hunts were allowed to hunt (Table 29).

Table 29. Deployed soldier's archery white-tailed deer hunt at Arden Hills Army Training Site, 2006-2008.

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**

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, due to military training conflicts the hunts were held on October 19-20 and 26-27. For the fifth year, hunters were permitted to use a bonus tag, allowing them to take a second antlerless deer. In 2008, the number of permitted hunters was 5,005.

A total of 4,167 hunters participated in the 2008 archery hunts (Figure 55 and Table 30). There were 516 deer taken during the two hunts. Hunter success was approximately 12 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 65 percent of the harvested animals were does and fawns.

Figure 55. General public archery white-tailed deer hunts at Camp Ripley, 1981-2008.

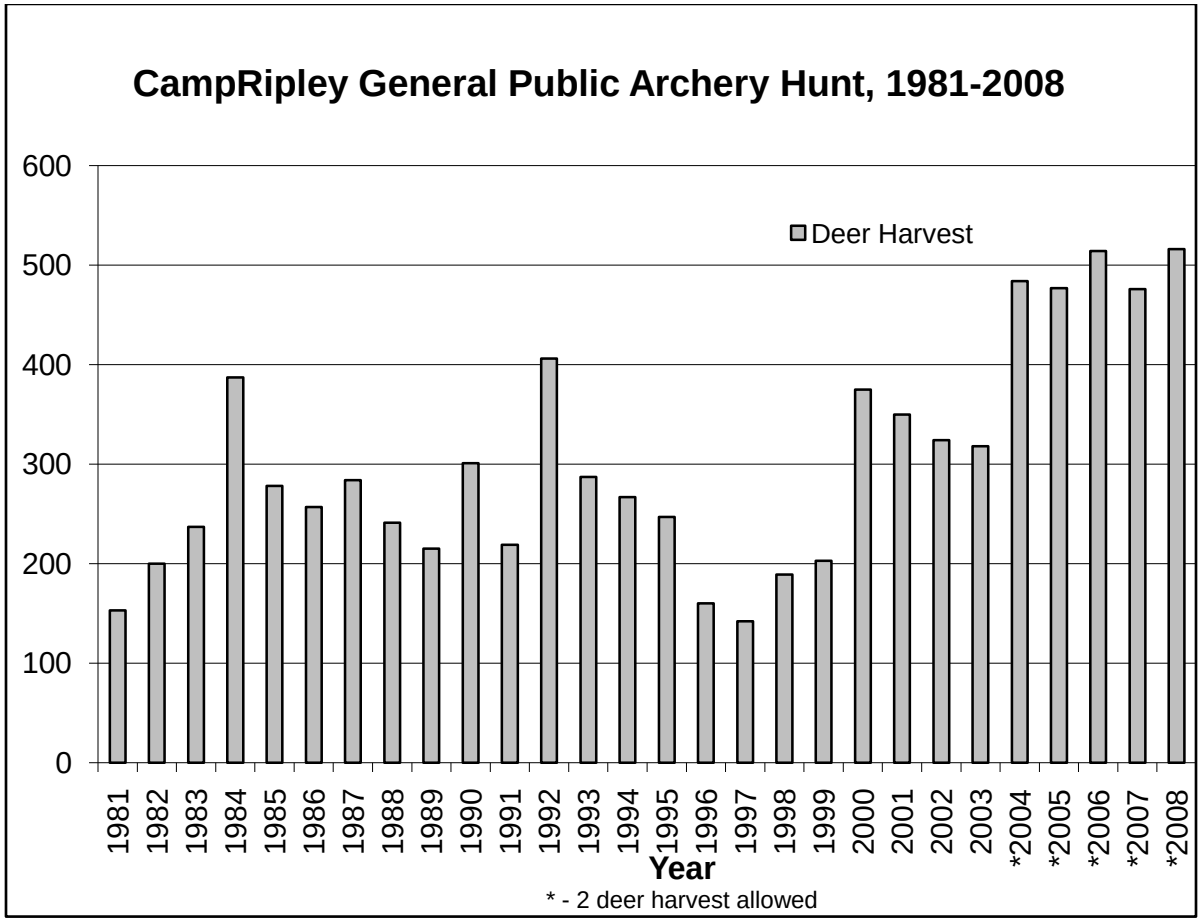


Table 30. General public archery white-tailed deer hunts at Camp Ripley, 1981-2008.

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**

*Years when bonus tag use allowed.

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

FORESTRY

Section	Goal	Created	Objectives	Created	Comments	2009 Update	Created
Forestry	Maintain Forest Vegetation Inventory for land management planning, and for monitoring changes	1/1/2003	Update aerial imagery in 2011.	3/26/2008	DNR Forest assessment flew in fall 2008	Update aerial imagery in 2011.	12/10/2008
			Little Falls DNR Forestry will verify, measure, and evaluate changes to the forest landscape attributed to annual alterations.	3/26/2008		Little Falls DNR Forestry will verify, measure, and evaluate changes to the forest landscape attributed to annual alterations.	12/10/2008
			Re-inventory through field verification additional forest stands so that along with alterations a minimum 4500acres of the forested area is updated annually.	3/26/2008	DNR will help identified what areas to re-inventory.	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
					New Objective	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
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.	3/26/2008		Encourage clear cutting on aspen stands identified through DFC determination to be part of Installation aspen base.	12/10/2008

FORESTRY							
Section	**Goal**	**Created**	**Objectives**	**Created**	**Comments**	**2009 Update**	**Created**
			Continue to develop mission-scape to characterize the landscape as it supports the military mission of Camp Ripley (Reference ITAM Plan).	**3/26/2008**	**Assessed 23 field artillery sites in 2008**	**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**
			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.	**3/26/2008**		**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**
			Create additional maneuver corridors in Maneuver K1 by thinning forest stands along some existing trail-ways providing for wider maneuver corridors without sacrificing concealment opportunity.	**3/26/2008**	**One corridor to be harvested in July 2009. Need land fund project for forest rehabilitation**	**In 2009 mark out and establish timber cut for an additional maneuver corridor in Maneuver K1.**	**12/10/2008**
			Maintain conifer visual buffers to outside highway traffic on west side of the Training Site; and establish 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.	**3/26/2008**	**Project complete on west side of Camp.** **See report**	**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.**	**12/10/2008**
			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.	**3/26/2008**		**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.**	**12/10/2008**

FORESTRY

Section	Goal	Created	Objectives	Created	Comments	2009 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.	3/26/2008	Possible buffer planting on east side of Camp Ripley	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
			Retain the present composition level 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.	3/26/2008		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
			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.	3/26/2008		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
			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.	3/26/2008		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.	12/10/2008
					New Objective	In 2009 collect native seed from Camp Ripley to promote regeneration of proper genotype.	12/22/2008

FORESTRY

Section	Goal	Created	Objectives	Created	Comments	2009 Update	Created
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.	3/26/2008		Maintain committed partnership with The Nature Conservancy, sharing as an adjoining landholder, through common planning efforts and cross-linked goal emphasis.	12/10/2008
			In 2009 develop a checklist that verifies that all land use restrictions and protections are met when implementing forest management practices.	3/26/2008		Continue environmental reviews of all harvest activities (as part of the stand exam process) and implement BMP where needed.	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.	3/26/2008	SCSU initiative underway	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
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 2008 create a Stand Exam Evaluation Process which delineates responsibilities, time frames and expectations for the condition and appearance to follow harvest or treatment.	3/26/2008	A process has been created , change objective	In Jan 2009 submit a 2 year harvest plan for Camp Ripley and implement the Stand Evaluation Process.	12/10/2008

FORESTRY							
Section	**Goal**	**Created**	**Objectives**	**Created**	**Comments**	**2009 Update**	**Created**
			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.	**3/26/2008**		**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.**	**12/10/2008**
			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.	**3/26/2008**		**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.**	**12/10/2008**
			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.	**3/26/2008**		**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.**	**12/10/2008**
			In 2008 conduct annual review of Forest Management Plan accomplishments and future proposals with MNDNR-Forestry Office, CRC-EN, and military training staff.	**3/26/2008**		**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**
					New Objective	**In 2009 establish a deployed soldier fuelwood collection point and maintain supply through DPW.**	**12/22/2008**

FORESTRY

Section	Goal	Created	Objectives	Created	Comments	2009 Update	Created
Forestry	Monitor fire danger levels and control wildfires	1/1/2003	In 2008 develop a wild land fire management plan to evaluate vegetation for specific fuels management and wildland fire suppression needs.	3/26/2008	In development through TNC	In 2009 complete the wild land fire management plan.	12/10/2008

GRASSLANDS

Section	Goal	Created	Objectives	Created	Comments	2009 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 2008and 2009 implement RTLA assessments 2 and 8 to evaluate all grasslands larger than 5 acres.	3/26/2008	Delete objective, addressed in RTLA as an objective		12/11/2008
			In 2009 evaluate and prioritize the grassland compartments for management needs based on previous years assessments.	3/26/2008		In 2009 evaluate and prioritize the grassland compartments for management needs based on previous years assessments.	12/11/2008
			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.	3/26/2008		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

WETLANDS							
Section	**Goal**	**Created**	**Objectives**	**Created**	**Comments**	**2009 Update**	**Created**
Wetlands	**Protect, restore, and manage wetland communities on Camp Ripley for the protection of wetland-dependent species and intrinsic value in accordance with federal, state, and local laws and regulations**	**1/1/2003**	**Obtain all necessary permits required by the "Federal" Clean Water Act (CWA) and "State" Wetland Conservation Act (WCA) before project implementation.**	**3/26/2008**		**Obtain all necessary permits required by the "Federal" Clean Water Act (CWA) and "State" Wetland Conservation Act (WCA) before project implementation.**	**12/11/2008**
			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.	**3/26/2008**		**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.**	**12/11/2008**
						Document wetland banking in annual accomplishment report.	**12/22/2008**
Wetlands	**Explore wild rice enhancement**	**3/26/2008**	**In 2008 identify three areas for wild rice enhancement.**	**3/26/2008**	**Complete, delete objective**		**12/11/2008**

IMPROVED GROUNDS

Section	Goal	Created	Objectives	Created	Comments	2009 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**		**In 2009 develop a landscape management plan to include maps, assessments and guidelines for maintenance, improvements and tree location.**	**12/10/2008**
			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**		**In 2010 conduct an annual inspection on all boulevards, sidewalks, and facilities for dead, dying or high-risk trees and have them removed.**	**12/10/2008**
			Maintain a tree nursery to supply landscaping needs as it relates to the landscape plan.	**3/26/2008**		**Maintain a tree nursery to supply landscaping needs as it relates to the landscape plan.**	**12/10/2008**
			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 2009 complete SCSU Study and implement control measures identified in findings for the protection of the improved grounds in the cantonment area.**	**12/10/2008**
			In 2010 start an annual update of the landscape management plan.	**3/26/2008**		**In 2010 start an annual update of the landscape management plan.**	**12/10/2008**

LAND USE

Section	Goal	Created	Objectives	Created	Comments	2009 Update	Created
Land Use	Identify and develop land use opportunities for the public	1/1/2003	In 2008, conduct two, two-day general public bow hunts for White-tailed deer in cooperation with MNDNR Wildlife.	3/26/2008		In 2009 conduct two, two-day general public bow hunts for White-tailed deer in cooperation with MNDNR Wildlife.	12/9/2008
			In 2008, conduct the two- day youth archery deer hunt in cooperation with MNDNR Wildlife.	3/26/2008		In 2009 conduct the two- day youth archery deer hunt in cooperation with MNDNR Wildlife.	12/9/2008
			In 2008, conduct a two-day, Disabled American Veterans deer hunt.	3/26/2008		In 2009, conduct a two-day Disabled American Veterans deer hunt.	12/9/2008
			To conduct other non-motorized public recreation events such as skiing, nature hikes, touring, dog-trialing or horseback trail riding as opportunities arise.	3/26/2008		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
			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.	3/26/2008		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.	12/9/2008
			Maintain approximately 21.5 miles of cross-country ski trails.	3/26/2008		Maintain approximately 21.5 miles of cross-country ski trails.	12/9/2008
			Conduct a biathlon race biennially.	3/26/2008		Conduct a biathlon race biennially.	12/9/2008
			In 2008, conduct a two-day, Disabled American Veterans turkey hunt.	3/26/2008		In 2009, conduct a two-day, Disabled American Veterans turkey hunt.	12/9/2008

LAND USE

Section	Goal	Created	Objectives	Created	Comments	2009 Update	Created
			In 2008, conduct a two-day deployed soldier deer hunt.	3/26/2008		In 2009, conduct a two-day deployed soldier deer hunt.	12/9/2008
					Sent information forward regarding a deployed soldier turkey hunt for 2009 New Objective	In 2009, conduct a 3-day deployed soldier turkey hunt.	12/9/2008
			In 2008, 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.	3/26/2008		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 2008 and 2009, develop a new boat access in Fosdick Lake to improve fishing access to the lake.	3/26/2008		In 2009, develop a new boat access in Fosdick Lake to improve fishing access.	12/9/2008
Land Use	Minimize land use conflicts on and off the installation	3/26/2008	Annually enroll 5-10 land owners in the ACUB Program.	3/26/2008		Annually enroll 5-10 land owners in the ACUB Program.	12/9/2008
			Continue to partner with MNDNR and MNBWSR to implement ACUB.	3/26/2008		Continue to partner with MNDNR and MNBWSR to implement ACUB.	12/9/2008
			Continue to secure funding to implement ACUB and subsequently enroll land in the program.	3/26/2008		Continue to secure funding to implement ACUB and annually enroll about 1000 acres of land in the program.	12/22/2008

LAND USE							
Section	**Goal**	**Created**	**Objectives**	**Created**	**Comments**	**2009 Update**	**Created**
			In 2009, to work with The Nature Conservancy on a land transfer regarding the Crow Wing River property owned by Minnesota Power.	**3/26/2008**		**In 2009, work with The Nature Conservancy on a land transfer regarding the Crow Wing River property owned by Minnesota Power.**	**12/9/2008**
			Continue to develop partnerships to protect natural resources around Camp Ripley.	**3/26/2008**		**Continue to develop partnerships to protect natural resources around Camp Ripley.**	**12/9/2008**

WILDLIFE-MAMMALS							
Section	**Goal**	**Created**	**Objectives**	**Created**	**Comments**	**2009 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.**	**3/26/2008**	**Surveyed in 2006-2008. Review objective after 2009.**		**12/9/2008**
			In 2009 and after aerial survey results, and harvest data information coordinate with the MNDNR, to review deer data and establish a harvest goal.	**3/26/2008**	**Age and weight data was collected in 2008 on most of the white-tailed deer**	**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**
Wildlife	**Continue to monitor the reproductive success, movements, and mortality of black bears on Camp Ripley**	**3/26/2008**	**In 2008, monitor the ten bears that are currently collared.**	**3/26/2008**		**In 2009, monitor the nine bears that are currently collared.**	**12/9/2008**

WILDLIFE-MAMMALS

Section	Goal	Created	Objectives	Created	Comments	2009 Update	Created
			Continue to monitor nuisance bear activity in accordance with the range regulations.	3/26/2008		In 2009, continue to monitor nuisance bear activity in accordance with the range regulations.	12/9/2008
			In 2008, participate in statewide black bear mark and recapture study using tetracycline baits.	3/26/2008	Completed	Delete objective	12/9/2008
Wildlife	Monitor populations of furbearers for comparison with state and regional data	1/1/2003	In 2008, conduct MNDNR scent-post surveys on Camp Ripley.	3/26/2008	Ongoing annual survey	In 2009, conduct MNDNR scent-post surveys on Camp Ripley.	12/9/2008
			From 2008 to 2010, participate in statewide fisher study.	3/26/2008		From 2008 to 2010, participate in statewide fisher study.	12/9/2008
Wildlife	Manage feral animals at Camp Ripley	1/1/2003	In 20008, update range regulation to address nuisance animal control	3/26/2008	Delete, objective completed		12/9/2008
Wildlife	Manage beaver populations at Camp Ripley	1/1/2003	In 2008, install three Clemson levelers and one deceiver in problem areas to prevent the washout of dikes and roads.	3/26/2008	Two deceivers and two levelers were placed in 2008	In 2009, install two Clemson levelers and one deceiver in problem areas to prevent the washout of dikes and roads.	12/9/2008
			In 2008, continue to remove nuisance beaver as needed.	3/26/2008	36 nuisance beaver removed	In 2009, obtain a permit to remove nuisance beaver as needed.	12/9/2008
			In 2009, develop nuisance beaver management guidelines.	3/26/2008		In 2009, develop nuisance beaver management guidelines.	12/9/2008
Wildlife	Manage porcupine populations at Camp Ripley	3-26-2008	In 2008, obtain a permit to target problems areas for porcupines and harvest nuisance porcupines.	3/26/2008	59 nuisance porcupines removed	In 2009, obtain a permit to target problems areas for porcupines and harvest nuisance porcupines.	12/9/2008

WILDLIFE-BIRDS

Section	Goal	Created	Objectives	Created	Comments	2009 Update	Created
Wildlife	Monitor bird populations on Camp Ripley	1/1/2003	In 2008, conduct point-count surveys on 90 plots.	3/26/2008		In 2009, conduct point-count surveys on 90 plots.	12/9/2008
				1/29/2009		In 2009, conduct pilot year research on bird monitoring stations (MAPS).	
			Continue to annually update species lists of resident birds found on Camp Ripley.	3/26/2008		In 2009, continue to annually update species lists of resident birds found on Camp Ripley.	12/9/2008
			In 2008, monitor turkey and grouse populations on Camp Ripley.	3/26/2008		In 2009, monitor turkey and grouse populations on Camp Ripley via spring drumming/gobbling counts.	12/9/2008
			In 2008, monitor blue heron rookery.	3/26/2008	Site no longer used.	Delete objective	12/9/2008
Wildlife	Continue to make bluebird-nesting boxes available for cavity nesting songbird species at the Camp Ripley Cemetery	1/1/2003	In 2008, determine the appropriate number of bluebird nest boxes to be maintained	3/26/2008	Completed	Install additional nest structures as needed.	12/9/2008
			Annually maintain and repair the 28 bluebird nesting boxes	3/26/2008	28 nest boxes monitored in 2008 Old nest boxes removed, 27 new nest structures installed	In 2009, recruit volunteer/s to monitor and maintain 27 bluebird nest structures (Gilbertson PVC).	12/9/2008
			Continue recruit a volunteer/s for annual maintenance and monitoring of bluebird nest boxes.	3/26/2008	Deanna Gehant, volunteer, monitored boxes.	Objective merged with existing objective. Delete objective	12/9/2008

WILDLIFE-BIRDS

Section	Goal	Created	Objectives	Created	Comments	2009 Update	Created
Wildlife	Monitor raptor populations on Camp Ripley	1/1/2003	In 2008, conduct a survey for owls.	3/26/2008	Reviewed & dismissed in 2008.	In 2009, conduct survey for owls.	12/9/2008
			In 2008, monitor nesting success of ospreys on Camp Ripley.	3/26/2008		In 2009, monitor nesting success of ospreys on Camp Ripley.	12/9/2008
Wildlife	Maintain species diversity, distribution of waterfowl populations within Camp Ripley	1/1/2003	In 2009, conduct maintenance checks and production surveys of all known duck nest boxes. Repair and replace nesting boxes as needed.	3/26/2008	Completed in 2008, 35 new wood duck nest structure established.	In 2009, recruit volunteer/s to monitor productivity and maintain 35 wood duck nest structures. Relocate and add structures, as needed.	12/9/2008
			In 2009, improve duck nesting success by relocating unused nesting boxes.	3/26/2008	Established 35 new wood duck nest structure locations.	Objective merged with existing objective. Delete objective	12/9/2008
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.	3/26/2008		Maintain the ban on the firing of white phosphorus munitions into wetland located in the Leach and Hendrickson impact areas indefinitely.	12/9/2008
			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.	3/26/2008		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
Wildlife	Control nuisance bird problems	1/1/2003	Install bird deterrent devices on buildings at Camp Ripley were needed.	3/26/2008		Install bird deterrent devices on buildings at Camp Ripley as needed.	12/9/2008

REPTILES AND AMPHIBIANS-INVERTEBRATES-FISHERIES							
Section	**Goal**	**Created**	**Objectives**	**Created**	**Comments**	**2009 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.	3/26/2008			12/9/2008
			In 2008, conduct annual anuran call surveys.	3/26/2008		In 2009, conduct annual anuran call surveys.	12/9/2008
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.	3/26/2008		In 2009, determine need for additional invertebrate surveys and establish schedule.	12/9/2008
Fisheries	Protect, establish, manage and enhance the fisheries resources at Camp Ripley	1/1/2003	In 2009, write management plans for each lake.	3/26/2008	Completed in 2008 on Ferrell, Fosdick and Lake Alott	In 2009, implement management recommendations for each lake management plan.	12/9/2008
			Annually, continue population enhancement through fish stocking as deemed by lake management plans.	3/26/2008		Annually, continue population enhancement through fish stocking as deemed by lake management plans.	12/9/2008
			Continue creel census program through range control for all fishable areas on and adjacent to Camp Ripley.	3/26/2008		Continue creel census program through range control for all fishable areas on and adjacent to Camp Ripley.	12/9/2008
			Continue to allow fishing opportunities as training permits.	3/26/2008		Continue to allow fishing opportunities as training permits.	12/9/2008
				3/26/2008	New objective	In 2009, complete a lake survey, by spring trapping of Lake Alott, Ferrell and Fosdick lakes.	12/9/2008
Fisheries	Continue to allow a rearing program by MNDNR fisheries in Camp Ripley		Establish schedules for fish rearing activities on lake and pond use at Camp Ripley.	3/26/2008		In 2009, coordinate fish rearing activities on lake and pond use at Camp Ripley.	12/9/2008

THREATENED AND ENDANGERED SPECIES							
Section	**Goal**	**Created**	**Objectives**	**Created**	**Comments**	**2009 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 2008, continue to monitor resident and transient threatened and endangered species that may be present at Camp Ripley.**	**3/26/2008**		**In 2009continue 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**
			In 2008 monitor gray wolf populations and movements and integrate monitoring with the Minnesota Gray Wolf Management Plan.	**3/26/2008**	**Currently three wolves are collared, As of Dec 11, 2008, gray wolves were reinstated as threatened in MN**	**In 2009, monitor gray wolf populations and movements and integrate monitoring with the Minnesota Gray Wolf Management Plan.**	**12/9/2008**
			In 2008, continue a monitoring program for Blanding's turtles.	**3/26/2008**		**In 2009, continue a monitoring program for Blanding's turtles.**	**12/9/2008**
			In 2008, continue to monitor bald eagle nests and provide protection to nests in accordance with the ARNG Training Site Policy on Bald Eagle Management.	**3/26/2008**		**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**
			Educate users about the presence and importance of protected species.	**3/26/2008**	**Range regulation and bulletin**	**Educate users about the presence and importance of protected species**	**12/9/2008**
			In 2008 and 2009, determine the presence/absence of the Canada lynx.	**3/26/2008**	**In 2007, established six Envirotel's cougar detection systems**	**In 2009, determine the presence/absence of the Canada lynx by using Envirotel's cougar detection system (hair sampling).**	**12/9/2008**
T & E Species	**Protect populations and habitats of special concern and other rare nongame wildlife species and prevent**	**1/1/2003**	**In 2008, update the Protected Species Management Plan for Camp Ripley.**	**3/26/2008**		**In 2009, identify SGCN species and update the Protected Species Management Plan for Camp Ripley and recommend management**	**12/9/2008**

THREATENED AND ENDANGERED SPECIES							
Section	**Goal**	**Created**	**Objectives**	**Created**	**Comments**	**2009 Update**	**Created**
	their decline to threatened or endangered status					**actions.**	
			In 2008, continue to monitor red-shouldered hawks to provide additional data on population, nest locations, and provide management recommendations.	**3/26/2008**	**In 2008, red-shoulder hawk trapping attempted to attach backpack transmitters, none captured.**	**In 2009, continue to monitor red-shouldered hawks to provide additional data on population, nest locations, and provide management recommendations.**	**12/9/2008**
			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.	**3/26/2008**		**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**
			In 2009, identify SGCN species and potential management actions.	**3/26/2008**	**Delete, objective is addressed above**		**12/9/2008**

RTLA							
Section	**Goal**	**Created**	**Objectives**	**Created**	**Comments**	**2009 Update**	**Created**
RTLA-Floral	**Provide military trainers and land managers with the necessary technical and analytical information to integrate doctrinally based training**	**3/26/2008**	**In 2008 implement RTLA Assessments #1, 2, and 5.**	**3/26/2008**	**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 2009 RTLA Assessment #1 will be conducted on the southern half of the training area. RTLA Assessment #2 will be conducted on 23 artillery firing points and RTLA Assessment #6 will be completed on the remaining 3 Land Navigation Courses.**	**12/11/2008**
			In 2009, implement RTLA assessments # 1, 2, 3, 4, 6.	**3/26/2008**		**In 2009, implement RTLA assessments # 1, 2, 3, 4, 6**	**12/11/2008**
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**	**3/26/2008**		**In 2011, continue a monitoring program for small mammals on core plots during the summer**	**12/11/2008**
RTLA	**Provide information to land managers about the status of natural and cultural resources on Camp Ripley**	**1/1/2003**	**In 2008, analyze RTLA assessments data to determine land capability and condition, to include recommendations for management**	**3/26/2008**	**Analyzed and recommended 23 FA points and 93 LRAM sites. Included Rx for managing each site.**	**In 2009, analyze RTLA assessments data to determine land capability and condition, to include recommendations for management**	**12/11/2008**
			In 2009, create an ITAM annual report which documents the accomplishments for that preceding year.	**3/26/2008**		**In 2009, create an ITAM annual report which documents the accomplishments for that preceding year.**	**12/11/2008**

RTLA							
Section	**Goal**	**Created**	**Objectives**	**Created**	**Comments**	**2009 Update**	**Created**
			In 2008, provide information to the Camp Ripley SDP, INRMP, IPMP, ICRMP, and Range Regulations.	**3/26/2008**		**In 2009, provide information to the Camp Ripley SDP, INRMP, IPMP, ICRMP, RCMP and Range Regulations.**	**12/11/2008**

GIS							
Section	**Goal**	**Created**	**Objectives**	**Created**	**Comments**	**2009 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.**	**3/26/2008**	**Completed for 2008**	**Complete metadata for all new and updated layers prior to loading into GDB.**	**11/26/2008**
			Maintain compliance with SDSFIE.	**3/26/2008**	**Completed for 2008**	**Maintain compliance with SDSFIE.**	**11/26/2008**
			Provide appropriate data and documentation in the required format for all Army and NGB data requests.	**3/26/2008**	**Completed for 2008**	**Provide appropriate data and documentation in the required format for all Army and NGB data requests.**	**11/26/2008**
GIS	**Maintain the MNARNG geographic database with sufficient completeness, consistency and accuracy for reliable query, analysis and application development**	**1/1/2003**	**Identify data requirements and procedures in support of environmental/INRMP initiatives. Capture status and update frequency for each required layer. Record in CRC-SE GIS Plan.**	**3/26/2008**	**Began process did not complete**	**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**
			House a current copy of the Camp Ripley forest inventory in the GDB. The source of this layer should be the DNR FIM.	**3/26/2008**	**Completed for 2008**	**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**

GIS							
Section	**Goal**	**Created**	**Objectives**	**Created**	**Comments**	**2009 Update**	**Created**
			Maintain ACUB data layers.	**3/26/2008**	**Completed for 2008**	**Maintain ACUB data layers.**	**11/26/2008**
			House current copies of the Camp Ripley and AHATS aerial photos in the GDB.	**3/26/2008**	**Completed for 2008**	**House current copies of the Camp Ripley and AHATS aerial photos in the GDB.**	**11/26/2008**
			Ensure copies of digital statewide aerial photos are available to env staff.	**3/26/2008**	**Using LMIC WMS. Complete for 2008**	**Ensure copies of digital statewide aerial photos are available to env staff.**	**11/26/2008**
GIS	**Maintain hardware and software systems appropriate for the info management needs of Camp Ripley**	**1/1/2003**	**Develop CRC-SE GIS Plan. Include data, software, and hardware requirements.**	**3/26/2008**	**Did not complete reference new goal**	**In 2009, develop GIS management plan to include data, software, hardware, application and staffing requirements.**	**11/26/2008**
			Replace GIS computers on a 5-year schedule.	**3/26/2008**	**Completed for 2008**	**Replace GIS computers on a 5-year schedule.**	**11/26/2008**
			Identify hardware needs for sustainment of data requirements. Record in CRC-SE GIS Plan	**3/26/2008**	**Hardware requirements are known, however cannot be recorded in GIS Plan**	**Identify hardware needs for sustainment of data requirements. Record in CRC-SE GIS Plan**	**11/26/2008**
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.**	**3/26/2008**	**Need to identify application requirements first. Did not complete**	**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**
			Develop and implement process for storage and output of common digital maps	**3/26/2008**	**Did not complete**	**Develop and implement process for storage and output of common digital maps**	**11/26/2008**

GIS							
Section	**Goal**	**Created**	**Objectives**	**Created**	**Comments**	**2009 Update**	**Created**
GIS	**Ensure geospatial data and applications support MNARNG enterprise GIS initiatives.**	**3/26/2008**	**Participate in the GIS Working Group.**	**3/26/2008**	**Completed for 2008**	**Conduct quarterly MNARNG GIS Working Group meetings and participate in the NGB GIS subcommittee**	**11/26/2008**
			Coordinate development and acquisition of geospatial data and applications with other users through the MNARNG GIS Working Group.	**3/26/2008**	**Completed for 2008**	**Coordinate development and acquisition of geospatial data and applications with other users through the MNARNG GIS Working Group.**	**11/26/2008**
			Make appropriate geospatial data available in a centralized location to reduce redundancy.	**3/26/2008**	**Completed for 2008**	**Make appropriate geospatial data available in a centralized location to reduce redundancy.**	**11/26/2008**
			Store data in an organized structure allowing end users to more easily locate appropriate data layers.	**3/26/2008**	**Completed for 2008**	**Store data in an organized structure allowing end users to more easily locate appropriate data layers.**	**11/26/2008**

TRI-LRAM							
Section	**Goal**	**Created**	**Objectives**	**Created**	**Comments**	**2009 Update**	**Created**
TRI					**New Goal**	**In 2009, complete a ITAM 5 year plan**	**12/22/2008**
					New Objective	**Reference Army/NGB guidance in preparing ITAM plan**	**12/22/2008**

TRI-LRAM							
Section	**Goal**	**Created**	**Objectives**	**Created**	**Comments**	**2009 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 2008, 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.**	**3/26/2008**		**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**
			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.	**3/26/2008**		**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.**	**12/11/2008**
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.**	**3/26/2008**		**Advise on the allocation of land to support current and projected training mission requirements.**	**12/11/2008**
			The TAC position will coordinate usage with external organizations, supporting agencies, tenant activities, and higher headquarters.	**3/26/2008**		**The TAC position will coordinate usage with external organizations, supporting agencies, tenant activities, and higher headquarters.**	**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.	**3/26/2008**		**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.**	**12/11/2008**

TRI-LRAM							
Section	**Goal**	**Created**	**Objectives**	**Created**	**Comments**	**2009 Update**	**Created**
LRAM	**Sustain the soil resources to ensure long-term military use**	**1/1/2003**	**Continue the site assessment to identify areas for redesign, rehabilitation, and/or repair by implementing RTLA assessment # 1.**	**3/26/2008**	**Completed north half of Camp Ripley. Identified 94 sites Delete objective already addressed in RTLA**		**12/11/2008**
					New Objective	**Implement management recommendations for the 23 sites identified in RTLA Assessment #2.**	**12/11/2008**
					New Objective	**Implement management recommendations for the 94 sites identified in RTLA Assessment #1.**	**12/11/2008**

SRA							
Section	**Goal**	**Created**	**Objectives**	**Created**	**Comments**	**2009 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.**	**3/26/2008**		**Continue to educate land users of their environmental stewardship responsibilities.**	**12/11/2008**
			In 2009, re-assess educational materials such as the soldier field cards, leader handbooks, video and posters/photos.	**3/26/2008**		**In 2009, re-assess educational materials such as the soldier field cards, leader handbooks, video and posters/photos.**	**12/11/2008**

SRA							
Section	**Goal**	**Created**	**Objectives**	**Created**	**Comments**	**2009 Update**	**Created**
			Conduct Environmental Briefings (Pre-camp conferences, trainer workshops, Training Area Coordination Briefings, schools, and civilian organizations).	**3/26/2008**		**Conduct Environmental Briefings (Pre-camp conferences, trainer workshops, Training Area Coordination Briefings, schools, and civilian organizations).**	**12/11/2008**
			Promote compliance with Camp Ripley environmental regulations.	**3/26/2008**		**Promote compliance with Camp Ripley environmental regulations.**	**12/11/2008**
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.**	**3/26/2008**		**Improve public relations through SRA by communicating our success at sustaining mission activities.**	**12/11/2008**
			Convey installation mission and training objectives to environmental professionals and the public.	**3/26/2008**		**Convey installation mission and training objectives to environmental professionals and the public.**	**12/11/2008**
			Continue to implement a public education program.	**3/26/2008**		**Continue to implement a public education program.**	**12/11/2008**
			Continue participation in national events such as NPLD, Arbor Day and Earth Day.	**3/26/2008**		**Continue participation in national events such as NPLD, Arbor Day and Earth Day.**	**12/11/2008**
			In 2008, apply for conservation award.	**3/26/2008**	**Complete, delete objective**		**12/11/2008**

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

ADMINISTRATION							
Section	**Goal**	**Created**	**Objectives**	**Created**	**Comments**	**2009 Update**	**Date**
INRMP	**Ensure adequate funding and resources to implement AHATS's INRMP**	**8/1/2007**	**Maintain two DMA staff to implement the Conservation and ITAM Programs at AHATS**	**4/9/2008**		**Continue to implement the Conservation and ITAM Programs at AHATS**	**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	**4/9/2008**		**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**	**12/12/2008**
			Maintain administration of the INRMP development, implementation, and updating through the Camp Ripley Environmental Office.	**4/9/2008**		**Maintain administration of the INRMP development, implementation, and updating through the Camp Ripley Environmental Office.**	**12/12/2008**
			Create an annual Conservation-INRMP update report. Update , review and obtain signatures at annual meeting with MNDNR and USFWS	**4/9/2008**		**Create an annual Conservation-INRMP update report. Update review and obtain signatures at annual meeting with MNDNR and USFWS**	**12/12/2008**
					New Objective	**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**
					New Objective	**Secure funding through the TCAAP Natural Resources Damage Assessment to supplement implementation of AHATS INRMP**	**12/12/2008**

ADMINISTRATION							
Section	**Goal**	**Created**	**Objectives**	**Created**	**Comments**	**2009 Update**	**Date**
					New Objective	**Develop and maintain a work plan of ITAM projects in the WAM that support the INRMP implementation**	**12/12/2008**
					New Objective	**Develop and maintain a work plan of environmental projects in the STEP that support the INRMP implementation**	**12/12/2008**
					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**	**12/12/2008**

RTLA-GIS							
Section	**Goal**	**Created**	**Objectives**	**Created**	**Comments**	**2009 Update**	**Date**
RTLA	**Monitor floral resources on AHATS**	**8/1/2007**	**In 2009, re-assess monitoring protocol for vegetation.**	**4/9/2008**		**In 2009, re-assess monitoring protocol for vegetation.**	**12/12/2008**
RTLA	**Monitor faunal (Birds, Mammals, and Reptiles and Amphibians) resources on AHATS**	**8/1/2007**	**In 2009, re-assess monitoring protocol for mammals.**	**4/9/2008**		**In 2009, re-assess monitoring protocol for mammals.**	**12/12/2008**
			In 2008, continue an annual monitoring program for birds on core plots.	**4/9/2008**		**In 2009, continue an annual monitoring program for birds on RTLA plots.**	**12/12/2008**

RTLA-GIS							
Section	**Goal**	**Created**	**Objectives**	**Created**	**Comments**	**2009 Update**	**Date**
			In 2009, re-assess monitoring protocol for reptiles and amphibians.	**4/9/2008**		**In 2009 re-assess monitoring protocol for reptiles and amphibians.**	**12/12/2008**
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.**	**4/9/2008**		**In 2009, reassess RTLA monitoring protocol.**	**12/12/2008**
					New Objective	**In 2009 continue to implement RTLA assessment # 1**	**12/12/2008**
			In 2009, create an ITAM annual report which documents the accomplishments for that preceding year.	**4/9/2008**		**In 2009, create an ITAM annual report which documents the accomplishments for that preceding year.**	**12/12/2008**
			In 2008, provide information to the AHATS SDP, INRMP, IPMP, ICRMP, and Range Regulations.	**4/9/2008**		**In 2009, provide information to the AHATS SDP, INRMP, IPMP, ICRMP, and Range Regulations.**	**12/12/2008**
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.**	**4/9/2008**		**In 2009, conduct a GIS needs assessment to determine application, data, and equipment requirements to support environmental management at AHATS.**	**12/12/2008**
			In 2010, develop and provide access to applications, data and equipment identified in needs assessment.	**4/9/2008**		**In 2010, develop and provide access to applications, data and equipment identified in needs assessment.**	**12/12/2008**
			Include GIS requirements for AHATS into a CRC-SE GIS Plan.	**4/9/2008**		**In 2009, include GIS requirements for AHATS into a GIS Plan.**	**12/12/2008**

TRI-LRAM							
Section	**Goal**	**Created**	**Objectives**	**Created**	**Comments**	**2009 Update**	**Date**
TRI	**Provide military trainers and land managers with the necessary technical and analytical information for them to meet their requirements**	**8/1/2007**	**In 2008, 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.**	**4/9/2008**		**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**
			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.	**4/9/2008**		**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.**	**12/12/2008**
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.**	**4/9/2008**		**Advise on the allocation of land to support current and projected training mission requirements.**	**12/12/2008**
			The TAC position will coordinate usage with external organizations, supporting agencies, tenant activities, and higher headquarters.	**4/9/2008**		**The TAC position will coordinate usage with external organizations, supporting agencies, tenant activities, and higher headquarters.**	**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.	**4/9/2008**		**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.**	**12/12/2008**

TRI-LRAM							
Section	**Goal**	**Created**	**Objectives**	**Created**	**Comments**	**2009 Update**	**Date**
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.**	**4/9/2008**		**Maintain Training Area Coordinator to provide full time support for TRI needs at AHATS.**	**12/12/2008**
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.**	**4/9/2008**	**RTLA assessment # 1 was completed, 34 sites were identified Move objective to RTLA**		**12/12/2008**
					New Objective	**Implement management recommendations for 34 sites identified in RTLA Assessment #1.**	**12/12/2008**

SRA							
Section	**Goal**	**Created**	**Objectives**	**Created**	**Comments**	**2009 Update**	**Date**
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.**	**4/9/2008**		**Continue to educate land users of their environmental stewardship responsibilities.**	**12/12/2008**

SRA							
Section	**Goal**	**Created**	**Objectives**	**Created**	**Comments**	**2009 Update**	**Date**
			Conduct Environmental Briefings (Pre-camp conferences, trainer workshops, Training Area Coordination Briefings, schools, and civilian organizations).	**4/9/2008**		**Conduct Environmental Briefings (Pre-camp conferences, trainer workshops, Training Area Coordination Briefings, schools, and civilian organizations).**	**12/12/2008**
			Promote compliance with AHATS environmental regulations.	**4/9/2008**		**Promote compliance with AHATS environmental regulations.**	**12/12/2008**
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.**	**4/9/2008**		**Improve public relations through SRA by communicating our success at sustaining mission activities.**	**12/12/2008**
			Convey installation mission and training objectives to environmental professionals and the public.	**4/9/2008**		**Convey installation mission and training objectives to environmental professionals and the public.**	**12/12/2008**
			Continue to implement a public education program.	**4/9/2008**		**Continue to implement a public education program.**	**12/12/2008**

VEGETATION MANAGEMENT

Section	Goal	Created	Objectives	Created	Comments	2009 Update	Date
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.**	**4/9/2008**		**Obtain all necessary permits required by the "Federal" Clean Water Act (CWA) and "State" Wetland Conservation Act (WCA) before project implementation.**	**12/12/2008**
			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.	**4/9/2008**		**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**
					New Objective	**Document wetland banking in annual accomplishment report**	**12/22/2008**
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.**	**4/9/2008**		**In 2009, start a process to implement NRDA projects if funding is received.**	**12/12/2008**
			In 2009, evaluate and prioritize the grassland compartments for management needs based on previous years assessments.	**4/9/2008**		**In 2009, evaluate and prioritize the grassland compartments for management needs based on previous assessments.**	**12/12/2008**

VEGETATION MANAGEMENT

Section	Goal	Created	Objectives	Created	Comments	2009 Update	Date
			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.	4/9/2008		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
			Ensure adequate fire breaks and other safety procedures are in place.	4/9/2008		Ensure adequate fire breaks and other safety procedures are in place.	12/12/2008
			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.	4/9/2008		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

PLANTED OR CULTIVATED VEGETATION NEAR BUILDINGS and BORDERS

Section	Goal	Created	Objectives	Created	Comments	2009 Update	Date
Cantonment	Protect and develop landscaped grounds for functional and aesthetic qualities in the urban area of AHATS	8/1/2007	In 2008, maintain a tree nursery to supply future landscaping needs.	4/9/2008		In 2009, maintain a tree nursery to supply future landscaping needs .	12/12/2008

PLANTED OR CULTIVATED VEGETATION NEAR BUILDINGS and BORDERS							
Section	**Goal**	**Created**	**Objectives**	**Created**	**Comments**	**2009 Update**	**Date**
			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.	**4/9/2008**		**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**

FISH AND WILDLIFE MANAGEMENT (Mammals)							
Section	**Goal**	**Created**	**Objectives**	**Created**	**Comments**	**2009 Update**	**Date**
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.**	**4/9/2008**		**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**
			In 2008 conduct the, two-two day, Youth archery deer hunts.	**4/9/2008**	**Completed 10/16-19/08** **4 deer harvested**	**In 2009 conduct, two-two day, Youth archery deer hunts.**	**12/12/2008**
			In 2008, conduct five (2-3 day), Deployed soldier archery deer hunts.	**4/9/2008**	**Completed 21deer harvested**	**In 2009, conduct five (2-3 day), Deployed soldier archery deer hunts.**	**12/12/2008**

FISH AND WILDLIFE MANAGEMENT (Mammals)							
Section	**Goal**	**Created**	**Objectives**	**Created**	**Comments**	**2009 Update**	**Date**
					New Objective Looking at implementing a Turkey hunt	**In 2009 conduct two, 3-day archery turkey hunts.**	**12/12/2008**
			In 2008, conduct one, three-day "Volunteer" archery deer hunt.	**4/9/2008**	**Completed** **11/ 28-30/08** **22 deer harvested**	**In 2009, conduct one three-day, "Volunteer" archery deer hunt.**	**12/12/2008**
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.**	**4/9/2008**		**In 2009 conduct scent post surveys to track population levels as needed.**	**12/12/2008**
			Annually record observations of nuisance and feral animal species.	**4/9/2008**		**Annually record observations of nuisance and feral animal species.**	**12/12/2008**
			Eliminate entry points for feral animals	**4/9/2008**		**Eliminate entry points for feral animals**	**12/12/2008**
			Remove nuisance and feral animals as needed	**4/9/2008**		**Remove nuisance and feral animals as needed**	**12/12/2008**

FISH AND WILDLIFE MANAGEMENT (Birds-Herps-Inverts-Threatened & Endangered Species)							
Section	**Goal**	**Created**	**Objectives**	**Created**	**Comments**	**2009 Update**	**Date**
Birds (Nesting Structures)	**Continue to make nesting structures available**	**8/1/2007**	**In 2009, map and determine the number of existing nesting structures.**	**4/9/2008**		**In 2009 map and determine the number of existing nesting structures.**	**12/12/2008**
			In 2010, repair, replace, or add nesting structures as necessary.	**4/9/2008**		**In 2010, repair, replace, or add nesting structures as necessary.**	**12/12/2008**
			In 2009, enlist the help of volunteers for annual maintenance and monitoring of nesting structures.	**4/9/2008**		**In 2009, enlist the help of volunteers for annual maintenance and monitoring of nesting structures.**	**12/12/2008**
Songbirds	**Monitor songbird populations on AHATS**	**8/1/2007**	**Conduct annual surveys for songbirds on RTLA plots.**	**4/9/2008**		**Conduct annual surveys for songbirds on RTLA plots.**	**12/12/2008**
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.**	**4/9/2008**		**Continue to support an annual anuran survey through the MNDNR.**	**12/12/2008**
			In 2009, investigate new methods for monitoring reptiles and amphibians at AHATS.	**4/9/2008**		**In 2009, investigate new methods for monitoring reptiles and amphibians at AHATS.**	**12/12/2008**
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.**	**4/9/2008**		**Continue to support the Audubon Society's July butterfly survey.**	**12/12/2008**
			In 2009, investigate whether any invertebrate studies or inventories are needed.	**4/9/2008**		**In 2009, investigate whether any invertebrate studies or inventories are needed.**	**12/12/2008**

FISH AND WILDLIFE MANAGEMENT (Birds-Herps-Inverts-Threatened & Endangered Species)							
Section	**Goal**	**Created**	**Objectives**	**Created**	**Comments**	**2009 Update**	**Date**
T & E Species	**Manage and protect species that are listed as threatened or endangered by the federal government or the State of MN**	**8/1/2007**	**In 2009, survey habitats inhabited by the plains pocket mouse and make management recommendations.**	**4/9/2008**		**In 2009, survey habitats inhabited by the plains pocket mouse and make management recommendations.**	**12/12/2008**
			In 2009, monitor the presence and reproductive success of trumpeter swans.	**4/9/2008**		**In 2009, monitor the presence and reproductive success of trumpeter swans.**	**12/12/2008**
			Continue a monitoring program specifically for Blanding's Turtles	**4/9/2008**		**Continue a monitoring program specifically for Blanding's Turtles**	**12/12/2008**
			Annually monitor for the presence of bald eagles	**4/9/2008**		**Annually monitor for the presence of bald eagles**	**12/12/2008**
			In 2010, monitor for the presence of the Henslow's sparrow.	**4/9/2008**		**In 2010, monitor for the presence of the Henslow's sparrow.**	**12/12/2008**

LAND USE							
Section	**Goal**	**Created**	**Objectives**	**Created**	**Comments**	**2009 Update**	**Date**
Land Use	**Identify and develop appropriate land use opportunities**	**8/1/2007**	**Continue to allow public access to AHATS for recreation and educational activities**	**4/9/2008**		**Continue to allow public access to AHATS for recreation and educational activities**	**12/12/2008**
		8/1/2007	**Continue to foster relationships with local interest groups that want to help maintain and develop AHATS natural resources.**	**4/9/2008**		**Continue to foster relationships with local interest groups that want to help maintain and develop AHATS natural resources.**	**12/12/2008**

Appendix C: Camp Ripley Interagency Agreement between Minnesota Department of Military Affairs and Minnesota Department of Natural Resources, 2008.

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 of 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: 8 Jan 2009

Department of Military Affairs

BY: _____
LARRY W. SHELLITO
The Adjutant General

Dated: 1-5-2009

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, 2008.

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 of 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: 8 Jan 2009

Department of Military Affairs

BY: _____
LARRY W. SHELLITO
The Adjutant General

Dated: 1-5-2009

Department of Natural Resources

BY: _____
MARK HOLSTEN
Commissioner of Natural Resources

Appendix E: Camp Ripley annual meeting minutes, 2008.

MEMORANDUM FOR RECORD 21 February 2008

SUBJECT: Minutes of the DMA, DNR and USFWS Annual Meeting, 20 February 2008

1. Introduction. MAJ Guy Konietzko at 0905 20 February 2008, called the annual meeting of the DMA-DNR Natural Resource committee to order. The meeting was held at room 1063 at Camp Ripley MN. Members present:

Department of Military Affairs:
MAJ Guy Konietzko, Deputy Post Commander
MAJ Keith Ferdon, Training Area Coordinator
Mr. Marty Skoglund, Environmental Supervisor
Mr. Bill Brown, Natural/Cultural Specialist
Mr. Jay Brezinka, Natural Resource Specialist

Department of Natural Resources:
Mr. Joe Kurcinka, Regional Director (St. Paul)
Mr. John Korzeniowski, Area Forestry Manager (Little Falls)
Ms. Linda Gormanson, Program Forester (Little Falls)
Mr. Beau Liddell, Wildlife Manager (Little Falls)
Mr. Brady Becker, Fisheries Asst. 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. Bob Leibfried, Regional Manager, Ecological Services (Grand Rapids)
Mr. Paul Roth, Manager Crow-Wing Park
Mr. Mark Hauck, Community Assistance Specialist (St. Cloud)

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

Saint Cloud State University:
Ms. Lee Anderson, GIS Specialist
Dr. Jorge Arriagada, Professor, Invasive Species Project
Mr. Joe Carlyon, Graduate Student, Invasive Species Project

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

2. Opening Remarks. MAJ Guy Konietzko welcomed everyone to Camp Ripley and provided a brief history of his involvement with the natural resource programs on Camp Ripley. MAJ Guy Konietzko thanked all of those present for their commitment and hard work in helping implement the natural resource programs at Camp Ripley and their commitment as a partner in the ACUB initiative. The objectives of the meeting were to discuss 2007 accomplishments and 2008 workplans.

3. Discussion. A presentation by MAJ Keith Ferdon regarding the future direction on range use and development kicked off the meeting. Progress reports and workplans were given first by the DMA and then by the DNR, and TNC. An update was then given on the Army Compatible Use Buffer (ACUB) programs; Listed below are some of the key issues, highlights, and projects for natural resource management on Camp Ripley.

Natural Resources: Discussion centered on updating or revising the Camp Ripley INRMP. The previous Camp Ripley INRMP was for the plan years of 2003-2007. The first step is to determine whether an update or revision is needed, and then to host a planning meeting for input. Listed below are the definitions for a Revision and Update:

- **Revision:** Changes to goals, objectives, management, legal, or regulatory changes that result in "Materially significant different biophysical consequences"
- **Update:** An update concerns selected portions of an existing INRMP that do not result in changes to goals and objectives, and that do not result in "Materially significant different biophysical consequences". Typically an update changes the status of projects/tasks to achieve specific objectives.
- Host an INRMP planning meeting at 0900 on March 26, 2008 at Camp Ripley.
- The issue of funding was also discussed. The DMA is looking for alternatives regarding funding due to the new funding matrix that was issued by National Guard Bureau. One option will be the Military Land Fund. DMA will continue to work with DNR regarding this issue.
- A Conservation Report will be generated by Camp Ripley staff showcasing the Natural and Cultural Resource accomplishments of 2007.

Wildlife: (Fauna)

1. All hunts were very successful. Harvest on Camp Ripley was 523 White-tailed Deer.
2. The DNR is implementing a Fisher and Pine Martin Project across the state, Camp Ripley along with Central Lakes College will participate in this project. The Fisher study was started in Jan. 2008.
3. Three measures (Vegetative Buffer, Fire Break and signage) are being implemented to protect the Bald Eagle Nest near the North Range on Camp Ripley, per biological assessment from USFWS.
4. Need cost estimate from DMA regarding the road damage during the 2007 Bow Hunt.
5. Status of Threatened and Endangered Species has changed in 2007 for the timber wolf and eagle.

Vegetation: (Flora)

1. Continue native grass seed harvest on Camp Ripley in 2008.
2. Complete a fire management plan for Camp Ripley in spring of 2008.
3. Continual mechanical thinning where needed (Gyro-trac).
4. Forest inventoried approx. 9000 acres in 2007.
5. Re-inventory approx. 4500 acres of forest in 2008.
6. Continue to implement prescribed fire program at Camp Ripley.
7. Continue to implement vegetation screening near the North Range and on West Boundary Road.
8. Continue to address the maneuver trail project in Maneuver Area K1.
9. Continue to implement the Invasive Species Project with SCSU.

Fisheries:

1. Harvested 11,249 walleyes and 56 Muskie's in 2007 from Camp Ripley.
2. Operate Cockburn, Coon Stump, Long, Muskrat and Rapoon for walleye rearing and Frog, and Miller for Muskies.
3. Lake Assessment on Lake Alott to be completed in 2008
4. Improve access into Muskrat Lake in 2007.
5. Create new access into Fosdick Lake in 2008

ACUB:

1. Secured $4,656,000 in Federal Funding for the ACUB Program in 2007.
2. Currently have 126 interested land owners (approx. 18,000 acres)
3. DNR and BWSR are still the principal partners in implementing the land deals.
4. About 25 lands deals are completed or in process totaling 4000 acres.
5. Crow-Wing State Park has acquired, through there Paul Bunyan Trail Project 526 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.

Cultural Resources:

1. Completed field work for evaluating MPRC, Remainder of Training Area 10, and Walk through Course.
2. Request concurrence from SHPO that all farmstead evaluations on Camp Ripley are complete with the finding of no eligibility to National Register of Historic Places.
3. Second annual consultation with representatives from 23 tribal governments.

Meeting was adjourned at 13:02 pm.

Minutes Submitted By:
Jay Brezinka, Natural Resource Specialist

Appendix F: Arden Hills Army Training Site annual meeting minutes, 2008.

MEMORANDUM FOR RECORD 10 April 2008

SUBJECT: Minutes of the DMA, DNR and USFWS Annual Meeting, 9 April 2008

1. Introduction. Mr. Dave Hamernick at 1005, 9 April 2008, 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:
MAJ Keith Ferdon, Training Area Coordinator
SGM Daniel Smith, Operation SGM
SSGT Jamie LeClair, Training Area Coordinator
Mr. Dave Hamernick, AHATS Program Manager
Mr. Todd Hendricks, Department of Public Works
Mr. Bill Brown, Natural/Cultural Specialist
Mr. Jay Brezinka, Natural Resource Manager

Army Reserve:
Mr. Marshal Braman, Natural Resource Manager

Department of Natural Resources:
Mr. Brian Dirks, Animal Survey Coordinator, (Camp Ripley)
Ms. Marilyn Danks, Biologist

Pollution Control Agency:
Mr. Hans Neve

United States Fish and Wildlife Service:
Mr. Dave Warburton, Biologist

Saint Cloud State University:
Dr. Jorge Arriagada, Professor, Invasive Species Project
Mr. Joe Carlyon, Graduate Student, Invasive Species Project

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 2007 accomplishments and 2008 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. SSGT LeClair then briefed the committee on the density and types of military use of the facility. A presentation was given by Mr. Dirks regarding the DMA's 2007 progress report and 2008 work plan. Comments were given by the DNR, and USFWS. Presentations were then presented by Mr. Carlyon (Invasive Species) and Mr. Andresen (Vegetation Program). Listed below are some of the key issues, highlights, and projects regarding natural resource management on AHATS.

Natural Resources: A handout was given to all those in attendance, which listed the goals and objectives of the AHATS INRMP. The intent of the handout is for each member to review the goals and objectives and provide comments back to the DMA regarding updates or changes. Please review and provide comments.
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.

Wildlife: (Fauna)

1. All hunts were very successful. Harvest on AHATS was 51 White-tailed Deer.
2. Many comments were received to try to increase the harvest of white-tailed deer on AHATS. 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.
3. A winter aerial survey identified 87 White-tailed deer.
4. Bird and small mammal surveys were completed.
5. Important Bird Area Dedication (IBA) 4 May, 2008.

Vegetation: (Flora)
A lot of discussion centered around updating the vegetation management portion of the AHATS INRMP; to include identifying potential vegetation restoration projects throughout AHATS. There was a great presentation on invasive species which led to a great discussion on this topic. Topics that were discussed include:

1. Prescribed fire program at AHATS.
2. Vegetation screening on the West and North Boundary of AHATS.
3. Invasive Species Project with SCSU.
4. Updating the vegetation management goals and objectives to include establishing restoration projects for the INRMP.
5. Addressing woody invasive species and St John's Wort.
6. Provide Invasive species mapping information to Mr. Moriarty for use in County Planning.
7. Restoration Projects in the Rice Creek Corridor.
8. The Oak wilt problem.

Cultural Resources: Based on the soil disturbance model developed by the St. Paul District of Army Corps of Engineers, 128 acres were identified on the installation as relatively undisturbed and warranted Phase I evaluation for SHPO determination. In addition 12 farmsteads remained to be evaluated for SHPO determination. The Phase I evaluation is in process with SHPO determination to be made later this summer. Once completed the Cultural evaluations should be finished for all of AHATS. Only Section 106 communication on building demolition with the SHPO will continue.

Meeting was adjourned at 12:32 pm.

Minutes Submitted By:
Jay Brezinka, Natural Resource Manager

Appendix G: Camp Ripley Land Fund Legislation, 2008.

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 H: Camp Ripley Land Fund Bylaws, 2008.

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 I: Arden Hills Army Training Site Natural Resources Damage Assessments, 2008.

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.

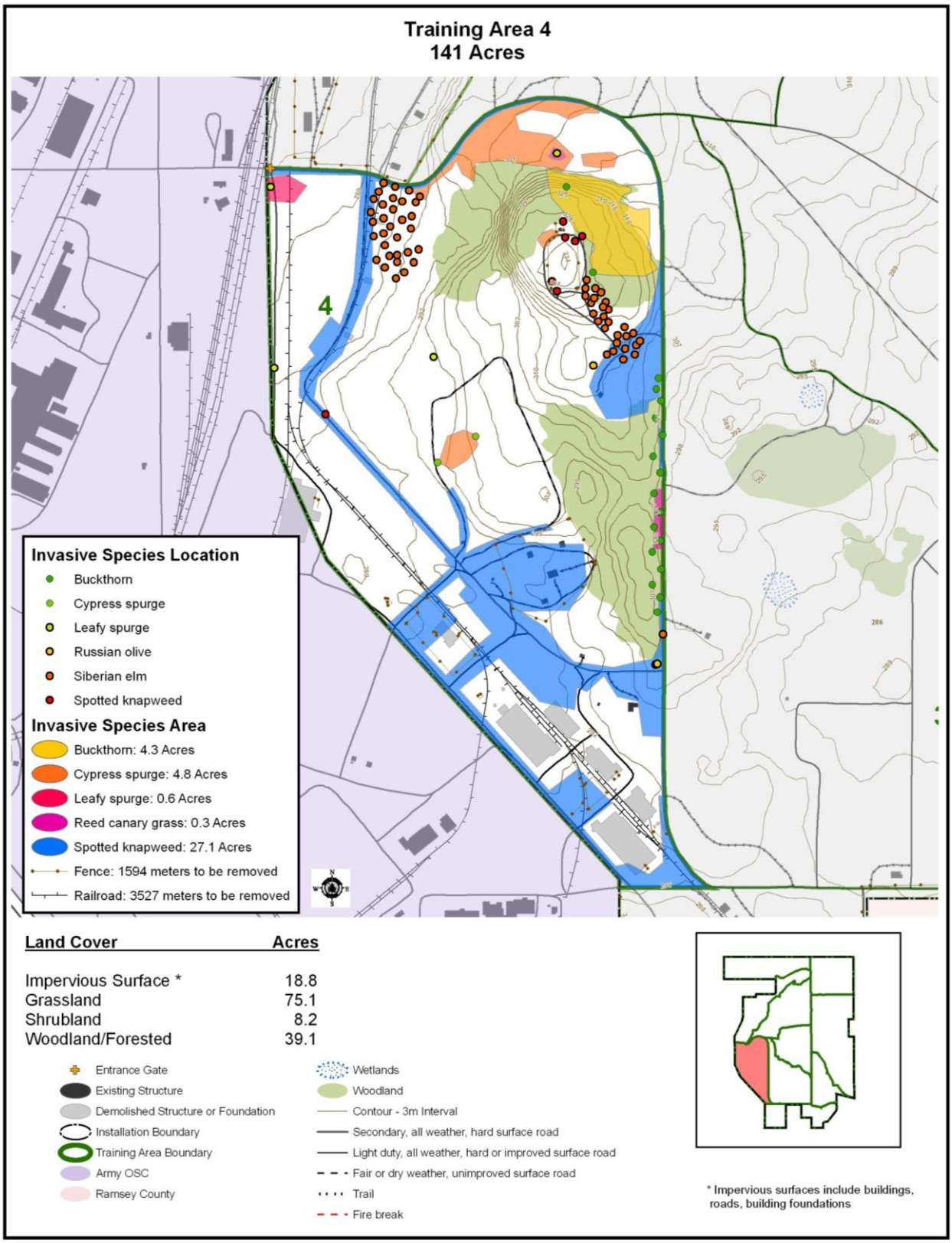
Sustainability: The value of this project is immeasurable; the MNARNG will be able to provide a safe and realistic training environment for our soldiers while providing multi-use benefits to the community. The environmental enhancements benefit the local flora and fauna, and the community will be able 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)	2012	2020	$20,000 annually

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
4
Invasive Species Location
Buckthorn
Cypress spurge
Leafy spurge
Russian olive
Siberian elm
Spotted knapweed
Invasive Species Area
Buckthorn: 4.3 Acres
Cypress spurge: 4.8 Acres
Leafy spurge: 0.6 Acres
Reed canary grass: 0.3 Acres
Spotted knapweed: 27.1 Acres
Fence: 1594 meters to be removed
Railroad: 3527 meters to be removed
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.

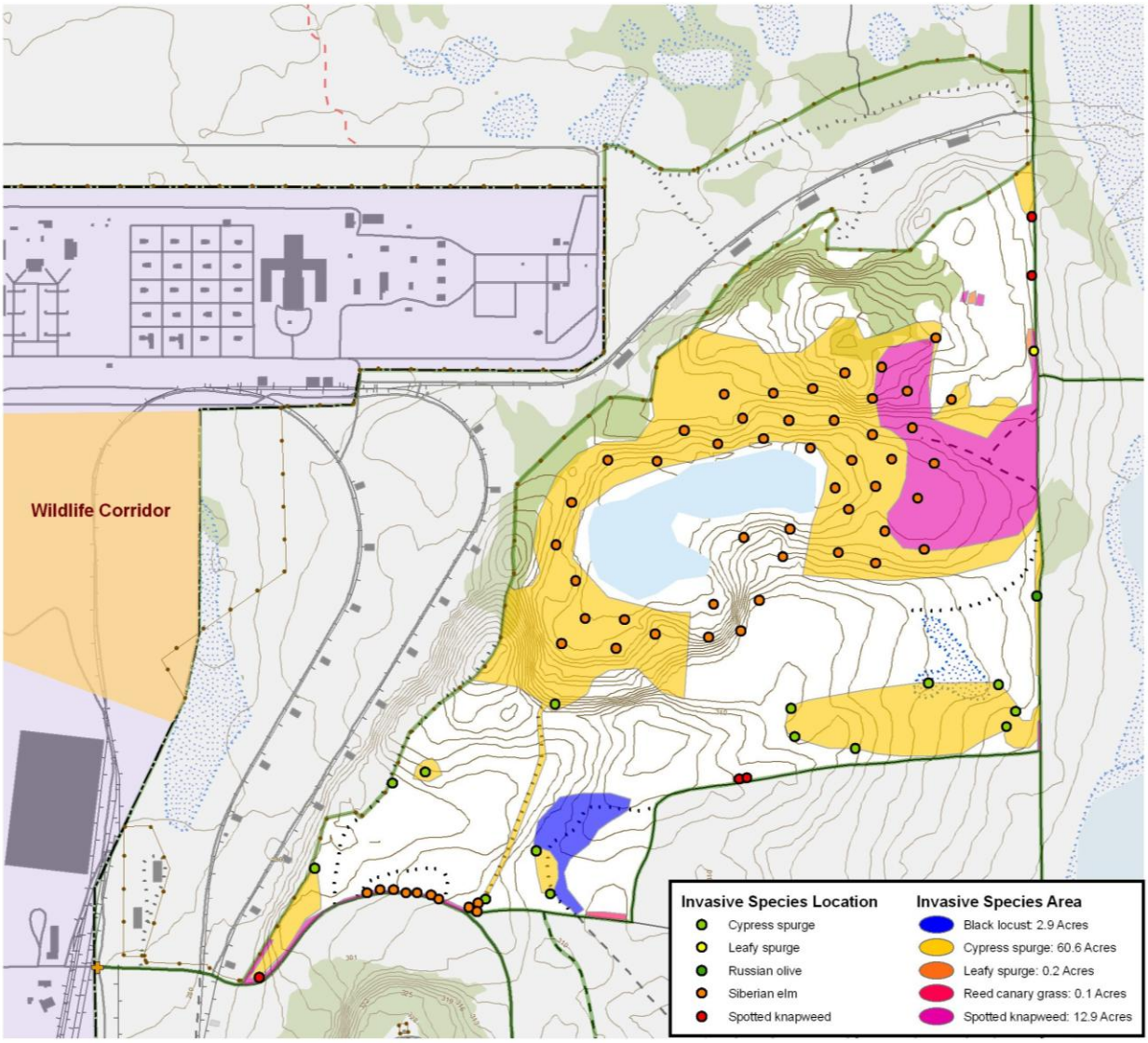
Project	Start Date	End Date	Estimated Costs
Stabilize the slopes of the borrow pit area	2012	2014	$750,000
Apply black dirt to approximately 40 acres	2012	2014	$1,750,000
Re-vegetate approximately 40 acres	2012	2014	$500,000
Invasive species control (Vegetation)	2014	2022	$15,000 annually
			Total: $3,135,000

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

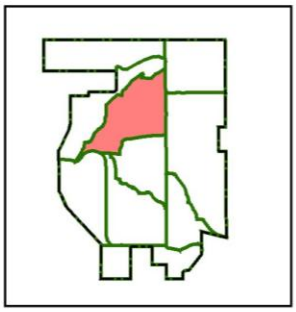
Site Description: Map found on next page.

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.

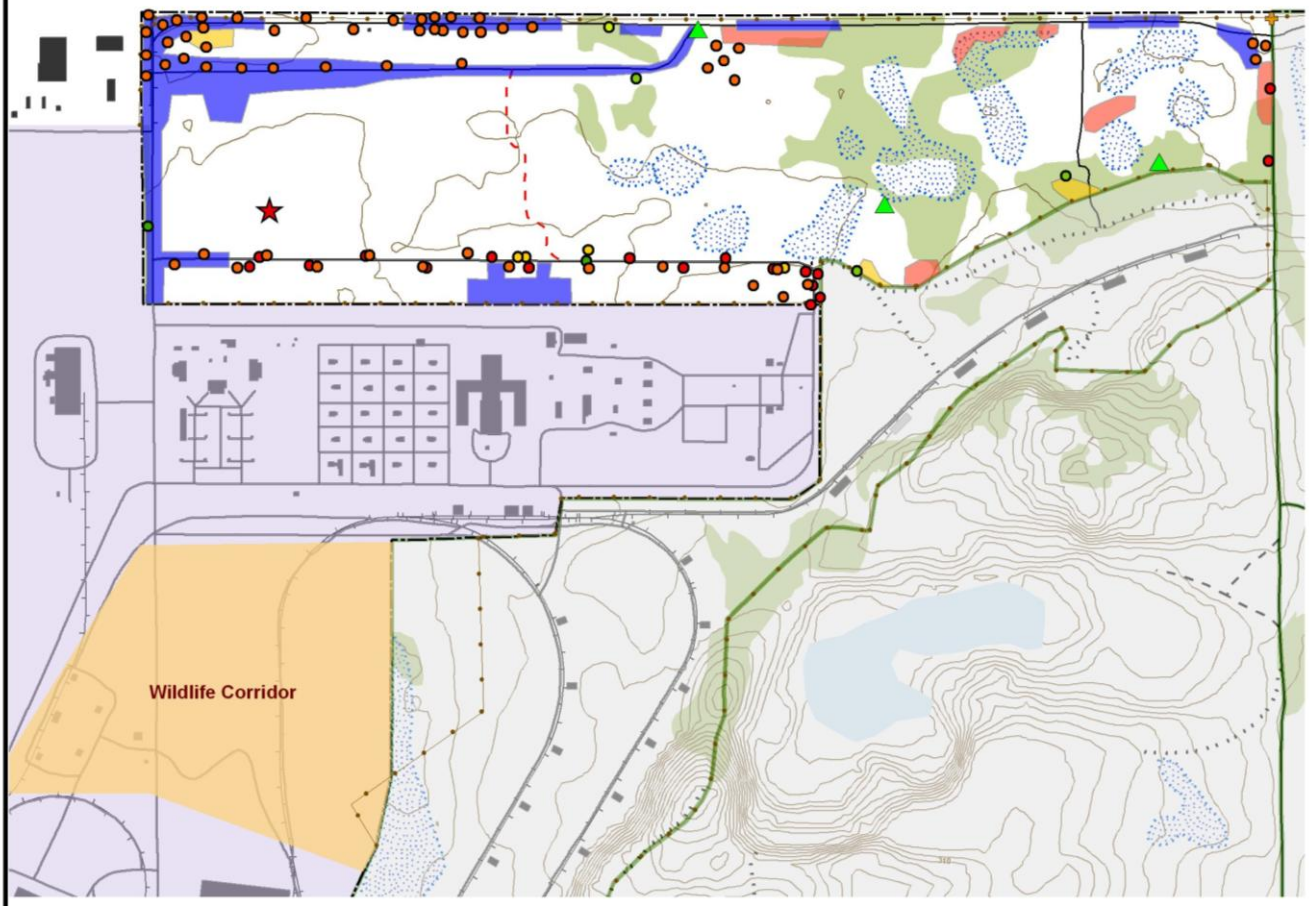
Projects	Start Date	End Date	Estimated Costs
Vegetation planting	April 2011	August 2012	$15,000
Prairie restoration	April 2011	August 2012	$65,000
Maintain a healthy wetland community	April 2012	August 2012	$15,000
Invasive species control (Vegetation)	2012	2020	$15,000 annually
			Total: $230,000

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

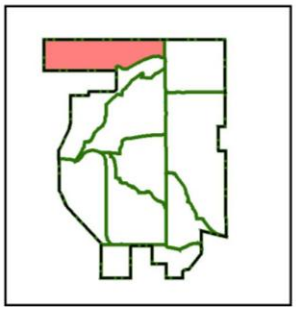
Invasive Species Location

- 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.

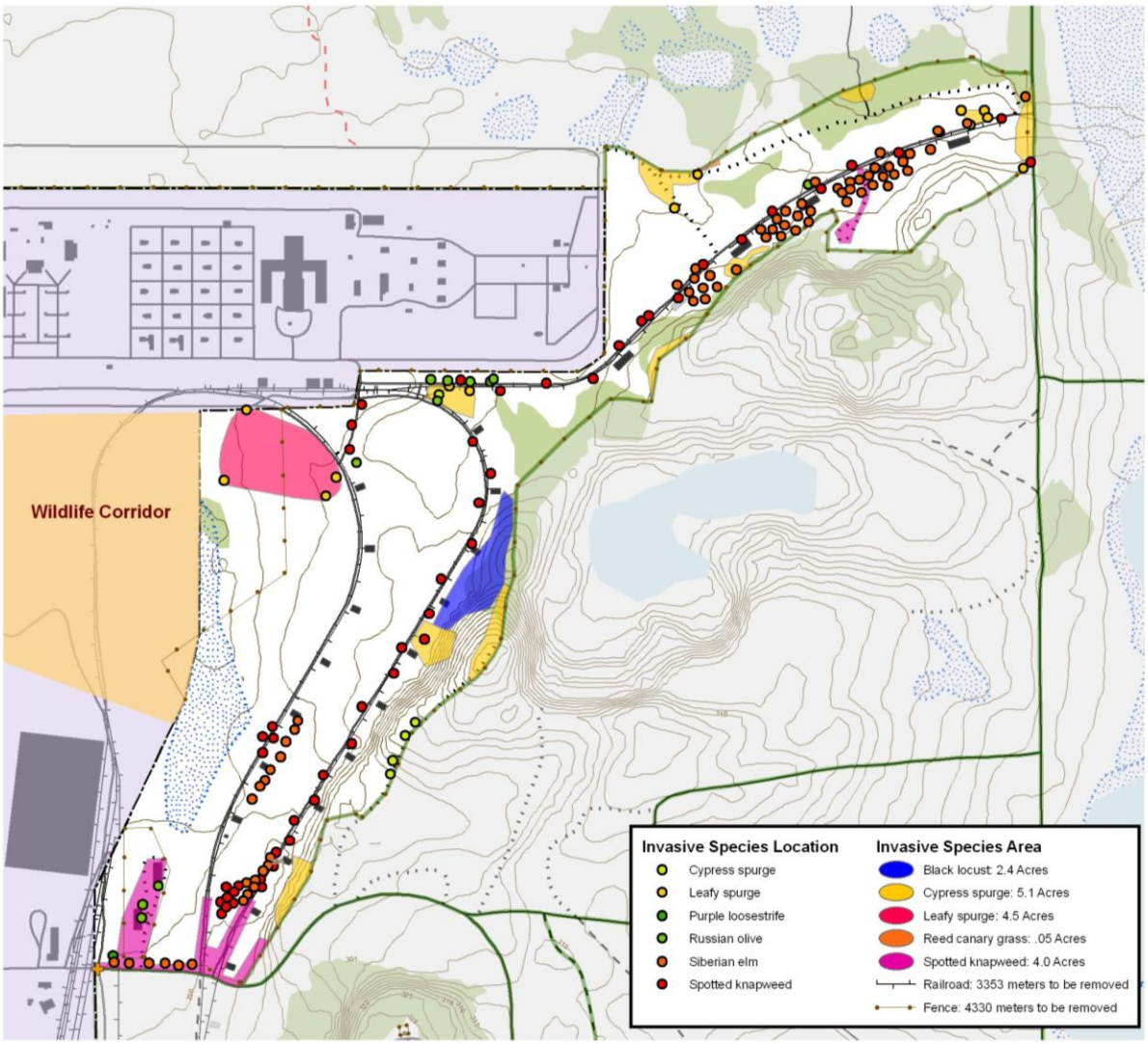
Projects	Start Date	End Date	Estimated Costs
Fence removal - wildlife impediment	April 2010	August 2011	$30,000
Railroad track removal - convert to trail	April 2010	August 2011	$85,000
Above ground utilities removal	April 2010	August 2011	$15,000
Establish fire break	April 2010	August 2011	$15,000
Vegetation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

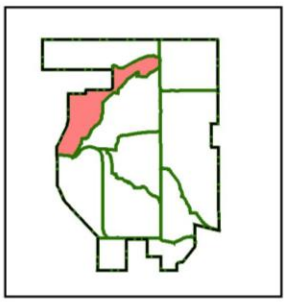
Site Description: Map found on next page.

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 J: Occurrences of Species in Greatest Conservation Need by Ecological Classification System Subsection and 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		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**	**1**		
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: Department of the Army Eagle Guidance Policy, September 2008.

DEPARTMENTS OF THE ARMY AND THE AIR FORCE
NATIONAL GUARD BUREAU
111 SOUTH GEORGE MASON DRIVE
ARLINGTON, VA 22204-1382

NGB-ARE

SEP 05 2008

MEMORANDUM FOR DISTRIBUTION TO ALL STATES ENVIRONMENTAL PROGRAM MANAGERS

SUBJECT: IMPLEMENTATION OF EAGLE POLICY GUIDANCE

1. Reference Memorandum, DAIM-ISE (ACSIM), 19 Aug 2008, subject: Eagle Policy Guidance (enclosure 1). The U.S. Fish & Wildlife Service determined the bald eagle to be recovered and announced removal from the Federal list of threatened and endangered species. However the discrete population of the Sonoran desert bald eagle from the Endangered Species Act (ESA) list is pending.

2. Any proposed Army actions that may affect this population will require ESA consultation. All current eagle management plans must be follow IAW existing Integrated Natural Resources Management Plans. Bald Eagles and Golden Eagles are still protected by the Bald and Golden Eagle Protection Act (BGEPA), the Migratory Bird Treaty Act (MBTA) and ESA (only in the Sonoran Desert of Arizona).

3. Request that each state Environmental Program Manager distribute the enclosed memorandum and guidance to your Natural Resources Managers, Range Managers, Training Coordinators and other pertinent Staff for review and implementation.

4. The point of contact for this action is Mr. Kenneth Conley, Endangered Species and Integrated Pest Management Programs Manager. He can be reached at 703-607-9952, or kenneth.conley3@us.army.mil.

Beth A. Erickson

Encl
as

BETH A. ERICKSON
Chief, Conservation Branch

DEPARTMENT OF THE ARMY
OFFICE OF THE ASSISTANT CHIEF OF STAFF FOR INSTALLATION MANAGEMENT
600 ARMY PENTAGON
WASHINGTON, DC 20310-0600

DAIM-ISE

AUG 1 9 2008

MEMORANDUM FOR SEE DISTRIBUTION

SUBJECT: Eagle Policy Guidance

1. References:

a. Final Rule Removing the Bald Eagle in the Lower 48 States from the List of Endangered and Threatened Wildlife, US Fish and Wildlife Service (USWFS), 9 Jul 07, 72 Federal Register 37346.

b. Order, 6 Mar 08, United States District Court for the District of Arizona, Number CV 07-0038-PHX-MHM.

c. USFWS, May 07, National Bald Eagle Management Guidelines.

d. US Army Environmental Command, Jun 07, Installation Summaries from the FY 2006 Survey of Threatened and Endangered Species on Army Lands.

e. Final Rule Authorizations Under the Bald and Golden Eagle Protection Act for Take of Eagles, USFWS, 20 May 2008, 73 Federal Register 29075.

2. The USFWS determined the bald eagle to be recovered and announced removal from the Federal list of threatened and endangered species (Reference 1a). The US District Court enjoined the USFWS from removing the discrete population of Sonoran desert bald eagles from the ESA list, pending the outcome of a court ordered USFWS status review and 12 month finding (Reference 1b). Any proposed Army action that may affect the Sonoran desert population will require ESA consultation (see map of Sonoran desert population at web address cited in paragraph 7).

3. Bald Eagles and Golden Eagles are still protected by the Bald and Golden Eagle Protection Act (BGEPA), the Migratory Bird Treaty Act (MBTA), and the Endangered Species Act (ESA) (only in the Sonoran Desert of Arizona). There is no apparent change in the protection requirements for bald eagles under BGEPA; however, the process for compliance and communicating with the USFWS may be more efficient and require fewer resources. A major difference between ESA and BGEPA is that an action agency may now make a determination of "not likely to adversely affect" without having to initiate any dialogue with the USFWS. The determination that an action will likely cause a disturbance or take of bald or golden eagles will require the action proponent to acquire a permit from the USFWS.

4. The take provisions for bald and golden eagles are different under current laws. Take provisions under the ESA are still applicable for the Sonoran desert population of bald eagles. The MBTA provides a limited permitting process for the intentional take of migratory birds, and the Army has legal authority to take migratory birds when conducting military readiness activities. There is no similar permitting process or military readiness exemption under BGEPA. The "take" of bald and golden eagles without a permit obtained under BGEPA is prohibited. Take or collection of any eagle, its parts, eggs or nests without a permit may result in civil or criminal penalties under BGEPA.

5. The USFWS updated the definition of "disturb" as an element of "take" under BGEPA (Reference 1c). The definition of disturb is, "... to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, (1) injury to an eagle, (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior". Take means "pursue, shoot, shoot at, poison, wound, kill, capture, collect, molest, or disturb" (Reference 1c). Although there is no specific reference to habitat in the definition, habitat degradation/manipulation that disrupts eagles at nests, foraging areas, and important roosts can wound, kill, or disturb eagles, each of which is specifically prohibited by BGEPA. Therefore, eagle nest sites, important foraging areas, and communal roost sites are afforded protection under the BGEPA to the degree that their loss would disturb or kill eagles. Nest and roosting sites may be used on a perennial basis; therefore, even during seasonal absence of bald or golden eagles, the loss or degradation of these and associated foraging areas could likely cause a disturbance to eagles upon their return to the area.

6. The bald eagle occurs on site at 41 Army installations, and it is contiguous to 15 installations (Reference 1d), and golden eagles are also known to occur on a number installations. Bald eagles also occur on installations in Alaska, but the occurrences are not included in Reference 1d because the Alaskan population of bald eagle was never listed under the ESA.

7. The USFWS is working on two elements to complete transition of desired protection and protection processes under the BGEPA: A take (intentional and unintentional) permit process for bald and golden eagles and a bald eagle monitoring plan. Information on USFWS bald eagle guidance and continuing efforts is at http://www.fws.gov/migratorybirds/baldeagle.htm.

8. The current Army eagle guidance for Army commands and installations including those in Alaska is:

a. Continue to budget for and comply with the BGEPA, MBTA, and existing biological opinions (BOs). Keep track of funding requirements necessary to comply with the BGEPA and/or manage for bald and golden eagles. Installations in the Sonoran Desert of Arizona will continue to comply with the ESA in conserving Sonoran desert bald eagles.

b. Do not conduct actions that may result in "take" of bald or golden eagles or "disturb" them without a permit.

(1) Installations with an ESA Section 7 incidental take statement issued before 19 June 2008 continue to have take authorization for one year (19 June 2009), as long as compliance with the terms and conditions of the incidental take statement is maintained (Reference 1e).

(2) Installations with an ESA Section 7 incidental take statement issued before 19 June 2008 and with activities which will continue to take eagles one year after 19 June 2008, must apply for a permit under the BGEPA (Reference 1e). The resulting permit authorizes the take of bald eagles as long as an action agency is in compliance with the terms and conditions of their incidental take statement. In applying for a permit, installations will have to provide certification that they are in full compliance. During the application process, an installation may request a reevaluation of the incidental take statement terms and conditions. Therefore, it may be possible to reduce restrictions and requirements. The regulation in Reference 1e does not cover new actions that may take eagles. The USFWS is still working on regulations that will authorize take of bald and golden eagles for new actions.

(3) Installations that may take eagles, and have no applicable incidental take statement, will have to apply to the USFWS for a take permit under the BGEPA. It is the prosecutorial discretion of the USFWS to issue violations of the BGEPA until take permits are authorized. Until such authorization for take is finalized, installations will follow the National Bald Eagle Management Guidelines (Reference 1c) to avoid take of bald eagles and/or will utilize the expertise of the USFWS to avoid take of bald or golden eagles. The USFWS is developing guidelines for raptor protection, and installations will be able to use these guidelines to assess impacts of actions on golden eagles until the USFWS develops a comparable document specifically for management of golden eagles. If an installation determines that a proposed action will adversely impact a bald or golden eagle, the installation, with input from USFWS, will implement reasonable measures to avoid, and if not possible, minimize such impacts.

(4) There is no permit for the salvage of dead eagles. Contact the local ecological services organizations of USFWS Field Offices for guidance on the disposition and/ or collection of dead eagles.

c. Continue to use the Installation Natural Resources Management Plan (INRMP), including the endangered species management component, to plan and implement management and protection of bald and golden eagles.

d. Conform to the recommendations in the National Bald Eagle Management Guidelines (Reference 1c) and incorporate applicable recommendations in the INRMP.

e. Continue to consider the impacts on bald and golden eagles in assessing actions under the National Environmental Policy Act.

f. Continue to review and comment as needed on USFWS draft policies and procedures relating to eagles.

g. Keep installation civilian and military personnel (especially military personnel engaged in operational training on the landscape) informed of the legal and recommended protection for bald and golden eagles.

h. Concerning the Arizona Sonoran desert bald eagle population, coordinate with USFWS on appropriate procedures to address any requirements stemming from Reference 1b.

9. The primary USFWS eagle POCs for installations are the ecological services organizations of the USFWS Field Offices (Reference 1c, page 16); however, permit requests to comply with Reference 1e will be sent to the USFWS Regional Migratory Bird Permit Office.

10. The Army Staff POC is Mr. Scott Belfit, 703-601-0700, email: Scott.Belfit@hqda.army.mil.

FOR THE ASSISTANT CHIEF OF STAFF FOR INSTALLATION MANAGEMENT:

Krishna Ganta

KRISHNA GANTA
Acting Chief, Environmental Division

DISTRIBUTION:
BASE REALIGNMENT AND CLOSURE OFFICE (DAIM-ODB)
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DIRECTOR, ARMY NATIONAL GUARD (NGB-ARE)
(CONT)

DAIM-ISE
SUBJECT: Eagle Policy Guidance

DISTRIBUTION (CONT):

US ARMY RESERVE COMMAND (AFRC-EN)
US ARMY MEDICAL COMMAND (MCFA-E)
US ARMY SPACE AND MISSILE DEFENSE COMMAND (SMDC-EN-VE)

CF:
CONSTRUCTION DIVISION (DAIM-ISC)
G-3/5/7 (DAMO-TRS)
US ARMY CORPS OF ENGINEERS (CEMP-CE/DE/CR)

Appendix L: Analysis of Camp Ripley's 2008 aerial deer survey.

STATE OF MINNESOTA
DEPARTMENT OF NATURAL RESOURCES
Biometrics Unit, 5463-C West Broadway
Forest Lake, MN 55025
Phone: 651-296-2703, Fax: 651-296-5202
Email: john.giudice@dnr.state.mn.us

Memorandum

To: Brian Dirks

From: John Giudice

Date: 25 November 2008

Re: Analysis of Camp Ripley's aerial deer surveys 2006-2008

INTRODUCTION

In March 2006 a helicopter survey of white-tailed deer was conducted within the boundaries of Camp Ripley, MN. The goal was to produce a population estimate that was within ±25% of the true population size with $\alpha = 0.10$. Secondarily, investigators wanted information on the spatial distribution of deer within Camp Ripley and potential habitat associations (for improving future surveys). A 2-D systematic quadrat sampling design (D'Orazio 2003) was used to minimize deer movements among 1-km^2 sample plots (due to survey disturbance) and because information on deer distribution and potential stratification variables were lacking for the Camp Ripley area. Counts were not adjusted for visibility bias; thus, estimates of population size and density were viewed as minimum values. However, visibility bias was minimized by using a helicopter and allowing survey intensity to vary as a function of cover and deer numbers (e.g., Gassaway et al. 1986). Furthermore, 75% of the sampling frame had <13% conifer cover and only 3 plots had >30% (max = 50%) conifer cover. Fifty percent of the sampling frame contained predominately deciduous woody cover. Thus, given adequate snow cover, visibility conditions were relatively good on most plots. The survey was repeated in 2007-2008, but the sampling frame was expanded to include plots adjacent to Camp Ripley that were considered potential wintering areas in past surveys (DelGiudice 1997).

METHODS

As noted above, aerial deer surveys conducted during 2006-2008 used similar methodologies (see Table 1, below). The primary difference was modification of the sampling frame in 2007-2008 to include peripheral plots that were classified as potential wintering areas in previous surveys (see Fig. 1, below). In addition, a uniform plot size (1 km^2) was used in 2007-2008 (plot size varied along the Camp Ripley boundary in 2006). Snow cover during the survey was better in 2007 and 2008 compared to 2006, although survey conditions deteriorated quickly in 2007 (J. DeJong, personal communications). The winters (Dec-Mar) of 2006-2008 were relatively mild in terms of deer winter severity, at least compared to 1996-1997 (another period of intensive deer surveys on Camp Ripley).

Table 1. Attributes of the 2006-2008 aerial deer surveys on Camp Ripley.

Attribute	2006	2007	2008
Sampling design	2-D systematic	2-D systematic	2-D systematic
Total plots	228	277	277
Area (mi^2)	79.1	106.8	106.8
Plot size (km^2)	0.27-1.0	Uniform (1.0)	Uniform (1.0)
Plots (n)	59	81	81
Sampling rate	0.26	0.29	0.29
Total days	2	3	3
Survey dates	Mar 14-15	Mar 9-13	Feb 28–Mar 10
Aircraft	Bell OH-58A	Bell OH-58A	Bell OH-58A
Pilot	M. Trenholm	M. Trenholm	M. Trenholm
Observers	J. DeJong, T. Notch	J. DeJong, T. Notch, B. Dirks	B. Dirks, T. Notch
Snow cover	Poor	Poor	Good
Winter severity (WSI at Brainerd)	Mild (WSI=29)	Mild (WSI=36)	Avg (WSI=63)

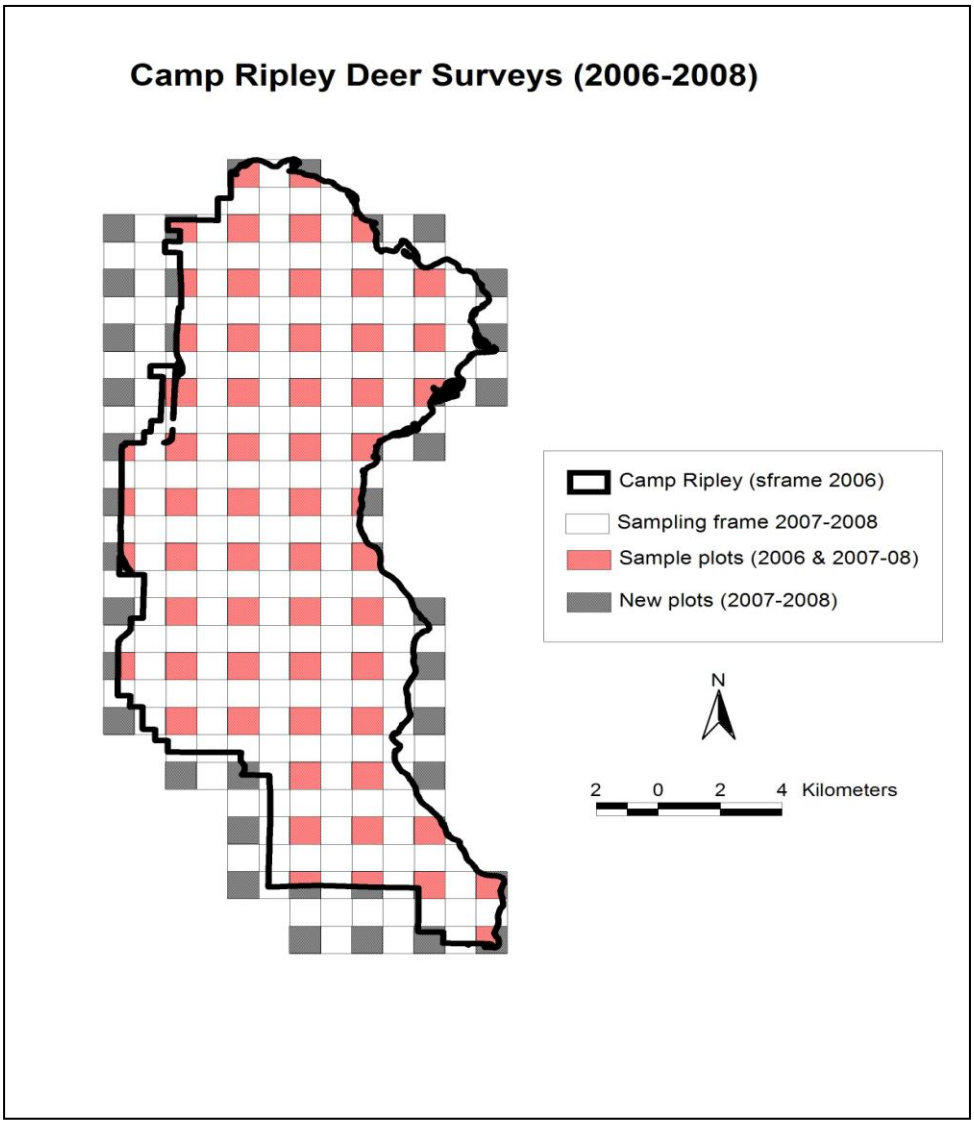

Figure 1. Sampling frames and plots for Camp Ripley deer surveys, 2006-2008.

In both years, minimum population size was estimated as the product of the sample mean and total plots in the sampling frame. Deer density (deer/mi^2) was estimated by dividing the population estimate by the area (mi^2) of the sampling frame. Variance formulas for simple random sampling can be used to estimate the variance of population estimates from 2-D systematic samples, but such estimates will be biased if counts are spatially correlated (D'Orazio 2003). Therefore, I used R-code modified after D'Orazio (2003) to estimate the variance of the estimated population total after adjusting for spatial correlation (Geary's C statistic).

RESULTS

Population Estimates & Sample Statistics

	2006	2007	2008
Sample plots	59	81	81
Total plots	228	277	277
Sampling rate	0.26	0.29	0.29
Groups detected	76	288	337
Mean group size	5.0	2.9	2.6
Range (group size)	1-68	1-26	1-13
Total deer detected	458	827	860
Mean deer/plot	7.8	10.2	10.6
SE (mean deer/plot)[a]	2.68	0.80	0.74
Range (deer/plot)	0-143	0-55	0-35
Geary's C (<1 = positive spatial correlation)	1.20	0.80	0.95
Population estimate ($\hat{\tau}$)	1,770[b]	2,828	2,941
$\hat{Var}(\hat{\tau})$ adjusted for spatial correlation	374,318	48,830	42,375
$\hat{Var}(\hat{\tau})$ | simple random sampling	312,115	60,973	44,432
90% CI (population total)	747 - 2,791	2,460 - 3,198	2,598 - 3,284
CV (%)	34.6	7.8	7.0
Relative error of CI bound (%)	57.7	13.1	11.7
Estimated density (deer/mi^2)	22	26	28
90% CI (deer/mi^2)	9 - 34	23 - 30	24 - 31

[a]Adjusted for estimated spatial correlation (D'Orazio 2003).
[b]The population estimate in 2006 is not directly comparable with estimates in 2007-2008 because the sampling frame was expanded in 2007.

Spatial Distribution

Deer were more evenly dispersed and group sizes were smaller in 2007-2008 than in 2006 (Fig. 2). Deer distributions in 2007 and 2008 were not correlated with major wintering areas identified in 1997 (DelGiudice 1997), whereas 75% of deer observations in 2006 were within 2 km of wintering areas #2 and #4 (see Fig. 2 and 3). It is not entirely clear why deer distributions differed substantially in 2006 vs. 2007-2008, but it may reflect differences in winter severity preceding the surveys and habitat and weather conditions during the surveys.

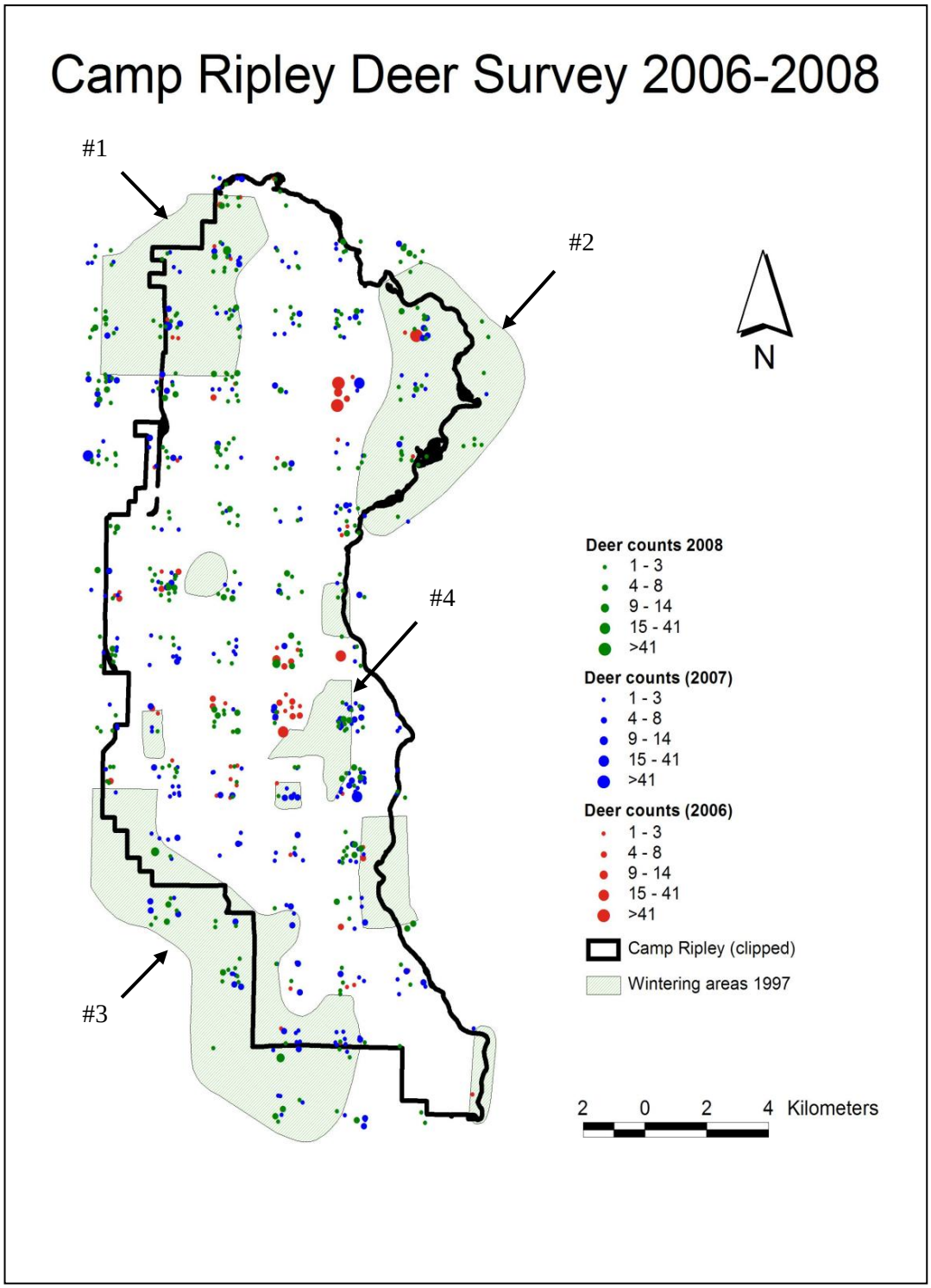

Figure 2. Distribution of deer observed (per group by plot) in Camp Ripley aerial surveys, 2006-2008.

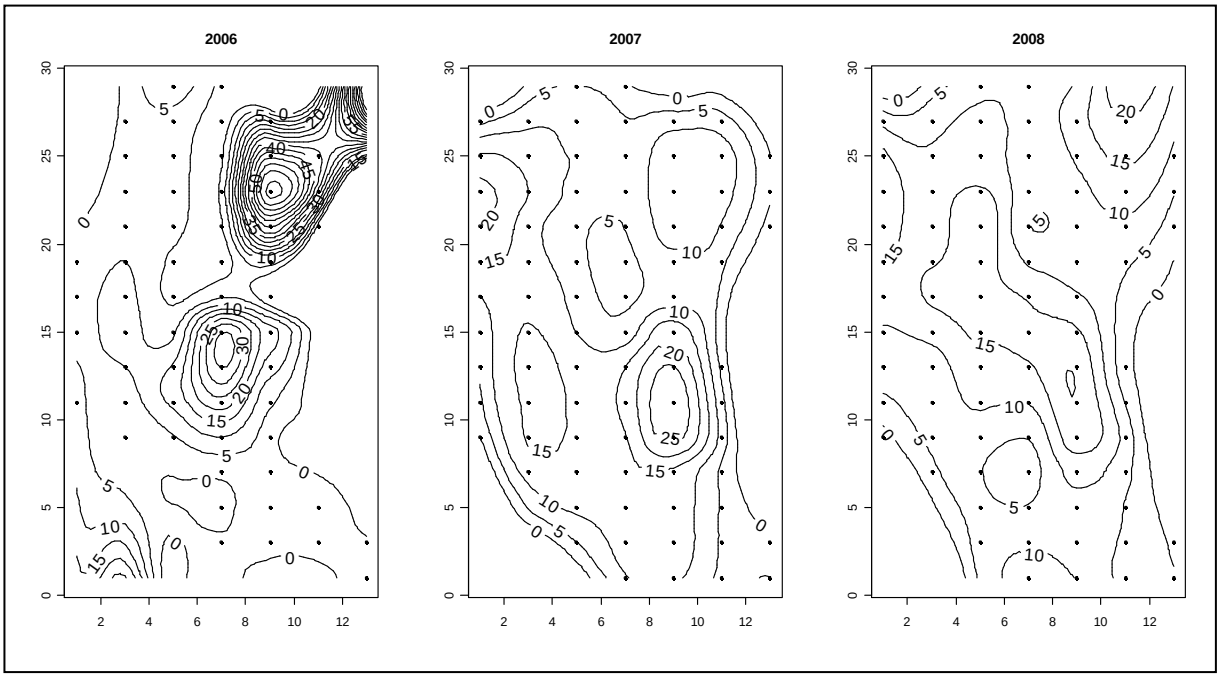

Figure 3. Contour plots of observed deer numbers (per plot) in Camp Ripley aerial surveys, 2006-2008. Black dots are sample plots and contour numbers are predicted deer numbers (based on Contour and Loess functions in program R's graphic and stats packages, version 2.8.0). X and Y axes are column and row coordinates of plots, respectively, beginning in the southwest corner of the sampling frame.

Habitat Associations

Deer counts/plot generally increased with % woody cover, but variation among plots was large (Fig. 4). The lack of strong and consistent habitat associations may partly reflect differences in average detection probability among cover types (especially dense conifer cover or cattails). However, habitat associations were inconsistent between years. For example, in 2006 more deer were counted in grassland-wetland cover than was expected based on availability, whereas deer counts in 2007 and 2008 appeared to be distributed randomly with respect to cover (Fig. 5). The lack of strong, consistent habitat associations probably have more to do with relatively mild winters than sightability differences (also see Spatial Distribution, above).

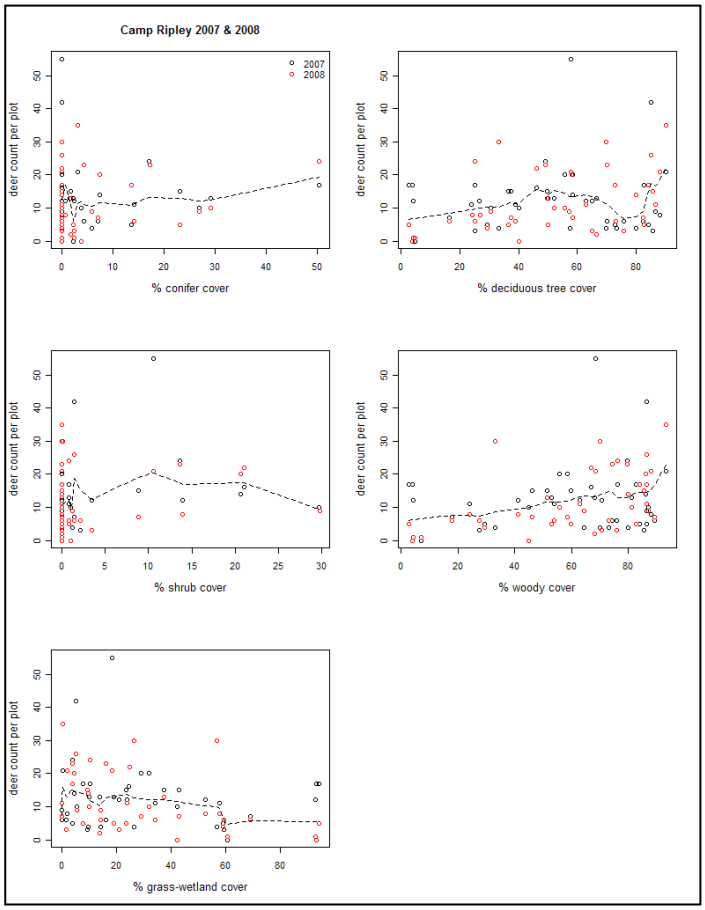

Figure 4. Scatter plots of deer counts and habitat composition in sample plots. Lines were fit with Friedman's SuperSmoother in program R's stat package, version 2.8.0. Note: vegetation data were missing or incomplete for plots located on and outside the boundary of Camp Ripley; thus, peripheral plots were excluded from scatter plots.

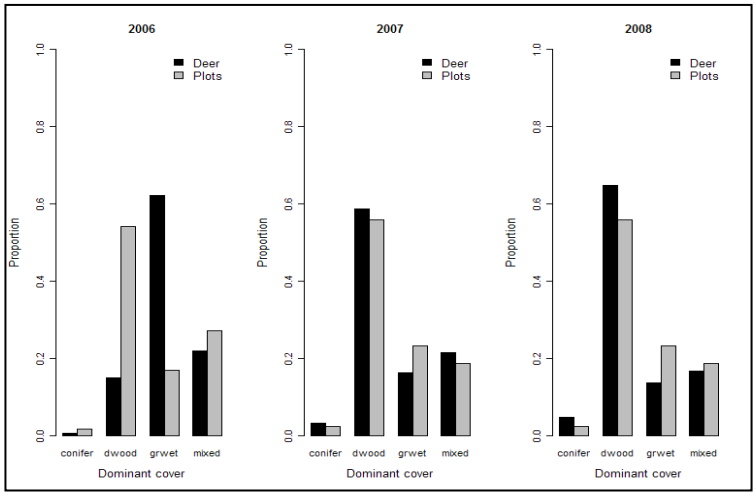

Figure 5. Proportion of deer observed by dominant cover type (comprising >50% of plot area) compared to the relative distribution of dominant cover types (by plot) within the sampling frames.

SUMMARY & POINTS OF CONSIDERATION

1. The 2007 and 2008 population estimates were precise (CV = 8%) and met precision goals (relative error $\leq$ 25%). In contrast, precision was poor in 2006 (CV = 34%). The dramatically improved precision in 2007 & 2008 was primarily due to a more even distribution of deer counts among sample plots (no extreme counts) and a larger sample size (81 vs. 59 plots). This result reiterates the importance of minimizing variation in deer counts among plots. Unfortunately, the improved precision was a function of deer distribution more than our sampling design. Thus, poor precision is still possible in future surveys if deer form large groups (clumped distribution) and the location of such groups is not predictable (if predictable the variance could be reduced via sampling design, e.g., stratification or dual-frame sampling).

2. Dominant vegetation types within plots were not strongly predictive of deer numbers in any survey year. Thus, stratification by vegetation type is not recommended (i.e., the gain in precision would be marginal at best). However, you could try dividing your sampling frame into 2 strata based on Fig. 3 (where stratum 1 = plots located in and around wintering areas #2 and #4, and stratum 2 = all other plots) and then draw a simple random sample from each stratum. Of course, an added benefit of the systematic survey is that it provides you with data on the distribution of deer throughout Camp Ripley, which may be valuable information in its own right.

3. Always be cognizant of the distinction between the statistical and biological populations. Movement and distribution of deer in and around Camp Ripley (the biological populations) may vary substantially within and among years. I think expanding your sampling frame to include potentially important peripheral areas was a good idea. However, absolute differences in population estimates for Camp Ripley (the statistical population) should be viewed cautiously, especially if there are weather or other events that may have influenced the number and distribution of deer using Camp Ripley during the survey (i.e., compared to other survey years). Differences in distribution of deer among cover types by year could also influence visibility bias, especially if substantially more deer are located in heavy conifer cover and P(det) is low in this cover type. This is a common interpretation challenge with many big-game surveys. Replicate surveys may provide additional information on sampling variation (e.g., due to variation in P[det] among replicates), but the cost-benefit tradeoff may not be worth it if most of the sampling variation is due to random movement of deer among plots (i.e., random sampling already provides an estimate of this source of variation).

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Appendix M. Fisher and Marten Demography and Habitat Use in Minnesota.

FISHER AND MARTEN DEMOGRAPHY AND HABITAT USE IN MINNESOTA

John Erb, Pam Coy, and Barry Sampson

SUMMARY OF FINDINGS

During winter 2007-08, we began work on a study of fisher (*Martes pennanti*) and marten (*Martes americana*) ecology in northern Minnesota. The primary goal this winter was to radiocollar a sample of animals to allow us to evaluate various field methods. A total of 18 martens (11M, 7F) were captured. Five martens (1M, 4F) appear to have slipped their collars in the first 6 weeks after capture. Of the remaining 13 martens, 3 (2M, 1F) were killed by raptors, 1 female dispersed, traversing ~ 15 miles (now missing), and 9 are currently being monitored. We radiocollared 9 fishers (2M, 7F), but 3 collars, all on females, fell off after the collar material broke (1 was later re-collared). Prior to the collar breaking, 1 female fisher dispersed 13 miles. Of the 7 fishers that remained collared, 1 female appears to have been accidentally or illegally trapped after the season closed, 1 female is missing, and 5 are currently being monitored. Only 2 of the currently monitored animals (1 fisher, 1 marten) are suspected to be adult females, but neither appears to have established a den and given birth. During winter, we opportunistically located 5 winter resting sites used by marten, including 1 in a rock pile, 1 in a slash/debris pile, and 3 in underground tunnels in the mossy substrate of lowland conifer forest. Since spring, we have also documented 2 above-ground marten rest sites, both in tree cavities. During winter, we also opportunistically located 5 fisher resting sites, including 2 in tree cavities, 1 in a slash pile, 1 in a beaver (*Castor canadensis*) dam, and 1 in an abandoned muskrat (*Ondatra zibethicus*) or beaver bank den. Since spring, 2 additional fisher rest sites were located, 1 in a red squirrel (*Tamiasciurus hudsonicus*) nest and 1 in a tree cavity. We have begun establishing prey sampling transects in the study areas, and are preparing to measure vegetative characteristics in animal home ranges. Full-scale trapping and collaring will begin in winter 2008-09.

INTRODUCTION

American marten and fisher are native to Minnesota, but reliable documentation of their historic distribution is limited. Undoubtedly, northeastern Minnesota was a stronghold for the marten population, though notable numbers likely occurred in the northern border counties as far west as Roseau county. Limited information suggests they occurred as far south and west as Crow Wing and Polk counties. As a result of over-harvesting, marten were considered rare in Minnesota by 1900, and extensive logging and burning around the turn of the century further contributed to the near extirpation of marten from Minnesota by the 1930s (Swanson et al. 1945). Fishers in Minnesota appear to have historically occupied a larger geographic area than martens, extending further south and west into the hardwood dominated transition zone, and also into southeast Minnesota (Swanson et al. 1945, Balser and Longley 1966). The impacts of over-harvest and habitat alteration were equally as detrimental to fisher, with populations substantially reduced by the 1930s.

Legally, fisher and marten were unprotected in Minnesota prior to 1917, after which harvest season length restrictions were implemented. These protections were removed in the mid-1920s, and remained so until all harvest was prohibited in 1929. Seasons remained closed until 1977 for fisher and 1985 for marten, when limited harvests were reinstated. Since then, trapping zones and quotas have periodically increased to the current combined quota of 5 fisher/marten per trapper. Recent harvest levels have been near 3,500 and 2,500 for marten and fisher, respectively. While harvest is legal in ~ the northern 50% of the state, most marten harvest occurs in counties bordering Canada, particularly in northeast and north-central Minnesota. Fisher harvest occurs in most of the northern 50% of the state, though harvest is

comparatively low in extreme northeast Minnesota (Lake and Cook counties), and rare, though perhaps increasing, in the Red River Valley (western Minnesota) and the highly fragmented transitional forests in central Minnesota.

While both species appear to have naturally re-colonized a significant portion of their historic range, Minnesota-specific information on species biology and ecology is limited. Except for carcass data obtained from harvested fisher and marten, we are aware of only 1 published field study in Minnesota. Specifically, Mech and Rogers (1977) opportunistically radiocollared 4 marten and reported survival and home range information for those animals. This information is now nearly 30 years old, and based on a very limited sample size. While fisher and marten populations appear to be 'healthy' based on current occupied range and recent harvest levels, their lower reproductive potential, lower density, and comparatively narrow habitat requirements make them more susceptible to over-harvest and the negative effects of human development and habitat alteration.

The primary objectives of this study are to: (1) estimate survival rates and causes of mortality for fisher and marten in Minnesota; (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.

Winter 2007-08 marked the pilot year of the study, with efforts focused on evaluating trapping and handling methods, radiocollar designs, aerial relocation efficacy, and den confirmation and inspection methods. Herein we present only those methods and results pertinent to field methods employed during the pilot year. Other objective-specific methods will be detailed in future years as results become available.

STUDY AREA

Marten research is focused on 1 study area located in northeastern Minnesota (Figure 1; Area 1). The area (~ 700 km^2) is composed of ~ 69% mixed forest, 15% lowland conifer or bog, 5% upland coniferous forest, 4% gravel pits and open mines, 3% regenerating forest (deciduous and coniferous), 2% shrubby grassland, 1% marsh and fen, 1% open water, and 0.4% deciduous forest. The area is ~ 90% public ownership, including portions of the Superior National Forest and state and county lands. Fishers are also present in this area at low to moderate density.

Fisher research will take place in 3 areas (Figure 1; Areas 1, 2, and 3), though the study in Area 3, a collaborative effort between Camp Ripley Military Reservation, Central Lakes Community College, and the Minnesota Department of Natural Resources, is not discussed in detail in this report. Area 2 (1075 km^2), our primary fisher study area, is composed of ~ 74% deciduous forest, 11% open water, 5% lowland conifer or bog, 5% marsh and fen, 2% regenerating forest (deciduous and coniferous), 1% coniferous forest, 1% grassland, and 1% mixed forest. Area 2 is ~ 67% public ownership, including portions of the Chippewa National Forest and State and county lands. Extremely few martens occupy Area 2.

METHODS

Our goal the first winter was to capture 15 martens and 15 fishers to evaluate numerous field techniques. We used cage traps to capture both fishers (Tomahawk Model 108) and martens (Tomahawk Model 106 or 108) during winter. Traps were baited with either deer or beaver meat, with commercial lure placed in or above the traps. We enclosed traps inside white plastic 'feed sacks' or burlap bags and further covered traps with snow or vegetation. All traps were checked daily.

To immobilize animals, we used metal 'combs' to restrict the animal to a small portion of the trap, or restrained the animal against the side of the trap by pulling its tail through the cage mesh. Animals were injected with a hand-syringe using a 10:1 mixture of ketamine and xylazine

(fisher: 30 mg/kg ketamine and 3 mg/kg xylazine; marten: 20 mg/kg ketamine, 2 mg/kg xylazine) (Kreeger et al. 2002). After processing, the xylazine was reversed with yohimbine at a dosage of 0.1 mg/kg (marten) or 0.15 mg/kg (fisher). We ear-tagged fisher with a monel # 3 tag in one ear (National Band and Tag Co., Newport, KY) and a 2-piece plastic mini-tag (Dalton I.D. Systems, UK) in the other ear. Marten were ear-tagged with a monel #1 tag (National Band and Tag Co., Newport, KY) in each ear. Passive Integrated Transponder (PIT) tags or lip tattoos may be used in the future if ear-tag retention is low.

During processing, animals were placed on either chemical hand warmers or heating pads connected to a power inverter and 12 volt battery. We monitored respiration, pulse, and rectal temperature during anesthesia. We weighed and sexed animals and removed a first pre-molar for aging. Morphological measurements taken included body length, tail length, hind foot length, and chest, neck, and head circumference. We removed guard hair samples for subsequent genotyping, and for evaluating the use of stable isotope analysis for deciphering food habits (Ben-David et al. 1997). To determine which females were pregnant in mid-winter, and eventually the percent of those that failed to produce a litter in spring, we planned to draw blood samples from either the jugular or femoral vein to measure serum progesterone levels (Frost et al. 1997). We were unsuccessful at drawing blood, but hope additional experience or training will allow us to do so in the future. Antibiotics were administered subcutaneously to all animals prior to release.

During the pilot year, we deployed several radiocollar models to compare overall performance. Fishers were collared with an ATS M1585 zip-tie collar (~ 43 g), an ATS M1930 collar (~ 38 g; deployed on females only) with a 16on/8off duty cycle, or a Lotec SMRC-3 collar (~ 61 g; deployed on adult males only). Martens were collared with an ATS M1565 zip-tie collar (~ 32 g), an ATS M1930 collar (~ 38 g; deployed on males only) with a 16on/8off duty cycle, or a Holohil MI-2 collar (~ 31 g). All radiolocations, except for some taken during the den-monitoring period, will be obtained from fixed-wing aircraft at approximately weekly intervals. During the pilot year, and periodically thereafter, we will test the accuracy of aerial radiolocations by placing transmitters in known locations of varying forest structure, and compute the mean distance between known and estimated locations. Detailed information on radiolocation methods and analysis will be presented in future years.

While data is absent for Minnesota, nearly all reported fisher natal dens have been in elevated tree cavities (Powell et al. 2003). Marten natal dens are also frequently in tree cavities (Gilbert et al. 1997), but may occur in more varied features (e.g., under-ground burrows, exposed root masses of trees, rock piles, large downed logs; Ruggiero et al. 1998). Confirmation of parturition and den location can often be accomplished by monitoring female movements and behavior. When necessary to help confirm exact den location, and to monitor female den attendance and kit emergence, we will also utilize remotely triggered cameras positioned near suspected dens (Jones et al. 1997). After den locations are confirmed, we will wait ~ 2 weeks and attempt to obtain counts of litter size using video inspection equipment. For viewing underground and tree cavity dens, we are evaluating use of a modified Aqua-Vu Scout SRT black and white video camera (Nature Vision Inc., Brainerd, MN), or an MVC2120-WP color video camera (Micro Video Products, Bobcaygeon, Ontario) connected to a laptop computer. Dens will only be examined when radio-marked females are not present. After initial den and litter confirmation, we will re-examine dens at 30-day intervals (up to 120 days) to determine which females recruit at least 1 offspring to the fall population.

RESULTS AND DISCUSSION

A total of 18 martens (11M, 7F) and 9 fishers (2M, 7F) were radiocollared during the first winter (Table 1). Tooth aging has not yet been completed. Of the 18 martens collared, 3 individuals (1M, 2F) were able to subsequently slip the collars off. Two additional females are presumed to have slipped their collars as well, but we have not yet been able to access the collar location to confirm (1 in a rock pile, 1 in a white pine tree cavity). No fishers have slipped their collars, but 3 females lost collars when the collar attachments broke (ATS M1585 zip-tie

attachment collars). One female was recaptured shortly thereafter, and a new collar was attached.

While we have yet to compute the number of captures per trap night, capture rate was considered high for marten in Area 1, with 18 individuals, plus 1 fisher, being captured in approximately 12 days of trapping by 1 trapping crew. While additional fisher captures would likely have occurred in Area 1, trapping was terminated after reaching our goal for marten capture. Fisher capture success was low in Area 2, with only 7 fisher being captured over ~ 10 weeks of trapping. While the low capture success appears due in part to a recent decline in fisher numbers, we believe it is also attributable to our decision to utilize only 1 trapping crew this first winter, which necessitated moving traps more frequently than desired in an attempt to examine or trap all portions of both study areas.

Three marten mortalities have been confirmed, all from raptor predation. Two males were killed within ~ 100 m of each other, but neither were consumed. Both were found along a forest edge (open power line corridor) and appeared to have escaped the initial attack, but puncture wounds penetrating the heart or lungs caused death shortly thereafter. One female marten was killed, likely carried a distance to a perch, and 'plucked', with only the head, fur, and collar remaining at the site. No human-related marten mortalities have been documented, but radiocollaring efforts began after the close of the harvest season. Only 1 fisher death has been documented, a female that appears to have been accidentally or illegally trapped after the harvest season closed.

One female fisher, we suspect a juvenile, dispersed 13 miles before her collar attachment broke and fell off. One female marten traversed ~ 15 miles since capture, though the maximum distance she was ever located from her original location center was ~ 6 miles. She is currently missing. Two other martens, both males, have moved 4-6 miles from their original location.

Of the 7 female martens captured, 4 slipped collars and 1 was killed by a raptor. For the remaining 2, 1 suspected juvenile is missing and 1 suspected adult does not appear to have established a natal den. Of the 7 female fishers captured, 3 lost collars when the collar attachment broke (1 was subsequently re-collared), 1 was accidentally or illegally trapped, and 1 is missing. For the 3 females currently collared, only 1 was suspected as being an adult, and she does not appear to have established a natal den.

Because no natal dens were confirmed, we have been unable to fully evaluate our video and camera methods for confirming dens, ascertaining litter size, or monitoring den attendance by females. However, as part of collar retrieval and ground checks on potentially denned females, we have had opportunity to document and examine various resting/den sites. Throughout winter, all resting sites we located for marten were either on or below ground, including 1 in a rock pile, 1 in an old slash/debris pile, and 3 underground in the mossy substrate of lowland conifer stands. During spring, we have also confirmed 2 marten resting sites in above ground tree cavities (1 in a live white pine, 1 in a black spruce snag), and another resting site in a slash/debris pile. While this sparse and opportunistic sample of resting sites is inadequate to draw any strong conclusions, it appears that martens may primarily use on- or below-ground dens in winter, with increasing use of above-ground sites in other seasons.

We confirmed 5 fisher resting sites used in winter, including 2 in tree cavities in large-diameter snags (1 trembling aspen (*Populus tremuloides*), 1 sugar maple (*Acer saccharum*)), 1 in a slash pile, 1 in a beaver dam, and 1 in an abandoned muskrat or beaver bank burrow on the edge of an old beaver pond. During spring, 1 collared female fisher has also been located in a red squirrel nest, and 1 non-radioed animal was followed to a tree cavity in a sugar maple snag.

Both video systems we are evaluating appear adequate for viewing details inside tree cavities and underground dens. Numerous slipped or broken collars were observed in such dens with the use of the portable video systems. We continue to experiment with improved (sufficiently sturdy, yet lightweight) poles for elevating the video probe to higher tree cavity entrances, and better underground attachments that are sufficiently sturdy to advance the video probe into the den, yet flexible and maneuverable enough for turning in more complex dens.

We also deployed a Reconyx PC85 remotely triggered camera (Reconyx LLP, Holmen, Wisconsin) at several potential natal den sites. While we did obtain pictures of a fisher near a suspected den site, we did not confirm repeated fisher or marten use at any of the monitored locations (i.e., they were not natal dens). Cameras also captured activity of other species, including squirrels, raccoons (*Procyon lotor*), and white-tailed deer (*Odocoileus virginianus*), and the cameras obtained sufficiently rapid sequences of pictures (~ 1 per second) necessary to detect quick movements to and from potential den sites.

FUTURE PLANS

Full-scale radiocollaring of fishers and martens will begin in December 2008, with a goal of annually collaring 40 martens (Area 1) and 30-40 fishers (~ 10 fisher in Area 1, 20 in Area 2, and 5-10 in Area 3). The project is currently planned as a 6-year study. Throughout this summer and fall, prey and vegetation sampling will commence, as will establishment of weather monitoring locations. More detailed description of these methods will be presented in subsequent years. Here, we outline basic sampling plans.

Prey sampling transects are being established in both study areas. Transects (n = 200 in each study area) will consist of 10 sampling locations spaced 20m apart, distributed in various cover types throughout the study area. Transects will generally be oriented perpendicular to roads or trails, with the first plot 30m off the trail. In spring, we will count snowshoe hare (*Lepus americanus*) pellets in a 1-m^2 plot at each sampling station (McCann et al. 2008). During fall, small mammal snap-trapping will occur for 2 consecutive days at the same sampling stations, similar to protocol used on an existing small mammal survey in Minnesota (Olson 2006). During both spring (hare pellet sampling) and fall (small mammal trapping), we will also count the number of red squirrels observed or heard along each transect. Rather than using 10-min point counts (Mattson and Reinhart 1996, Bayne and Hobson 2000), with our small mammal/hare pellet stations as the sampling points, we will simply record the number of unique squirrels observed/heard along each transect while checking pellet plots and small mammal traps. Information on white-tailed deer and ruffed grouse (*Bonasa umbellus*) populations may be available from existing surveys or population models.

Throughout summer, we will collect vegetative information from individual fisher and marten home ranges. Sampling will occur in randomly located plots, stratified by cover type within each home range. We will collect quantitative data on: (1) tree DBH and height, and ultimately basal area and volume of trees, by species; (2) % canopy cover (deciduous and coniferous); (3) sapling density; (4) understory cover density; (5) density and volume of snags; (6) density, volume, and other characteristics of coarse woody debris; and (7) density and volume of exposed root masses.

Weather sampling stations will be established within different cover types throughout the study area. At each station we will monitor daily temperature throughout the year, and weekly snow depth and snow density from ~ December 1 – May 1. Depending on the amount of spatial variability in temperature and snow conditions within a study area, we will either assign a study area specific average to all animals, or assign home-range specific results based on data from the nearest cover type appropriate stations.

Prey sampling data will be summarized by cover type, and, along with vegetative data from home ranges and pertinent weather information, will be used to help elucidate any observed differences in survival and reproduction across individuals or years, and to evaluate the reliability or applicability of existing fisher or marten habitat models/recommendations developed elsewhere (e.g., Allen 1982, 1983, Carroll et al. 1999, Naylor et al. 1999, Payer and Harrison 2004, Fuller and Harrison 2005, Bowman and Robitaille 2005, Zielinski et al. 2006). We will also continue to collect tissue samples from prey species to quantify species-specific stable isotope ratios. If prey-specific chemical signatures are sufficiently distinct, it may be possible to describe late-summer/fall food habits for fisher and marten based on chemical analysis of guard hair samples. In addition, we will examine whether animal-specific isotope ratios are correlated with home range habitat characteristics (e.g., cover type) or prey

population indices, and whether there is any correlation between isotope ratios (food habits) and survival or reproductive success.

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Table 1. Sex, weight, and status of fishers and martens radiocollared during winter 2007-08.

Study Area	Species	ID	Sex	Weight (kg)	Status
Area 1	fisher	F08-304	F	2.50	Alive
Area 1	marten	M08-140	F	0.65	Alive
Area 1	marten	M08-162	F	0.60	Disperser, now missing
Area 1	marten	M08-206	F	0.61	Raptor predation
Area 1	marten	M08-202	F	0.50	Slipped collar
Area 1	marten	M08-188	F	0.62	Presumed slipped collar – not yet retrieved
Area 1	marten	M08-138	F	0.52	Slipped collar
Area 1	marten	M08-213	F	0.61	Presumed slipped collar – not yet retrieved
Area 1	marten	M08-161	M	0.82	Alive
Area 1	marten	M08-184	M	0.89	Alive
Area 1	marten	M08-136	M	0.79	Alive
Area 1	marten	M08-134	M	0.89	Alive
Area 1	marten	M08-204	M	0.82	Alive
Area 1	marten	M08-215	M	1.07	Alive
Area 1	marten	M08-217	M	1.06	Alive
Area 1	marten	M08-219	M	0.81	Alive
Area 1	marten	M08-211	M	1.05	Raptor predation
Area 1	marten	M08-209	M	0.90	Raptor predation
Area 1	marten	M08-132	M	0.71	Slipped collar
Area 2	fisher	F08-375	F	2.70	Collar attachment broke, re-collared, now missing
Area 2	fisher	F08-353	F	2.95	Alive
Area 2	fisher	F08-351	F	2.70	Accidentally or illegally trapped
Area 2	fisher	F07-002	F	2.60	Collar attachment broke
Area 2	fisher	F08-374	F	2.70	Collar attachment broke
Area 2	fisher	F08-077	M	2.50	Alive
Area 2	fisher	F08-373	M	4.70	Alive
Area 3	fisher	F07-326	F	2.7	Alive

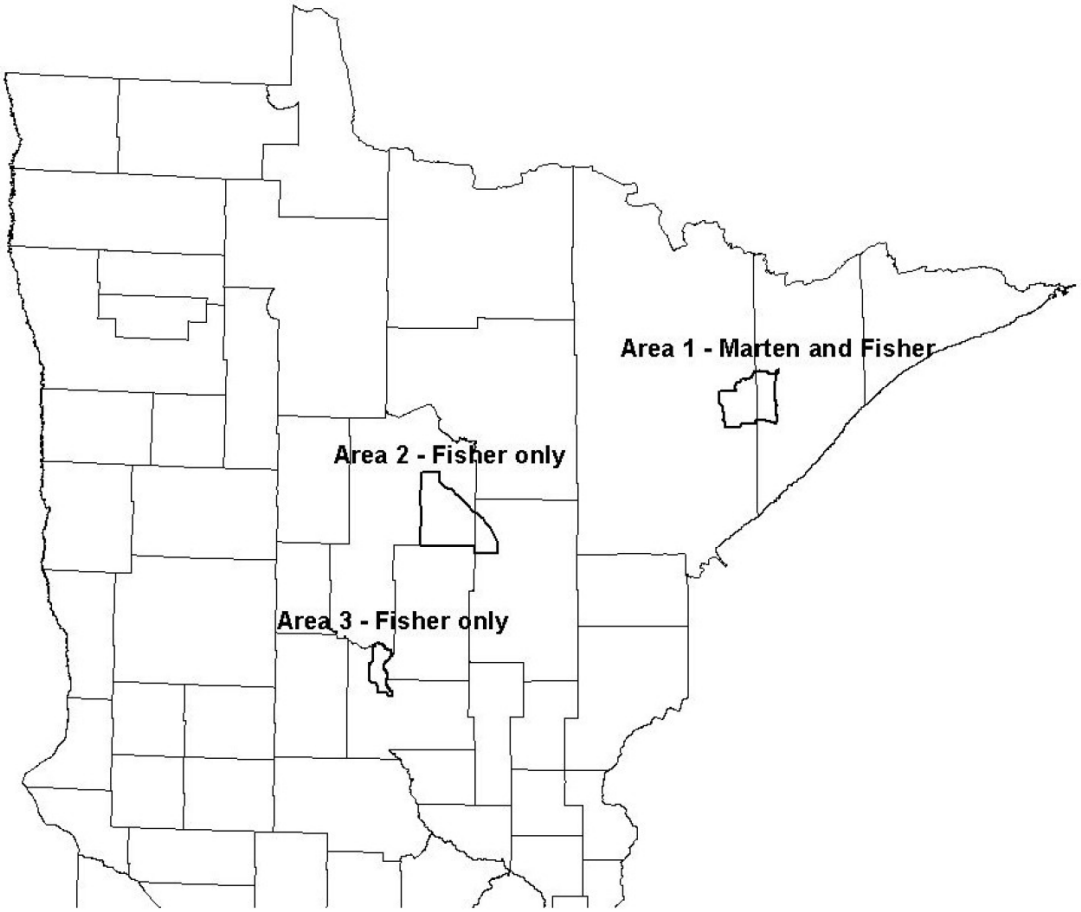

Figure 1. Fisher and marten study areas.

Appendix N. Camp Ripley fisher project graduate student proposal, 2008.

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

Introduction:

Historical Background:

Fisher (*Martes pennanti*) populations were nearly extirpated throughout their historic range in the United States due to over-harvesting and habitat loss, which was also true for Minnesota (Powell 1981). No protective measures were in place in Minnesota before 1917 when fisher harvest was prohibited from the first of March to the fifteenth of October, while trapping seasons were shortened by two additional weeks in both 1918 and 1923 (Balser and Longley 1966). In 1933 the harvest of fisher at any time was prohibited until it was reopened in 1977 (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 unknown. (Balser and Longley 1966).

Current Survey Method:

To estimate fisher population size, the Minnesota Department of Natural Resources (MNDNR) uses track surveys (John Erb, unpublished data). The track method requires adequate snowfall and quality, ability to identify tracks, and access to fisher populations (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). With the use of radiotelemetry the delineation of home range sizes has been more accurate, 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.

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 for dens and resting sites (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 found in 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).

Project Goals:

1) Determine home range size for adult male and female fisher.
2) Locate and describe natal den sites.
3) Identify factors used by adult female fisher to select den sites.
4) Estimate parturition rate and juvenile survival rate.
5) Use light detection and ranging information to determine vegetative habitat structure within predetermined home range boundaries and the area within 50 meters of recorded tracks.
6) 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.

Materials and Methods:

Trapping:

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 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. Fisher will not be live-trapped during the months of April through July to avoid interruption of the breeding cycle and rearing of offspring. Twenty 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 individuals will be immobilized (under the supervision of Dr. Brent Henkes, D.V.M. and Brian Dirks, Camp Ripley Animal Survey Coordinator) with a 33 mg/kg of a 10:1 ratio of Ketamine:Xylazine via jabstick (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, Belant 2001). To prevent injury to the animal and to avoid administering improper doses, individuals will be restrained using live-trap dividers (Thomasma and Peterson 1998). Anesthetized individuals will be weighed, sexed, standard body measurements taken, and have a hair sample removed for DNA analysis. After measurements have been taken animals will be fitted with standard VHF radio-collars (radio transmitter, Model #M1930, Advanced Telemetry Systems, Isanti, MN) and an ear tag (National Wing Bands Style 893, National Band and Tag Co. Newport, KY). The radio-collars are designed to last two years. 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, Self and Kerns 2001, Weir and Corbould 2007). Animals will then be placed back into the trap until they regain dexterity whereupon they will be released. If an inadequate number of individuals have been fitted with collars (<4) by January 31st, 2008 local fur-bearing trappers (<5 miles of Camp Ripley border) will be offered current maximum pelt price about $65 per live-trapped fisher to be fitted with radiotransmitters.

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). These hair-snaring devices have ranged from using live-stock currycombs, barb-wire, glue-traps, and gun brushes. For this study the use of currycombs will be implemented following Belant (2003). Samples will be used to identify presence or absence of fisher and to distinguish between individuals. During the breeding and whelping season (April to mid-August) traps will be modified into hair-snares (Arthur 1988). Each trap will have a currycomb (4 circular steel bands, 10.6 cm external diameter) attached to the door with three plastic securing devices (Belant 2003). The currycomb will be oriented so that the large-toothed side will collect the hair sample. Zip-ties will allow the door to open and close as normal but will not allow it to lock; this is achieved by looping each zip-tie around both sections of the door. What this will enable is the safe departure of the animal as well as safely gathering a single hair sample. After the animal exits, the door remains shut eliminating the possibility of contaminating the sample from another animal. If hair-snaring fails to produce the desired results it will be excised from the project.

Radiotelemetry:

Using a minimum of 25 triangulated points, home range size will be determined using 100% minimum convex polygon (MCP) (Arthur et al 1989, Zielinski et al 2004, Koen et al 2007). 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). Within state home range sizes have been shown to differ as well (Zielinski et al 2004).

Radiotelemetry will also be used to locate females during the reproductive season to locate 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, personal communication). Once a den has been identified the location and the den will described based on distance to road, elevation, cover type, height of den opening, the species and dbh of den tree (adopted by Baldwin and Bender 2007). When dealing with a species that rear offspring in a den, it is important to identify key factors that are used by animals to select den sites for the management of the species (Baldwin and Bender 2007). Dens will be inspected with video probes to determine litter size and to describe the structure of the natal den. Remotely operated video probes were successfully used with spotted hyenas (*Crocuta crocuta*) to document productivity, neonatal mortality, and litter size prior to emerging from the den (White et al 2006). 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, personal communication). Juvenile survival will be determined by monitoring offspring (either by homing in on the mother's signal or via remote cameras) at birth, 30, 60, and 90 days of age (John Erb, personal communication).

Vegetation Structure:

Existing aerial LIght Detection And Ranging (Lidar) information will be used to estimate vegetation structure within delineated home ranges to determine habitat useage. Lidar is a remote

sensing technology that can create a three dimensional measurement of the canopy and sub-canopy (Lefsky et al 2002). 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%.

During winter months fisher tracks will be recorded by following the fisher trail with a hand-held GPS unit. Following tracks has been used to find kill sites, quantify kill success rate, and to note habitat use (Arthur et al 1989, Powell 1993). Although it is difficult to identify individuals by tracks, thereby eliminating the ability to determine a non-collared individual's home-range, this information may still prove useful. It is possible to determine if an animal is using habitat for hunting or if it is merely passing through by the track pattern (Powell 1993).

Dietary Analysis:

A common method to determine the diet of carnivore species is to analyze the contents of gastrointestinal tracts (GI tracts) (Powell 1993). These data can be used to determine the frequency of occurrence and the total volume of prey species (Powell 1993). These data are qualitative and will only be used as an index as proposed by Powell (1993).

Known prey species of fisher in Minnesota include snowshoe hare (*Lepus americanus*), red squirrel (*Tamiasciurus hudsonicus*), gray squirrel (*Sciurus carolinesis*), cottontail rabbit (*Sylvilagus floridanus*), various small mammals (deer mice [*Peromyscus* spp.], voles [*Microtus* spp., *Clethrionomys gapperi*], lemmings [*Synaptomys* spp.], shrews [*Sorex cinereus*, *Blarina brevicauda*], and moles [*Chondylura cristata*]) and porcupine (*Erethizon dorsatum*) (Kuehn 1989). Other items include various reptiles, amphibians, birds, deer carrion (*Odocoileus virginianus*) and fruits (Kuehn 1989).

Gastrointestinal tracts will be taken from the carcasses of legally harvested fisher from the following counties in Minnesota; Aitkin, Cass, Crow Wing, Mille Lacs, Morrison, and Todd (Giuliano et al 1989, Kuehn 1989, Weir and Harestad 2005). These counties were chosen for their proximity to Camp Ripley and that they were not included in Kuehn's study of northern Minnesota counties, which included Beltrami, Cook, Itasca, Koochiching, Lake, Lake of the Woods, and Saint Louis (1989). Both study areas can be seen in Figure 2. 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). Following Guiliano and co-workers harvested fisher will be classified by age, sex, and mass (1989).

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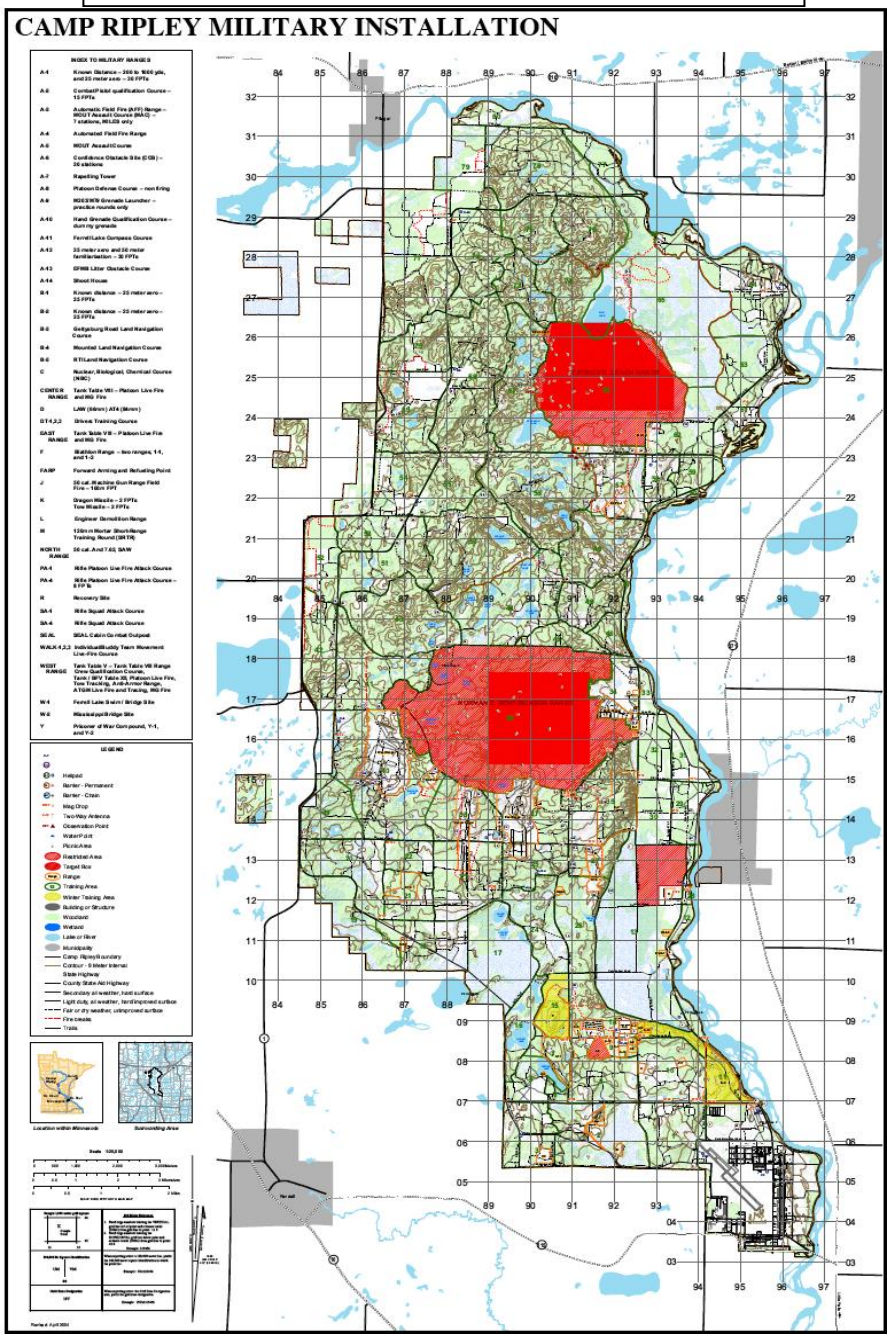
Figure 1. Camp Ripley encompasses 53,000 acres.



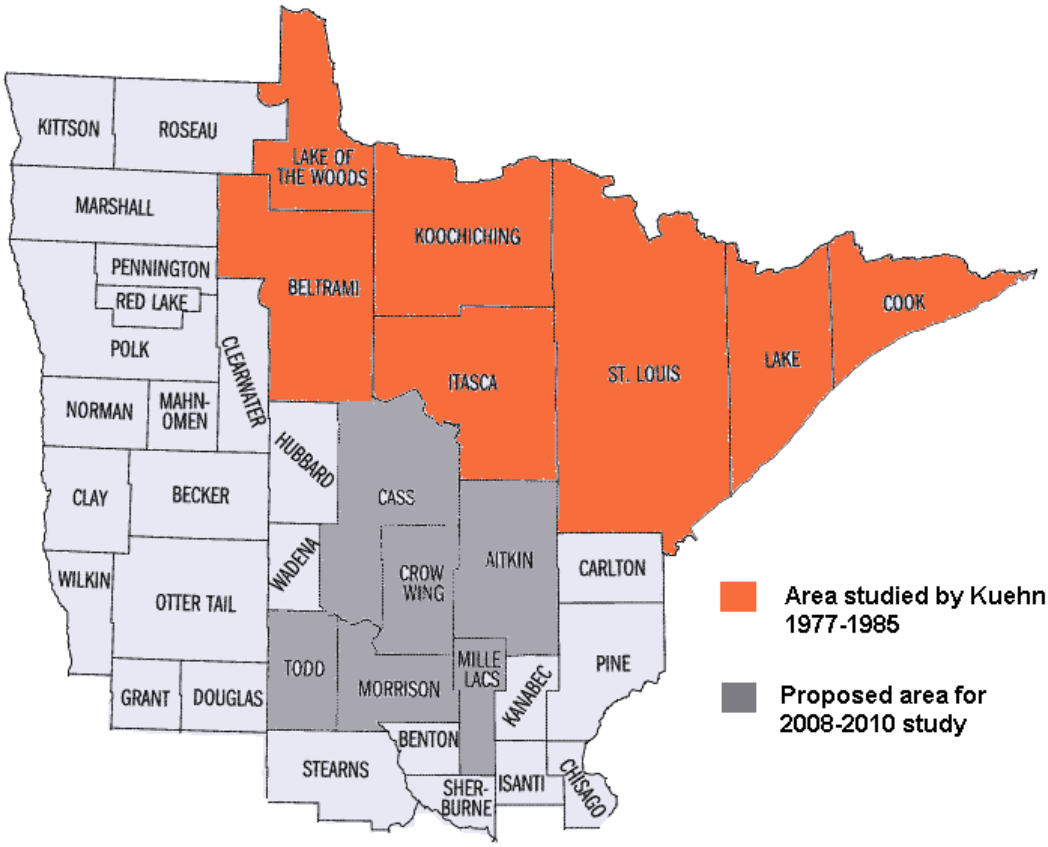


Figure 2: The focal area of Kuehn's study encompassed 50, 300 square kilometers of the northern range of the fisher population. This study will encompass 19,360 square kilometers of the southern range of fishers in Minnesota.

Appendix O. Lake management plans, Camp Ripley, 2008.

LAKE MANAGEMENT PLAN (Fosdick Lake)

Region	DNR Area	D.O.W. Number	County	Lake Name	Acreage
Camp Ripley	Little Falls	49-64	Morrison	Fosdick	26

Long Range Goal: Attempt to maintain the abundance of Crappies > 9 inch (8/ trap net).

Operational Plan:

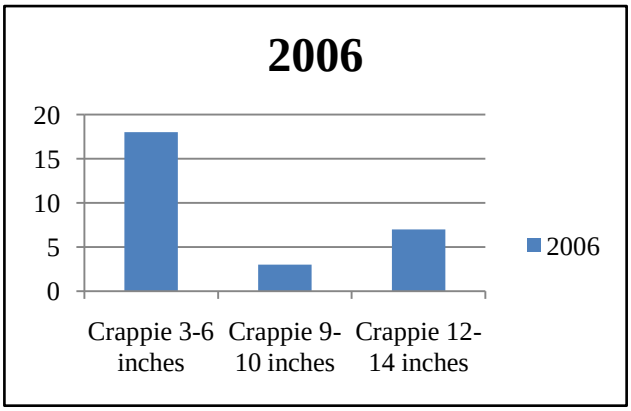
1. Assess size structure of crappie and walleye with spring trap netting in odd years, next survey 2009.
2. Continue to implement the creel/recreational use survey through Range Control.

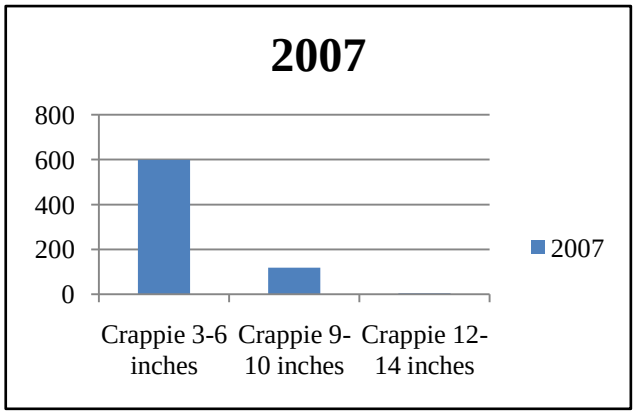
Midrange Objective:
Improve the lake as a crappie and walleye fishery.

Potential Plan:
1. Bi-annually; stock walleye fingerlings at a rate of up to 1 lb/acre (26 lbs), (Carry-over from a Camp Ripley water basin).
2. In fall of 2008 close existing access and establish a new access on East side of Lake. (Reference map).
3. In 2009-2010 establish a fishing pier near the new access. (Reference map).

NARRATIVE: (Historical perspectives - various surveys; past management; social considerations; present limiting factors; survey needs)

Historically Fosdick Lake was used a walleye rearing pond by the DNR until 2005 when it was converted over to a recreational fishery by the DMA. In the spring of 2005, 13 adult crappies were added to the lake. Nine trap nets were placed into Fosdick Lake in the spring of 2006 and 2007 to determine size and fish present. Seven walleyes were netted in 2006 ranging from 16-22 inches and 1 walleye was netted in 2007. Twenty-eight crappies were test netted in 2006 and 713 crappies were netted in 2007. Refer to the graph for the sizes and numbers of crappies present.



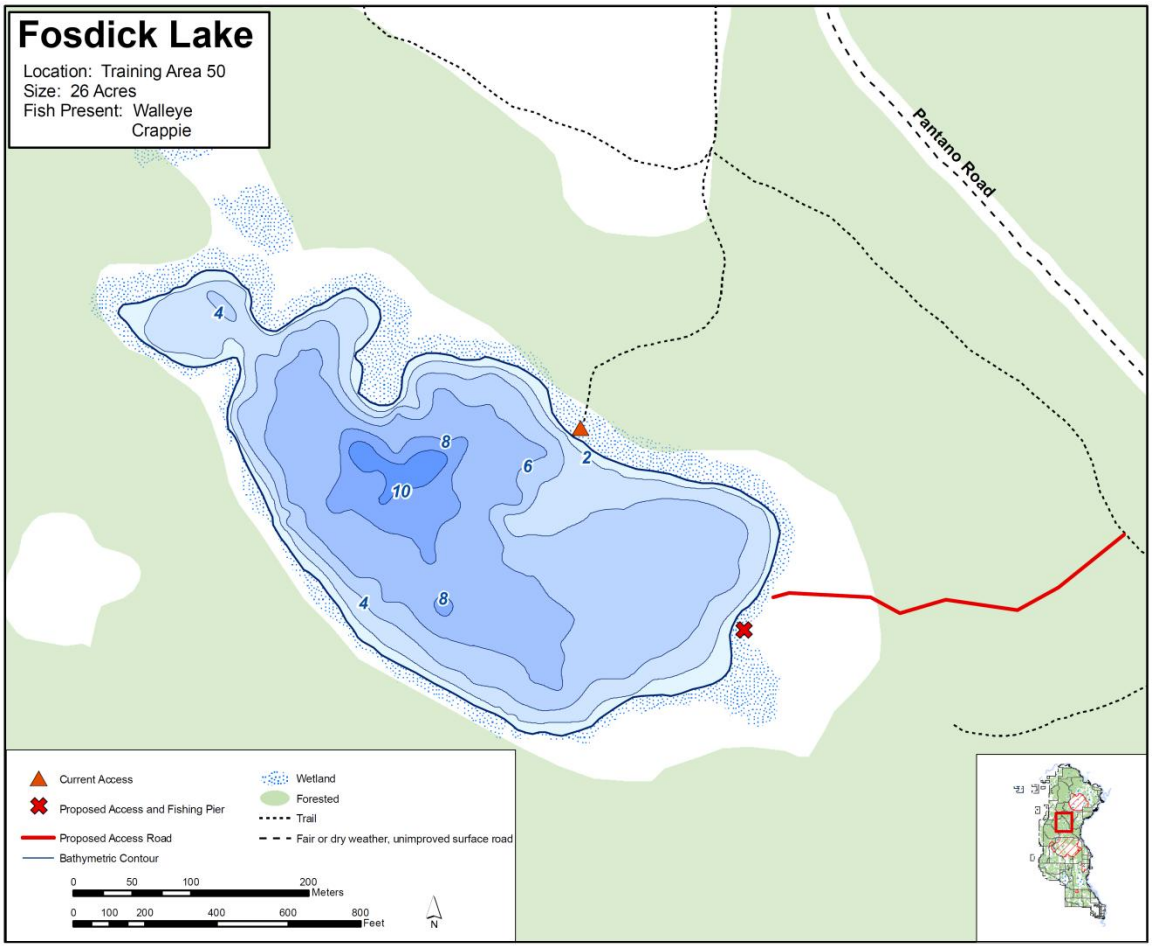


Creel Survey:
In 2007, there were 2 recorded fishing visits to Fosdick Lake. Sixteen (6 inch) crappies were caught and released.

In 2008 there were 6 recorded fishing visits to Fosdick Lake. Six-hundred and forty three crappies were caught and 28 were kept.

Primary Species Management:	Secondary Species Management:
Crappie	Walleye

DNR Area Fisheries Supervisor Signature:	Date:
DMA Natural Resource Manager Signature:	Date:


Fosdick Lake
Location: Training Area 50
Size: 26 Acres
Fish Present: Walleye
Crappie
Pantano Road
4
8
6
2
10
4
8
Current Access
Proposed Access and Fishing Pier
Proposed Access Road
Bathymetric Contour
Wetland
Forested
Trail
Fair or dry weather, unimproved surface road
0 50 100 200 Meters
0 100 200 400 600 800 Feet
N

LAKE MANAGEMENT PLAN (Ferrell Lake)

Region	DNR Area	D.O.W. Number	County	Lake Name	Acreage
Camp Ripley	Little Falls	49-58	Morrison	Ferrell	51

Long Range Goal: Attempt to maintain the abundance of walleyes (5/ trap net).

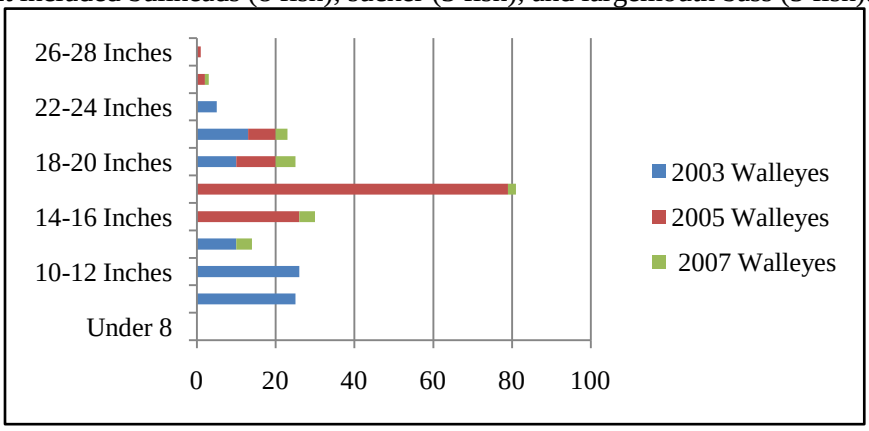
Operational Plan:
1. Assess size structure of bluegill and walleye with spring trap netting in odd years, next survey 2009.
2. Continue to implement Limit Regulations (3 Walleyes & 10 Bluegills).
3. Continue to implement the creel/recreational use survey through Range Control.

Midrange Objective:
Improve the lake as a walleye and bluegill fishery.

Potential Plan:
1. Bi-annually; stock walleye fingerlings at a rate of up to 1 lb/acre (51 lbs), (Carry-over from a Camp Ripley water basin).
2. In 2009-2010 establish a fishing pier on the West side of the lake. (Reference map).

NARRATIVE: (Historical perspectives - various surveys; past management; social considerations; present limiting factors; survey needs)

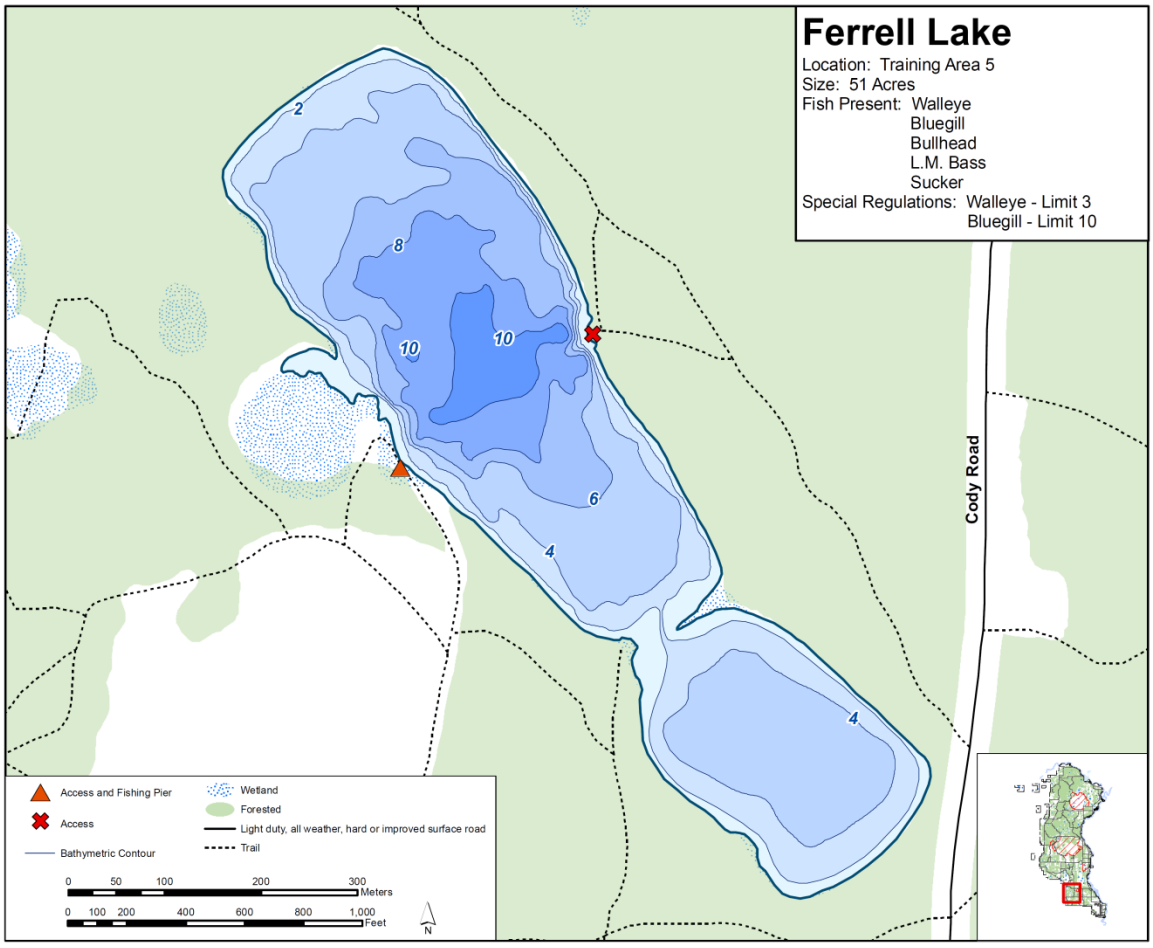
Ferrell Lake was reclaimed as a walleye rearing pond in 1983 and has had a carryover walleye population since that time. On September 13, 1999 trap netting in Ferrell Lake revealed the presence of several year classes of walleye from the 8-20 inches in length. So in 1999 Ferrell Lake was converted over to a recreational fishery by the DMA. From September 15-21, 1999 both Fosdick Lake and Cockburn Lake were harvested for walleye fingerlings by DMA. A total of 1,360 adult walleyes weighing 1,105.7 lbs. were stocked into Ferrell Lake. Also 62 lbs of Bluegills (17/lb.) were stocked into Ferrell Lake on September 17th, 1999. In spring of 2005, 2035 (5") walleyes (43/lb) were released into Ferrell Lake. In spring of 2007, 1232 (5") walleyes (46 /lb) were released into Ferrell Lake. Spring trap netting was completed in 2003, 2005 and 2007. The graph below depicts the number of walleyes and their size. In 2007 approx. 800 sunfish of all sizes were trap netted. Other fish present included bullheads (8 fish), sucker (3 fish), and largemouth bass (5 fish).



Creel Survey
In 2007, there were 47 recorded fishing visits to Ferrell Lake.
In 2008, there were 77 recorded fishing visits to Ferrell Lake.

Primary Species Management:	Secondary Species Management:
Walleye/Bluegill	Large Mouth Bass

DNR Area Fisheries Supervisor Signature:	Date:
DMA Natural Resource Manager Signature:	Date:


Ferrell Lake
Location: Training Area 5
Size: 51 Acres
Fish Present: Walleye
Bluegill
Bullhead
L.M. Bass
Sucker
Special Regulations: Walleye - Limit 3
Bluegill - Limit 10
Cody Road
2
8
10
10
6
4
4
Access and Fishing Pier
Access
Bathymetric Contour
Wetland
Forested
Light duty, all weather, hard or improved surface road
Trail
0 50 100 200 300 Meters
0 100 200 400 600 800 1,000 Feet
N

LAKE MANAGEMENT PLAN (Lake Alott)

Region	DNR Area	D.O.W. Number	County	Lake Name	Acreage
Camp Ripley	Little Falls	49-73	Morrison	Lake Alott	40

Long Range Goal: Increase the numbers of walleyes and maintain the diversity of fish species currently present.

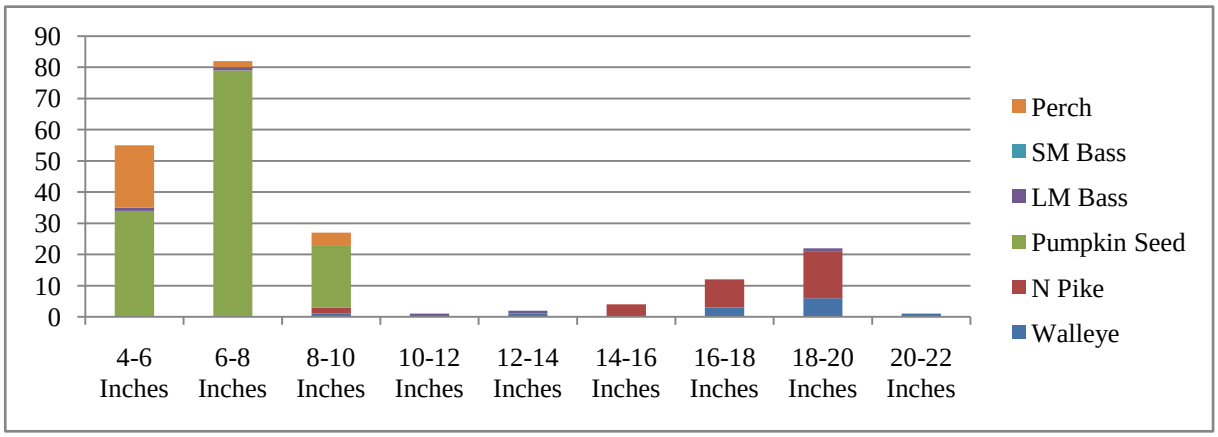
Operational Plan:
1. Trap net in spring of 2009 to assess fish abundance and sizes.
2. Continue to implement the creel/recreational use survey through Range Control.

Midrange Objective:
Improve the lake as a walleye fishery.

Potential Plan:
1. Bi-annually stock walleye fingerlings at a rate of up to 1 lb/acre (40 lbs), (Carry-over from a Camp Ripley water basin).
2. Introduce crappies to the lake.

NARRATIVE: (Historical perspectives - various surveys; past management; social considerations; present limiting factors; survey needs)

Historically Lake Alott was used a recreational fishery. Adult muskie "Mississippi River Strain" were stocked into Lake Alott in the mid 1980's. The intent was to determine if natural reproduction occurs. In the spring of 2005 net trapping was completed to determine size and fish present. The graph below list those species present. One Muskie at 42 inches was also trapped.

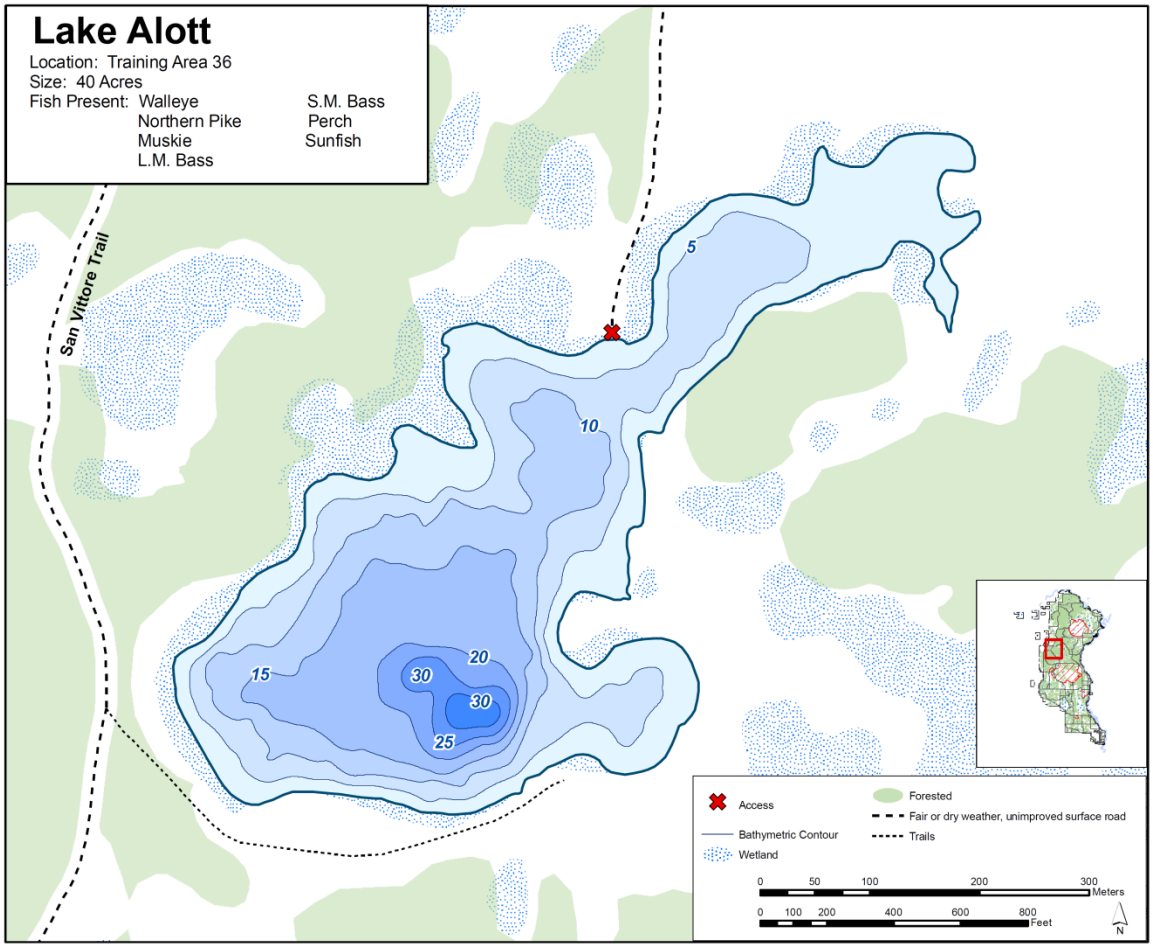


Creel Survey
In 2007, there were 7 recorded fishing visits to Lake Alott.

In 2008, there were 12 recorded fishing visits to Lake Allot.

Primary Species Management:	Secondary Species Management:
Walleye	Crappie

DNR Area Fisheries Supervisor Signature:	Date:
DMA Natural Resource Manager Signature:	Date:


Lake Alott
Location: Training Area 36
Size: 40 Acres
Fish Present: Walleye
Northern Pike
Muskie
L.M. Bass
S.M. Bass
Perch
Sunfish
San Vittore Trail
5
10
15
20
30
30
25
Access
Bathymetric Contour
Wetland
Forested
Fair or dry weather, unimproved surface road
Trails
0 50 100 200 300 Meters
0 100 200 400 600 800 Feet
N