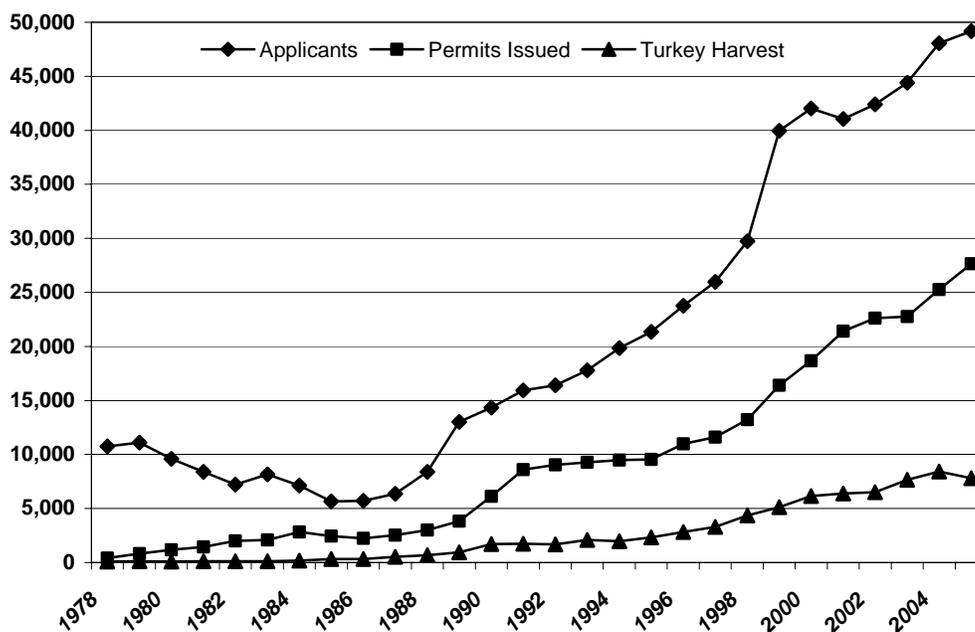


Minnesota Department of Natural Resources

Long Range Plan For The Wild Turkey In Minnesota



Minnesota Spring Wild Turkey Information



I. EXECUTIVE SUMMARY

This document provides a long-term vision for the wild turkey management program of the Minnesota Department of Natural Resources (MNDNR) with specific actions for fiscal years 2006-2011. The plan was completed in cooperation with the National Wild Turkey Federation (NWTF), Fond du Lac and Mille Lacs Bands of Ojibwe, White Earth Reservation, and the Great Lakes Indian Fish and Wildlife Commission. Long-range planning objectives have been combined with specific actions and time lines to form an operational plan.

Minnesota's wild turkey population has continued to expand since the first successful reintroduction in southeastern Minnesota in the 1960s. The trap and transplant program has successfully established a wild turkey population throughout the southern and western half of Minnesota. The 2006 turkey population is estimated at 60,000 birds with 32,856 spring 2006 turkey hunting permits available. However, demand for permits still exceeds availability. Therefore, MNDNR's 2011 management goal is to establish and maintain the spring wild turkey population at or above 75,000 in suitable habitats to maximize hunting and viewing opportunities. In order to meet that goal, this plan outlines actions for habitat management, acquisition/easements, hunting season management, population management, and information and education that will ensure a successful management program.

II. 2025 VISION STATEMENT

In 2025 there are 50,000-spring season wild turkey hunting permits available in Minnesota. Hunt quality is high with success rates over 20% and hunter interference rates less than 40%. The trap and transplant program has been completed after successfully filling appropriate available turkey habitat and the statewide turkey population exceeds 100,000 birds.

Although local turkey populations fluctuate with weather conditions, the wooded and agricultural landscape provides sufficient resources to maintain a self-sustaining population. However, a stable long-term population continues to depend upon adequate conservation of mature timber.

Turkey hunting continues to have an important impact on rural economies throughout the primary turkey range. Average expenditures by spring turkey hunters in 2005 were estimated at \$17 million dollars, much of which was funneled into the economy of rural Minnesota. In 2025 average expenditures exceed \$60 million dollars per year.

The following plan describes goals and actions to address issues related to northern range, trap and transplant, population and season management, land acquisition, and habitat management that will result in a spring population of 75,000 wild turkeys and 35,000 spring hunting permits by 2011.

III. HISTORICAL BACKGROUND

The ancestral range of eastern wild turkeys (*Meleagris gallopavo silvestris*) is believed to have included extreme southern Minnesota (Leopold 1931 and Mosby 1959). Turkeys were extirpated from Minnesota after 1880, because of the removal of forested habitats during settlement and unregulated hunting. The first attempts to re-establish wild turkeys in Minnesota occurred in the mid-1920s when hundreds of pen-reared birds were released throughout southern and central Minnesota. In 1926 approximately 250 pen-reared birds from Maryland, Pennsylvania, and Texas were released in 11 Minnesota counties. In 1957, 37 pen-reared turkeys purchased from the Alleghany Turkey Farm in Pennsylvania were released in the Whitewater Wildlife Management Area (WMA) in Winona County. All attempts using pen-raised turkeys failed.

Efforts using live-trapped wild turkeys to re-establish a Minnesota turkey population began in the 1960s. Between 1964-1968, 39 Merriam's wild turkeys (*Meleagris gallopavo merriami*) and eastern wild turkeys live-trapped in Nebraska, South Dakota, and Arkansas were released in the Whitewater WMA. However, the Merriam's subspecies was not well adapted to Minnesota's forest habitat. In 1971 and 1973, 29 eastern wild turkeys, trapped in Missouri and released in Houston County, demonstrated the potential of this subspecies to quickly expand in an area with proper habitat and develop a population that could sustain annual spring and fall hunting seasons. Minnesota's present wild turkey population is a direct result of releases in which only wild-trapped eastern wild turkeys were used.

Today, the establishment of wild turkeys throughout more than half of southern and western Minnesota (Figure 1) is considered to be a wildlife management success story. MNDNR has released wild turkeys throughout much of Minnesota through live-trapped turkeys introduced from Missouri, New York, Illinois, and other states, as well as translocating thousands of birds from within Minnesota (Appendix A). The rapid range expansion of wild turkey within Minnesota is a result of the excellent habitat provided by a mix of forest and agricultural land. Research has resulted in a broader understanding of turkey ecology in Minnesota and improved management techniques.

The first modern spring hunting season for wild turkeys occurred in 1978 in 2 permit areas in southeastern Minnesota (Figure 2). As turkey numbers increased, a fall season was initiated in 1990. By 2005, the opportunity to hunt wild turkeys had expanded to 66 hunting permit areas throughout half of Minnesota (Figure 3) with many permit areas having both spring and fall hunting. Even though 31,784 spring and 4,410 fall turkey hunting permits were available in 2005, interest still exceeded the opportunity to hunt (Appendix B). In order to increase hunting opportunity, MNDNR wildlife managers improve existing habitats to increase wild turkey numbers and identify new areas that can naturally sustain wild turkeys without negatively impacting other wildlife management efforts.

Several decades of research in Minnesota have provided valuable information about the wild turkey's requirements for life and ability to survive Minnesota's harsh winters. Wooded landscapes, interspersed with agricultural land, are the key to healthy wild turkey populations. Timberlands provide roosting sites and year-round cover, forest edges and openings provide

cover for nesting and brood rearing. Agricultural land provides an important and reliable food source. Haroldson et al. (1998) showed that turkeys could survive winter temperatures in Minnesota provided they could find food. Recent research efforts have focused on increasing hunter numbers while maintaining a safe and quality turkey hunting experience (Kimmel 2001).

Habitat management and research, plus cooperation between MNDNR, NWTF, and other sporting organizations have provided a healthy wild turkey population and excellent turkey hunting opportunities in Minnesota.

IV. RESOURCE MANAGEMENT

During the 1960's and 1970's when successful restoration efforts began and modern turkey hunting seasons were first established in Minnesota, management was limited to releasing wild turkeys in suitable habitats, establishing corn food plots, and monitoring the developing populations. Once a turkey hunting season was initiated, management expanded to include carefully setting and monitoring hunting seasons, enforcing hunting regulations, collecting harvest statistics, and monitoring population trends to delineate areas with turkey populations that could be hunted. In 1976 the Minnesota state NWTF chapter was formed providing additional funding for the wild turkey program. Food plot establishment in conjunction with an active trap and transplant program dominated turkey management activities through the late-1990s.

The Minnesota Legislature authorized the creation of the Wild Turkey Stamp in 1996 and it became effective March 1, 1997. This additional funding source increased the scope of habitat management for wild turkeys to include land acquisition and habitat development. The DNR Section of Wildlife and Division of Forestry have worked closely together to acquire and improve turkey habitat. Since the inception of the turkey stamp approximately 67% of habitat dollars have gone to land acquisition, 22% to forest and grassland development, and 11% to the establishment of food plots.

V. RESOURCE ANALYSIS

A. Habitat Needs

Quality habitat for eastern wild turkeys contains a combination of forested and open cover. Eastern wild turkeys were once thought to require only large tracts of undisturbed forest to persist. However, in Minnesota wild turkey populations were found to thrive in areas with only 20% forest habitat.

Nesting: Moderate to dense ground vegetation with a diverse mix of woody and herbaceous species characterizes wild turkey nesting habitat in Minnesota (Lazarus and Porter 1985). This type of dense ground vegetation is usually associated with forest openings or forest/field edge habitat, but turkeys will also nest in other habitats with appropriate concealment cover.

Brood-rearing: Good brood-rearing habitat needs to produce abundant insect populations where young poults can forage efficiently (Porter 1992). Habitat that provides cover for poults, but still

allows hens visibility to detect predators is ideal. Forest understory or fields with a diversity of herbaceous cover provide good foraging areas for poults.

Fall and Winter Habitat: Food and roosting cover are the two most important habitat components for wild turkeys during the fall and winter. Turkeys use mature hardwood and conifer stands for roosting. During winter, the use of conifers by wild turkeys for roosting might provide additional thermal protection. In Minnesota food becomes a critical factor during severe winters. Agricultural land that provides a reliable winter food source is important, especially in the northern range.

Wild turkeys are opportunistic feeders and diets vary by habitat and season. Plant foods make up most of an adult bird's diet, however a diet with a large insect component is necessary to provide protein for proper growth and development of turkey poults. Interspersion of habitats in close proximity is critical for providing foraging, nesting, brood-rearing, and roosting cover to support local turkey populations.

B. Population Projection

The primary habitat for wild turkeys in Minnesota (southern and central Minnesota) was filled during trap and transplant efforts in the 1990s. More recent trap and transplant efforts have been to infill areas in the primary range and to expand the population northward. Increases in turkey populations will result from population growth in areas with newly established populations and expansion of the population at the northern edge of its range. Weather and climate are both significant factors affecting turkey populations through out the state but become increasingly more influential in northern portions of the range. Future wild turkey populations in Minnesota will depend upon the conservation and development of existing habitat, particularly mature forest.

Wild turkey populations in Turkey Zone 1 have reached carrying capacity and are projected to remain stable with normal annual fluctuations through 2011 (Figure 4). Protecting existing habitat in these areas is essential to maintain current population levels. Urban sprawl in metropolitan areas; particularly near Minneapolis, St Paul, St Cloud, Rochester and Brainerd; and large lot development in southeastern Minnesota will negatively impact turkey habitat and limit hunter access to land.

Moderate population increases are projected for Turkey Zone 2 by 2011, most of which are in primary turkey range. Populations in these areas continue to exhibit growth and some areas have experienced infill releases since 2000. Southwest Minnesota is heavily cultivated and lack of tree cover could be a limiting factor for wild turkey populations. Configuration of tree cover, mostly present as small woodlots around farmsteads, limits huntable habitat in this area.

Turkey populations in Turkey Zone 3 are in a growth phase and are being supplemented by translocated birds in appropriate areas. Much of this area is at what is currently believed to be the extreme northern limit in Minnesota and it is difficult to predict what populations will be in 2011. These populations, as the most recently established, have the most potential for population growth. However, turkey populations in secondary habitat are not expected to reach the same

density as in the turkey's primary habitat in Minnesota. Therefore future increases will likely be small. The major limiting factor in northern populations is the potential for turkey mortality due to severe winter weather. A shortened breeding season in this region also has the potential to impact population growth through reduced poult survival. Population increases in this area are dependent upon continued mild to moderate winters and successful new releases.

Maintenance of current populations in southeastern Minnesota, moderate increases in south and central Minnesota, and minimal increases in the north will lead to a projected wild turkey population of 75,000 in 2011.

C. Demand

Since Minnesota's first modern hunting season in 1978, there have always been more applications for hunting than available permits. In 1978 there were 10,740 applications for only 420 available permits (Appendix B). By 1985, the number of applications had dropped to 5,662, likely a result of both the poor success at getting a permit and in harvesting a turkey. However, increasing turkey populations, with the subsequent increase in available permits and hunting success, have resulted in applications steadily climbing since the 1980s. For the spring 2005 turkey hunting season, there were 49,181 applicants for 31,784 available permits (Appendix B).

In recent years interest in spring turkey hunting has outpaced the increase in hunting opportunities. In the past 5 years an average of 18,800 interested individuals per year have not had an opportunity to hunt wild turkeys.

Interest in fall turkey hunting in Minnesota is lower than for the spring season, however, the number of applicants shows a similar trend (Appendix B). When fall turkey hunting was first established in Minnesota in 1990, 4,522 applicants applied for 1,000 available hunting permits. The number of applicants for fall seasons decreased to a low of 2,782 applicants for 2,200 available permits in 1992. Since 1992, there has been an increasing trend toward the recent high of 5,878 applicants for 4,380 available permits for the fall 2004 turkey hunt.

Almost all of Minnesota's turkey hunters are Minnesota residents. Minnesota has not attracted large numbers of nonresident hunters due to much larger eastern wild turkey populations in neighboring states.

D. Economic Value

Turkey hunting has an important impact on rural economies throughout the primary turkey range. Average expenditures by Minnesota spring turkey hunters in 2005 were estimated at \$17 million dollars based on an average annual expenditure of \$614.20 per turkey hunter in the Midwest (Southwick Associates, Inc. 2003). Expenditures include lodging, meals, transportation, guns, ammunition, and other special clothing and equipment. Expenditures made by turkey hunters in Minnesota generate additional spending in local economies creating jobs, tax revenues, and other benefits with a total estimated economic impact estimated at \$33 million a year. In 2011 with 35,000 spring permits available, average expenditures for spring turkey

hunters would increase to \$25 million with a total estimated economic impact of \$47 million a year.

Average expenditures by turkey hunters include the license and Turkey Stamp fees. Revenue generated from the sale of the \$5 Turkey Stamp is dedicated for wild turkey population management, habitat conservation and restoration, and research. Turkey Stamp revenues have generated an additional \$69,000 to \$155,000 annually for the wild turkey management program. Revenues from Turkey Stamp sales would increase to \$175,000 in 2011 with 35,000 spring turkey hunters.

VI. ECOSYSTEM CONSIDERATIONS

Habitat management and land acquisition projects initiated for the benefit of wild turkeys have a positive impact on many other wildlife species in Minnesota. Oak management projects initiated for turkeys benefit other species that eat acorns such as white-tailed deer, black bear, squirrels, mice, rabbits, foxes, raccoons, grackles, ruffed grouse, quail, blue jays, woodpeckers, and waterfowl. Forest openings maintained for wild turkeys also benefit white-tailed deer, cottontail rabbits, ruffed grouse, song sparrows, broad-winged hawks, and northern flickers.

There is no research to date that indicates wild turkeys have or will have a negative ecological impact in areas where they are transplanted north of their historic range. A California study that specifically looked for impacts to threatened and endangered species failed to find any evidence of such impacts (Barrett and Kucera, 2005). However, some turkey management practices applied in inappropriate areas of the state could negatively impact habitat composition, and in turn existing wildlife populations. In grassland ecosystems the establishment of woody cover, especially tall deciduous and coniferous trees intended for roost sites, attract predators and habitat generalists that have a negative impact on native prairie wildlife species. Woody cover plantings for wild turkeys in the grassland ecosystems in Minnesota should be limited to riparian corridors.

As wild turkey populations expand northward, the overlap with primary ruffed grouse range increases. Quality habitat for northern ruffed grouse populations includes a combination of different aged aspen stands. Woody cover plantings or forest management for wild turkeys that changes the current forest composition could negatively impact ruffed grouse populations. When planning habitat management projects for wild turkeys in the periphery of their range, the habitat needs of species in their primary range should take precedence.

VII. 2011 GOAL

Establish and maintain the spring wild turkey population at or above 75,000 in suitable habitats to maximize hunting and viewing opportunities.

VIII. ACTIONS

A. HABITAT MANAGEMENT

ACTION A₁: Use Turkey Stamp dollars to improve turkey habitat throughout the turkey range in Minnesota.

The following are examples of habitat management projects that would be eligible for Turkey Stamp funding:

- Native woody cover/shrub plantings with emphasis on winter fruit bearing species (specify if planting are to provide roosts or winter food)
- Oak savannah management
- Oak management
- Streamside corridor development and maintenance (woody vegetation)
- Food plot establishment* (guidelines will be developed by Turkey Committee in 2007)

*** We strongly discourage artificial feeding (i.e., feeders, handouts) for turkeys! Turkey Stamp funds will not be used for artificial feeding.**

ACTION A₂: Develop a model to allocate Turkey Stamp funds to each MDNR Region for habitat work.

PROCEDURE A₁: The Turkey Committee Chair will work with the Regional Managers and the Division Management Team (DMT) to allocate lump sums of money to the Regions through the normal budgeting process. The Turkey Committee will review and comment as appropriate. Regions will prioritize and allocate funds. Funded projects must meet the requirements of the Turkey Stamp dedicated account. The Chair will report back to the Committee detailing expenditures by activity.

PROCEDURE A₂: The Turkey Committee will develop an allocation model.

PRODUCT A₁: Annually establish or improve 100-300 acres of wild turkey habitat on public and/or private land. Turkey Stamp funds will assist in the completion of projects.

PRODUCT A₂: Allocation model.

B. ACQUISITION / EASEMENTS

ACTION B: Use Turkey Stamp dollars to leverage other funds to acquire turkey habitat in fee title or perpetual easement.

PROCEDURE B: The Turkey Committee Chair will work with the Regional Managers and DMT to allocate a lump sum of habitat acquisition money to the Wildlife Land Acquisition Coordinator. The Turkey Committee Chair will then work with the Wildlife Land Acquisition Coordinator to find an appropriate project that benefits turkeys and meets the timing and other

requirements of the Division's normal acquisition process. The Turkey Committee will review and comment as appropriate. Chosen projects must meet the requirements of the Turkey Stamp dedicated account. The Chair will report back to the Committee detailing expenditures by project.

PRODUCT B: Annually acquire 20-50 acres of important wild turkey habitat using acquisition, perpetual easements, or donations.

C. HUNTING SEASON MANAGEMENT

ACTION C: Provide quality turkey hunting opportunities where populations can sustain harvest.

PROCEDURE C₁: Model wild turkey population and hunting season characteristics. Growing turkey populations will allow for increased hunting opportunity. The number of available permits and areas open to hunting is a reflection of the success of the total wild turkey program. Careful monitoring of turkey abundance and hunting pressure is necessary so that areas with developing populations are not opened prematurely and the potential for hunting accidents is minimized.

The spring season population/permit allocation model incorporates wild turkey population survey data (using Hunters Observing Wild Turkeys [HOWT] as a population index), harvest registration information, turkey hunter and landowner surveys, and habitat information to help make management decisions (Kimmel 2001). The Turkey Committee will review model recommendations at the July meeting prior to adjusting permit levels or opening new areas to hunting.

Develop a fall season permit allocation model by December 2006 that will integrate with the spring season model to help with decisions regarding fall hunting seasons. Model results will be available annually by March 1. If the fall season harvest or safety problems warrant concern, a fall turkey hunter survey will be developed to obtain information needed to ensure a safe, quality hunt and a viable population.

The Farmland Wildlife Populations and Research Group (FWPRG) will generate population/permit allocation model results and send to Regional and Area Wildlife Managers by July 1 (spring season) and by March 1 (fall season). Lead managers will coordinate with alternate managers (Appendix C) and tribal biologists, where appropriate, and send permit number recommendations back to FWPRG by July 15 (spring season) and by April 1 (fall season). The Turkey Committee will review the permit number recommendations at the July meeting (spring season) and in April by e-mail (fall season). Once permit numbers are established, FWPRG will send final recommendations to the Farmland Wildlife Program Leader (and copy the Area and Regional Wildlife Managers) by August 15 (spring season) and by May 1 (fall season). The Farmland Wildlife Program Leader is responsible for obtaining approval from the DMT so that the MNDNR Commissioner can issue final approval by September 1 (spring season) and May 15 (fall season).

PROCEDURE C₂: Conduct spring turkey hunter surveys once every two years in approximately 1/3 of the permit areas open to turkey hunting. Spring turkey hunter survey results will be available by December 1 of the year the survey is completed.

PROCEDURE C₃: Complete research to determine the potential impact of increasing permit numbers on hunter access and hunt quality. A graduate student will conduct hunter and landowner surveys during 2005 and 2006 under supervision of FWPRG.

PROCEDURE C₄: Maintain wild turkey harvest data and hunt information. Annual turkey harvest reports will be provided by July 1 (spring season) and December 1 (fall season) by FWPRG. Harvest registration will be completed entirely using the electronic licensing system (ELS). An annual review of hunting season logistics (e.g., regulations, licensing, surplus permits, season dates, etc.) will be completed by the Turkey Committee at the July meeting (spring season) and the December meeting (fall season). If changes are necessary, recommendations will be made to DMT.

PRODUCT C₁: A synopsis providing information on the number of available wild turkey hunting permits, and number and locations of hunting permit areas, will be available prior to permit application deadlines for spring and fall hunting each year. By 2011, hunting permits will be available for at least 35,000 spring hunters and 5,000 fall hunters. This increase will result in an annual spring harvest of approximately 10,000 birds and a fall harvest of approximately 1,000 birds. Turkey hunting seasons will maintain a success rate >20% and a hunter interference rate <40% in each permit area. Modeling information will be available by July 1 (spring season) and March 1 (fall season) of each year for developing hunting season quotas.

PRODUCT C₂: Spring turkey hunter survey data will be available once every 2 years in December, and all permit areas will be surveyed by December 2009.

PRODUCT C₃: A draft landowner survey report will be available in July 2006 and the final report will be available in December 2006.

PRODUCT C₄: Annual turkey harvest reports will be provided by July 1 (spring season) and December 1 (fall season).

D. POPULATION MANAGEMENT

ACTION D₁: Develop list of priority wild turkey releases sites.

ACTION D₂: Maintain trap and transplant program until wild turkeys have been released at designated priority release sites.

ACTION D₃: Implement plan to complete trap and transplant activities.

ACTION D₄: Set turkey harvest goals for new turkey permit areas.

ACTION D₅: Survey Minnesota's wild turkey population once every 2 years.

ACTION D₆: Complete northern turkey survival study in Northwest Minnesota by December 2007.

ACTION D₇: Use the GUIDELINES FOR DEALING WITH TURKEY COMPLAINTS developed and by the Wild Turkey Committee and approved in June of 2005 for managing nuisance birds.

PROCEDURE D₁: The Area Wildlife Manager may coordinate with appropriate alternate managers (Appendix C), Forest Wildlife Coordinator, Area Foresters, tribal biologists and major landowners (e.g., Forest Service, US Fish and Wildlife Service) in reviewing the potential release areas in their jurisdiction. Twenty-seven potential releases areas were identified by applying a geographic information system (GIS) analysis, developed by the Turkey Plan Subcommittee, to unoccupied potential turkey habitat within the state (Appendix D). Release site proposals (Appendix E) will be reviewed by the Area Wildlife Manager and approved by the appropriate Regional Wildlife Manager. The Area Wildlife Manager will send the approved release site proposal to the appropriate Regional Turkey Committee Representative and Committee Chair (Appendix F) who will present the proposal to the Turkey Committee. The release site list will be reviewed and prioritized annually by the Turkey Committee at the July meeting. Release sites will be restricted to the areas identified in Figure 5 that are in suitable wild turkey habitat as identified by the Area Manager and Turkey Committee.

Criteria for prioritizing release sites will include current turkey habitat available based on MN-GAP land cover data and other GIS layers, the potential for hunting seasons, impact of turkey management on other species, winter food availability and public issues (e.g., landowner complaints).

Cooperative habitat management work should be completed prior to releases and follow-up and habitat maintenance work should continue after releases with assistance from NWTF and/or local sportsmen's clubs where possible.

PROCEDURE D₂: MNDNR will hire seasonal laborers (trapping assistants) and assemble all equipment necessary for trapping prior to January each year. Trapping crews will identify flock locations, obtain landowner permission, establish trap sites, and use rocket nets to capture wintering flocks. Trapped birds will be examined, banded, and immediately transported to the highest priority release site. A sample of the captured turkeys will be tested for diseases based on the 2005 disease testing protocol (Appendix G). The Trapping Crew Leader will provide a trap and transplant report at the end of each trapping season.

PROCEDURE D₃: Unoccupied potential turkey habitat in Minnesota was identified between a line based on Deer Permit Area boundaries that approximates the 40-day snow line (average of 40 days \geq 12 inches of snow) and the northern extent of documented turkey distribution based on the 2002 wild turkey population survey. A GIS analysis was then conducted that identified areas with at least 20% agriculture, 20% forest, and at most a 50% conifer forest component. Seven potential turkey release areas were identified with 27 theoretical release sites (Figure 5).

However, we expect this number to be reduced when the 2006 wild turkey survey results are compiled. In addition there are 5 sites that were not filled in 2006 (87 turkeys) and 2 research sites (65 turkeys) that need to be filled during the 2007 trapping season. Fifteen females and 7 males are typically released at a given site, which amounts to 594 turkeys for the potential release sites in northern MN. Averaging 150 birds trapped each winter, it will take 5 years to transplant the 746 turkeys required to complete this program.

Linear habitats, such as riparian corridors and beech ridges making up most of the potential habitat in northwest Minnesota, are not identified with the type of GIS analysis used. Results of the northwest turkey research project will be used to assess the suitability of these habitats and modify the potential release site map (Figure 5) if necessary. Additionally, in the 4 years since the last wild turkey population survey, wild turkey populations have expanded northward naturally. The potential release site map will also be updated after completing the wild turkey population survey in 2006.

PROCEDURE D₄: FWPRG will solicit input from Regional and Area Wildlife Managers, tribal biologists and other stakeholders regarding desired harvest goals for new permit areas once huntable turkey populations are established. Goals will be developed and approved by the Turkey Committee.

PROCEDURE D₅: Since 1986, MNDNR has conducted a fall population survey requesting wild turkey sighting information from a random sample of antlerless deer hunters. This survey, known as the Hunters Observing Wild Turkeys (HOWT) survey, provides information on population trends and range expansion. This information is essential for determining management objectives, evaluating the progress of the transplant program, setting hunting seasons, and locating gaps in turkey populations. This survey will be continued by FWPRG every 2 years. The results of the 2006 survey will be used to update the occupied/unoccupied wild turkey range map used as the extent for the GIS analysis.

PROCEDURE D₆: MNDNR will conduct a research project in northwest Minnesota through December 2007. This project will provide information about over-winter and annual survival, habitat use, recruitment, and landowner attitudes about translocated wild turkeys. The results of the study will help to further define the northern extent of the potential wild turkey population in Minnesota and provide important information for managing northern turkey populations.

PROCEDURE D₇: Follow protocols from GUIDELINES FOR DEALING WITH TURKEY COMPLAINTS.

PRODUCT D₁: List of priority wild turkey releases sites.

PRODUCT D₂: Annual trap and transplant report.

PRODUCT D₃: Five-year plan will be updated in June 2007 using data from the wild turkey population survey in fall 2006 and results from the northwest turkey research project. Trap and transplant program will be terminated no later than 2012.

PRODUCT D₄: List of desired harvest goals by permit area as new permit areas are opened for hunting.

PRODUCT D₅: Range map of the wild turkey in Minnesota. Updated every two years.

PRODUCT D₆: Report summarizing results of the northwest study by spring 2008.

PRODUCT D₇: Turkey complaints are handled in a timely and satisfactory fashion.

E. INFORMATION AND EDUCATION

ACTION E₁: Develop information and education materials promoting the wild turkey management program and hunting opportunities.

ACTION E₂: Continue to partner with NWTF and others as appropriate to develop turkey habitat workshops for private landowners.

ACTION E₃: Conduct a thorough literature search on habitat management for wild turkeys.

ACTION E₄: Evaluate turkey research needs.

PROCEDURE E₁: The Turkey Committee (or designated sub-committee) will develop a “Wild Turkey in Minnesota” booklet and update the “Managing your Woodland for Wild Turkeys” brochure. Develop other information materials as necessary. Coordinate efforts with NWTF and other interested parties as appropriate.

PROCEDURE E₂: The MNDNR Section of Wildlife will continue to partner with NWTF and others to develop and promote private landowner workshops to help encourage turkey habitat management on private land.

PROCEDURE E₃: Wild turkey management decisions can be determined using information from wild turkey surveys/research and management that has previously been conducted. FWPRG will supervise the review of turkey habitat management literature (e.g., timber stand improvement, roosting needs) and develop a database of available research reports and publications. The Turkey Committee will review a draft of an annotated bibliography prior to distribution to wildlife offices.

PROCEDURE E₄: A research needs list was developed from a 1999 survey of MNDNR employees from primarily the Section of Wildlife, but also included employees from Forestry, Parks and Enforcement Divisions. The survey identified potential areas of research needed to obtain information to improve wild turkey management in Minnesota (Appendix H). This list will be reviewed and prioritized so that research proposals can be developed in the event time and funding become available. Research needs will be re-evaluated in 2007.

PRODUCT E₁: Booklets, brochures, fact sheets, news releases, hunter clinics, etc. promoting the wild turkey management program will be developed and made available to the public.

PRODUCT E₂: Private land workshops will be offered as appropriate.

PRODUCT E₃: An annotated bibliography of reports pertinent to wild turkey management in Minnesota will be available to all wildlife offices by 2009.

PRODUCT E₄: A turkey research plan will be available by 2008.

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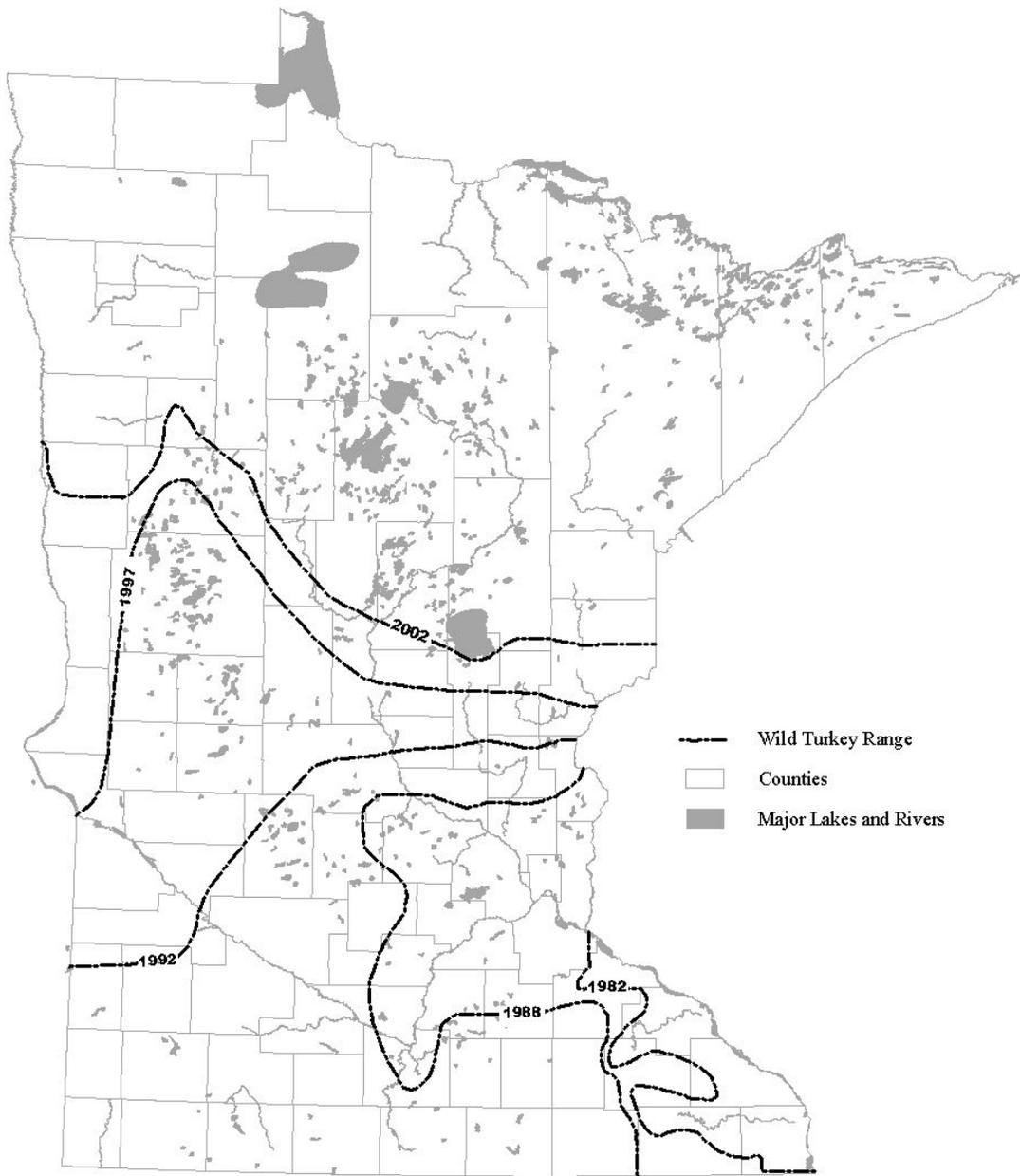


Figure 1. Wild turkey range in Minnesota based on fall turkey sightings by antlerless deer hunters and wild turkey release site information, 1982-2002.

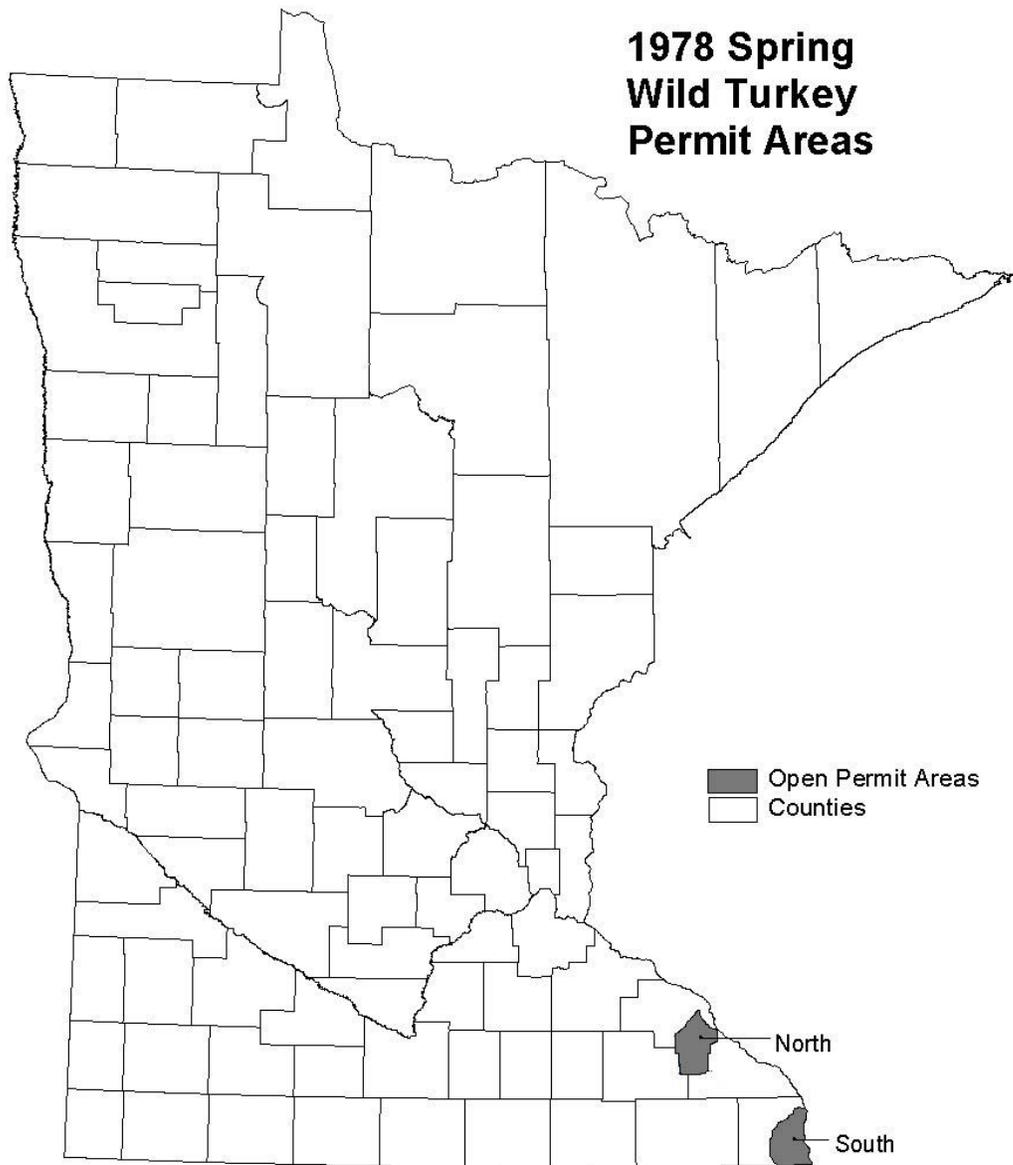


Figure 2. Wild turkey permit areas open to spring hunting in Minnesota, 1978.

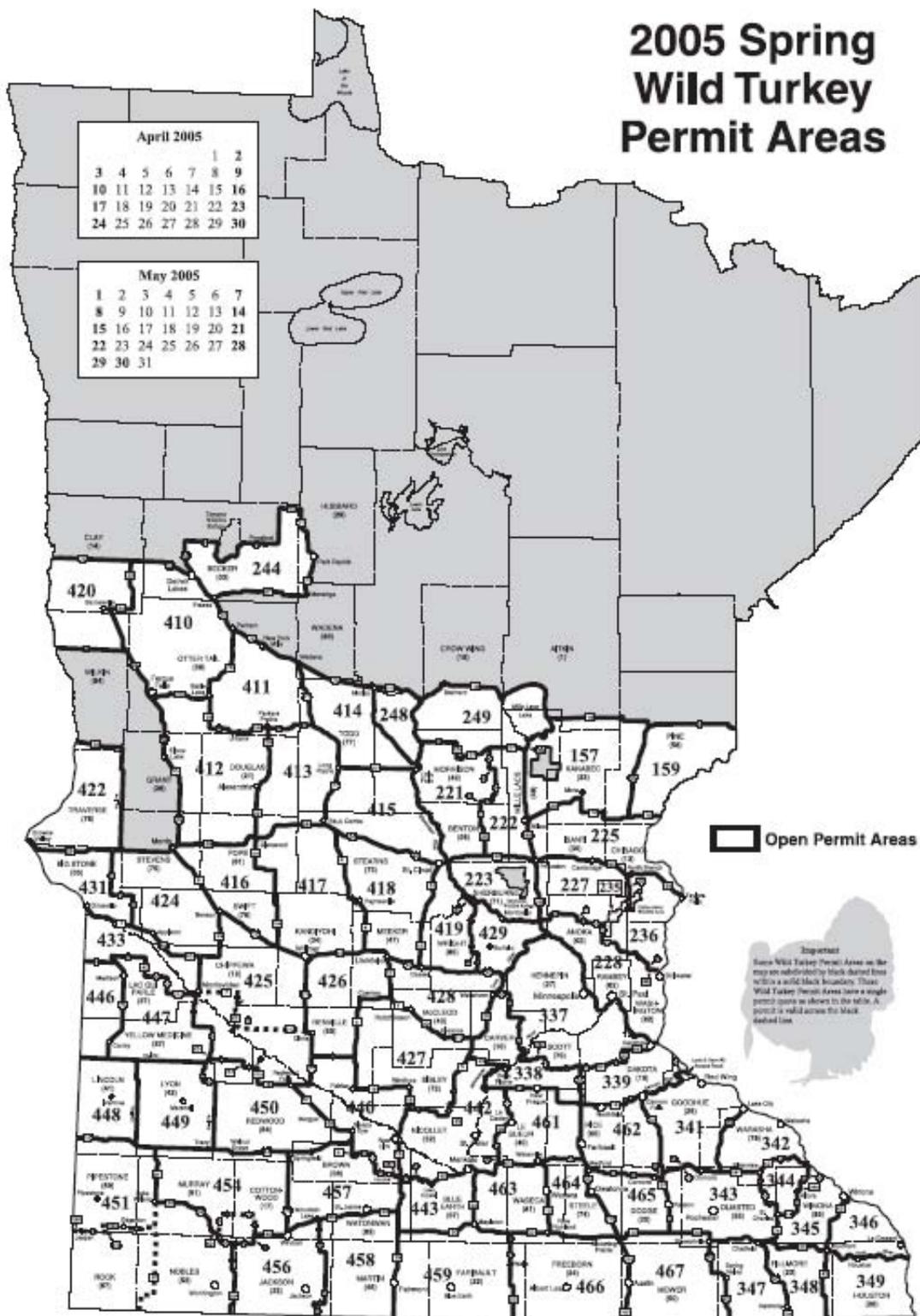
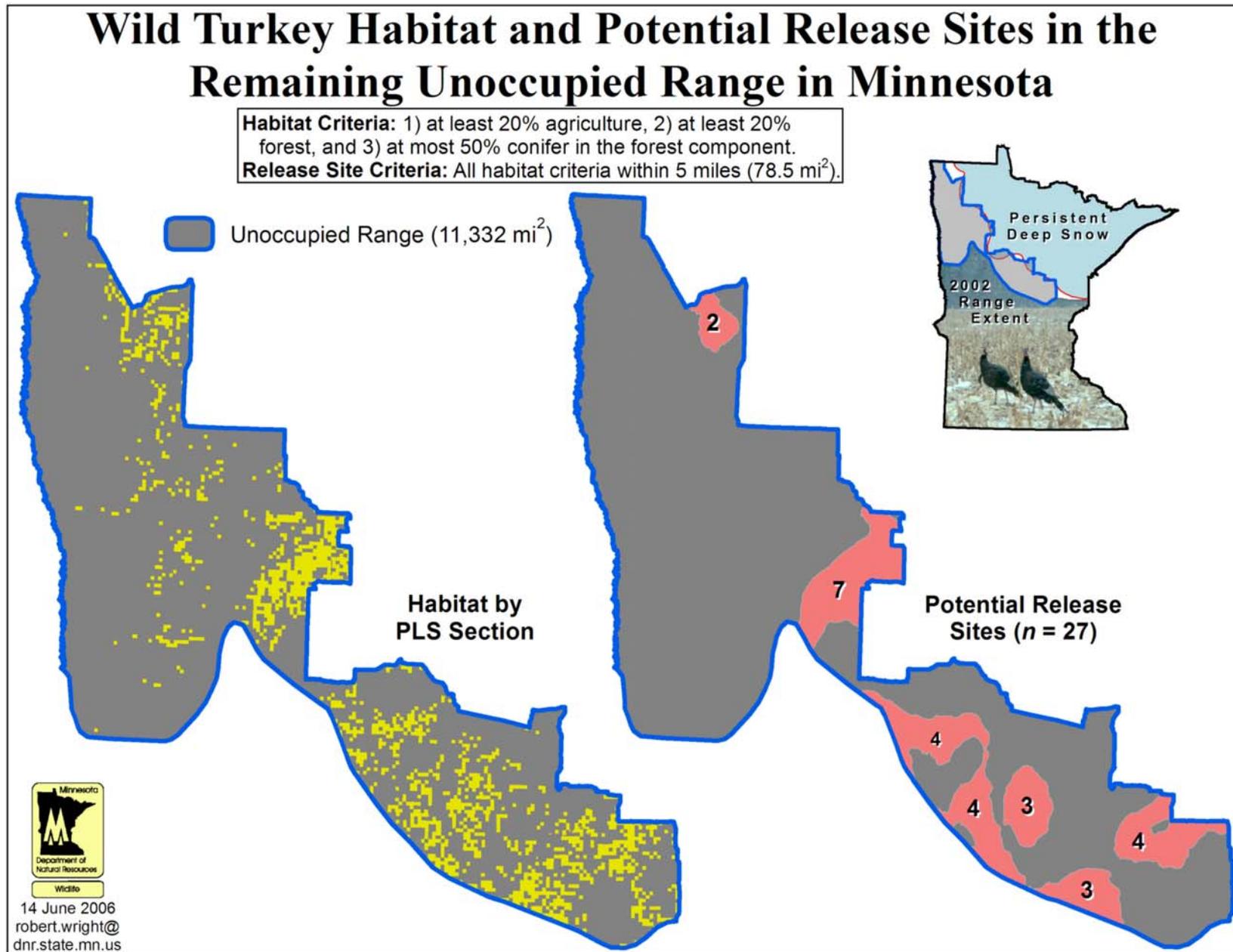


Figure 3. Wild turkey permit areas open to spring hunting in Minnesota, 2005



Figure 4. Turkey zones used to project wild turkey population in 2011 based on the area of Minnesota surveyed during the fall wild turkey population survey.

Figure 5.



Appendix A. Wild turkey releases in Minnesota from 1971–2006.

County	Number of Birds Released	Origin	Years Released
Aitkin	18	MN	06
Anoka	36	MN, IL	79, 89, 90
Becker	46	MN	95
Benton	50	MN	01, 02, 03
Big Stone	40	MN	01, 05
Blue Earth	86	MN, NY	86, 91, 92, 93
Brown	48	MN	92, 97
Carver	37	NY, IL	86, 93
Chisago	100	MN, AR	80, 83, 84, 89, 90, 94
Clay	18	MN	00
Cottonwood	56	MN	94, 01, 05
Crow Wing	43	MN	98, 01
Dakota	20	MN	93
Dodge	74	MN	92, 93
Douglas	141	MN	94, 96, 98, 00, 01
Faribault	46	MN	93
Fillmore	47	MN, AR	77, 82, 84
Freeborn	68	MN, IL	92, 94, 95
Goodhue	317	MN, WI	78, 79, 85, 86, 87, 88, 89, 90, 91, 92, 93
Grant	30	MN	98
Hennepin	22	MN	90
Houston	42	MN	71, 73, 77
Isanti	163	MN, IL	92, 93, 94, 97, 99
Jackson	42	MN	91, 05, 06
Kanabec	85	MN	02, 03, 04, 05
Kandiyohi	40	MN, WI	93, 05
Lac Qui Parle	74	MN	85, 94, 95, 98
LeSueur	79	MN, MO	93, 96
Lincoln	73	MN, IL	93, 94, 95
Lyon	44	MN, IL	93, 94
Mahnomen	18	MN	01
Martin	18	MN, MO	02
Meeker	96	MN, MO	96, 98
McLeod	21	MN	93
Mille Lacs	292	MN	96, 00, 01, 02, 03, 04, 05
Morrison	99	MN	96, 00, 01, 04, 05
Mower	86	MN, IL, WI	93, 94

County	Number of Birds Released	Origin	Years Released
Murray	21	MN	99
Nicollet	85	MN, NY	85, 88, 89, 92
Nobles	24	MN	05, 06
Norman	12	MN	04
Olmsted	106	MN, IL	78, 81, 88, 92, 93
Ottertail	177	MN	93, 98, 00, 05
Pennington	39	MN	06
Pine	41	MN	02, 03, 05, 06
Pope	104	MN	94, 96, 98, 00
Red Lake	40	MN	06
Redwood	103	MN, WI	90, 93, 01
Renville	52	MN	90, 97
Rice	133	MN	80, 88, 89, 91, 93
Rock	21	MN	99
Scott	53	MN, NY	86, 88, 92
Sherburne	115	MN	92, 96, 04, 05
Stearns	288	MN, WI	83, 92, 93, 94, 96, 97, 00, 04, 05
Steele	86	MN	92, 94, 95
Swift	22	MN	05
Todd	64	MN	96, 99, 05
Wabasha	140	MN	76, 80, 88, 89
Wadena	25	MN	03
Waseca	21	WI	92
Washington	75	MN, OK	88, 89, 90, 91, 94
Watsonwan	21	MN	05
Winona	91	MN	77, 84, 85, 86
Wright	142	MN	85, 91, 92, 94, 97, 01
Yellow Medicine	66	MN	95, 99

Appendix B. Spring and fall wild turkey applications, permits, and harvest in Minnesota, 1978-2005.

Year	Spring Applications	Spring Permits Available	Spring Permits Issued	% of Available Issued	Spring Harvest	% Spring Hunter Success ^a	Fall Applications	Fall Permits Available	Fall Harvest
1978	10,740	420	411	97.9	94	22.9	-	-	-
1979	11,116	840	827	98.5	116	14.0	-	-	-
1980	9,613	1,200	1,191	99.3	98	8.2	-	-	-
1981	8,398	1,500	1,437	95.8	113	7.9	-	-	-
1982	7,223	2,000	1,992	99.6	106	5.3	-	-	-
1983	8,153	2,100	2,079	99.0	116	5.6	-	-	-
1984	7,123	3,000	2,837	94.6	178	6.3	-	-	-
1985	5,662	2,750	2,449	89.1	323	13.2	-	-	-
1986	5,715	2,500	2,251	90.0	333	14.8	-	-	-
1987	6,361	2,700	2,520	93.3	520	20.6	-	-	-
1988	8,402	3,000	2,994	99.8	674	22.5	-	-	-
1989	13,007	4,000	3,821	95.5	930	24.3	-	-	-
1990	14,326	6,600	6,126	92.8	1,709	27.9	4,522	1,000	326
1991	15,918	9,170	8,607	93.9	1,724	20.0	2,990	2,200	552
1992	16,401	9,310	9,051	97.2	1,691	18.7	2,782	2,200	588
1993	17,800	9,625	9,265	96.3	2,082	22.5	3,186	2,400	605
1994	19,853	9,940	9,479	95.4	1,975	20.8	3,124	2,500	601
1995	21,345	9,975	9,550	95.7	2,339	24.5	3,685	2,500	648
1996	23,757	12,131	10,983	90.5	2,841	25.9	4,453	2,500	685
1997	25,958	12,530	11,610	92.7	3,302	28.4	4,574	2,580	698
1998	29,727	14,035	13,229	94.3	4,361	33.0	4,526	2,710	828
1999	39,957	18,360	16,387	89.3	5,132	31.3	5,354	2,890	865
2000	42,022	20,160	18,661	92.6	6,154	33.0	5,263	3,090	735
2001	41,048	22,936	21,404	93.3	6,383	29.8	4,501	2,870	629
2002	42,415	24,136	22,607	93.7	6,516	28.8	5,180	3,790	594
2003	44,415	25,016	22,770	91.0	7,666	33.7	5,264	3,870	889
2004	48,059	27,600	25,261	91.5	8,434	33.4	5,878	4,380	758
2005	49,181	31,784	27,638	87.1	7,800	28.2	4,542	4,410	656

^a Success rate not adjusted for non-participants.

Appendix C. Lead and alternate Area Wildlife Managers for turkey permit areas.

Permit Area	Lead Manager	Alternate Manager
157	Dave Pauly	Dave Dickey
159	Rich Staffon	Dave Pauly
221	Beau Liddell	
222	Dave Pauly	Beau Liddell
223	Fred Bengtson	Dave Pauly
225	Dave Pauly	
227	Bob Welsh	Dave Pauly, Fred Bengtson
228	Bob Welsh	Diana Regenscheid, Bryan Lueth
235	Dan Rhode	Dave Pauly
236	Bob Welsh	Dave Pauly, Bryan Lueth
244	Earl Johnson	Rob Naplin
248	Beau Liddell	Gary Drotts
249	Gary Drotts	Beau Liddell, Dave Dickey, Dave Pauly
337	Bryan Lueth	Diana Regenscheid, Bob Welsh
338	Diana Regenscheid	Jeanine Vorland, Joel Anderson
339	Diana Regenscheid	Mike Tenney
341	Mike Tenney	
342	Mike Tenney	Gary Nelson
343	Tony Stegen	Jeanine Vorland, Gary Nelson
344	Jon Cole	Gary Nelson
345	Gary Nelson	Tony Stegen
346	Gary Nelson	
347	Gary Nelson	Tony Stegen
348	Gary Nelson	Tony Stegen
349	Gary Nelson	
410	Don Schultz	Earl Johnson
411	Don Schultz	Beau Liddell
412	Kevin Kotts	Don Schultz
413	Kevin Kotts	Beau Liddell, Fred Bengtson, Don Schultz
414	Beau Liddell	Gary Drotts
415	Beau Liddell	Fred Bengtson
416	Kevin Kotts	Dave Soehren
417	Fred Bengtson	Leroy Dahlke, Kevin Kotts
418	Fred Bengtson	Leroy Dahlke
419	Fred Bengtson	Leroy Dahlke
420	Don Schultz	
422	Kevin Kotts	Dave Soehren, Don Schultz
424	Dave Soehren	Kevin Kotts, LeRoy Dahlke
425	Leroy Dahlke	Jeff Zajac, Dave Soehren
426	Leroy Dahlke	Jeff Zajac
427	Joel Anderson	Jeff Zajac, Leroy Dahlke, Diana Regenscheid
428	Joel Anderson	Fred Bengtson, Diana Regenscheid, Leroy Dahlke
429	Fred Bengtson	
431	Dave Soehren	

433	Dave Soehren	Dave Trauba, Leroy Dahlke
435	Jeff Zajac	Bob Meyer, Leroy Dahlke
440	Jeff Zajac	Joel Anderson
442	Joel Anderson	Jeff Zajac
443	Joel Anderson	Randy Markl, Jeff Zajac
446	Dave Soehren, Brad Olson	Bob Meyer
447	Dave Soehren, Brad Olson	Bob Meyer
448	Bob Meyer	
449	Bob Meyer	
450	Jeff Zajac	Bob Meyer
451	Wendy Krueger	Bob Meyer
452	Wendy Krueger	
453	Wendy Krueger	
454	Randy Markl	Wendy Krueger, Jeff Zajac, Bob Meyer
455	Mark Gulick	
456	Randy Markl	
457	Randy Markl	Jeff Zajac
458	Randy Markl	
459	Joel Anderson	Randy Markl
461	Jeanine Vorland	Joel Anderson
462	Jeanine Vorland	Mike Tenney
463	Joel Anderson	
464	Jeanine Vorland	Joel Anderson
465	Jeanine Vorland	
466	Jeanine Vorland	Joel Anderson, Tony Stegen
467	Tony Stegen	Gary Nelson, Jeanine Vorland

Appendix D. Identifying Potential Wild Turkey Release Sites in the Remaining Unoccupied Range in Minnesota

Overview

The Wild Turkey Action Plan Working Group (Group) was tasked with developing the 2006-2011 Wild Turkey Action Plan for the Wild Turkey Committee. A major goal of this effort was to estimate the number of releases needed to stock all remaining unoccupied habitat. To accomplish this, both the northern boundary of wild turkey range and the remaining unoccupied habitat were identified.

This document presents the Geographic Information System (GIS) analyses and results addressing 1) the northern management boundary, 2) potential habitat in the remaining unoccupied range and 3) an estimate of the number of releases needed to stock this habitat. All analyses were based on the criteria developed by the Group.

Northern Management Boundary

This boundary was ecologically defined as the line demarking persistent deep snow (at least 12 inches for at least 40 days a year, on average) and was practically defined as the northernmost boundaries of the Deer Permit Areas that approximate this snow line (Figure 1). This results in approximately 11,332 mi² of unoccupied range, based on wild turkey distribution as of 2002.

Identifying Potential Habitat in the Unoccupied Range

Potential wild turkey habitat in Minnesota is comprised of 1) at least 20% agriculture, 2) at least 20% forest and 3) at most 50% conifer in the forest component.

Analyses were performed using the land use/cover GIS layer of the Minnesota Gap Analysis Program (MNGAP; Table 1). Level 3 cover types considered important to wild turkeys were generalized to Agriculture, Deciduous/Mixed Forest and Coniferous Forest (Table 2, Figure 2).

An analysis by Public Land Survey (PLS) section indicated that approximately 14% of the unoccupied range has potential as wild turkey habitat (Figure 3). Most is in the eastern portions, as the west is dominated by agriculture and has little forest cover.

Estimating Potential Release Sites

A potential release site was defined as having all habitat components within 5 miles; an effective area of a 78.5-mi² circle ($\pi r^2 = 3.14 \times 25 = 78.5$).

The entire unoccupied range was analyzed to determine which geographic areas met the release site criteria. Each resulting "patch" with an area of at least 78.5 mi² was divided by 78.5, and the results were rounded up to the nearest whole number.

Approximately 27 releases are needed to stock the remaining unoccupied habitat (Figure 3).

Contact Information

For questions or comments regarding the details of the GIS analyses, contact Bob Wright, Wildlife GIS Specialist, Minnesota Department of Natural Resources, at 651-296-3293 or Robert.wright@dnr.state.mn.us.

See Bill Penning, Farmland Wildlife Program Coordinator, at 651-259-5230 or bill.penning@dnr.state.mn.us, with questions or comments regarding the criteria developed by the Wild Turkey Action Plan Working Group.

Bob Wright
Wildlife GIS Specialist
June 14 2006

Table 1. Land Use/Cover Classification System for the Minnesota Gap Analysis Project.1

LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	
90 - Non-Forest	80 - Non-Vegetated	50 - Developed	01 - Mixed Developed	
			02 - High intensity urban	
			03 - Low intensity urban	
			04 - Transportation	
			05 - Barren	
	81 - Crop/Grass		51 - Barren	06 - Cropland
				07 - Grassland
				08 - Prairie
				09 - Upland Shrub
				10 - Lowland Deciduous Shrub
	82 - Shrubland		52 - Cropland	11 - Lowland Evergreen Shrub
				53 - Grassland
				54 - Upland Shrub
				55 - Lowland Shrub
				12 - Water
83 - Aquatic Environments		56 - Aquatic	13 - Floating Aquatic	
			14 - Sedge Meadow	
			15 - Broadleaf Sedge/Cattail	
			16 - Jack Pine	
			17 - Red/White Pine	
91 - Conifer Forest	84 - Upland Conifer Forest	58 - Pine	18 - Red Pine	
			19 - White Pine mix	
			20 - Balsam Fir mix	
			21 - White Spruce	
			22 - Upland Black Spruce	
			59 - Spruce/Fir	23 - Upland N. White-Cedar
				24 - Red Cedar
				25 - Upland Conifer
				26 - Lowland Black Spruce
				27 - Stagnant Black Spruce
	85 - Lowland Conifer Forest		60 - Upland Cedar	28 - Tamarack
				29 - Stagnant Tamarack
				30 - Lowland N. White Cedar
				31 - Stagnant N. White Cedar
				32 - Stagnant Conifer
92 - Deciduous Forest	86 - Upland Deciduous Forest	61 - Upland Conifer	33 - Aspen/White Birch	
			62 - Lowland Black Spruce	
			63 - Tamarack	
			64 - Lowland N. White Cedar	
			65 - Stagnant Conifer	
			66 - Aspen/White Birch	34 - White/Red Oak
				67 - Oak
				35 - Bur/White Oak
				36 - Red Oak
				37 - Northern Pin Oak
	87 - Lowland Deciduous Forest		68 - Maple/Basswood	38 - Maple/Basswood
				69 - Upland Deciduous
				70 - Black Ash
				71 - Silver Maple
				72 - Cottonwood
		73 - Lowland Deciduous	39 - Upland Deciduous	
			40 - Black Ash	
			41 - Silver Maple	
			42 - Cottonwood	
			43 - Lowland Deciduous	
93 - Conifer-Deciduous mix	88 - Upland Conifer-Deciduous	74 - Upland Conifer-Deciduous	44 - Upland Conifer-Deciduous	
			75 - Pine-Deciduous mix	
			45 - Jack Pine-Deciduous mix	
			46 - Red/White Pine-Deciduous	
			76 - Spruce/Fir-Deciduous mix	
		77 - Redcedar-Deciduous mix	47 - Spruce/Fir-Deciduous mix	
			48 - Redcedar-Deciduous mix	
			78 - Lowland Conifer-Deciduous	
			49 - Lowland Conifer-Deciduous	
			89 - Lowland Conifer-Deciduous	

1 Land use/cover types are derived from 1991-92 LANDSAT satellite imagery using the Gap Analysis Program methodology developed by the U.S. Geological Survey.

Table 2. Reclassification of MNGAP Level 3 land use/cover types to potential wild turkey cover types².

<u>MNGAP Level 3</u>	Potential Cover Types
Cropland	Agriculture
Grassland	
Pine	Conifer Forest
Spruce/Fir	
Upland Cedar	
Upland Conifer	
Lowland Black Spruce	
Lowland N. White Cedar	
Aspen/White Birch	
Oak	Deciduous/Mixed Forest
Maple/Basswood	
Upland Deciduous	
Black Ash	
Silver Maple	
Cottonwood	
Lowland Deciduous	
Upland Conifer-Deciduous	
Pine-Deciduous mix	
Spruce/Fir-Deciduous Mix	
Red Cedar-Deciduous Mix	
Lowland Conifer-Decid. Mix	

² The following cover types were deemed unsuitable for wild turkeys: Developed, Barren, Lowland Shrub, Aquatic, Marsh, Tamarack, Stagnant Conifer, and Lowland Conifer-Deciduous. Upland Shrub was considered to be unimportant for analyses.

Figure 1.

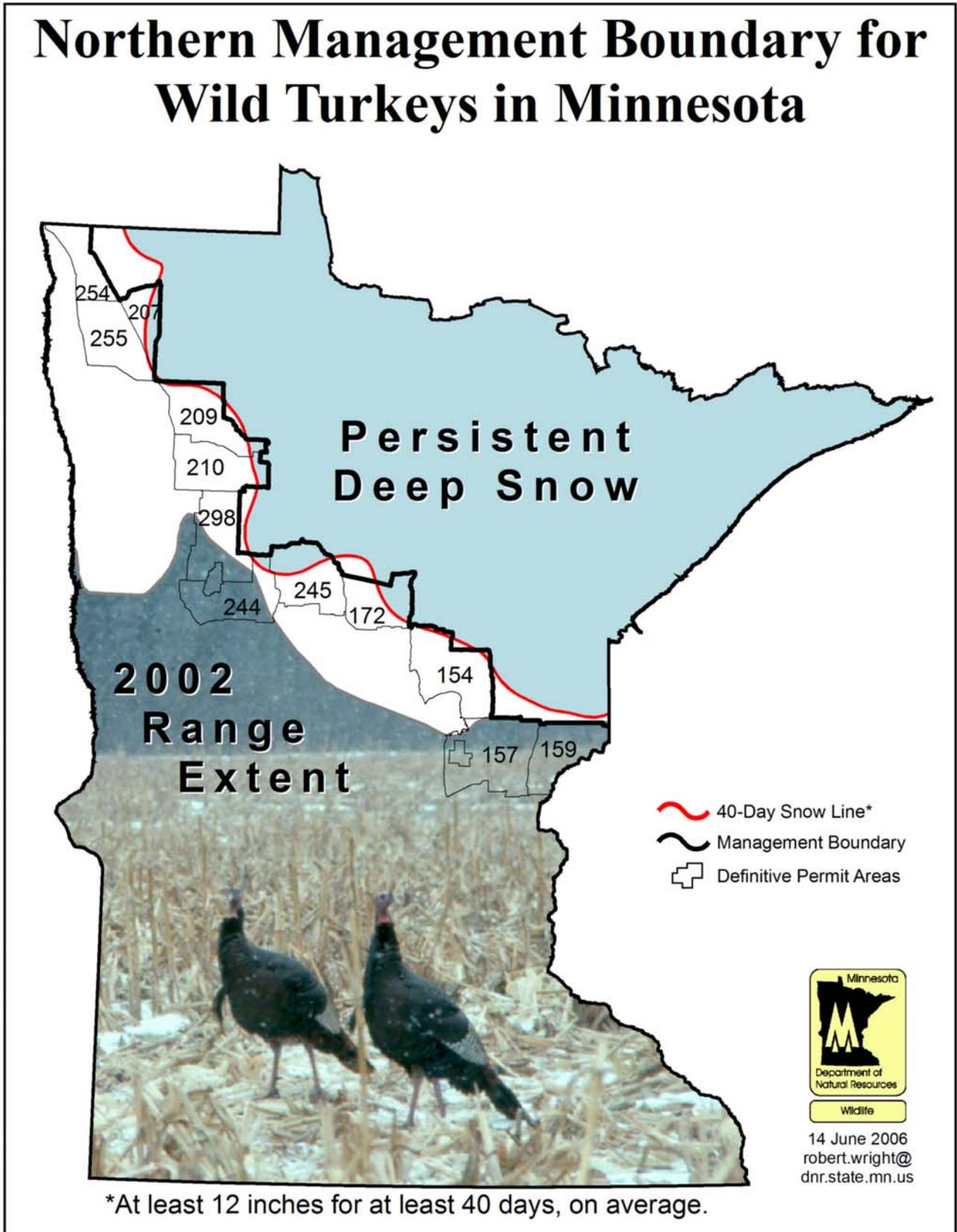


Figure 2.

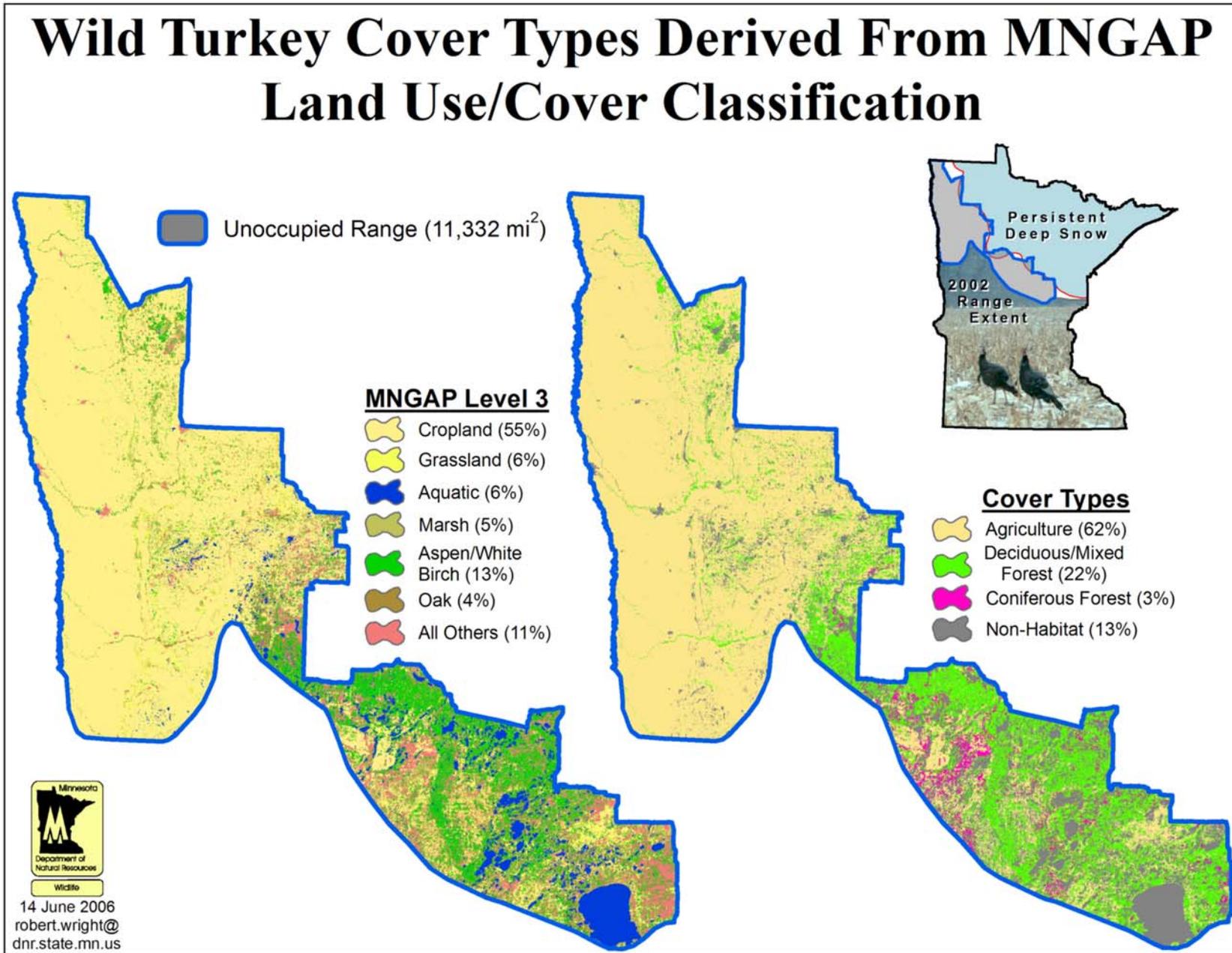
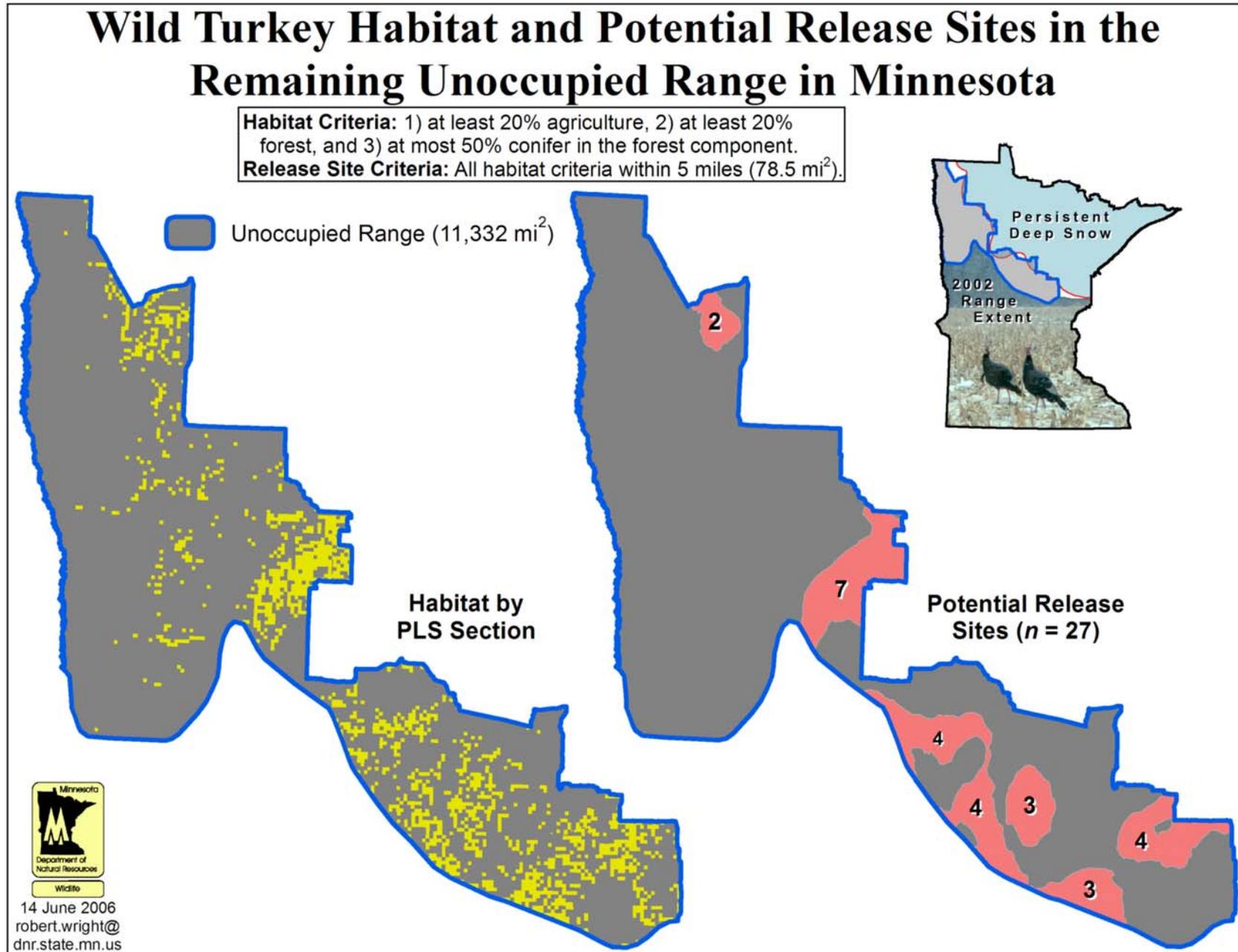


Figure 3.



Appendix E. Wild turkey release site proposal form.

Release Site Name _____

Release Location:

County _____

Township _____

Range _____

Section _____

Landowner:

Name _____

Address _____

Phone Number _____

Attach map showing the specific release site proposed, proximity to established wild turkey populations and other recent release sites. Include release site dates and turkey permit area.

I. Vegetation and Land Use of 200 mi² release area

A. Forest composition

1. Percent of forested land _____

2. Mature oaks present: Many _____ Some _____ None _____

3. Range expansion potential:

Good _____ Average _____ Poor _____

B. Quality of openings: Good _____ Average _____ Poor _____

C. Interspersion: Good _____ Average _____ Poor _____

D. Human disturbance potential:

No Problem _____ Potential Problem _____ Continual Problem _____

Attach map showing land use of 200 mi² surrounding the release area. Include food plot locations.

II. Topography

A. South-facing slopes:

Abundant _____ Present _____ Not Present _____

III. Winter Weather

A. Food availability:

Food plots Planned _____ Not Planned _____

If planned, how many acres? _____

Agriculture Common _____ Present _____ Not Present _____

Natural foods Abundant _____ Present _____ Not Present _____

- B. Average snow depth_____
- IV. Public Issues
- A. Potential for hunting season: Good_____ Fair_____ Poor_____
- B. Landowner complaints in proposed release area:
None_____ Few_____ Several_____ Many_____
- C. Public relations: Planned_____ Not Planned_____
- D. Local sportsmen's club (e.g., NWTF) involved? Yes_____ No_____
- If yes, name of club: _____
- V. Impacts on Other Species (e.g., native grouse) Management
- A. Concerns regarding competition between turkeys and other species:
- B. Concerns regarding time and money for turkey management:
- VI. Game Farm Turkeys
- A. How many game farm turkeys are in the area of proposed release:
None_____ Few_____ Several_____ Many_____
- VII. Within 5 miles of a State Park?_____ Note: Notify the Park Manager of any releases within 5 miles of a State Park. No releases allowed within 1 mile of a State Park.
- VIII. Other Concerns

Please attach any additional comments.

Approvals:

Area Wildlife Manager

Date

Regional Wildlife Manager

Date

Appendix F. Contacts for the Turkey Committee Chair and Regional Representatives for wild turkey release proposals.

Turkey Committee Chair – Bill Penning
Region 1 Representative – Ross Hier
Region 2 Representative – Martha Minchak
Region 3 Representative – Fred Bengtson
Region 4 Representative – Gary Nelson

Appendix G.

DEPARTMENT OF NATURAL RESOURCES
Wildlife Section

STATE OF MINNESOTA
Office Memorandum

DATE: January 30, 2007

TO: Dr. Dale Lauer
Poultry Testing Laboratory, Minnesota Board of Animal Health

FROM: Bill Penning
Farmland Wildlife Program Leader

PHONE: 651-259-5230

SUBJECT: Disease testing protocol for wild turkeys trapped and transplanted in Minnesota

From January to March each year the Minnesota Department of Natural Resources (MDNR) traps and transplants on average 200 wild turkeys. Typically turkeys are trapped from Chisago, Houston, Olmstead, Wabasha, Washington, and Winona counties. On average 10 turkeys are captured at one time and transplanted to multiple releases sites. A wild turkey release consists of 12-15 females and 7-10 males, from more than one capture site to increase genetic diversity. For over 20 years some subset of trapped turkeys has been tested for disease and no positive cases have been found to date.

The MDNR is currently updating our disease testing protocol for the wild turkey trap and transplant program. Outlined below is a draft protocol. Please review and let me know if the protocol meets with your approval.

Goal: To monitor for disease in wild turkey populations in Minnesota and be able to respond if disease is detected in translocated wild turkeys.

- 1) A blood sample will be taken from 10 birds in each flock from which wild turkeys are trapped.
- 2) Wild turkeys will be released immediately after capture and transport prior to receiving test results. All released birds will be identified with numbered leg bands that correspond to individual blood samples.
- 3) The disease testing will be coordinated through the University of Minnesota Veterinary Diagnostic Laboratory. The following diseases will be tested for: *Mycoplasma gallisepticum*, *M. Synoviae*, *M. Meleagridis*, Salmonella, Newcastle disease, Hemorrhagic Enteritis, Bordetella, Avian Influenza, and Avian Pneumovirus.
- 4) Test results will be provided to Dr. Dale Lauer at the Minnesota Poultry Testing Laboratory.

- 5) The disease testing protocol for the wild turkey trap and transplant program will be reviewed yearly prior to the trapping season.
- 6) Should disease be detected DNR will consult with the Board of Animal Health and others as appropriate to develop a response plan that outlines the actions the DNR will take to mitigate the effects of the disease.

Appendix H. List of turkey research needs developed from a 1999 survey of Minnesota Department of Natural Resources employees. The list is ordered by frequency of responses (top = most frequently identified need).

Research Need

Mortality factors (predation)

Winter ecology (winter habitat, northern range limits, and survival)¹

Habitat requirements

Impacts on other plant and animal species and habitats²

Habitat management evaluations

Food plot values

Depredation

Population/permit allocation model

Productivity

Illegal harvest

Documentation of native turkey range

Effects of inbreeding

Effects of early mowing

Model sensitivity analysis/verification

Landowner attitude survey

Landowner habitat guide

Movement distance of introduced turkey

Food habits

Oak regeneration

¹ Winter habitat and survival research less important in southern parts of Minnesota.

² Impacts on other species and habitats was Parks employees main concern.