



United States Department of the Interior

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Memorandum

To: Assistant Regional Director-Ecological Services, Fort Snelling, MN (ES/TE)
Attention: Pete Fasbender

From: Field Supervisor, ES Field Office, Green Bay, WI

Subject: Formal Intra-Service Section 7 Consultation: Issuance of a proposed section 10(a)(1)(A) subpermit for research, monitoring, and depredation abatement activities involving the gray wolf in Wisconsin.

This document transmits the Fish and Wildlife Service's (Service) biological opinion based on our review of the proposed action to issue a section 10(a)(1)(A) permit to the Wisconsin Department of Natural Resources (DNR) to replace Federal Endangered Species Permit PRT-697830 Subpermit 05-03. That permit was previously issued to the Wisconsin DNR on February 28, 2005. The proposed permit also would cover agents of the Wisconsin DNR specifically listed in the permit including personnel of the U.S. Department of Agriculture (USDA)-Animal Plant Health Inspection Service (APHIS)-Wildlife Services (WS) and the Ho-Chunk Nation. The biological opinion addresses the effects of the proposed action on the gray wolf in accordance with section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.). In sections of the biological opinion, the gray wolf may also be referred to as the eastern timber wolf as it pertains to references from the Service's 1978 and 1992 Eastern Timber Wolf Recovery Plans.

The Service is proposing to issue a section 10(a)(1)(A) permit to the Wisconsin DNR to live-trap wolves for monitoring and research associated with Wisconsin DNR wolf research activities, and depredation abatement purposes throughout Wisconsin. Section 10(a)(1)(A) permits are not required for activities carried out by qualified employees or agents of State conservation agencies which are party to Cooperative Agreements with the Service, provided such activities do not result in lethal take or permanent disablement of listed species, or removal of specimens from the wild for more than 45 days. As the Wisconsin DNR and its agent, the USDA-APHIS-WS, will conduct activities that will unavoidably result in lethal take, they have applied for a section 10(a)(1)(A) permit. Since issuing a section 10(a)(1)(A) permit is a Federal action, the Service must, pursuant to section 7 of Act, ensure that issuance of the permit will not jeopardize the gray wolf. This biological opinion documents the Service's compliance with the section 7(a)(2) mandate and provides a take exemption for any incidental take which may occur.

This biological opinion is based on 1) information provided in the Wisconsin DNR's February 11, 2005 letter requesting re-issuance of a permit for activities involving the capture, handling and control of problem wolves, 2) electronic mail messages from Mr. Adrian Weydeven providing additional information on current wolf population status, 3) biological information provided by the Wisconsin DNR in annual Wisconsin wolf status and monitoring reports, and 4) telephone conversations with Wisconsin DNR wolf biologist, Mr. Adrian Wydeven. A complete administrative record of this consultation is on file at the Green Bay, Wisconsin, Ecological Services Field Office.

Consultation History

February 11 2005 - The Wisconsin DNR requested that its previous Federal Endangered Species Permit PRT-697830 (Subpermit No. 03-05) be reissued to include coverage of several additional activities including 1) continued population monitoring efforts with live-trapped/radio-collared wolves, 2) radio-tracking additional live-trapped/collared wolves at depredation sites, 3) researching use of shock collars on wolves to alter depredation behavior and avoid areas of conflict such as cattle in pastures, 4) live-trapping wolves by contracted personnel from the USDA-APHIS-Wildlife Services to remove depredating wolves from areas of wolf/livestock/human use conflict, and 5) conduct lethal control of wolves in certain circumstances.

February 22 2005 - The Wisconsin DNR sent an electronic message to the Service providing additional information on current population status of wolves and mange infestation levels in Wisconsin.

February 25 2005 – Additional telephone conversations were conducted with the Wisconsin DNR and USDA-APHIS-WS from which additional information on wolf depredations and control activities was received.

February 28 2005 - The Service issued Federal Endangered Species Permit PRT-697830 (Subpermit No. 05-03).

March 3, 2005 - The Wisconsin DNR requested that the Service amend Federal Endangered Species Permit PRT-697830 (Subpermit No. 05-03) to authorize an increased number of wolves to be euthanized in conjunction with depredation abatement activities in Wisconsin.

March 10 2005 - The Wisconsin DNR sent an electronic message to the Service providing additional information on wolf mortality rates in Wisconsin.

March 21 2005 – Additional telephone conversations were conducted between staff of the Service's Green Bay, Wisconsin, Ecological Services Field Office and the Wisconsin DNR from which additional information on wolf depredations and control activities was received

BIOLOGICAL OPINION

DESCRIPTION OF PROPOSED ACTION

On February 28, 2005, the Service issued Federal Endangered Species Permit PRT-697830 Subpermit 05-03, which authorized the Wisconsin DNR and its agents to euthanize up to eight wolves, if those individual wolves could be proven to have engaged in repeat depredations on private lands. The Wisconsin DNR has requested expanded authority to euthanize wolves at depredation sites, in anticipation of increased depredation events likely to occur in the immediate future, with the advent of the spring livestock birthing season. This request for expanded lethal take authority is the subject of this opinion.

The Service is proposing to issue a section 10(a)(1)(A) permit to the Wisconsin DNR to live-trap wolves for monitoring, research, and depredation abatement purposes. The specific activities the Service proposes to authorize under the section 10(a)(1)(A) permit are to:

- (1) trap and retrap wolves in number 4, 14 or 7 McBride-Button leg hold traps and CDR 7.5 foot hold, and cable restraints throughout Wisconsin;
- (2) chemically immobilize and radio-collar or ear tag up to 30 adult and yearling, and 30 pup wolves annually;
- (3) collect blood samples, carry out routine noninvasive health assessment procedures, administer standard medications, and affix ear tags to all captured wolves;
- (4) aerially track radio-tagged wolves at daily to weekly intervals;
- (5) attach electronic avoidance collars, or similar devices, to depredating wolves with the aim of conditioning potentially depredating animals to avoid livestock facilities;
- (6) euthanize wolves captured at sites with a recent documented wolf depredation on private lands within Wisconsin State boundaries.
- (7) euthanize captured wolves that are infected with mange or other serious contagious disease, at the discretion of the Wisconsin DNR, to prevent the further spread of such disease, or wolves that are injured such that their survival is unlikely.

Wolves captured in the wild for monitoring and research purposes will be radio-collared and released at the capture site. Wolves will be live-trapped in Number 4, 14, or 7 McBride Button leg hold traps modified to minimize injury, and CDR 7.5 foot hold, and cable restraints. Adults, yearlings, and large pups (30+ pounds) will be immobilized and radio-collared. Blood samples will be collected to determine the relative health and disease status of the wolves. Radio-collared wolves will be located at least once a week. No more than 30 adult and yearling wolves and 30 pups will be live-trapped annually for monitoring and research activities. All wolf trapping activities will occur under the supervision of the Wisconsin DNR's Wolf Coordinator, and District Supervisors for USDA-APHIS-WS Rhinelander and Waupun Districts, respectively. All Wisconsin DNR personnel and personnel of other agencies listed in the permit will receive

formal training in immobilization and handling of wild animals and will follow the Wisconsin DNR's protocol for trapping and immobilizing wolves.

In addition, the Wisconsin DNR proposes to euthanize wolves captured at depredation sites where there has been a documented wolf depredation within that calendar year. Pups of the year captured prior to August 1 will be released unharmed. The number of wolves captured at depredation sites will be dependent upon the number of verified complaints received. In calendar year 2004, 27 wolves were trapped at 12 farms in Wisconsin, of which 24 were euthanized.

To minimize adverse effects to wolves captured by the permittee and its agents, the following permit conditions are proposed:

- (1) Number 4, 14, or 7 McBride-Button leg hold traps or CDR 7.5 foot hold, and cable restraints must be used;
- (2) Pups of the year captured prior to August 1 will be released unharmed;
- (3) A wolf may be euthanized after confirmed depredations on livestock (including poultry) as defined in the Wisconsin Wolf Management Plan (WDNR 1999), livestock guard animals, and pets confined or leashed on private land, have occurred at the site previously within the same calendar year (depredations on bear dogs or other free-roaming dogs do not qualify as depredation events that would trigger lethal control);
- (4) Lethal take in response to depredations shall be confined to within ½ mile of a documented wolf depredation site, and to within Wisconsin State boundaries;
- (5) Wolves may be euthanized at the discretion of the Wisconsin DNR if infected with mange or other serious contagious disease;
- (6) A maximum of 47 wolves per year can be lethally taken, including up to 34 at depredation sites, 3 wolves infected with mange or other disease, and 10 wolves severely injured to the extent they wolf not be expected to survive
- (7) Control actions for depredating wolves in the vicinity of Native American Indian reservation boundaries must be coordinated with the respective Tribe prior to taking action, with the Service acting as decision-maker if the Tribe and the Wisconsin DNR are unable to agree on a course of action. Wolves clearly identified as being of reservation origin (wearing Tribal radio collars, ear tags, or other markings) will not be lethally taken without the permission of the Tribe;
- (8) The Wisconsin DNR is required to report lethal take to the Service's Green Bay Ecological Services Field Office within 5 days of the action;
- (9) Only those individuals identified on the section 10(a)(1)(A) subpermit may lethally take wolves.

STATUS OF THE SPECIES

Species not considered further in this opinion

Federally-listed threatened or endangered species most likely to be affected by the proposed action are those species which occur in the same habitat and territories in Wisconsin that are occupied by the gray wolf and which could be trapped unintentionally. Since the gray wolf population in Wisconsin is increasing and wolves are dispersing into many areas of the state, all federally-listed species known to occur in Wisconsin were evaluated as to potential effects from the proposed action.

Species federally-listed as threatened include the bald eagle (*Haliaeetus leucocephalus*), whooping crane (*Grus americana*), Canada lynx (*Lynx canadensis*), northern monkshood (*Aconitum noveboracense*), prairie bush-clover (*Lespedeza leptostachya*), Pitcher's thistle (*Cirsium pitcheri*), Fassett's locoweed (*Oxytropis campestris* var. *chartacea*), dwarf lake iris (*Iris lacustris*), and eastern prairie fringed orchid (*Platanthera leucophaea*); those listed as endangered are the Kirtland's warbler (*Dendroica kirtlandii*), piping plover (*Charadrius melodus*), Higgins' eye pearly mussel (*Lampsilis higginsii*), winged mapleleaf mussel (*Quadrula fragosa*), Karner blue butterfly (*Lycaeides melissa samuelis*), and Hine's emerald dragonfly (*Somatochlora hineana*). The eastern massasauga rattlesnake (*Sistrurus catenatus catenatus*), and the mussels sheepsnose (*Plethobasus cyphus*) and spectaclecase (*Cumberlandia monodonta*) are candidate species that may be listed in the future. Areas of critical habitat have been designated for the piping plover at six sites in Ashland, Douglas, Manitowoc, and Marinette counties in Wisconsin.

In addition to the gray wolf, the only federally-listed species that potentially may be affected by activities authorized by the proposed permit is the Canada lynx. However, available information including surveys, trapping records, etc. indicate that while lynx may occasionally occur in northern forested areas of Wisconsin and Minnesota, no resident Canada lynx populations are known currently from Wisconsin. Further, trapping methods that will be used by the Wisconsin DNR and its agents minimize the potential that lynx might be captured or harmed as a result of the activities that would be authorized by the proposed permit. Therefore, the Service has concluded that issuing the proposed permit may affect, but is not likely to adversely affect the Canada lynx in Wisconsin.

Gray wolf

Life history

Wolves are social animals, normally living in packs of two to ten members. Packs are primarily family groups consisting of a breeding pair, their pups from the current year, offspring from the previous year, and occasionally an unrelated wolf. Packs occupy, and defend from other packs and individual wolves, a territory of 20 to 214 square miles. Normally in each pack only the top-ranking male and female breed and produce pups. Litters are born from early April into May; they can range from one to eleven pups, but generally contain four to six pups. Yearling wolves frequently disperse from their natal packs, although some remain with their pack. Dispersers may become nomadic and cover large areas as lone animals, or they may locate suitable

unoccupied habitat and a member of the opposite sex and begin their own territorial pack. Dispersal movements of over 500 miles have been documented. (USFWS, 2003)

Status and distribution

The Service issued a final rule on April 1, 2003 (USFWS 2003), which changed the classification of the gray wolf under the Act; for the gray wolf in Wisconsin, the status was changed from endangered to threatened. This action finalized the Service's proposal first published on July 13, 2000, (USFWS 2000). Increases in gray wolf numbers, expansion of the species' occupied range, and progress toward achieving the reclassification and delisting criteria in several approved gray wolf recovery plans indicated that the species' previous classification throughout most of its range was no longer appropriate. The final rule established three distinct population segments (DPS) for the gray wolf in the United States and Mexico. This rule included establishment of an Eastern DPS which includes the two areas proposed as a Western Great Lakes DPS and a Northeastern DPS, which were combined and expanded in the final rule. Gray wolves in the Eastern DPS and Western DPS were reclassified from endangered to threatened due to their successful recovery. Gray wolves in the Southwestern DPS retained their endangered status. Gray wolves were removed from the protections of the Act in all other areas of the 48 coterminous states. The existing gray wolf experimental population designation for gray wolves in parts of Arizona, New Mexico, and Texas was retained, but the two experimental population designations for reintroduced gray wolves in Idaho, Montana, and Wyoming were removed. A new special rule under section 4(d) of the Act was promulgated for the threatened Western DPS, to replace the original special rule that applied to the two experimental populations. A second special rule under section 4(d) applied to the Eastern DPS. All existing designations of critical habitat areas in Minnesota and Michigan were retained by the reclassification of wolves in Michigan and the continuation of the wolf's threatened status in Minnesota.

The Service's April 1, 2003 final rule to reclassify the wolf was challenged in court through the filing of at least two separate suits by parties objecting to the change in the species' status in areas where they believed populations have yet to recover. A January 31, 2005 court decision in U.S. District Court in Oregon vacated the final reclassification and section 4(d) regulations, which resulted in the loss of Wisconsin DNR authority to lethally take wolves in response to depredation complaints. Because depredation of livestock on private lands by wolves can result in a loss of support for wolf recovery, the Wisconsin DNR has requested a separate permit to allow for control of depredating wolves.

Reclassification and delisting criteria for the eastern timber wolf

The recovery (delisting) and reclassification (from endangered to threatened) criteria for the eastern timber wolf focus on numbers of wolves, numbers of populations, distribution of populations, and the likelihood of future favorable management and protection. Specifically, both of the Service's 1978 and 1992 Eastern Timber Wolf Recovery Plans (Eastern Plan) identify two delisting criteria for the eastern timber wolf. First, the Eastern Plan requires that the survival of the wolf in Minnesota must be assured. While there is no specific numerical criterion for a Minnesota wolf population, the Eastern Plan identifies State subgoals for use by land managers and planners. The Eastern Plan's subgoal for Minnesota is 1,251 to 1,400 wolves. The Service

believes that this first delisting criterion identifies a need for reasonable assurances that future State and Tribal wolf management practices and protection will result in a viable recovered population of gray wolves within the borders of Minnesota for the foreseeable future.

The second delisting criterion in the Eastern Plan requires that at least one viable wolf population must be re-established within the historical range of the eastern timber wolf outside of Minnesota and Isle Royale. The Eastern Plan states that a re-established viable wolf population can take either of two forms. If it is located more than 100 miles from the Minnesota wolf population it would be considered "isolated," and there likely would be very low frequency of movement of individuals and genetic material from one population to the other. Such an isolated population would have to consist of at least 200 wolves for at least 5 years (based upon late winter counts). Alternatively, if the second population is located within 100 miles of another self-sustaining wolf population (for example, the Minnesota wolf population), a re-established population having a minimum of 100 wolves for at least 5 years would be considered viable. Such a smaller population would be considered to be viable because its proximity would allow frequent immigration of wolves from Minnesota to supplement it numerically and genetically.

The Eastern Plan does not specify where in the eastern United States the second population should be re-established, and the second population could be located anywhere within the geographical area covered by the Eastern Plan except on Isle Royale and in Minnesota itself. The 1992 Eastern Plan also contains criteria for reclassifying wolves in Wisconsin to threatened status, as well as for consideration of reclassification of wolves in Michigan. The Eastern Plan specifies that wolves in Wisconsin could be reclassified to threatened status if the wolf population within the state remained at or above 80 (late winter counts) for three consecutive years. Because the Michigan wolf population was so small at the time the Eastern Plan was being revised (fewer than 20 wolves outside of Isle Royale), the Eastern Plan does not contain a reclassification criterion for Michigan wolves. Instead, it states that if Wisconsin wolves reach their reclassification criterion, consideration should also be given to reclassifying Michigan wolves. The Eastern Timber Wolf Recovery Team which prepared the 1978 and 1992 Eastern Timber Wolf Recovery Plans used these criteria when it recommended to the Service that the gray wolf in the Western Great Lakes States be classified to threatened as soon as possible.

The Eastern Timber Wolf Recovery Team recently clarified that it will consider the numerical delisting criterion to have been achieved when six successive late winter wolf surveys include five successive years that the wolf population was maintained at the specified level. Because the Wisconsin-Michigan wolf population was first known to have exceeded 100 wolves in the late winter 1993-94 survey, the numerical delisting criterion was satisfied in early 1999. (USFWS 2003)

Recovery progress of the gray wolf in the eastern states of Minnesota, Michigan and Wisconsin

Minnesota

The Minnesota Department of Natural Resources in 2003-2004 estimated the Minnesota wolf population at 3,020 wolves, in an estimated 485 packs (Erb and Benson, 2005). This estimate is greater than that of the 1997-1998 estimate of 2,445 wolves in 385 packs, but is not thought to represent a significant change in the numbers or distribution of wolves in the state (Erb and

Benson, 2005). The Minnesota DNR has prepared a Wolf Management Plan with a minimum population goal of 1600 wolves. This plan contains provisions which the Minnesota DNR believes will ensure the viability of the Minnesota wolf population for the foreseeable future. (USFWS 2003).

Michigan

The Michigan Department of Natural Resources estimated in 2004 that the Michigan wolf population was at 360 wolves in 77 packs (Beyer, et. al. 2004). The Michigan DNR has prepared a Final Wolf Management Plan with a minimum population goal of 200 wolves and provisions to protect the viability of their wolf population for the foreseeable future. (Refsnider 2002)

Wisconsin

Wolves are considered to have been extirpated from Wisconsin by 1960. There were no formal attempts made to monitor Wisconsin's wolf population from 1960 until 1979. From 1960 through 1975, there were scattered reports of individual wolves and an occasional wolf pair was reported. However, there was no evidence that there was any wolf reproduction occurring in Wisconsin, and the wolves that were reported may have been dispersing animals from Minnesota.

Wolf population monitoring by the Wisconsin DNR began in 1979 and estimated a statewide population of 25 wolves at that time. This population remained relatively stable for several years, then declined to the mid and upper-teens in the mid-1980s. This decline is believed to have been a result of decreased survival of wolf pups due to an epidemic of canine parvovirus (CPV) in the wolf population. During that time an experimental parvovirus vaccine was developed by the Wisconsin DNR with partial Service funding, but it was never administered to wild wolves because CPV-caused mortality decreased after 1987.

In the late 1980s the Wisconsin wolf population began an increase that continues today. The Wisconsin DNR intensively monitors its wolf population, using a combination of aerial, ground and satellite radio telemetry, snow tracking, and wolf sign surveys. During the winter of 2003-2004, 39 of Wisconsin's 108 wolf packs had members carrying active radio transmitters much of the season. Three additional radio-tracked wolves were loners, and one was in an adjacent Minnesota pack. Minimum wolf population estimates (late-winter counts) for 1994 through 2004 are 57, 83, 99, 148, 178, 205, 248, 257, 323, 335, and 373 animals, comprising 14, 18, 28, 35, 47, 57, 66, 70, 81, 94, and 108 packs, respectively (WDNR 2004a). Final results for the late winter count of 2005 are not yet available, but are believed to be approximately 400 animals (A. Wydeven, pers. comm. 2005). Because the monitoring methods focus on wolf packs, it is believed that lone wolves are undercounted in Wisconsin, and that these population estimates are probably slight underestimates of the actual wolf population within the state.

In 1995 wolves were first documented in Jackson County, Wisconsin, an area well to the south of the northern Wisconsin area occupied by other Wisconsin wolf packs. During the winter of 2003-2004, there were at least 50 wolves in 15 packs and at least 2 loners in this central Wisconsin forest region (WDNR 2004a).

Wolf numbers in Wisconsin have greatly surpassed the second population goal identified in the Eastern Timber Wolf Recovery Plan and exceeded its reclassification criteria several years ago. Although population growth stalled between 1999-2000 and 2000-2001, the Wisconsin wolf population has continued to increase since that time. Between 2002-2003 and 2003-2004, the wolf population in Wisconsin increased from 335 to 373, or 11.3 percent. The average annual rate of growth over the past 10 years has been greater than 20 percent.

Summary of recovery progress of gray wolves in the western Great Lakes DPS

Subsequent to the completion of the 1978 Eastern Timber Wolf Recovery Plan, and to some extent prior to the listing of the eastern timber wolf as an endangered species in 1974, a wide variety of conservation actions for the wolf have been undertaken by a broad spectrum of governmental agencies and private organizations. These actions encompass protection of wolves and the important components of their habitat, including dispersal corridors, denning and rendezvous sites; maintenance of habitat conditions that produce healthy prey populations; removal of depredating wolves and wolf packs to reduce illegal killing of wolves; reducing wolf exposure to potentially fatal encounters with humans; curative and prophylactic treatment of live-trapped wolves against diseases and parasites; research on various aspects of wolf biology; and providing factual biological information to the public and decision-makers. These recovery activities have been carried out by Federal, State, Tribal, county, and local units of government, private conservation organizations, academic researchers, private landowners and corporations, and numerous private citizens.

The outcome of these activities has been to reverse the historical downward trend in gray wolf numbers and increase occupied range in the western Great Lakes states. Wolves now occupy nearly half of Minnesota, most of Michigan's Upper Peninsula, and much of the northern quarter of Wisconsin. In addition to this successful reoccupancy of the "north woods," fifteen packs of wolves now occupy central Wisconsin, and dispersing gray wolves from Minnesota are moving into North and South Dakota. There also have been recently confirmed deaths and sightings of wolves in the Lower Peninsula of Michigan. (M. Decapita, pers.comm. 2004).

ENVIRONMENTAL BASELINE

The gray wolf was extirpated from Wisconsin by 1960 as the result of deliberate actions to minimize or eliminate wolf populations. Human-related mortality and disease are the primary factors influencing wolf numbers today. As explained previously, however, the gray wolf population within the action area has been steadily increasing in number and expanding its range since the late 1980s. Specifically, the Wisconsin population has increased at an average annual rate of more than 20 percent over the last 10 years (from 57 in 1994 to 373 in 2004), and in Michigan, the growth rate has been only slightly less (from 57 in 1994 to 360 in 2004). Wolf numbers in Wisconsin have greatly surpassed the second population goal identified in the Eastern Timber Wolf Recovery Plan and exceeded its reclassification criteria several years ago.

The primary factors influencing wolf recovery today are human-related mortality and disease. However, as evidenced by the increasing population, these factors do not appear to be appreciably hindering the conservation of the gray wolf in Wisconsin.

EFFECTS OF THE ACTION

The anticipated effects from the activities that would be authorized by the proposed permit range from no perceptible effect to mortality. For purposes of monitoring and research, some level of incidental take is anticipated, despite every reasonable effort that will be made to minimize or avoid such take. In the case of depredation abatement activities, wolves captured at a site with a recent documented wolf depredation are proposed to be immediately euthanized, resulting in intentional lethal take. Each of these categories of take analyzed in this opinion is discussed separately below.

Incidental Take

The Wisconsin DNR has worked diligently to minimize injury or death caused by its research and monitoring trapping activities for wolves. Traps have been modified to cause minimal injury, trappers have received formal training in the chemical immobilization and handling of wild animals, a Wisconsin DNR protocol has been developed for these activities, and all trappers receive refresher training prior to each trapping season. The training emphasizes: (1) proper trap site selection and trap placement to reduce mechanical injuries to wolves; (2) drugs and dosage rates to use for immobilizing captured wolves; (3) monitoring vital signs of immobilized wolves including body temperature, respiration, and heart rate; and (4) guidelines/procedures to follow if any injuries or emergencies are encountered.

Between 1993 and 1999, 4 of 87 wolves captured by the Wisconsin DNR and its agent, the USDA-APHIS-WS, died from trapping activities. Since 1999, a total of 4 additional wolves have died, out of a total of at least 148 captures for purposes of monitoring. Thus, overall, capture-related mortality from live trapping since 1993 has averaged 3.4 percent. Table 1 lists mortality and severe injury rates for 1993-1998 for live-captured wolves in Wisconsin. The overall mortality and injury rates were 4.6 percent for live-captured related activities for all wolves caught from 1993-1998. Injury rates for live-captured related activities for Wisconsin wolves since 1998 have not yet been summarized, but are thought to be similar, or lower, than rates experienced from 1993 to 1998 (A. Wydeven, pers. comm. 2005). Table 2 shows capture-related injury and mortality from six wolf studies across North America. Mortality rates for live-captured wolves from capture activity ranged from 1.7 to 7.0 percent in five studies, and severe injuries averaged 11.3 percent in one study. Capture-related mortality in Wisconsin is similar to these other studies, and injury rates are less than the listed study.

The Wisconsin DNR has stated it is committed to minimizing injuries and death of wolves captured in monitoring and research activities. The Wisconsin DNR has required all wolf trappers to be certified in the use of tranquilizer drugs prior to being able to trap wolves in the state. All wolf trappers will be recertified each spring and will update knowledge on drugs and wolf health monitoring. Also, the Wisconsin DNR will be examining their trapping procedures and determining if they need to limit trapping or modify trapping methods in areas where the risk of injury or death may increase.

The Service proposes to allow the use of electronic avoidance (dog shock) collars on livestock depredating wolves to reduce and prevent depredation. This use of electric avoidance collars and similar devices is experimental and has had limited testing to date in Wisconsin. The Service

believes there is low potential for the incidental take of wolves from these electronic devices through injury and death. Dog shock collars are used routinely without apparent adverse effects. Electronic shock collars appear to be very effective at conditioning dogs to avoid the activities which result in an electric shock and it is believed the collars will work similarly on the dog's close cousin, the gray wolf. The idea is to use a dog shock collar on all pack members, and trigger the shocking by an automatic proximity sensor placed in the livestock area. The hope is to condition the wolves to associate the shock with proximity to that livestock pasture area so they will learn to avoid it.

The alternative to using electronic avoidance collars is to trap the entire pack doing the depredation and relocate all of them to a new area which would be unfamiliar to the pack and thus potentially more risky. Removing an entire pack usually does not work because in highly suitable wolf habitat another pack will quickly move into the unoccupied pack territory and may start the same depredating habits at the same site. Also, the trapping effort to capture the whole pack would be the same for relocating or placing electronic avoidance collars on all pack members. When a pack is relocated there are numerous additional risks to the wolves associated with holding, transporting, and releasing wolves in an unknown and strange area outside of the pack's home territory. These relocating risks appear to be greater than the risk of injury and death due to the use of electronic shocking devices. In addition, the majority of suitable wolf habitat in the state is already occupied, which greatly limits relocation options.

The Service anticipates that the level of injury and mortality associated with the activities to be undertaken will mirror past years' rates. That is, under the proposed permit, no more than 5 percent of individuals captured will be injured or killed during trapping activities for monitoring, research, or the placement of electronic avoidance collars. In addition to these actions, depredation abatement activities may result in the death of wolf pups that may be lethally injured when captured prior to August 1 of each year. As such, we anticipate that up to 4 wolves may be incidentally taken (i.e., injured or killed) in the course of trapping for monitoring, research and depredation abatement activities over the course of a year.

Intentional Take

Depredation Abatement

The Wisconsin DNR and its agent, the USDA-APHIS-WS, also propose to euthanize wolves involved in depredating on livestock and pets on private land in Wisconsin. Prior to issuance of the special 4(d) rule in April 2003 which allowed for lethal take of depredating wolves, the Wisconsin DNR practiced relocation of wolves involved in depredations, and moved problem wolves to other areas of suitable, but primarily unoccupied habitat. Problems associated with this approach included wolves returning to their previous location, resumption of their depredating habits at the new location, and being killed by resident wolf packs in the release area. Thus, in order for translocation to have a reasonable probability of assisting wolf recovery, there must be unoccupied wolf habitat available within the state, but at a great distance from the depredation incident site, in order for the translocated wolf to survive and reproduce without causing additional depredation problems. As the Wisconsin wolf population expands in number and range, the frequency of depredation incidents is increasing, yet there are fewer suitable release sites available.

During winter 2001-2002, the Wisconsin DNR received a request from the Forest County Board of Supervisors, to stop relocating wolves into Forest County, where the Wisconsin DNR had traditionally relocated many problem wolves. Since that time, Florence, Iron, Langlade, Lincoln, Marinette, Oconto, Rusk, and Taylor Counties, and the Town of Mason in Bayfield County, have passed resolutions against release of problem wolves. With most suitable wolf habitat occupied by wolf packs, the Wisconsin DNR now has limited places to relocate problem wolves. Wherever the Wisconsin DNR releases wolves, there is a likelihood of wolves going to new sites and causing additional depredation; thus, the Wisconsin DNR has expressed a need to euthanize wolves at depredation sites.

Lethal depredation control has been successful in reducing conflicts between the recovering wolf population and domestic animals in Minnesota. It resolves the immediate depredation problem without the removal of excessive numbers of wolves, and avoids removing any wolves when the depredation is not verified as being caused by wolves or is not likely to be repeated. It is significantly less expensive, less labor-intensive, and more effective than translocating such problem wolves, and thus is more appropriate for the expanding wolf population that now exists in Wisconsin. Based on an analysis of the Wisconsin DNR's expected incidence of depredation control, the Service proposes to allow up to 34 gray wolves to be intentionally killed per year.

To analyze this level of take in the context of how it is expected to affect the population, the effects of the previous two years of depredation abatement activities on wolf populations in Wisconsin, since promulgation of the special rule under section 4(d) of the Act in 2003, can be examined. In addition to this information, a much longer record of depredation abatement activities exists for the State of Minnesota (Table 3). During the 10-year period from 1993 to 2002, an average of 6.4 percent of the Minnesota winter wolf population was lethally taken by USDA-WS as a result of depredation abatement activities. Despite this level of take, the wolf population in Minnesota has continued to increase from an estimated 1500 wolves in 233 packs in 1988-1989, to 2445 wolves in 385 packs in 1997-1998, to 3020 wolves in an estimated 485 packs in 2004 (Erb and Benson, 2005). Clearly, this level of take (6.4 percent) has not prevented the Minnesota wolf population from continuing to expand.

Between 1991 and 2002, 34 wolves were trapped at depredation sites in Wisconsin. Lethal take authorized by the special 4(d) rule in Wisconsin beginning in 2003 and continuing through all of 2004 resulted in the lethal take of 17 wolves in 2003 and 24 in 2004. This level of take represents approximately 5 percent and 6.4 percent of the late-winter Wisconsin wolf population for 2003 and 2004, respectively. Considering that some of the animals euthanized during this period were in fact young of the year taken after August 1, and, thus, were members of an age group not yet in existence at the time of the late winter count, these percentages are an over-estimate of the take of the late winter population. The actual number of young of the year to adults lethally taken at depredation sites was 8 of 17 in 2003 and 4 of 24 in 2004. Therefore, the number of adult and yearling wolves lethally taken in 2003 was 9, out of a late-winter population total of 335, or 2.7 percent. In 2004, this number was 20 out of 373, or 5.4 percent, and for the two years combined, approximately 4 percent of the individuals in the late winter population.

If the average proportion of pups to adults is assumed by combining totals for both years, approximately 29 out of 41, or 70 percent of euthanized wolves for any one year would be

expected to be adults. Using the current preliminary late-winter estimate of 400 wolves (A. Wydeven, pers.comm. 2005), and applying a figure of 6 percent, derives an estimate of 24 adults that could be lethally taken and still allow for continued population growth as recently experienced in both Minnesota and Wisconsin. The addition of the previously observed proportion of young-of-the-year wolves to this total results in an additional 10 pups which could be lethally taken, or a total allowable take of 34 per calendar year, using the assumptions outlined above.

To examine this level of mortality in the context of overall mortality of the population, two separate data sets provided by the Wisconsin DNR were examined. Data on survival of radio-collared wolves monitored by the Wisconsin DNR indicates that from 2000 through 2004, between 49 and 84 wolves were monitored annually. During this period, annual mortality of radio-collared wolves ranged from approximately 17 to 26 percent, for an average of approximately 22.6 percent (Table 4). These data also provide another independent measure of that proportion of total mortality resulting from lethal take at depredation sites, being 5 percent in 2003 and 8 percent in 2004. Although the numbers of animals involved in this set of data are very small and hence not statistically significant, they show an agreement with other estimates of the same statistic.

Another estimate of mortality of the Wisconsin wolf population is derived by examining all known mortalities in relation to the estimated total population. For the year 2004, a total of 70 wolf deaths were recorded in the state, which represents 19 percent of the 2003-2004 late-winter population count of 373 wolves. This figure is certainly a conservative estimate of mortality, since many wolf deaths likely remain undocumented. This estimate is very close to that derived from the sample of radio-collared wolves described above.

Since the advent of the expanded lethal take authorized by the special rule in 2003, the Wisconsin wolf population has continued to grow despite this additional mortality, increasing by more than 15.4 percent between 2002 and 2004, or over 7.7 percent per year. As noted above, while final numbers are not yet tallied, it appears that the Wisconsin wolf population has continued to increase between 2004 and 2005. In summary, the total estimated annual mortality of the Wisconsin wolf population is estimated to be 20 percent, and in 2003 and 2004, approximately 3 to 6 percent of this mortality was due to lethal take at depredation sites. The Wisconsin wolf population has continued to grow under this level of mortality, suggesting that the approximately 6 percent level of take currently proposed for this permit action can be expected to allow the Wisconsin wolf population to remain stable or continue to grow.

Therefore, because of the anticipated low level of additional mortality that will result from this approach, and the likelihood of a larger increase in illegal wolf killing and loss of public support for wolves which could result from increasing incidence of livestock depredations, the Service believes that limited lethal control will contribute to conservation of the gray wolf in Wisconsin.

Sarcoptic Mange

Sarcoptic mange is a disease that commonly afflicts Wisconsin wolves, and has caused significant mortality of the population in recent years (USFWS 2004). Wolves nearing death from mange generally crawl into dense cover and are difficult to discover if they are not radio-

tracked (Shelley and Gehring 2002). Thus, radio-collared wolves provide one of the best measures of actual mortality from mange. During the winter of 2002–03, approximately 36 percent of the radio-collared wolves being tracked by WI DNR died from mange (WDNR 2003, 2004). The prevalence of the disease may have contributed to the relatively small population increase of 2.4 percent in 2003 as compared to the average 18 percent since 1985 (USFWS 2004). Between 2000 and 2004, mange accounted for 19 of 73 deaths of radio-collared wolves in Wisconsin, or 26 percent of all confirmed deaths.

Clearly, mange has been shown to be a significant source of mortality in Wisconsin. The Wisconsin DNR's February 11, 2005 letter requested authorization to euthanize wolves that are afflicted with mange or other serious contagious disease, instead of translocating or relocating them. As this permit will allow for euthanization of depredating wolves rather than relocation, there is a decreased need for this authorization. However, as there may be circumstances where it is desirable to euthanize animals severely infected with mange or other disease to avoid the further spread of the disease, the Service believes it appropriate to authorize the Wisconsin DNR to euthanize up to three wolves annually for this purpose. Given the seriousness of mange and the potential to thus reduce the spread of the disease, we believe that this take may result in a net beneficial effect, but is not likely to have any significant adverse effect, on the Wisconsin wolf population. As this take is likely to be nearly all compensatory, and not additive, we do not believe it will result in any additional level of mortality to the population.

Injured Wolves

According to Wisconsin DNR monitoring reports, the major causes of wolf mortalities in Wisconsin in recent years include illegal shooting, vehicle collision, mange, and death caused by other wolves. Occasionally, Wisconsin DNR employees encounter wolves that have been injured for various reasons, and are unlikely to survive. In 2004, at least 5 wolves were euthanized by DNR personnel, including four that had been mortally injured due to vehicle collision, and one pup that had a pail stuck on its head for a long period of time (WDNR 2004b). In all cases, these animals were euthanized to prevent further pain and suffering of animals that were virtually certain to die within a short period. To allow Wisconsin DNR to respond in this fashion to these kinds of situations in the future, the Service will authorize the lethal take of up to 10 animals per year, but only in those situations where in the best judgment of the Wisconsin DNR biologist, the animal was likely to die within a short time period of the injuries sustained. As is the case with animals with mange or other contagious disease, the Service believes that this mortality will be nearly all compensatory, and not additive, and, therefore, would have no detectable adverse affect on the Wisconsin wolf population.

Summary

The Service anticipates that issuance of the section 10(a)(1)(A) subpermit will result in adverse effects to individual wolves. Pursuant to the permit, up to 51 animals may be taken. Specifically, the Service expects no more than 4 wolves to be incidentally injured or killed during depredation abatement trapping or while conducting research or monitoring activities, no more than 34 wolves intentionally killed for depredation abatement purposes, no more than 3 wolves euthanized that are severely infected with mange or other contagious disease, and no more than 10 wolves euthanized that have sustained various injuries likely to result in death.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, Tribal, local or private actions that are reasonably certain to occur in the action area considered in the biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act. It is anticipated that future State, Tribal, local or private actions combined with this proposed wolf trapping action will contribute to the conservation of the gray wolf in and around the action area of the State of Wisconsin. Also, the Wisconsin DNR has prepared a Wisconsin Wolf Management Plan (October 27, 1999) which will provide for the continued existence and conservation of the gray wolf in Wisconsin. These efforts should contribute to the long-term survival of the gray wolf in Wisconsin. It is not anticipated that any future State, Tribal, local or private actions are to occur in the action area considered in this biological opinion that would adversely impact the gray wolf associated with the proposed action.

CONCLUSION

After reviewing the current status of the gray wolf, the environmental baseline for the action area, the effects of the proposed trapping of wolves for monitoring, research, and depredation abatement, and the cumulative effects, it is the Service's biological opinion that the trapping of wolves for monitoring, research, and depredation abatement, as proposed, is not likely to jeopardize the continued existence of the gray wolf in Wisconsin. No critical habitat has been designated for the gray wolf in Wisconsin; therefore, none will be affected.

As previously discussed, the Service believes the Wisconsin wolf population is increasing at a rate of 7 to 20 percent annually. The Service anticipates that the issuance of the proposed section 10(a)(1)(A) subpermit will result in an additional mortality of 6 percent annually. This increased rate of mortality is not likely to measurably slow the recovery of the species in Wisconsin, Minnesota or Michigan, and as such, the conservation status of the gray wolf rangewide will not be appreciably affected. Therefore, the Service believes the proposed actions will not jeopardize the continued existence of the gray wolf.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act

provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement. The measures described below are non-discretionary, and must be undertaken by the Service so that they become binding conditions of any permit issued to the Wisconsin DNR for the exemption in section 7(o)(2) to apply. The Service has a continuing duty to regulate the activity covered by this incidental take statement. If the Service (1) fails to assume and implement the terms and conditions or (2) fails to require the Wisconsin DNR and its agents to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit document, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the Wisconsin DNR and its agents must report the progress of the action and its impact on the gray wolf to the Service as specified in the incidental take statement. [50 CFR§402.14(i)(3)]

Amount or Extent of Take

The Service anticipates that up to four gray wolves per year may be taken incidentally as a result of this proposed action. The incidental take is expected to be in the form of death, injury, or removal from the wild.

Over the period between 1993 and 2004, the Wisconsin DNR's trapping efforts resulted in the incidental death of eight wolves. That is, an average of 0.67 wolves per year being killed.

The use of electronic avoidance collars and similar devices for reducing and preventing livestock depredation may potentially injure or result in death of trapped wolves. However, it appears that the potential for such injury and death is very low and should pose little risk to most trapped wolves relative to this action.

Therefore, the Service believes up to four wolves per year could be incidentally taken.

Effect of the Take

In the accompanying biological opinion, the Service determined that the levels of anticipated incidental and intentional take analyzed are not likely to result in jeopardy to the species or destruction or adverse modification of critical habitat.

Reasonable and Prudent Measures

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize impacts of incidental take on the gray wolf:

1. The Service will ensure that incidental lethal take levels do not exceed the levels anticipated in this biological opinion.
2. The Service will require the permittee and its agents to follow the most current wolf capturing protocols to ensure injury potential is minimized to the fullest extent.
3. The Service will require the permittee and its agents to ensure all wolf trappers are properly trained in chemical immobilization, trapping, and medical treatment.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, the Service must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and outline required reporting/monitoring requirements. These terms and conditions are non-discretionary.

Terms and Conditions associated with RPM # 1

1. The Service will require the permittee and its agents to cease trapping wolves and to contact the Green Bay Ecological Services Field Office promptly if four wolves have been incidentally injured or killed.
2. The Service will require that all wolf injuries or mortalities as a result of trapping activities be reported to the Service's Region 3 Endangered Species Permits Office at (612)713-5343, the Green Bay Ecological Services Field Office at (920) 866-1717, and the Service's nearest Law Enforcement Office within 5 calendar days.
3. The Service will require that dead or moribund wolves be transferred to the U.S. Geological Survey's Wildlife Health Laboratory in Madison, Wisconsin, for necropsy of radio-collared wolves or if Federal legal cases are involved; dead or moribund wolves will be submitted to the Wisconsin DNR Wildlife Health Lab in Monona, Wisconsin, for non-collared wolves or if State legal cases are involved. Specimens may be retained for further study or educational purposes with the written permission of the Madison Wildlife Health Laboratory; copies of such permission must be submitted annually to the Service's Region 3 Endangered Species Permit Office at Fort Snelling, Minnesota, by January 31.
4. The Service will require that a full report of activities conducted, as well as copies of all data obtained from those activities, be submitted to the Service's Region 3 Endangered Species Permit Office and the Service's Green Bay Ecological Services Field Office by January 31 of each year. In addition, copies of all reports and publications resulting from those data must be submitted to the Service's Region 3 Endangered Species Permits Office and the Service's Green Bay Ecological Services Field Office as they become available. The report should include the following:
 - a. the date, location, age, sex, ear tag number, and general description of the physical condition of each wolf captured;
 - b. the results of any non-lethal wolf studies;
 - c. any administration of medications to captured wolves;
 - d. the disposition of any wolves killed, injured, salvaged, and/or transported to the Madison Wildlife Health Laboratory;
 - e. the results of any blood analysis;

- f. the results of efforts to address and resolve depredation issues, including repeat depredations by wolves; and
- g. a summary that includes the following for each wolf injury or mortality that has occurred:
 - (1) the date and time of the taking;
 - (2) the names of any persons involved in the taking;
 - (3) the circumstances surrounding any taking, including the stimulus for the taking, and/or human activities involved;
 - (4) the behavioral responses of any gray wolves taken; and
 - (5) any actions taken to avoid or minimize taking.

Terms and Conditions associated with RPM # 2

The Service will require the permittee and its agents to follow the Wisconsin DNR/USDA wolf trapping protocols or, if other procedures are proven to cause fewer injuries or mortalities, those procedures shall be utilized instead.

Terms and Conditions associated with RPM # 3

The Service will require that all trappers working for the Wisconsin DNR, USDA-APHIS-WS, or other agent of the permittee, be trained in and receive annual refresher courses in the trapping, chemical immobilization, and medical handling of wild animals (with emphasis on wolves) to minimize injury and death to wolves.

Summary

The Service believes that no more than four gray wolves per year will be incidentally taken as a result of the proposed action. The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed action. If, during the course of the action, this level of incidental take is exceeded, such incidental take represents new information requiring reinitiation of consultation and review of the reasonable and prudent measure provided. The Federal agency must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent alternative.

REINITIATION NOTICE

This concludes formal consultation on the actions outlined in the request. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not

considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

Questions pertaining to this biological opinion should be directed to Mr. Joel Trick at (920) 866-1737.

Janet M. Smith

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Table 1. Injury rate and mortality related to live-capture activity on Wisconsin wolves, 1993 -1998. (Pils 1998)

Year	Total Captures	Severe Injuries	Capture-related Deaths
1993	9	0	1
1994	11	0	0
1995	17	2	1
1996	14	0	0
1997	18a	0	0
1998	<u>18b</u>	<u>2</u>	<u>2</u>
Total	87	4 (4.6%)	4 (4.6%)

a One wolf captured twice

b Two wolves captured twice

Table 2. Mortality or Severe Injuries of Live-captured Wolves Due to Capture-related Activities (ratio of injury or death versus total captures). (Pils 1998)

4/151 died (2.6%) (helicopter darting)	(Ballard 1987)
1/60 died (1.7%) (leg-hold trapping)	(Fritts 1981)
2/54 died (3.7%) (helicopter darting)	(Peterson 1984)
12/106 injured (11.3%) (leg-hold trapping)	(VanBallenberghe 1984)
4/57 died (7.0%) (leg-hold trapping)	(Berg 1982)
1/26 died (3.8%) (leg-hold trapping)	(Bjordge 1989)

Table 3. Number of individuals and percentage of wolf population taken from 1993 – 2002 as a result of Minnesota USDA Wildlife Services’ wolf depredation control activities (USDA 2002).

Year	Population Estimate	Wolves Taken	Percentage of Population Taken (Estimate)
1993	2000	139	7.0
1994	2000	172	8.6
1995	2000	78	3.9
1996	2200	154	7.0
1997	2300	216	9.8
1998	2400	161	6.7
1999	2500	151	6.0
2000	2600	148	5.7
2001	2750	109	4.0
2002	2750	146	5.3

Table 4. Mortality of radio collared wolves in Wisconsin 2000-2004.

Mortality Factors	2000	2001	2002	2003	2004	Total
Illegal Shooting	2 (17%)	4 (28%)	3 (21%)	4 (20%)	4 (31%)	17 (23%)
Vehicle Collision	1 (8%)	1 (7%)	2 (14%)	3 (15%)	2 (15%)	9 (12%)
Depredator Euthanized	0	0	0	1 (5%)	1 (8%)	2 (3%)
Capture Related	0	1 (7%)	1 (7%)	0	2 (15%)	4 (5%)
Total Human	3 (25%)	6 (43%)	6 (43%)	8 (40%)	9 (69%)	32 (44%)
Mange	4 (33%)	4 (28%)	2 (14%)	6 (30%)	3 (23%)	19 (26%)
Other Disease	1 (8%)	2 (14%)	0	0	2 (2%)	5 (7%)
Malnutrition	0	0	2 (14%)	0	0	2 (2%)
Other Wolves	3 (25%)	2 (14%)	1 (7%)	1 (5%)	1 (8%)	8 (11%)
Accident	0	0	1 (7%)	0	0	1 (1%)
Total Natural	8	8	7	8	4	35 (48%)
Unknown	1		1	4		6 (8%)
Total Wolves Dead	12	14	14	20	13	73
Total Collared Wolves	49	55	84	78	62	
% Increase from Previous Year	21	1	26	2	11	
Wolf Population	248	257	327	335	373	