



United States Department of the Interior

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IN REPLY REFER TO:

March 20, 2006

Memorandum

To: Assistant Regional Director, Ecological Services

From: *Acting* Field Supervisor, East Lansing Field Office, Michigan *gjd*

Subject: **Biological Opinion** (Log No. 06-R3-ELFO-01)
Section 7 Consultation on Issuance of permit under Section 10(a)(1)(A) to Michigan Department of Natural Resources' for Gray Wolf Depredation Control Activities

Pursuant to section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.) (ESA), this biological opinion addresses the U.S. Fish & Wildlife Service's (Service) issuance of an Endangered Species Act section 10(a)(1)(A) permit to Michigan Department of Natural Resources (MDNR) that would allow intentional take of gray wolves for conservation purposes. Specifically, the MDNR plans to lethally take gray wolves that have depredated livestock or other domestic animals. Since issuing a section 10(a)(1)(A) permit represents a Federal action, the Service must, pursuant to section 7 of the 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.

For reasons discussed below, it is our biological opinion that issuance of a section 10(a)(1)(A) permit for MDNR's Wolf Depredation Program is not likely to jeopardize the continued existence of gray wolves, nor any other listed species. Our biological opinion analyzed the impact of removing up to 11% (10% intentional take, 1% incidental take) of Michigan's gray wolf population annually. Incidental take is based on the annual MDNR population estimate, so the actual number of wolves expected to be incidentally taken can be adjusted upon determination of each annual population estimate, if this permit is renewed in subsequent years.

Critical habitat has been designated for gray wolves on Isle Royale in Michigan. There is no other designated critical habitat for wolves in Michigan. As planned wolf depredation abatement activities will not occur on Isle Royale, critical habitat will not be affected.

Consultation History

September 7, 2005 - The MDNR requested an Endangered Species Act section 10(a)(1)(A) permit to enhance the survival of the wolf population in Michigan. Specifically they sought the authority to use injurious harassment and lethal control to abate wolf-related threats to domestic animals. They sought authority to designate federal and tribal organizations as State agents to carry out these activities. They also sought authority to designate private individuals and organizations to carry out injurious harassment.

October 14, 2005 - The MDNR supplied supplemental information in support of their 10(a)(1)(A) permit application to the Service's regional office in Minnesota.

November 22, 2005 – Electronic mail correspondence occurred between staff of the Service's U.P. Ecological Services Sub-Office and the MDNR from which additional information and clarification was provided regarding non-lethal injurious harassment.

March 2, 2006 – Conversation occurred between staff of the Service's U.P. Sub-office and the MDNR regarding the rate of wolf fatalities and injuries due to capture in foot hold traps.

Biological Opinion
Log No. 06-R3-ELFO-01

DESCRIPTION OF THE PROPOSED ACTION

As defined in 50 CFR 402.02, “action” means all activities or programs, of any kind, authorized, funded, or carried out, in whole or in part, by Federal agencies in the United States or upon the high seas. The “action area” is defined as all areas directly or indirectly affected by the effects of the actions (including the proposed action and any interrelated or interdependent actions) and not merely the immediate area involved in the action. The direct and indirect effects of the actions must be considered in conjunction with the effects of other past and present federal, state, or private activities, as well as cumulative effects of reasonably certain future State or private activities within the action area in determining whether a proposed action will jeopardize the continued existence of a listed species.

The proposed action considered in this Biological Opinion (Opinion) is the issuance by the Service of a 10(a)(1)(A) permit to the Michigan Department of Natural Resources (MDNR) allowing the use of injurious harassment and lethal control to reduce the incidence of domestic animal depredation by gray wolves. This Opinion considers only those species that may be affected by the proposed action. We have determined that the proposed action may affect, but is not likely to adversely affect the bald eagle (*Haliaeetus leucocephalus*) and Canada lynx (*Lynx canadensis*), and is likely to adversely affect the gray wolf (*Canis lupus*).

Action Area

Michigan’s wolf depredation control program (program) will be conducted where wolves are present in Michigan. Currently, wolves are found throughout the Upper Peninsula (U.P.) of Michigan. The U.P. encompasses approximately 10.1 million acres (2.5 million hectares), divided into fifteen counties: Alger, Baraga, Chippewa, Delta, Dickinson, Gogebic, Houghton, Iron, Keweenaw, Luce, Mackinac, Marquette, Menominee, Ontonagon, and Schoolcraft. Wolf damage management activities will not be conducted on Isle Royale National Park in Keweenaw County.

In late fall 2004, a wolf was trapped and shot in Presque Isle County in the northern Lower Peninsula (L.P.) of Michigan. MDNR biologists have since observed and confirmed additional wolf tracks in Presque Isle County (Brian Roell, MDNR, pers. comm. February 2006). These observations were the first documented evidence of wolves in the L.P. since the early 1900’s. If wolves become established in the L.P., the proposed action area would expand to encompass the entire state.

Activities associated with the proposed action will largely occur on privately owned land. If verified wolf depredation occurs on private land adjacent to public land, however, project activities may occasionally occur on Federal (U.S. Forest Service or U.S. Fish & Wildlife Service), State, or county owned lands. When these circumstances arise, the

MDNR or its designated agent will notify the land holding agency, and obtain permission prior to initiating project activities. Lethal control on tribal lands will only occur upon the request from a tribe.

Project Description

Background

European colonists brought negative views of wolves to North America. While these views were largely based on myth and folklore, wolf depredation of livestock posed a valid threat to early settlements (Fritts et al. 2003). These negative views and threats to livestock led to the nearly complete extirpation of wolves from the contiguous U.S. (Bangs and Shivik 2001). In the U.S. today, farmers and ranchers frequently hold a negative view of wolves (Fritts et al. 2003). When wolves prey on livestock, some form of wolf control usually follows (Fritts et al. 2003). If the State or Federal government does not act, livestock owners likely will and their actions could lead to the indiscriminate killing of wolves (Fritts et al. 2003). Because of this, livestock depredation continues to be a major problem in wolf conservation.

With an increased wolf population, depredation of livestock and domestic animals has increased along with control of the depredating wolves (USFWS 2003a). In Minnesota, the estimated wolf population increased by 15% from 1988 to 1993 and the number of wolves killed, as a result, increased by 223% (Paul 1994). In Michigan a similar trend has begun to emerge. Of all the depredation events confirmed since 1996, approximately 60% occurred since 2003 (MDNR 2005) when the late winter wolf population surpassed 300 individuals.

With increases in livestock and pet depredation comes an increased possibility of public backlash (Mech 1995). In the revised Eastern Timber Wolf Recovery Plan (USFWS 1992) and the Michigan Gray Wolf Recovery and Management Plan (MDNR 1997), the Service and MDNR determined that a wolf damage management program including the relocation or removal of depredating wolves is necessary and advisable to minimize negative attitudes toward wolf recovery and facilitate wolf conservation. The MDNR has identified social tolerance of wolves as one of the primary factors limiting expansion of the Michigan wolf population (MDNR 1997). This determination is consistent with the opinion of wolf experts who have asserted that wolf distributions could be expanded if some form of wolf damage management were implemented (Bangs et al. 1995, Mech 1995, Boitani 2003, Fritts et al. 2003, Mech and Boitani 2003). Mech (1995) noted that wolf conservation at the local level may become more socially acceptable if some form of localized wolf control is allowed. The Wildlife Society, a North America based international organization of professional wildlife biologists, has stated that “Control of wolves preying on livestock and pets is imperative and should be prompt and efficient if illegal killing is to be prevented and human tolerance of the presence of wolves is to be maintained” (Peek et al. 1991). Selective removal of depredating wolves, as would occur under the proposed section 10(a)(1)(A) permit, would therefore assist with the conservation of wolves in Michigan.

States where the wolf is listed as an endangered species (all Midwest states except Minnesota) have limited options for controlling depredating wolves. Management options for depredating wolves are severely restricted by general prohibitions under the Endangered Species Act (Act). The Act and its implementing regulations (50 CFR 17.21) set forth a series of general prohibitions and exceptions that apply to all endangered wildlife. These prohibitions, in part, make it illegal to take (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect; or to attempt any of these) any endangered wildlife species. The Code of Federal Regulations (CFR), at 50 CFR 17.21(c)(5), provides states with the authority to take endangered wildlife if, among other conditions, the taking will not keep the animal in captivity for more than 45 days or result in the death or permanent disabling of the animal.

Given these restrictions, the only methods currently available for addressing wolf depredation in Michigan are non-injurious harassment or live-trapping and translocation. These techniques, however, are no longer sufficient or practical for management of depredating wolves in the current wolf population. Non-injurious harassment, use of cracker shells or other pyrotechnics, is sometimes successful at scaring wolves away from possible depredation sites (Bangs and Shivik 2001). Over time, however, non-injurious harassment loses its effectiveness as wolves become habituated (Cluff and Murray 1995). Wolves that have been live-trapped and relocated often do not remain near release sites and may even return to their original territories (MDNR 2005a). Wolves are also so widely distributed throughout the U.P. that wolves relocated into a resident wolf pack territory are likely be killed by that pack (MDNR 2005b). If the relocated wolves survive near the release site, they may also continue to exhibit problem behavior (MDNR 2005b). Relocation of animals also can be perceived by the public as an introduction of additional wolves in the U.P. (MDNR 2005b).

To effectively address wolf depredation, the MDNR applied for a 10(a)(1)(A) permit (2005a) to utilize techniques that would result in injurious harassment or lethal control of depredating wolves. Section 10(a)(1)(A) of the ESA allows the Service to grant permits for the take of a federally listed species for, “scientific purposes or to enhance the propagation or survival of the affected species”. As stated above, selective removal of depredating wolves will likely result in greater tolerance of wolves and help in the conservation of wolves in Michigan. Supplemental information provided by the MDNR provides further evidence that issuance of a 10(a)(1)(A) for wolf depredation control is appropriate (MDNR 2005b).

Proposed Activities

To conserve wolves in Michigan the MDNR proposes to conduct injurious harassment and lethal control of wolves involved in depredation of livestock or other domestic animals. Injurious harassment includes the use of nonlethal ammunition such as rubber bullets or projectile bean bags. Methods of lethal control to resolve wolf depredation on livestock and domestic animals will include leg-hold traps or snares, and shooting. Wolves trapped or snared will then be killed by shooting or lethal injection. Tranquilizer/transmitter darts may also be used to facilitate removal of wolves in urban

areas (Brian Roell, MDNR, pers. comm. March 2005). Lethal control could also include day or night-time shooting or use of other humane lethal techniques.

The MDNR has requested the authority to designate other federal agencies and tribal governments as State agents authorized to conduct lethal and non-lethal (injurious harassment) control activities. Agents of the State would receive wolf training identical to MDNR depredation control trappers and they would adhere to all Conservation Measures listed below.

The MDNR has also requested the authority to designate private organizations and individuals as State agents which would be authorized to conduct injurious harassment. These private agents would be informed and trained on the safe and appropriate use of harassment equipment and techniques.

The MDNR has also proposed conservation measures to reduce impacts to the gray wolf population in the U.P. These conservation measures will be incorporated in the 10(a)(1)(A) permit, are part of the proposed action and are considered in the analysis of effects section.

The following conservation measures will be employed when using non-lethal injurious harassment:

- (1) Non-lethal, injurious harassment may be utilized when a wolf attacks or closely approaches livestock or other domestic animals.
- (2) Injurious harassment will not be used if it would cause permanent physical damage or death to a wolf.
- (3) Personnel, and all State agents, will be trained in the safe and appropriate use of harassment techniques and equipment.

The following conservation measures will be employed when using lethal control methods:

- (1) Wolf depredation on lawfully present domestic animals must be verified by appropriately trained personnel.
- (2) If a verified depredation has not occurred in the current calendar year, lethal control shall only proceed when all of the following conditions are met:
 - (a) Verified depredation occurred at the site or in the immediate vicinity during the previous year;
 - (b) There is strong evidence one or more members of the depredating pack has remained in the area since the verified depredation;
 - (c) Based on wolf behavior and other factors, the depredation is likely to be repeated; and
 - (d) Trapping is conducted in a location and in a manner to minimize the likelihood of capture of a wolf or wolves from a non-depredating pack.

- (3) Depredation control activities must occur within 1 mile of the depredation site.
- (4) Taking, handling, and killing wolves must be carried out in a humane manner, and may include use of steel leghold traps, snares, shooting, and lethal injection.
- (5) Traps and snares must be checked at least every 24 hours.
- (6) Young-of-year wolves trapped before August 1 must be released.
- (7) Lactating females trapped before July 1 must be released near the point of capture unless they have been involved with chronic depredation problems; in this case, lactating females may be captured and killed.
- (8) Lethal control efforts may not be implemented at livestock operations or on other private lands where landowners or land managers fail to follow technical assistance guidelines in a timely manner.
- (9) Lethal control may not be used when wolves kill dogs that are free-roaming, hunting, or training on public lands.

SPECIES NOT LIKELY TO BE ADVERSELY AFFECTED BY THE PROPOSED ACTION

Bald Eagle

Bald eagles nest in every county of the U.P. and many counties of the L.P. Bald eagles could potentially be captured in foot snares and leghold traps which will be utilized as part of the Program. This effect, however, is expected to be discountable as the type of trap sets used are unlikely to attract eagles and traps will be set with pan tension devices which are intended to reduce or eliminate the possibility of capturing non-target birds and animals, including bald eagle (Turkowski et al. 1984, Phillips and Grover 1996). Furthermore, as part of on-going USDA Wildlife Services' (WS) national wildlife management program, WS has utilized spring activated foot snares and no incidental capture of bald eagle has occurred in the history of their program (WS 2003).

We conclude that issuance of a 10(a)(1)(A) permit for wolf depredation control is "not likely to adversely affect" the bald eagle.

Canada Lynx

In November 2003, a lynx was trapped in Mackinac County in the eastern portion of the U.P. Scat and hair samples from the animal were tested and provided verification that the individual was a wild Canada lynx. Over the last several years two other reports of lynx observations (tracks only) have been made (Don Lonsway, Wildlife Services, pers. comm.). Unfortunately, these observations could not be verified with DNA testing. The historic data and recently verified lynx trapped in the U.P. suggests that lynx may be present throughout the U.P., within suitable habitat. However, we estimate that lynx, where actually present, are likely to be present in extremely low numbers. There are no data to suggest that a resident breeding population exists at this time.

Leg-hold traps, neck snares, foot snares, or shooting associated with the Program could be used in potential lynx habitat. Lynx have been captured incidentally in leg-hold traps which were set to capture other mammal species (USFWS 2001). Therefore, there is some risk of incidental capture of lynx from MDNR's use of leg-hold traps for wolf depredation control purposes. However, based on WS program's history of no non-target lynx captures in the eastern U.S. (WS 2004), the risk is extremely low. In the unlikely event that lynx are trapped, the requirement for trap checks to occur no less frequently than every 24 hours will reduce the likelihood of serious injury; any accidentally-trapped individuals will be released, if in healthy condition.

Other trapping or lethal control techniques used as part of the wolf depredation control program, foot snares, and shooting or darting, should present at worst a very limited risk of incidental impacts to lynx. If foot snares are used in lynx habitat, incidental take could potentially occur, but is highly unlikely; injuries will be minimized by the trap check frequency. A ten year (fiscal year 1989 to 1998) review of WS program data indicates that WS' use of snares set for wolves failed to capture any non-target lynx (WS 2004.) Shooting or darting would have no effect on lynx because positive identification of target species would be made before animals are shot. Therefore, the incidental capture or injury of lynx is discountable.

We conclude that issuance of a 10(a)(1)(A) permit for wolf depredation control is "not likely to adversely affect" the Canada lynx.

SPECIES LIKELY TO BE ADVERSELY AFFECTED BY THE PROPOSED ACTION

We determined that the proposed action considered in this Opinion is "likely to adversely affect" the gray wolf. The remainder of this Opinion addresses whether the proposed action, including any interrelated or interdependent actions, is likely or not likely to jeopardize the continued existence of the gray wolf.

Gray Wolf

Status of the Species and Critical Habitat

This section presents the relevant biological and ecological information. The purpose is to provide the appropriate information on the species' life history, habitat, and range-wide distribution and conservation status for analyses in later sections. This section also documents the effects of all past human and natural activities or events that led to the current status of the species.

A. Species Description and Life History

Gray wolves are the largest wild members of the Canidae, or dog family, with adults ranging from 18 to 80 kilograms (kg) depending upon sex and subspecies (Mech 1974). Wolves' fur color is frequently a grizzled gray but it can vary from pure white to coal black. Wolves may appear similar to coyotes (*Canis latrans*) and some domestic dog breeds (such as the German shepherd or Siberian husky) (*C. familiaris*). However, wolves' longer legs, larger feet, wider head and snout, and straight tail distinguish them from both coyotes and dogs (USFWS 2003a).

Wolves primarily are predators of medium and large mammals. Wild prey species in North America include animals such as white-tailed deer (*Odocoileus virginianus*), moose (*Alces alces*), and elk (*Cervus canadensis*). Small mammals, such as snowshoe hare (*Lepus americanus*) and beaver (*Castor canadensis*), birds, and large invertebrates are sometimes taken. In the Midwest, during the last 22 years, wolves have also killed domestic animals including cattle, sheep, goats, dogs, and cats (USFWS 2003a).

Wolves are social animals, normally living in packs of 2 to 12 wolves. 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 typically occupy and defend from other packs and individual wolves, a territory of 50 to 550 square kilometers. Usually, only the top-ranking (alpha) male and female in each pack breed, and a single litter is produced annually. Litter sizes range between 1 to 11 pups, but generally include 4 to 6 pups (USFWS 2003a).

Once thought to need wilderness areas to survive, research, as well as the expansion of wolf range over the last two decades, has shown that wolves can successfully occupy a wide range of habitats, and they are not dependent on wilderness areas for their survival. Wolves tend to more readily occupy heavily forested areas and landscapes with low road densities (Mladenoff et al. 1995). Mech (1995) believes that inadequate prey density and a high level of human persecution are the main factors that limit wolf distribution.

The historical decline and near extirpation of wolves from the lower 48 states was caused by intensive control programs including bounties and widespread poisoning, intended to eliminate wolves. This large scale extirpation effort was driven by negative views of wolves due to folklore and livestock depredation.

B. Range-wide Status and Distribution of the Species

The proposed project will occur within the range of the eastern timber wolf (*Canis lupus*), and this discussion is focused only on that gray wolf population. The eastern timber wolf was listed as an endangered species in Michigan and Minnesota in 1974. At that time, a few wolves occurred in Michigan at Isle Royale National Park. Wisconsin had scattered reports of individual wolves and occasional reports of wolf pairs (USFWS 2003A). At the time of listing, Minnesota was the stronghold for the eastern timber wolf with several hundred wolves occurring in the northern portions of that State.

i. Recovery Progress

Currently, eastern timber wolves are commonly found in Minnesota and number in the hundreds in northern Wisconsin and the U.P. of Michigan. In Minnesota, the wolf has been listed as a threatened species since 1978 and a wolf depredation control program, similar to the one described for Michigan in this BO, has been conducted since 1978.

The federal numerical recovery goals, as set out in the Eastern Timber Wolf Recovery Plan (Plan, USFWS 1992), have been met. Recovery criteria in the Plan require that at least two viable wolf populations must exist within the eastern United States. Furthermore, these two populations must satisfy the following conditions. First, the survival of the wolf in Minnesota must be stable or growing, and its continued survival must be assured. Second, another population must be reestablished outside of Minnesota and Isle Royale. The Plan provides two alternatives for reestablishing this second viable wolf population. If the population is beyond 100 miles from the Minnesota population, it must contain 200 wolves for at least 5 consecutive years (USFWS 2003a). If the population is within 100 miles of the Minnesota population, it must contain at least 100 wolves for at least 5 consecutive years (USFWS 2003a).

Minnesota

In Minnesota, the wolf population size is not surveyed or estimated annually, however in 2004 Minnesota Department of Natural Resources (MNDNR) estimated the wolf population had reached approximately 3,020 individuals (Erb and Benson 2004). The previous estimate (for the winter of 1997-98) estimated a Minnesota wolf population of 2445 wolves (Erb and Benson 2004).

While the Plan identifies no numerical recovery criterion for Minnesota, the Plan does identify State subgoals for use by land managers and planners. For Minnesota, the Plan's subgoal is 1,251 to 1,400 wolves. The Minnesota wolf population currently is estimated to be more than double that numerical goal.

A wolf depredation control program, similar to the one described for Michigan in this BO, has been conducted in Minnesota since 1978 when wolves were reclassified as threatened and a 4(d) regulation was promulgated. Although the number of wolves in Minnesota may have stabilized at about 3000 (Erb and Benson 2004), the number in the state grew significantly during approximately 20 years of lethal wolf control until at least 1998. The number of depredating wolves killed in Minnesota peaked at 216 in 1997 and has ranged from 105 to 161 since then (USDA APHIS, unpubl. data).

Wisconsin and Michigan

In Wisconsin and Michigan, wolf populations also have increased substantially since they naturally recolonized the states in the early 1990's. Late winter wolf population estimates in Wisconsin from 1994 to 2005 are 57, 83, 99, 148, 178, 205, 248, 257, 323, 335, 373 and 425 animals respectively (Figure 1). In Michigan, wolf population estimates from 1994 – 2005 are 54, 80, 116, 112, 140, 174, 216, 249, 278, 321, 360 and 406, respectively (Figure 1, Table 1). Wisconsin and Michigan combined contained approximately 831 wolves in 2005 (Figure 1, Table 1). (All Michigan wolf estimates exclude wolves on Isle Royale.)

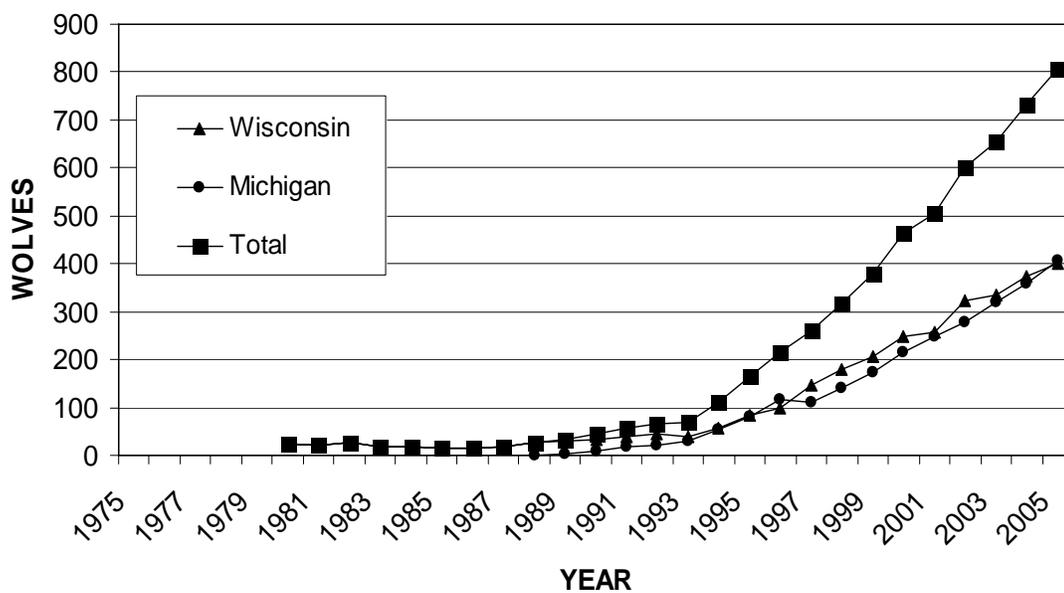


Figure 1. Wolf population estimates for Wisconsin, Michigan, and Wisconsin and Michigan combined (total) from 1973 - 2005.

The annual percent change in the wolf population from 1994 – 2005 has ranged from +3.63% to +49.49% in Wisconsin and -3.45% to +48.15% in Michigan (Figure 2, Table 2). In Michigan and Wisconsin the combined average annual percent change from 1995 – 2005 was +17.54%. Over the last 5 years the 2-state combined average annual percent change has decreased to +12.42% but still shows a notable increasing population trend (Figure 2, Table 2).

The second criterion for successful recovery of the eastern timber wolf is the formation of a second viable population, which is more than 100 miles away from Minnesota, of at least 200 wolves for 5 years. The Michigan/Wisconsin wolf population is more than 100 miles from Minnesota and recent surveys indicate more than 800 wolves in these two

Table 1. Wolf population estimates for Wisconsin, Michigan, and Wisconsin and Michigan combined (Total) from 1980 - 2005.

YEAR	WISCONSIN	MICHIGAN	TOTAL
1980	25	0	25
1981	21	0	21
1982	27	0	27
1983	19	0	19
1984	17	0	17
1985	15	0	15
1986	16	0	16
1987	18	0	18
1988	28	0	28
1989	31	3	34
1990	34	10	44
1991	40	17	57
1992	45	21	66
1993	40	30	70
1994	57	54	111
1995	83	80	163
1996	99	116	215
1997	148	112	260
1998	178	140	318
1999	205	174	379
2000	248	216	464
2001	257	249	506
2002	323	278	598
2003	335	321	601
2004	373	360	733
2005	425	406	831

states. A minimum population of at least 200 wolves has been exceeded for ten consecutive years (Fig 1). Also, while no numerical individual state recovery criteria for Michigan and Wisconsin are listed in the Plan, State subgoals were incorporated. For Wisconsin and Michigan, the Plan's subgoals are 80 and 80 – 90 wolves, respectively (USFWS 1992). Current populations in both these States are more than four times these numerical subgoals.

Environmental Baseline

This section describes the species status and trend information within the action area. It also includes an analysis of past, present and future impacts from past and ongoing State, tribal, local, private actions or from such actions that will occur contemporaneously with the proposed action. The anticipated impacts from unrelated Federal actions that have

been the subject of formal or informal consultation are also included in the environmental baseline.

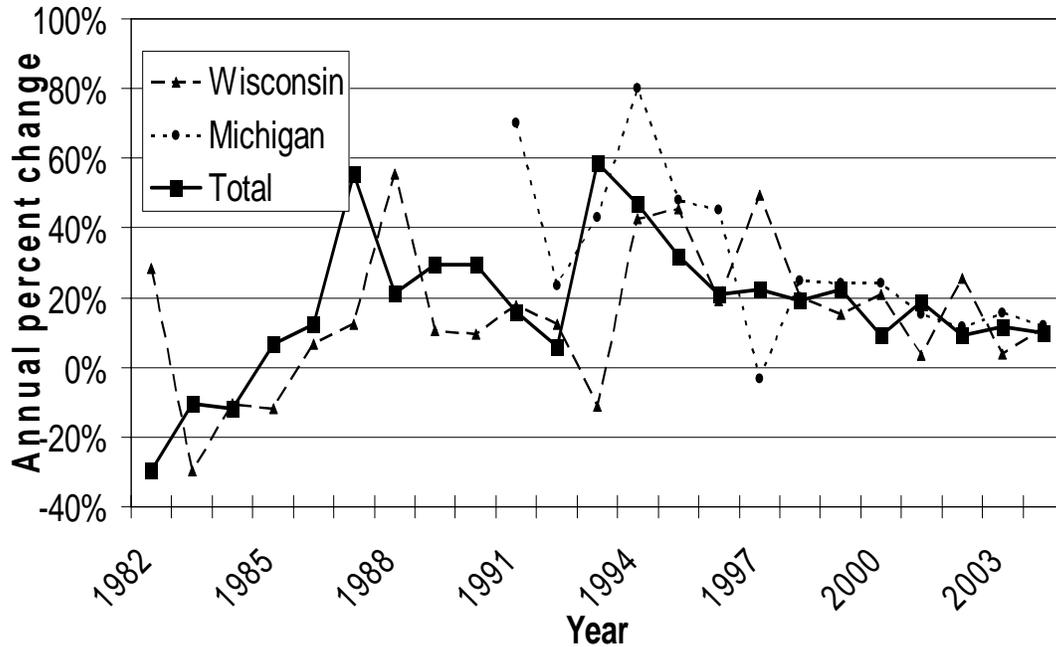


Figure 2. Annual percent change of gray wolf population in Wisconsin, Michigan and Wisconsin and Michigan combined (Total) from 1981 – 2005.

A. Status of the Species within the Action Area

The Program’s action area contains the entire gray wolf population in Michigan. Gray wolves are currently found in all counties of the U.P. Recent evidence suggests that wolves may be dispersing into the northern L.P.; however, at this time a breeding population has not been confirmed there. As previously stated under “Status and Distribution of the Species”, the winter 2004-2005 wolf population in Michigan was estimated at 406 individuals (Figure 1, Table 1) an increase of nearly 13% from 2004 estimate. Over the last five years in Michigan, the wolf population has grown on average about 14% annually (Figure 2, Table 2).

B. Factors Affecting the Species within the Action Area

Throughout the range of the wolf, three main factors dominate wolf population dynamics: food, people, and source populations (Fuller et al. 2003). These factors are likely to play the primary role regulating the U.P.’s wolf population, as well.

Table 2. Annual percent change of gray wolf population in Wisconsin, Michigan, and Wisconsin and Michigan combined (total) from 1981 - 2005.

YEAR	WISCONSIN	MICHIGAN	TOTAL
1981	-16	-	-16
1982	28.57	-	28.57
1983	-29.63	-	-29.63
1984	-10.53	-	-10.53
1985	-11.76	-	-11.76
1986	6.67	-	6.67
1987	12.50	-	12.50
1988	55.56	-	55.56
1989	10.71	-	10.71
1990	9.68	-	9.68
1991	17.65	70.00	29.55
1992	12.5	23.53	15.79
1993	-11.11	42.86	6.06
1994	42.50	80.00	58.57
1995	45.61	48.15	46.85
1996	19.28	45.00	31.90
1997	49.49	-3.45	20.93
1998	20.27	25.00	22.31
1999	15.17	24.29	19.18
2000	20.98	24.14	22.43
2001	3.63	15.28	9.05
2002	25.68	11.65	18.77
2003	3.72	15.47	9.15
2004	11.34	12.15	11.74
2005	13.94	12.78	13.37

i. Food

Prey density and vulnerability are important in determining what areas wolves inhabit and at what level. It appears that, over time, absent severe human persecution, wolf numbers are mainly limited only by food (Fuller et al. 2003). In expanding populations, as in the U.P., the wolf population is likely to grow until food is a limiting factor. As the U.P. population continues to grow by approximately 14% annually (Figure 2), it is unlikely that prey is a limiting factor for wolves in the U.P. at this time.

ii. People

The indirect or direct killing of wolves by humans also is important in determining the location and density of wolf populations (Fuller et al. 2003). Direct killing of wolves

occurs, however at much lower rates than was experienced in the past. In Michigan, there were 18 known wolves killed as a result of poaching from 2002 to 2005 (MDNR 2002, 2003b, 2004, 2005c).

Wolf populations do not appear to be greatly affected by other human factors such as snowmobiles, vehicles, or logging activities, except when they result in accidental or intentional killing of wolves or changes to prey density (Fuller et al. 2003). If the wolf population is large enough, even when these factors have an adverse effect on individuals, there appears to be little effect on the wolf population (Fuller et al. 2003). In Michigan, a total of 34 road-killed wolves were reported to Michigan DNR between 2002 and 2005 (MDNR 2002, 2003b, 2004, 2005c). These deaths seem to have had no discernable effect on the wolf population (Figure 1, Table 1).

iii. Source Populations

Source populations are important in establishing new populations and maintaining populations that are heavily harvested or experience high mortality from other causes (Fuller et al. 2003). As the U.P. has had a resident wolf population for over 10 years and is not subject to heavy harvesting or other forms of excessive mortality, the importance of a source population is likely minimal at this time. However, the U.P. wolf population is not isolated. Immigration and emigration of wolves among the U.P., Wisconsin, Canada, and Minnesota occurs, and immigration was the basis for the re-establishment of the U.P. wolf population. Immigration may not now have a significant annual effect on the U.P. wolf population but it likely contributes to the long-term sustainability of the population.

iv. Other Factors

Natural mortality is a factor affecting the wolf population in the U.P. The two main sources of natural wolf mortality are starvation and intraspecific strife (Fuller et al. 2003). On Isle Royale, where no human-caused wolf deaths occur, annual mortality due to starvation and intraspecific strife averaged 32.5% from 1971 – 1995 (Peterson et al. 1998). Diseases, such as mange, also can affect wolf populations. From 2000 to 2004, WDNR documented that natural mortality resulting from mange is the cause of 26% of all radio-collared wolf deaths in Wisconsin (Table 3). MDNR collects similar mortality information. Until recently, however, all radio-collared wolves were vaccinated and therefore did not reflect the true level of disease mortality experienced by the larger population. In Michigan, the natural mortality rate is clearly well below the survival rate of wolves is not preventing continued growth of the population, which as the population continues to increase by approximately 14% annually.

It is unknown how the addition of human-caused mortality would affect natural mortality rates. However, compensatory mechanisms in this population most likely would allow an increase in human caused mortality to result in a decrease in natural mortality. In any case, the demonstrated annual rate of increase in the Michigan wolf population has occurred in spite of all causes of mortality.

Table 3. Natural mortality of radio collared wolves in Wisconsin 2000 – 2004 (Adrian Wydeven, WDNR, pers. comm. March 2005). Number in parenthesis is percentage of total mortality (natural and human caused) observed in radio collared wolves.

Mortality Factor	2000	2001	2002	2003	2004	Total
Mange	4	4	2	6	3	19 (26%)
Other disease	1	2	1	2	-	5 (7%)
Malnutrition	-	-	2	-	-	2 (2%)
Other wolves	3	2	1	1	1	8 (11%)
Accident	-		1	-	-	1 (1%)
Total	8	8	7	8	4	35 (48%)

C. Summary of the Environmental Baseline

The eastern timber wolf has reached the numerical recovery goals stated in the Plan, and recent data suggest that the wolf populations in Minnesota may be stable and the populations in Wisconsin, and Michigan continue to increase. The primary factors influencing wolf recovery in the U.P. are prey density, human related mortality, and natural mortality. However, as evidenced by the increasing population, these factors are not preventing continued growth of the gray wolf population in Michigan.

The current rate of population increase likely will not continue into the foreseeable future. As the wolf population in Michigan expands to fill all available habitat, and if the cultural carrying capacity is approached, the rapid population growth rate is expected to slow and eventually stop. At that time we would expect to see negative growth rates (that is, wolf population declines) in some years, due to short-term fluctuations in birth and mortality rates. However, adequate wolf monitoring programs, as identified in the Michigan Gray Wolf Recovery and Management Plan (1997), should identify excessively high mortality rates or low birth rates and would trigger timely corrective action when necessary.

Effects Of The Action

This section assesses the effects of the proposed action, including the direct and indirect effects together with the effects of other activities that are interrelated or interdependent (50 CFR 402.02). Indirect effects are those that are caused later in time, but are still reasonably certain to occur. Interrelated actions are those that are part of a larger action and depend upon the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration (50 CFR 402.02). We are not aware of any actions that are interdependent or interrelated to the proposed action being considered in this Opinion.

A. Analysis of the Effects of the Action

The proposed action is expected to result in both purposeful and incidental take of gray wolves. Purposeful take is take that is intended as part of the proposed action (e.g. capture and killing of target wolves). Purposeful take will be quantified here, based on the maximum amount that is expected to occur as part of this proposed action. Incidental take is take that occurs unintentionally during the conduct of an otherwise lawful activity (e.g., injury or death of pups as a result of the capture of a lactating female). Incidental take is also quantified here to the extent possible and is further discussed in the incidental take statement. In order to minimize the amount of incidental take that may occur, the proposed action incorporates the conservation measures listed above in Section 1.b.iii, Conservation Measures. These measures are taken into account in our analysis of the extent of take that will occur.

i. Non-lethal Injurious Harassment

Non-lethal injurious harassment techniques such as the use of bean bag projectiles, rubber bullets, or other non-lethal projectiles could be used to prevent a depredation event. This method requires a person to “guard” the livestock or other domestic animals and initiate injurious harassment if a wolf approaches the guarded area. Methods which require around-the-clock vigilance are most effectively used when the landowner or resource manager assists with the implementation. Therefore, MDNR has requested the authority under 10(a)(1)(A) to train and authorize private individuals to use non-lethal injurious harassment techniques.

Non-lethal injurious harassment could be deadly at very close range if a vulnerable spot on the body is hit by a non-lethal projectile, although the likelihood of this type of injury is very low (Bangs, USFWS, pers. comm., Bangs et al. 2004). In the western U.S. the Service has issued approximately 200 permits to landowners for the use of non-lethal projectiles to help deter wolf depredation. The permits resulted in only a few dozen wolves being shot at with less than 5 actually being hit by a projectile. All of the wolves ran away, and none of the wolves appeared to have been seriously injured (Bangs, USFWS, pers. comm.).

Mortality or serious injury is not expected to result from non-lethal injurious harassment. Incidental take in the form of injury to eyes or other body parts could occur if rubber bullets or other techniques are utilized at close range. According to the Conservation Measures (see Section 1.b.iii. Conservation Measures) all private individuals will be trained in the appropriate and safe use of non-lethal injurious harassment techniques.

ii. Lethal Wolf Control

Where necessary, lethal control of depredating wolves may be used. Trapping may be used to facilitate lethal wolf control. Trapping methods including land restraint snares with stops, spring activated foot snares, and leg-hold traps are all non-lethal techniques to capture wolves. These specific trapping techniques allow the release of non-target individuals, such as young of year, lactating females, or non-target species. Lethal

control is intended to cause purposeful take of wolves since depredating animals will be intentionally harmed, harassed, or killed.

Wolves may also be unintentionally killed, harassed, or harmed as a result of lethal control activities. Young-of-year animals may be unintentionally trapped before August 1, causing injury of their paws or legs, and possibly death. Conservation measures (see above under Proposed Activities) ensure that all young of year wolves captured alive before August 1 will be released (i.e. young of year can not be purposefully killed before August 1), minimizing the potential for lethal or injurious harm.. As with young-of-year wolves, unintentional trapping of a lactating female prior to July 1 may also cause harm, harassment, or death. Capture of a lactating female could cause harm to her pups. An extended absence or death of the mother could decrease pup survival. Conservation Measures will help maximize pup survival since most lactating females will be released prior to July 1, when pups are most dependent. Therefore, we expect that incidental take of pups associated with capture or mortality of lactating females will be infrequent because most lactating females will not be euthanized and, if captured, will be released in less than 24 hours.

Other techniques which are lethal or facilitate lethal control include day or night-time shooting, aerial gunning, and darting. These techniques are virtually 100% selective for removing target animals as positive identification is made before the animal is shot. Purposeful take in the form of death is a result of these techniques. As discussed above, incidental take in the form of injury or death to pups is expected if lactating females are shot prior to July 1.

B. Discussion of Take and Its Potential Effect on the Eastern Timber Wolf Population

i. Estimate of Purposeful Take

Based on Minnesota wolf depredation control data from the early 1980s when the wolf population was around 1,500 individuals, the Service previously estimated that 2 to 3 percent of Michigan's wolf population would be taken annually as a result of depredation control under a proposed special regulation (USFWS 2003a). However, based upon more recent data from the Minnesota wolf depredation program and estimates based on recent Michigan and Wisconsin experiences, we believe that purposeful take may exceed this estimate.

WS has conducted a wolf damage management program in Minnesota since 1986 (USFWS 2003a). In spite of over fifteen years of lethal wolf control, Minnesota's wolf population has met and exceeded recovery goals (USFWS 1982). The number of wolves killed annually from 1979 to 2005 as a result of depredation control activities ranged from 6 to 216 (Table 4). Since the wolf population is much larger in Minnesota than in Michigan it is appropriate to look at these numbers as a percentage of the wolf population. The estimated percentage of the wolf population taken each year in Minnesota ranged from 0.5% to 9% (Table 4). This level of take has not prevented the

Table 4. Estimated number of wolves in Minnesota and percentage of wolf population taken from 1979 – 2005 as a result of USDA Wildlife Services’ wolf depredation control activities in the state (USDA 2002, William Paul, USDA Wildlife Services, unpublished data 2003, 2004, and 2005). The wolf population was estimated by fitting a line through Minnesota wolf population estimates for 1979, 1989, 1998, and 2004. Population estimates in parentheses indicate numbers based on survey results for those years.

Year	Population Estimate	Wolves Taken	Percentage of Population Taken (Estimate)
1979	(1235)	6	0.5
1980	1241	21	2
1981	1287	29	2
1982	1335	20	2
1983	1385	42	3
1984	1437	36	3
1985	1491	31	2
1986	1546	31	2
1987	1604	43	3
1988	1664	59	4
1989	(1625)	81	5
1990	1790	91	5
1991	1857	54	3
1992	1926	118	6
1993	1998	139	7
1994	2073	172	8
1995	2150	78	4
1996	2230	154	7
1997	2314	216	9
1998	(2445)	161	7
1999	2490	151	6
2000	2582	148	6
2001	2679	109	4
2002	2779	146	5
2003	2882	125	4
2004	(3020)	105	3
2005	3128	134	4

recovery of the gray wolf in Minnesota or the establishment and recovery of the gray wolf populations in Wisconsin and Michigan.

The MDNR and Wisconsin Department of Natural Resources (WDNR) operated a wolf damage management program under the authority of a special 4(d) rule and a previous 10(a)(1)(A) permit in 2003, 2004, and 2005. Although only approximately three years of

data were collected, the information indicates that much less than 10% of the population was removed annually (Table 5, Table 6). The wolf population in 2005, after operation of the depredation control program for nearly two years, increased by 13.4% in Michigan and Wisconsin combined (Figure 2, Table 2).

Table 5. Number of individuals and percentage of wolf population taken from April 2003 – September 2005 under authority of a 4(d) rule or permit in Michigan (Brian Roelle, MDNR, pers. comm. 2005).

Year	Population Estimate	Wolves Taken	Percentage of Population Taken (Estimate)
2003	321	4	1
2004	360	6	2
2005	405	2	0.5

Table 6. Number of individuals and percentage of adult wolf population taken from April 2003 – September 2005 under authority of a 4(d) rule or permit in Wisconsin (Adrian Wydeven, WDNR, pers. comm. 2005). YOY is young of year wolves.

Year	Population Estimate	Wolves Taken	Percentage of Population Taken (Estimate)
2003	335	9 adults, 8 YOY	2.7
2004	373	20 adults, 4 YOY	5.4
2005	425	20 adults, 9 YOY	4.7

Based on recent data collected by WS in Minnesota and limited depredation data in Michigan and Wisconsin, we estimate that between 1 and 10% of the wolf population may be purposefully taken as a result of depredation abatement program. The purposeful take will include both adult wolves and young of year wolves (killed after August 1). In Michigan, at the late winter 2005 population level of 406 wolves, this would equate to 4 to 40 wolves. As depredation events will likely increase with an increase in wolf population, it is appropriate to utilize percentage of the population versus absolute numbers of individuals.

ii. Impact of take on Michigan’s wolf population and Eastern timber wolf population

We anticipate purposeful take as a result of issuing the 10(a)(1)(A) permit to range from 1 to 10% of the wolf population annually. Also, we anticipate incidental take (as discussed in the Incidental Take Statement below) will be less than 1% of the adult wolf population annually. Therefore, we anticipate a combined incidental and purposeful take from 1 to 11% (incidental take up to 1% and purposeful take up to 10%) of the adult wolf population annually in Michigan.

Many studies have examined various levels of mortality and harvest and the impacts these mortality levels have on gray wolf populations:

- Mech (1970) suggests that over 50% of wolves older than 5-10 months must be killed to “control” the wolf population. Control in this instance means keeping the wolf population below the level to which it would rise without other forms of human caused mortality.
- Gasaway et al. 1983 recorded stable wolf populations after early winter harvests of 16 to 24%, and wolf population declines of 20 – 52% after harvests of 42 - 61%.
- Ballard et al. (1997) suggests that the wolf population remained stable at 53% winter mortality, which included some natural mortality.
- Fuller (1989b) observed stable or slight increases in the wolf population at an annual mortality rate of 29%.
- Haber (1996) reported that wolf populations may not be able to withstand repeated annual reductions of 25-50%. He believes these removals, in the form of hunting, trapping, and government control efforts, may have impacts on wolf population dynamics, social interactions, and the long-term health of the population. Haber also reported that it is difficult to fully understand the impacts of wolf exploitation because detailed comparative information on behavior from both exploited and protected wolf populations is scarce.
- USDA WS (2002) in Minnesota has taken between 4 and 10% of the wolf population for many years as a result of implementing a depredation control program in Minnesota, and the Minnesota wolf population increased during that period. Further, while the WS control program occurred, and while other natural and human caused mortality occurred, this population provided most, if not all, of the source wolves for Wisconsin and Michigan.

There is considerable variation in what researchers have found to be sustainable levels of human caused wolf mortality. Productivity is likely the most important factor in determining the annual percentage of a wolf population that can be killed by humans without causing a population decline (Fuller et al. 2003). The higher the population’s productivity, the higher the level of mortality the population may sustain. Currently, the U.P. wolf population is highly productive, resulting in an average annual increase of 14% over the past 5 years (Figure 2).

As discussed previously, compensatory mortality operates within the wolf population. Compensatory mortality means that if more wolves are killed for depredation control purposes, fewer wolves would die from starvation, interspecific strife, or other natural causes. So, the removal of 11% of the population annually should not greatly influence gray wolf numbers in Michigan. Even if a portion of the 11% take is additive mortality, this additional mortality might result in a slightly decreased rate of population growth, but is not likely to reduce the recovery or survival of the wolf in Michigan.

Furthermore, wolf mortality due to poaching may decrease with the implementation of the depredation abatement program. In the absence of an abatement program, it is more likely that wolves perceived to be causing depredation would be illegally killed. Illegal killing likely would be less selective and may remove more individuals than is necessary, or the wrong individuals, to curtail depredation activities. Hence, a reduction in poaching may off-set some of the mortality associated with the depredation control program.

Eastern timber wolf packs are currently established in Michigan, Wisconsin, and Minnesota. All three states have established wolf populations which no longer rely solely on wolf immigration from other states for their survival. As Wisconsin and Minnesota both have gray wolf populations which do not depend on Michigan's population for survival, and Michigan's population is unlikely to change as a result of this program, we expect the proposed project will have no impact on Wisconsin or Minnesota wolf populations. Implementation of the Michigan wolf depredation abatement program, therefore, is not likely to appreciably reduce the survival and recovery of the eastern timber wolf.

Cumulative Effects

Cumulative effects include the combined effects of any future State, local, or private actions that are reasonably certain to occur within the action area covered in this 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.

Although we are aware of no major U.P. wide non-Federal actions which are reasonably certain to occur, it may be expected that other scattered activities, particularly on private lands, could have a progressive negative effect on wolves. Future actions include: timber harvest, road construction, recreation, permanent removal of native vegetation, and fragmentation caused by human development. County and private land timber harvest may not consider the needs of the wolf or its prey species. Human disturbance and loss of suitable wolf habitat could result from timber harvest. In addition, related timber harvest road construction activities are not regulated and would not necessarily include protection and conservation measures for wolves and their habitats. Conversely, forest management that increases numbers and distribution of moose and deer could have a beneficial effect on wolves. Recreational activities associated with state, county, and private lands will continue in the action area, and are reasonably certain to increase over the next decade in Michigan.

Although future State, Tribal, local or private actions could adversely impact gray wolves, it is anticipated that future State, Tribal, local or private actions combined with this proposed program will also contribute to the conservation of the gray wolf in the U.P. of Michigan. The MDNR has prepared a Michigan Gray Wolf Management and Recovery Plan (1997) and developed guidelines for managing depredating wolves, which will provide for the continued existence and conservation of gray wolves in Michigan. These efforts should contribute to the long-term survival of the gray wolf in Michigan.

Conclusion

After reviewing the current status of the gray wolf, the environmental baseline for the action area, the effects of the action and the cumulative effects, it is the Service's biological opinion that the action as proposed is not likely to jeopardize the continued existence of the gray wolf and is not likely to destroy or adversely modify designated critical habitat. Critical habitat for this species has been designated at Isle Royale National Park in Michigan; however, this action does not affect that area and no destruction or adverse modification of that critical habitat is anticipated.

The following factors were of primary importance in our jeopardy assessment:

- 1) The wolf population in Michigan, Wisconsin, and Minnesota has surpassed recovery goals and the wolf population continues to increase in Michigan and Wisconsin.
- 2) The current rate of increase for the Michigan and Wisconsin wolf population is approximately 13% annually.
- 3) Mortality as a result of the proposed action would likely be partially compensatory. However, the proposed action could increase the mortality rate for the U.P. wolf population by up to 11%. Currently, the wolf population in the U.P. is increasing by 14% annually.
- 4) Based on scientific literature and information obtained from the Minnesota wolf depredation control program, purposeful and incidental take of up to 11% is unlikely to cause a decline in the wolf population. The wolf population in Minnesota increased during approximately two decades when control of depredating wolves resulted in the death of approximately 0.5 to 9 % of the population. We expect purposeful mortality in MI to be between 4-10% annually. The current rate of increase in the Michigan population may slow as a result of the proposed action.
- 5) In 2003, 2004, and 2005 MDNR employed the same lethal methods discussed here to resolve selected wolf depredations. Those measures appear to have had no impact on the overall Michigan wolf population.
- 6) Implementation of the proposed action may decrease illegal take of wolves, so that component of the current mortality rate may be reduced and would partially off-set the additional mortality that will occur as a result of the proposed action.
- 7) We believe that the proposed action is unlikely to cause a noticeable continuing decline in annual recruitment and will not appreciably reduce the survival or recovery of the wolf in Michigan, Wisconsin, or Minnesota.

We believe the proposed action will not appreciably reduce the likelihood of both the survival and recovery of the eastern timber wolf in the wild by reducing their reproduction, numbers, or distribution.

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.

In general, an incidental take statement specifies the impact of any incidental taking of endangered or threatened species. It also provides reasonable and prudent measures that are necessary to minimize the impacts of the take and sets forth terms and conditions which must be complied with in order to implement the reasonable and prudent measures.

Amount Or Extent Of Take

In this incidental take statement, we are evaluating the incidental take of gray wolf that may result from issuance of a Endangered Species Act section 10(a)(1)(A) permit for implementation of a wolf depredation control program. The Service anticipates that incidental take of gray wolves will result from the proposed activities. Injurious harassment and lethal control of depredating wolves could result in incidental take by:

- 1) unintended injury or death of wolves from close range or improper application of injurious harassment techniques (1 per year);
- 2) injury or death of lactating females wolves intended for release (not involved in chronic depredation: 1 per year);
- 3) injury or death of young of year prior to August 1 (1 per year);
- 4) indirect injury or death of pups if lactating females are captured and die or are not released in a timely fashion (prior to July 1; up to 6 pups per year);
- 5) indirect injury or death of pups if lactating females are euthanized (up to 6 pups per year);

Non-lethal injurious harassment

Non-lethal injurious harassment could be deadly at very close range if a vulnerable spot on the body is hit by a non-lethal projectile, although the likelihood of this type of injury is very low (Bangs, USFWS, pers. comm., Bangs et al. 2004). In the western U.S. the

Service has issued approximately 200 permits to landowners for the use of non-lethal projectiles to help deter wolf depredation. As part of obtaining a permit, all landowners received special training in the proper use of non-lethal projectiles. The permits resulted in only a few dozen wolves being shot at with less than 5 actually being hit by a projectile. All of the wolves ran away, and none of the wolves appeared to have been seriously injured (Bangs, USFWS, pers. comm.). Based on this experience, both lethal and injurious (serious and minor injuries) incidental take of wolves from non-lethal injurious harassment will be extremely low (<1 wolf/5 years). For purposes of the 10(a)(1)(A) permit, which would be issued or renewed annually, we would anticipate serious injury or death of one wolf due to non-lethal injurious harassment annually.

Lethal control activities and lactating females

Lethal control activities will also result in incidental take. As indicated above, incidental take will result from serious injury or death of lactating females captured prior to July 1. In Michigan, with only 12 wolves taken as a result of depredation control (Table 5), limited information is available to estimate the likely capture rate of lactating females. However, in Wisconsin only two lactating females (one confirmed in 2004 and one possible lactating female in 2003) were captured and killed purposefully for depredation control (Wydeven pers. comm. February 2006). One wolf each in 2003 and 2004 was less than 0.3% of the Wisconsin wolf population for those years. This capture rate would be expected to fluctuate somewhat annually based on where and when wolf depredation control takes place, but likely would remain at a very low percentage of the state's wolf population.

Serious accidental injury or death of trapped lactating females is expected to occur at an even lower rate. Based on MDNR records, since active management began in 1992, out of 237 wolves captured for all reasons, only 4 wolves died accidentally as a result of trapping and research activities (Beyer pers. comm. March 2006). These 4 accidental deaths occurred over 14 years, and represent a very low annual percentage of the Michigan state wolf population. Clearly, if lactating females are captured, well below 1% per year might be accidentally killed. The rate of serious injury to paws and legs would likely be higher than fatalities, but still quite low, around 1.5% of those captured. Together, the possibility of injury or death is likely to be less than 2.5% of the individuals captured.

Estimates of the numbers of wolves likely to be captured for depredation control are discussed above under "Estimate of Purposeful Take", and ranged from 1 – 10% of the population annually. In the unlikely event that half of all depredating wolf captures were lactating females, they would represent 0.5 – 5% of the population. If we estimate that the likely rate at which lactating females would be seriously injured or die accidentally or incidentally each year as a result of trapping would be about 2.5%, then incidentally taken lactating females would approximate 0.0125 to 0.125% (.025 x .005 to .025 x .05) of the wolf population annually. At a population level of 405 wolves that would equate to .05 to .5 wolf per year, or 1 wolf every 2 to 20 years. Since this is a low number which likely would not significantly change even if the wolf population tripled, we

assume that 1 lactating female may incidentally die or be seriously injured annually as a result of issuing the 10(a)(1)(A) permit.

Lethal control activities and young of year

Incidental take of young of year could occur indirectly by serious injury or death to lactating females or directly by serious injury or death as a result of being trapped. Associated with the capture and temporary holding or lethal control of lactating females is the indirect incidental take (lethal and non-lethal) of young of year pups. If lactating females are captured and released, then pups may be harmed due to the temporary inability to nurse or be groomed by the female. Serious injury or death of these pups is unlikely as lactating females will be released within 24 hours. We anticipate this effect on pups would be insignificant as it will not rise to the level where take would occur.

If, however, lactating females are incidentally or purposefully killed then their pups may be harmed or die. The extent of harm to the pups would depend on the pup's stage of development. If the pups are no longer milk-dependent, they may be successfully raised by other adult pack members. The average wolf litter size is 4 to 6 pups (Mech 1970). If one lactating female were incidentally killed (as discussed under lethal control activities and lactating females above) then up to 6 pups could be incidentally taken. If an additional lactating female was purposefully killed due to repeat depredation, then an additional 6 pups would be taken. We anticipate up to 12 pup mortalities could occur as a result of incidental and purposeful killing of lactating females.

Additionally, we anticipate that young of year wolves may be seriously injured or die as a result of being caught in a trap prior to August 1 annually. The likelihood that young of year wolves would be captured near a depredation site prior to August 1 is minimal since pups stay close to homesites (den and rendezvous areas) until they are at least 3 months old, and young of year don't begin hunting with adult pack members until at least 4 months old (Packard 2003). Fuller (1989) found that pups are typically born in mid to late April annually in Minnesota. This suggests that pups would reach 3 months of age around mid-July. A two week period of time, from mid-July to August 1, would be the likely time when young of year may be accidentally captured at a depredation site.

Although young of year capture at depredation sites is unlikely it has occurred in Wisconsin. In 2005, five young of year wolves were captured and released prior to August 1 as a result of depredation control (WDNR 2005). We were unable to accurately determine what proportion of the young of year wolf population these 5 wolves represented in order to calculate a capture rate. However, the number of young of year trapped as a result of depredation control activities versus the total young of year present in the Wisconsin wolf population in 2005 was likely less than 1%. As with lactating females, a very small percentage (up to 2.5%) of the captured young of year wolves would be accidentally hurt or killed as a result of the trapping.

In the winter 2004 – 2005, 87 wolf packs were known in the Upper Peninsula (Huntzinger et. al 2005). If each pack produced on average 4 pups (some packs may

produce no pups while other packs may produce 6 pups) that would equate to 348 pups. If 2005 events in Wisconsin are representative and are applied to Michigan estimated pup production, 5/348, or 1.4%, of pups each year might be trapped during depredation control. If 2.5% of those pups were accidentally injured or killed, then 0.036% (0.025 x 0.014) of pups per year would be incidentally taken. For purposes of the 10(a)(1)(A) permit, which is issued annually, we assume 1 young of year wolf could be accidentally or incidentally seriously injured or killed prior to August 1 due to trapping.

Effect Of Take

In the accompanying Opinion, we determined that the proposed action is not likely to jeopardize the continued existence of the gray wolf. Therefore, we believe that the level of anticipated incidental take associated with the actions completed under the Wolf Damage Management Program is not likely to jeopardize the species.

Reasonable And Prudent Measures

The Service believes that the following reasonable and prudent measures are necessary and appropriate to minimize the incidental take of gray wolves during the proposed action:

1. The Service will ensure that incidental and intentional take levels do not exceed the levels anticipated in this biological opinion.
2. The Service will require the permittee and its agents to follow current wolf capture protocols to ensure injury potential is minimized to the fullest extent possible.
3. The Service will require the permittee and its agents to ensure all wolf trappers are properly trained in proper chemical immobilization, trapping, and medical treatment.
4. Disposition and salvage of any gray wolf specimens shall be in compliance with the conditions specified in MDNR's procedure "Disposal of Wildlife Carcasses and Parts".

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. These terms and conditions will be 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 East Lansing Field Office or the U.P. Sub-Office if the level of incidental take is exceeded.

2. The Service will require that all intentional and incidental wolf injuries or mortalities as a result of their lethal wolf control activities be reported to the Service's Region 3 Endangered Species Permits Office, the East Lansing Field Office, U.P. Sub-Office, and the Service's nearest Law Enforcement Office within 5 calendar days.

Terms and Conditions associated with RPM # 2

The Service will require the permittee and its agents to follow the Michigan DNR's wolf trapping and handling 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 Michigan DNR, or a designated State agent, 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.

Terms and Conditions associated with RPM # 4

The Service will require all wolf specimens be disposed of or salvage in compliance with the conditions specified in MDNR's procedure "Disposal of Wildlife Carcasses and Parts".

Requirements For Monitoring And Reporting Incidental And Intentional Take Of Gray Wolves

Federal agencies have a continuing duty to monitor the impacts of incidental take resulting from their activities [50 CFR 402.14(i)(3)]. In doing so, the Service will require a report from MDNR annually which describes the progress of the action and its impact on the gray wolf.

- 1) Supply the Service's East Lansing Field Office with a report due by January 31st of each year, that outlines the following:
 - a) the date, location, age, sex, ear tag number and general description of the physical condition of each wolf captured;
 - b) description of any medications administered to captured wolves;
 - c) the disposition of any wolves injured, killed, salvaged, held and transported;
 - d) the results of any blood analysis;
 - e) the results of efforts to address and resolve depredation issues, including repeat depredations by wolves; and

- f) a summary that includes the following for each wolf incidental and intentional injury or mortality that occurred (incidental and intentional mortality should be addressed separately in the report):
 - i) the date and time of the taking;
 - ii) the name of any persons involved in the takings;
 - iii) the circumstances surrounding any taking, including the stimulus for the taking, and/or human activities involved;
 - iv) the behavioral responses of any gray wolves taken; and
 - v) any actions taken to avoid or minimize taking.

In addition, copies of all reports and publications resulting from those data must be submitted to the Service's East Lansing Field Office as they become available.

Incidental take of adult and young of year wolves are likely to result from this action. We anticipate that the incidental take will be no more than 1% of the wolf population annually. Further, the Service believes that between 1 and 10% of Michigan's wolf population will be intentionally taken annually as a result of the Program activities. 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, the level of incidental take is exceeded, such take represents new information requiring reinitiation of consultation and review of the reasonable and prudent measures 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 measures.

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 or intentional 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. Specifically, if the level of purposeful take exceeds 10%, the Service should reinitiate consultation. An increase level of take represents new information that indicates that the effects of the action may be affecting the wolf in an extent not considered in this biological opinion (50 CFR 402.16). In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

References

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