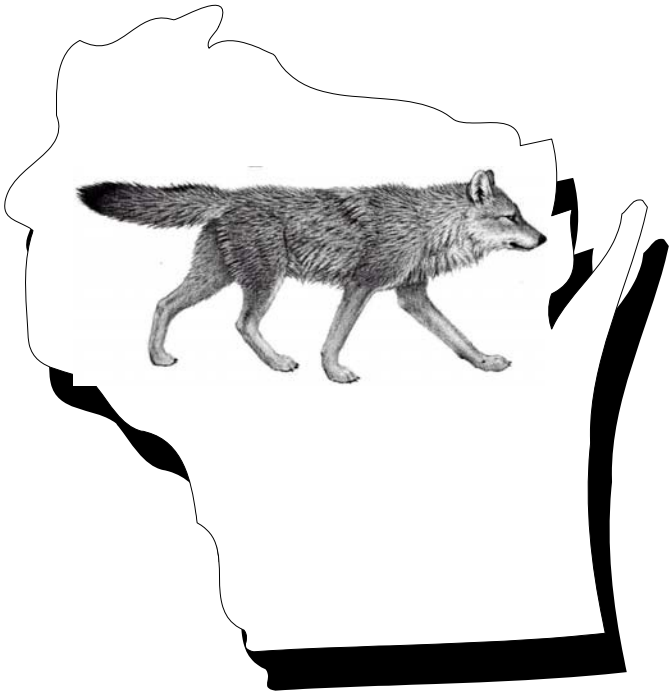
FINAL ENVIRONMENTAL ASSESSMENT

FOR THE MANAGEMENT OF

WOLF CONFLICTS AND DEPREDATING WOLVES

IN WISCONSIN



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in cooperation with

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and the

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SUMMARY

The United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service, Wildlife Services (WS), the Wisconsin Department of Natural Resources (WDNR) and the United States Department of Agriculture, Forest Service, Chequamegon-Nicolet National Forest (USFS) have prepared a new Environmental Assessment (EA) analyzing the potential environmental impacts of alternatives for WS involvement in managing gray wolf (*Canis lupus*) damage and conflicts in Wisconsin. This analysis addresses changes in wolf management in Wisconsin subsequent to the removal of wolves from the Federal list of Threatened and Endangered species. Once completed, this EA and the resulting agency Decision will replace the EA completed by WS, the WDNR and the U.S. Department of the Interior, Fish and Wildlife Service in April 2006 (USDA 2006) and the WS Decision and Finding of No Significant Impact (FONSI) completed on March 2007.

The United States Fish and Wildlife Service (USFWS) decision to remove the Western Great Lakes Distinct Population Segment of gray wolves from the federal list of Threatened and Endangered species (72FR 6052-6103) went into effect and full management authority for gray wolves transferred to WDNR and the Tribes on March 12, 2007. After delisting, the WDNR developed new guidelines for managing wolf conflicts, which allow more flexibility in addressing wolf damage problems than was permitted while wolves were federally protected. The WDNR has requested that WS continue its role as a designated agent of the state for wolf conflict management and aid in the implementation of the new wolf damage management guidelines. However, changes in the guidelines have environmental impacts requiring a new environmental analysis prior to a WS decision to participate in WDNR wolf damage management.

Four alternatives for WS involvement in Wisconsin wolf conflict management are analyzed including the Preferred Alternative, Revised Integrated Wolf Damage Management (RIWDM). Under the preferred alternative, WS would use and/or recommend the full range of legal, practical and effective nonlethal and lethal methods for preventing or reducing wolf damage while minimizing harmful effects of damage management measures on humans, wolves, other species, and the environment in accordance with the new Wisconsin Wolf Damage Management Guidelines. Management strategies would be developed for individual sites by applying the WS Decision Model (Slate et al. 1992). When appropriate, farm management practices (animal husbandry), frightening devices, and livestock guarding animals would be recommended and utilized to reduce wolf damage. In other situations, when the damage situation and landowner practices meet WDNR requirements (Appendix E), wolves would be removed as humanely as possible using foot-hold traps, foot snares, cable restraints, and shooting. In determining the damage management strategy, preference would be given to nonlethal methods when they are deemed practical and effective. Lethal methods would be used to reduce damage after practical and appropriate nonlethal methods have been considered and determined to be ineffective or inappropriate in reducing damage to acceptable levels. However, nonlethal methods may not always be applied as a first response to each damage problem. The most appropriate initial response to a wolf damage problem could be a combination of nonlethal and lethal methods, or there could be instances where application of lethal methods alone would be the most appropriate strategy. A second alternative involves the continuation of the current WS Integrated Wolf Damage Management program, which includes limits on wolf damage management activities that were established when wolves were federally classified as either an endangered or threatened species. The third alternative would work in much the same way as the preferred alternative except that WS would only use and provide advice on nonlethal methods for wolf damage management. The WDNR and private landowners would still be able to use lethal methods in accordance with state laws and the wolf depredation management guidelines. Under the last alternative considered, WS would not be involved in wolf damage management in Wisconsin, but the WDNR and private landowners would still be able to use lethal and nonlethal methods in accordance with state laws

and the wolf depredation management guidelines. Under the first three alternatives, WS damage management assistance could be provided on private or public property in Wisconsin when the resource owners/managers request assistance to alleviate wolf damage, wolf damage is verified, and agreements have been completed specifying the details of the damage management action to be conducted. The types of verified wolf or wolf-dog hybrid conflicts that could be addressed include: 1) depredation/injury of domestic animals, 2) harassment/threats to domestic animals, 3) property damage, and 4) injury and/or potential threats to human safety (e.g. habituated/bold wolves). All wolf damage management would be conducted in compliance with appropriate federal, state, and local laws.

The environmental issues considered for each alternative include impacts on the wolf population, nontarget species including state and federally listed threatened and endangered species, public and pet health and safety, humaneness of the methods to be used, and sociological issues including the aesthetic and sociological values of wildlife.

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ACRONYMS /ABBREVIATIONS

APHIS	Animal and Plant Health Inspection Service
AVMA	American Veterinary Medical Association
BO	Biological Opinion
CDFG	California Department of Fish and Game
CE	Categorical Exclusion
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
DPS	Distinct Population Segment
EA	Environmental Assessment
EIS	Environmental Impact Statement
EJ	Environmental Justice
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FDA	Food and Drug Administration
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FY	Fiscal Year
GAO	U. S. General Accounting Office
GLIFWC	Great Lakes Indian Fish and Wildlife Commission
IPM	Integrated Pest Management
IWDM	Integrated Wildlife Damage Management
MIS	Management Information System
MOU	Memorandum of Understanding
NEPA	National Environmental Policy Act
NWRC	National Wildlife Research Center
PWDM	Proactive Wolf Damage Management
SOP	Standard Operating Procedure
T/E	Threatened and Endangered
USC	United States Code
USDA	U.S. Department of Agriculture
USDI	U.S. Department of Interior
USFS	U.S. Department of Agriculture, Forest Service
USFWS	U.S. Department of the Interior, Fish and Wildlife Service
WCES	Wisconsin Cooperative Extension Service
WCFA	Wisconsin County Forester Association
WDATCP	Wisconsin Department of Agriculture, Trade and Consumer Protection
WDM	Wolf Damage Management
WDNR	Wisconsin Department of Natural Resources
WRS	Wisconsin Revised Statutes
WS	Wildlife Services
WWMP	Wisconsin Wolf Management Plan

CHAPTER 1: PURPOSE OF AND NEED FOR ACTION

1.0 INTRODUCTION

Gray wolf *(Canis lupus)* populations in North America, including the wolf population in Wisconsin, have undergone a dramatic recovery in recent years. The combination of an increasing Wisconsin wolf population, human encroachment on wild habitats and conversion of natural landscapes to agricultural and urban environments has led to increased conflicts between wolves and humans. Some conflicts with wolves include depredation on livestock and pets, and risks to human health and safety from potentially hazardous or threatening wolves. Management of conflicts with wolves is addressed in the Wisconsin Wolf Management Plan (WWMP; Wisconsin Department of Natural Resources (WDNR 1999, 2007*b*) and in the United States Department of Interior, Fish and Wildlife Service (USFWS) Eastern Timber Wolf Recovery Plan (USFWS 1992). Prompt, professional management of damage and conflicts with wolves is an important component of wolf recovery efforts because it facilitates local public acceptance and tolerance of wolves (Fritts et al. 1992, Fritts 1993, Mech 1995, WDNR 1999, 50 CFR 17.40(o), Wydeven and Jurewicz 2005).

Wildlife damage management, a specialized field within the wildlife management profession, is the science of reducing damage or other problems caused by wildlife and is recognized as an integral part of wildlife management (Berryman 1991, The Wildlife Society 1992). The United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Wildlife Services[1] (WS) program is the Federal agency authorized by Congress to conduct wildlife damage management to protect American agricultural, industrial and natural resources, property and human health and safety from damage associated with wildlife (Act of March 2, 1931 as amended 46 Stat. 1486; 7 USC 426-426c). Wildlife Services is a cooperatively funded, service-oriented program that provides assistance to requesting public and private entities and government agencies. Before WS responds to requests for assistance and conducts any wildlife damage management, a request must be received and an *Agreement for Control* must be signed by the landowner/administrator for private lands or other comparable documents for public lands must be in place. Wildlife Services responds to requests for assistance when valued resources are damaged or threatened by wildlife. Responses can be in the form of technical assistance or operational damage management depending on the complexity of the wildlife problem and the funding that is available. Wildlife Services activities are conducted in accordance with applicable Federal, State and local laws, Cooperative Agreements, "Agreements for Control", Memoranda of Understanding (MOUs), and other applicable documents (WS Directive 2.210). These documents establish the need for the requested work, legal authorities and regulations allowing the requested work, and the responsibilities of WS and its cooperators.

This environmental assessment (EA) documents the potential impacts to the human environment for each of the four alternatives for WS involvement in wolf damage and conflict management in Wisconsin. This analysis relies mainly on existing data contained in published documents (Appendix A), including The Eastern Timber Wolf Recovery Plan (USFWS 1992), the Animal Damage Control[1] (WS) Programmatic Final Environmental Impact Statement (EIS) (USDA 1997, Revised), and the WWMP (WDNR 1999, 2007*b*) whereby pertinent portions of these documents are incorporated by reference.

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[1] On August 1, 1997, the Animal Damage Control program was officially renamed "Wildlife Services."

1.1 PURPOSE

The purpose of this EA is to evaluate the potential impacts of alternatives for managing damage by and conflicts with wolves and wolf-dog hybrids in Wisconsin. Management activities would be intended to protect agricultural resources, property, pets, and human health and safety in Wisconsin, and to conserve wolf populations. This EA evaluates four different alternatives for WS involvement in wolf damage management in Wisconsin.

1.2 NEED FOR WOLF DAMAGE MANAGEMENT IN WISCONSIN

The need for action in Wisconsin is based on verified wolf depredation, harassment, and threats to livestock, game farm animals and pets, property damage, and risks to human safety from potentially hazardous or threatening wolves or habituated/bold wolves. The need exists to provide a prompt, professional, effective program to resolve wolf conflicts in order to minimize wolf damage and conflicts and associated negative attitudes and actions toward wolf conservation in Wisconsin. Any wolf damage management (WDM) program developed should include access to a range of damage management techniques that allow for effective management of damage by and conflicts with wolves while still retaining a healthy and viable wolf population in Wisconsin. The program should be conducted by personnel well trained and qualified in WDM. Control methods should target depredating wolves/wolf packs or wolf-dog hybrids. There should be a system for monitoring the use of WDM control methods and cumulative impacts on the wolf population. WDM should not have significant adverse effects on nontarget species populations.

In the revised Eastern Timber Wolf Recovery Plan (USFWS 1992) and the WWMP (WDNR 1999, 2007*b*), the USFWS and WDNR determined that a wolf damage management program including the relocation and/or removal of depredating wolves is necessary and advisable to minimize negative attitudes toward wolf recovery and facilitate wolf conservation. The WDNR has identified social tolerance of wolves as one of the primary factors limiting expansion of the Wisconsin wolf population (Wydeven and Jurewicz 2005). 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), the nation's leading expert in wolf biology and management, noted that wolf conservation at the local level may become more socially acceptable if some form of localized wolf control is allowed (Mech 1995; Section 1.3.10). The Wildlife Society is an international organization of professional wildlife biologists especially focused on North America states. This professional organization 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).

1.3 BACKGROUND

1.3.1 Wolf Distribution and Legal Classification - General

The original distribution of wolves covered most of the Northern Hemisphere north of latitude 20ºN (Mech 1974). This places the wolf second only to the Pleistocene lions (*Panthera leo*) in having attained the widest distribution of all wild land-dwelling mammals (Nowak 1983). Wolves are not restricted to specific habitat types but occupied a wide range of habitats that contained suitable prey. Wolves once occurred in the Middle East and all across Europe, including the old Soviet Union (Pimlott 1975, Mech 1982).

Prior to European settlement, gray wolves occupied much of North America except, possibly, for the large desert areas of the United States and the Southeast. The first European settlers viewed wolves and other large predators as a threat to their safety and a competitor for food resources (Young and Goodman 1944). They also viewed the New World as a vast wilderness that needed to be tamed and conquered. The early settlers established bounties and other systems for eliminating wolves. One of the first laws passed by the Puritans in the New Haven colony established a bounty for wolves and foxes. In 1648 all towns in the Massachusetts Bay colony were ordered to maintain dogs for the purpose of destroying wolves (Conover 2002).

The attitude that wilderness and wildlife were something to be tamed and conquered remained largely unchanged until the late 1800s when there was a shift in public attitudes toward wildlife and an increasing awareness that wildlife populations were not infinite. Sport hunting gained popularity and groups were established that advocated for the management and preservation of game species populations. Another philosophy also began to emerge which held that nature and wilderness possessed special value and should be preserved for their own sake and for the wellbeing of man. Unfortunately, the attitude that some types of animals were "good" (e.g., species that could be hunted or which provided sport) or "bad" (e.g., animals that preyed on "good" animals) still prevailed. Government management strategies usually involved taking action to protect some species and eradicate others (e.g., predators). Concerns about food shortages and high food prices during the World Wars led to increased emphasis on livestock production. During WWI Congress allocated $125,000 to deal with predatory animals and the U.S. Government hired its first professional hunters to remove predators (Anderson 1991, Conover 2002). Predator "control" still included bounties, large-scale use of poisons and other predator removal techniques that emphasized reducing predator populations and not necessarily just working to resolve specific depredation problems. By about 1900 government and private wolf removal efforts had resulted in the extirpation of gray wolves from the eastern half of the United States except for the upper Great Lakes region, and by about 1930 most wolf populations in the west were almost eliminated. In Canada the trend was similar (Carbyn 1983*a*) but not as complete.

It wasn't until approximately the 1960's when societal attitudes shifted to a more widespread recognition of the value and importance of predators in ecosystems. There was greater emphasis on and understanding of the fact that ecosystems are complex and fragile and that predators played an important role in ecosystems. Large-scale efforts to reduce predator populations were no longer accepted by many segments of the public. In 1974 the gray wolf in the contiguous 48 states was listed as endangered under provisions of the ESA. A Federal *"Recovery Plan for the Eastern Timber Wolf",* approved in 1978 and revised in 1992, stated that a primary objective is to reestablish viable wolf populations in as much of its former range as possible (USFWS 1978, 1992). When wolf distribution expended from Minnesota into Wisconsin, Nowak (1983) referred to this as "one of the most remarkable wildlife comebacks in history."

As a result of the protection placed upon them, wolves spread back into formerly occupied ranges from Alaska to the Great Lakes. In response to increasing and expanding wolf populations, on April 1, 2003, the USFWS changed the classification of the gray wolf under the ESA. The USFWS established three distinct population segments (DPSs) for the wolf in the lower 48 states. The wolves in Wisconsin were in the Eastern DPS and were reclassified from endangered to threatened in this action (68 FR 15804-15875). The USFWS also established a special regulation under section 4(d) of the ESA which applied provisions for wolf damage management similar to those in Minnesota for most of the Eastern DPS. This special regulation allowed for lethal control of depredating wolves in situations where management authorities deemed those actions were warranted. USFWS found that these special rules were necessary and advisable to provide

for the conservation of the wolves in the Western and Eastern DPS (50 CFR 17.40(n) and (o), respectively). Lethal control was carried out by the WDNR and USFWS or their designated agents. Personnel from WS were designated agents of the WDNR through a cooperative agreement signed by the WDNR Bureau of Endangered Resources and Bureau of Wildlife Management and WS. On July 21, 2004, the USFWS initiated the process for delisting wolves in the Eastern DPS (69 FR 43663 43692).

On January 31, 2005 a United States District court in Oregon enjoined and vacated the USFWS' Final Reclassification Rule of April 2003 that changed the status of the gray wolf from endangered to threatened in the Eastern and Western DPSs. The ruling effectively returned the wolves in Wisconsin to their previous endangered status and cancelled the special regulations established under section 4(d) of the ESA.

On March 27, 2006, the USFWS published a proposed rule to establish a new DPS called the Western Great Lakes Distinct Population Segment (WGLDPS) for gray wolves in the upper Midwest region. The WGLDPS included all of Minnesota, Wisconsin, Michigan, the eastern half of North and South Dakota, the northern half of Iowa, northern Illinois and Indiana and northwestern Ohio (70 FR 15266-15305) (Figure 1-1). At the same time, the USFWS also announced a proposal to remove gray wolves in the WGLDPS from the federal list of endangered and threatened species. On February 8, 2007, the USFWS issued its final rule that the WGLDPS was established and that gray wolves in this region were removed from the federal list of endangered and threatened species (72 FR 6052-6103). This ruling became effective on March 12, 2007 and returned primary management authority for wolves to the WDNR and Tribes.

Figure 1-1. Western Great Lakes Distinct Population Segement for Gray Wolves (USFWS 2007).

1.3.2 Wolves in Wisconsin

Gray wolves occurred throughout Wisconsin prior to European settlement. However, they were extirpated from southern Wisconsin by the 1880's and central Wisconsin by 1914. A remaining wolf population occurred in a few northern Wisconsin counties, but had declined to fewer than 50 animals by 1950. The last Wisconsin wolf was probably killed in the late 1950's (Wydeven et al. 1995).

In 1974 the gray wolf in the contiguous 48 states was listed as endangered under provisions of the ESA. The State of Wisconsin listed wolves as endangered in 1975 when it appeared that wolves were beginning to reinhabit the state. A Federal "*Recovery Plan for the Eastern Timber Wolf*", approved in 1978 and revised in 1992, stated that a primary objective is to reestablish viable

populations in as much of its former range as possible (USFWS 1992). Under the protections of the ESA, wolf populations in Wisconsin and Minnesota freely disperse (Figure 1-2). Wolf population monitoring by the WDNR began in 1979, when the wolf population was estimated at 25 wolves in five packs (Figure 1-3). The number of wolves has increased considerably since that time. During the winter of 2006-2007, the minimum population estimate was 540 wolves in 138 packs (Wydeven et al. 2007). Wisconsin's annual minimum wolf population estimates are provided in Figure 1-3. These estimates are derived from surveys conducted during winter, prior to pup production, when population size is at an annual low. Over the period of 1990-1999 the Wisconsin wolf population increased at an average annual rate of 22 % (range -11% to +49%), and slowed to 11% between 2000-2006. The Wisconsin wolf estimate of 540 for 2006 represents a 16% increase from 2006.

The wolf population has exceeded all recovery criteria established for the eastern United States in the federal wolf recovery plan (USFWS 1992). The federal plan required that at least two viable wolf populations must exist within the eastern United States and that one of the populations must exist outside of Minnesota and Isle Royale. The Federal recovery plan provided two alternatives for reestablishing this second viable wolf population. If the wolf population was more than 100 miles from the Minnesota population, it had to contain 200 wolves for at least 5 consecutive years (USFWS 2003). If the wolf population was less than 100 miles of the Minnesota population, it had to contain at least 100 wolves for at least 5 consecutive years (USFWS 2003). The Michigan/Wisconsin wolf population is less than 100 miles from Minnesota and recent surveys indicate more than 900 wolves in these two states. The minimum population requirement of at least 100 wolves has been exceeded since 1994 (Fig 1-4). Also, while no numerical individual state recovery criteria for Michigan and Wisconsin are listed in the federal plan, State subgoals were incorporated. For Wisconsin and Michigan, the subgoals were 80 and 80 – 90 wolves, respectively (USFWS 1992). Current populations in both states are more than four times the numerical subgoals.

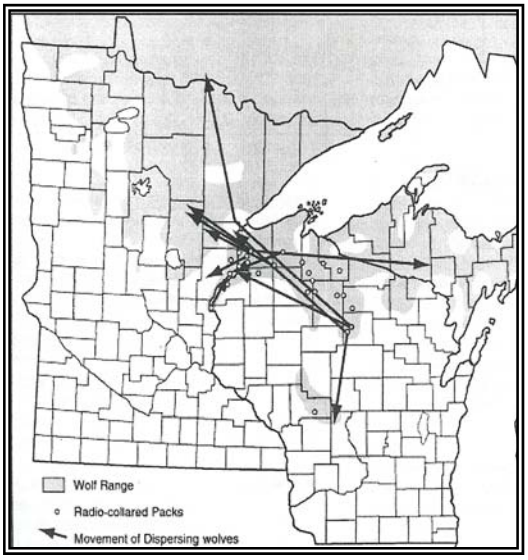


Figure 1-2. Dispersal of Wisconsin Wolves

The federal recovery plan also required that the wolf population in Minnesota be stable or growing, and its continued survival must be assured. In Minnesota, the wolf population size is not surveyed or estimated annually, however in 2004 Minnesota Department of Natural Resources estimated the wolf population had reached approximately 3,020 individuals. The previous estimates for the winter wolf population in Minnesota were 2,445 in 1997-98, 1,500-1,750 for 1988–89, and 1,235 for 1978-179 (Fuller et al. 1992). A wolf depredation control program has been conducted in Minnesota since 1978 when wolves were reclassified as federally threatened and a 4(d) regulation was promulgated. After 25 years of wolf damage management including lethal removal of wolves, the Minnesota wolf population has still increased by 245%, or almost 2 ½ times the 1979 population and, at present, is believed to be relatively stable (Erb and Benson 2004).

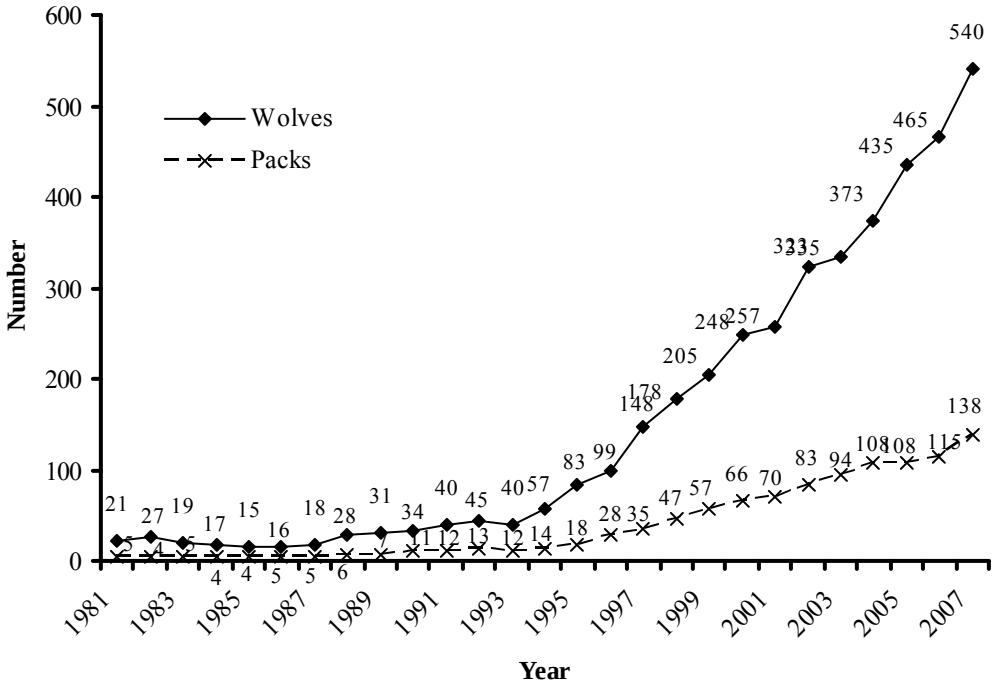


Figure 1-3. Late winter minimum wolf population in Wisconsin from 1980-2007. These are statewide counts and include tribal lands.

In 1986, the WDNR created a Wolf Recovery Team to develop a Wisconsin Wolf Recovery Plan. The Wisconsin Wolf Recovery Plan was approved by the Wisconsin Natural Resource Board in 1989 (WDNR 1989). This plan followed the intent of the Federal Recovery Plan and supported reclassification of the wolf in Wisconsin from *"endangered"* to *"threatened"* when a minimum population of 80 animals was maintained for three consecutive years. The WDNR also established a goal of 250 wolves for reclassifying wolves from threatened to protected, and a management goal of 350 wolves. The Wisconsin recovery goal for down-listing to threatened was achieved in 1997, and in 1999 wolves were officially reclassified to "threatened" by the State. The WWMP was revised in 1999 after the state reclassified wolves as threatened (WDNR 1999). The WDNR removed wolves from the state endangered and threatened species list and listed them as protected wild animals (nongame species) in 2004. The Wisconsin wolf population surpassed the management goal of 350 wolves in 2004 and has increased by 14 % in 2005, 7 % in 2006, and 16% in 2007.

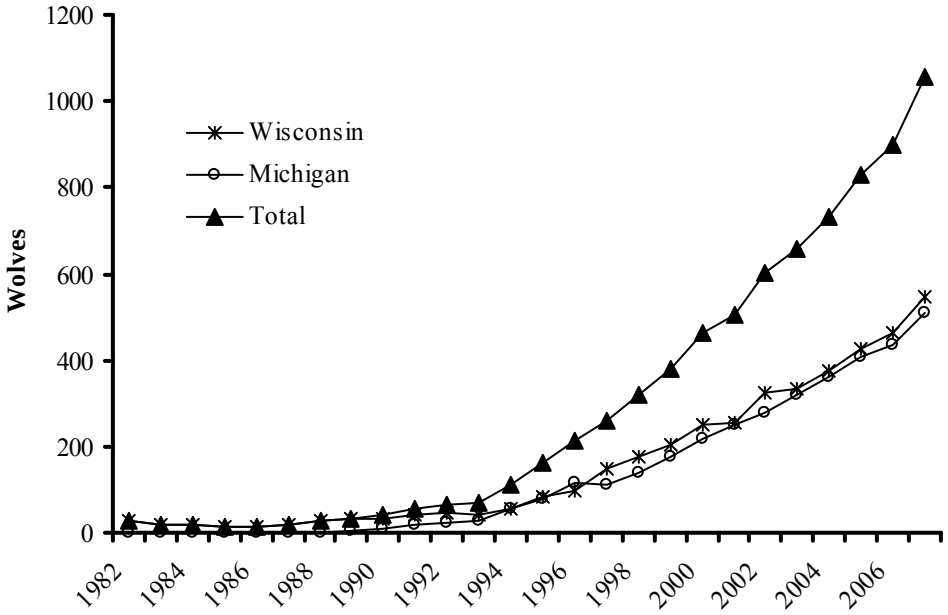


Figure 1-4. Wolf population estimates for Wisconsin, Michigan, and Wisconsin and Michigan combined (total) from 1980 - 2007.

1.3.3 Wolf Ecology

Gray wolves are carnivores and acquire food through predation and scavenging. Wolves can attain speeds of 35–44 miles/hour over short distances (Mech 1974) and a travel gait of five miles/hour can be maintained for long distances. The presence of wolves in an area is dictated in part by the availability of habitat for its prey species. Wolves in forested environments appear to depend generally on their sense of smell and hearing (Mech 1970). Their sense of smell is highly developed, enabling them to detect odors from distances as far as 1½ miles; smell functions both to detect prey (Mech 1970) and in territorial marking and social interaction (Asa et al. 1985). Harrington and Mech (1982) reported that wolves replied to human howls from a distance of three miles and possibly from as far as six miles. Vision in wolves is apparently acute but, compared with smell and hearing, may be the least highly developed; but, this is difficult to test.

The social behavior of gray wolves is affected by their reproductive cycle and need to hunt in packs. Pack dynamics, social status of individuals, movements, and certain aspects of seasonal habitat use are all affected by their reproductive behavior. Gray wolf packs normally consist of pups, several sub adults and the dominant male and female that can reproduce annually. During 2005 and 2006 the average Wisconsin wolf pack size was approximately 4.0 animals (Wydeven an Wiedenhoeft 2006). Because wolves are recolonizing Wisconsin, average pack size is somewhat smaller than has been reported elsewhere because newly formed packs consisting of two animals that show reproductive activity are included in estimating wolf pack size. About 38% of all adult females fail to reproduce (Packard et al. 1983). This failure is believed to be the result of deferred reproduction (i.e., lack of copulation) rather than the suppression of hormonal cycles (Packard et al. 1983, 1985). Delayed behavioral maturation provides an adaptive advantage to the pack in that many members help raise just a few young or the young of the dominant pair. The pack can remain as a viable social unit, necessary for successful hunting,

while reducing competition for mates and maintaining pack unity through their social hierarchy. This also provides an advantage to the alpha males and females by increasing the probability that only their genes are passed on.

The social standing of wolves within a pack influences the breeding cycle among high-ranking members in the hierarchy. Alpha animals suppress lower-ranking animals in their behavior towards them and generally mate with other high-ranking animals. Some captive females have been observed as capable of conceiving at ten months of age (Medjo and Mech 1976), but sexual maturity in the wild usually is attained at 22 months and often wolves do not breed until their third or subsequent years. Females coming into estrus for the first time may do so two weeks later than those that have previously bred (Rausch 1967). Estrus in wolves lasts from five to seven days (Mech 1974) or longer and occurs any time from January to March, depending on latitude. Most breeding in Wisconsin occurs in February (WDNR 1999).

Ovulation and implantation are regulated by a number of factors. In one study (Rausch 1967), females breeding for the first time shed an average of 6.1 ova and implanted 5.4 embryos, whereas older females shed an average of 7.3 ova and implanted 6.5 embryos. Five adult females found in Wisconsin in the 1980s and early 1990s, had an average of 5.2 (range 3-8) fetuses. Gestation lasts about 63 days and average litter size is about six, with extremes recorded being from 1 to 11 (Mech 1974). A wolf pack generally produces one litter per year (Packard and Mech 1980); however, well-documented cases of births of more than one litter per pack per year have been recorded both in captivity (Paquet et al. 1982) and in the wild (Murie 1944, Van Ballenberghe 1983). In Yellowstone National Park, the production of 2-3 litters in one year by a single pack has been documented on multiple occasions (USFWS et al. 2002, Smith et al. 2005). In such cases, adults in the pack often divide their time between dens and will unite the family groups after the pups become mobile (Murie 1944). Occasionally, subordinate wolves that have left the pack are known to have produced pups (Peterson et al. 1984).

Young are usually born in earthen dens dug by female wolves or in dens taken over from other animals. Availability of suitable habitat for denning is only of secondary importance when compared to prey availability (Carbyn 1975, Ballard and Dau 1983). Young are born with their eyes closed and initially have a poor thermoregulatory system. In Wisconsin, birth occurs from mid to late April (WDNR 1999). Newborn pups weigh about one pound (Rutter and Pimlott 1968) and their movements are limited to a slow crawl. Eyes open at 11–15 days (Mech 1970), but pups see poorly until they are several weeks old.

At about three weeks, pups will emerge from the den and can be found romping near den entrances (Young and Goldman 1944). Social interactions begin to develop during this period. After several weeks pups are moved to activity sites, which are also referred to as *"rendezvous"* or *"home sites"*; generally less than 1.2 miles from den sites (Carbyn 1975, Peterson et al. 1984). Thereafter, pup activity is centered on a succession of home sites progressively farther from the den. By four to six months, pups have reached nearly adult size; they then range with the rest of pack.

Wolves are opportunistic predators and prey most extensively on ungulates and beaver (*Castor canadensis*); although in exceptional cases they have resorted to feeding on garbage (Grace 1976) or such unusual food items as insects (Kuyt 1972) and fish (Bromley 1973). Mandernack (1983) found deer at 55%, beaver at 17%, and snowshoe hare (*Lepus americanus)* at 12% volume (relative bulk density) of 334 wolf scats found in Wisconsin, but scat samples were biased toward the warmer months. Mettke (1998) found 78% deer by volume in 47 scats from a pack in northwest Wisconsin in late winter and early spring. Surprisingly both studies also found pig

(*Sus scrofa),* probably from carcasses thrown in the forest, and Mettke (1998) also found 3% volume of calf remains in scats.

In general, wolves prey on the most vulnerable animals. Young, older, or otherwise less robust individuals are most vulnerable to wolf predation (Murie 1944, Pimlott et al. 1969, Mech and Frenzel 1971, Mech and Karns 1977, Peterson 1977, Carbyn 1983*b*). Snow conditions and forage limitations may render a large proportion of a prey population vulnerable to wolves. When food is plentiful, wolves normally eat meat at about 2 oz prey/pound of wolf/day (Kolenosky 1972) (i.e., an 80 pound wolf would consume about 10 pounds of meat); however, consumption rates in the wild may be as high as 3 oz. prey/pound wolf (i.e., 15 pounds of meat for an 80 pound wolf) (Fuller and Keith 1980) and 4 oz prey/pound wolf (20 pounds of meat for an 80 pound wolf) (Carbyn 1983*b*). However, wolves have an amazing ability to survive long periods with little or no food. Mech (1977) learned that as a result of food deprivation during winter, wolves conserved energy by traveling less and sleeping more than under normal conditions.

Wolves kill and consume other carnivores, including other wolves (Young and Goodman 1944, Van Ballenberghe and Erickson 1973, Fuller and Keith 1980), dogs (Young and Goodman 1944, L. Carbyn, pers. observation, USDA/WS pers. observations) and bears (*Ursus americanus*, *U. maritimus*) (Horejsi et al. 1984, Ramsay and Stirling 1984, Paquet and Carbyn 1986). At other times carnivores are killed and not consumed. For example, wolves have been observed to kill but not eat dogs, coyotes (*Canis latrans*) (Carbyn 1982, Crabtree & Sheldon 1999), wolverines (*Gulo gulo*) (Boles 1977), and mink (*Mustela vison*). In addition, instances have been recorded where more prey are killed than can be consumed (i.e., surplus killing) (Bjärvall and Nilsson 1976, Mech 1977, Eide and Ballard 1982, DelGiudice 1998). Killing by wolves ranges from predation (killing to eat either an entire carcass or part of it) to defensive, territorial and surplus killing. In cases where coyotes, dogs, or other wolves are killed but not consumed defensive or territorial killing is implicated.

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.

1.3.4 Benefits and Ecological Role of Wolves

Wildlife generally is regarded as a source of economic, recreational, and aesthetic benefits (Decker and Goff 1987), and the mere knowledge that wildlife exists is a positive benefit to many people. Direct benefits are derived from a user's personal relationship or direct contact with wildlife and may include both consumptive (e.g., using or intending to use the animal such as in hunting or fishing) and non-consumptive uses (e.g., observing or photographing animals) (Decker and Goff 1987).

Wolves play an important role in predator/prey relationships. By culling old, young, sick, and injured individuals from a prey population, it is believed that wolves help maintain healthier, viable prey populations when other prey population mortality factors are in balance (Mech 1970). Similarly, wolves may help reduce risk of disease transmission from wild ungulates to livestock by preying on sick individuals and reducing the incidence of disease in wild ungulates (Stronen et al. 2007).

Wolves may also play a role in the development of riparian and upland plant communities in various locations within the U.S. Research has shown that wolf predation on elk in the greater Yellowstone National Park region of northwestern Wyoming and southwestern Montana altered elk behavior and habitat use which, in turn, resulted in less foraging pressure on sensitive riparian areas and increased willow and quaking aspen height in riparian/wet meadow habitats (Ripple et al 2001, Ripple and Beschta 2004). A similar study by Fortin et al. (2005) suggests that there may also be a behavioral component to these wolf-elk interactions. Elk may still travel through high wolf use areas, but they may alter their habitat preferences from aspen in riparian zones to conifer forest and open meadow habitat types (Fortin et al. 2005).

On Isle Royale National Park in Lake Superior, balsam fir growth has been linked to wolf-moose interactions (McLaren and Peterson 1994). When wolves were relatively scarce, moose numbers grew, which led to depletion of balsam fir forage. It was observed that vegetation response followed moose response. When wolf numbers were higher, moose numbers were low and balsam fir growth increased (McLaren and Peterson 1994). These studies suggest that wolf recovery may present a management tool for helping to restore certain types of vegetation and to conserve biodiversity (Ripple et al. 2001, Ripple and Beschta 2004).

A study in Wisconsin and Michigan has shown that diversity and biomass of forbs in white cedar (*Thuja occidentalis*) stands was more diverse and at higher biomass in the interior than on the edge of wolf pack territories (Anderson et al. submitted). Differential use by wolves of core and edge portions of their territories cause deer to spend less time in the interior, and more time on the edge of wolf territories (Mech & Harper 2002). Since the 1990s, deer populations in much of northern Wisconsin have been above management goals, thus any predation by wolves may reduce some of the negative effects of deer herbivory on native plant communities.

Wolves are important predators on beaver (Potvin et al. 1992), which in turn may affect trees, orchids, trout habitat, and forest roads. Predation by wolves on coyotes and other mesopredators, may benefit smaller predators and ground nesting birds that can be affected by mid-sized predators (Crabtree and Sheldon 1999).

Viewing wolves or hearing them howl in their natural habitat is a popular activity in certain areas and is considered to add value to many people's outdoor experience. Organized tours for the purpose of viewing wolves or hearing them howl are conducted at some U.S. and Canadian national parks such as Yellowstone (WY), Denali (AK), Wood Buffalo (Alberta, Canada), and Riding Mountain (Alberta, Canada). Howl tours are also held in northern Wisconsin by several groups (WDNR 1999, Wydeven and Wiedenhoeft 2005). Small or large group howling attempts can also be made in any area where wolves are known to be present. Such activities provide not only aesthetic viewing but there may also be associated economic (tourism) benefits.

1.3.5 Importance of Wolves in Native American Culture and Beliefs

Wolves play an important role in tribal culture and beliefs. The exact nature of this relationship and role varies among tribes. One example of the role of wolves in tribal beliefs comes from the Anishinabeg (Ojibwe). Ma'iingan, the wolf, has special significance to the Anishinabeg, who regard the wolf as a brother, and as a being with whom their fates are intertwined. Anishinabeg teachings state that Ma'iingan and Original Man were told by the Creator to travel the earth together and name all of creation. During their journey, the two became as brothers. After their task was completed, the Creator told them they must go their separate ways. The Creator said that from that time forward they both would be feared, respected and misunderstood by the people that would join them later on this earth, and that what would happen to one of them would

also happen to the other. Wolves also figure prominently in the Clan Systems used by some tribes.

The following information was provided by the Lac du Flambeau Band of Lake Superior Chippewa Indians:

> "In a manner similar to many religions, the Ojibwe also have a belief in the canons of creation. Wolves occupied North America before the arrival of humans. Thus, in Ojibwe culture, wolves as they existed before the Ojibwe are older than the Ojibwe and are to be respected in manner similar to which the Ojibwe respect an elder who [possesses] more knowledge and life experiences. The Great Spirit created the wolf with purpose and the Ojibwe believe the wolf should be allowed to fulfill that purpose both spiritually and physically. The wolf serves an important purpose in maintaining the delicate balance of nature and the Ojibwe have accorded the wolf great respect for preserving that balance.
>
> The wolf is prevalent in many cultural tales of the Ojibwe. The wolf was a close companion to the Ojibwe primary cultural hero "Wenaboozho". One episode with "Wenaboozho" and the wolf resulted in the creation of the Ojibwe, and for this reason the Ojibwe maintain high honor for the wolf. The dog, as the relative of the wolf is a reminder of the creation episode and, as an act of respect for the wolf, the Ojibwe people frequently have dogs in their presence.
>
> Ojibwe prophets predicted that the wolf and Native people in North America would be disdained. The prophesies declared that the hair of both would be removed by visitors from across the great ocean. The prophesies also declared there would be attempts to remove both the wolf and the Native people from their ancestral home. As stated within the Environmental Assessment for the Management of Wolf Conflicts and Depredating wolves in Wisconsin (EA), prior to European settlement, gray wolves occupied all of North America. By about 1900, gray wolves had disappeared from the eastern half of the United States except for the upper Great Lakes region, and by 1950 the wolf population in northern Wisconsin counties had declined to fewer than 50. However, the prophesy also states that both the wolf and Native people will survive to demonstrate the need for ecological balance to save our grandmother earth."

The WDNR and WS recognize the importance of wolves in tribal culture and will continue to work with individual tribes and the Great Lakes Indian Fish and Wildlife Commission to try and address their concerns regarding WDM in Wisconsin. Specific measures to address tribal concerns were developed during the preparation of the previous EA (USDA 2006). These measures will remain in place as Standard Operating Procedures, Section 3.5. WS will also work with the tribes on any new issues relative to WS' involvement in the implementation of the new state wolf damage management guidelines.

1.3.6 Wolf Impact on Elk and Moose in Wisconsin

In 1995, the WDNR reintroduced elk to northern Wisconsin. The Wisconsin Elk herd was estimated at approximately 135 animals on July 1 2007 (WDNR 2007*a*). Elk are currently classified as a protected species in the state. Predation, primarily by bears and wolves has been an important mortality factor. For example, in 2005, the deaths of 5 elk were attributed to wolves. Wolf territory placement also impacts spatial distribution and habitat use by elk in the state (Anderson et al. 2005). Wisconsin also has a small population of moose that may also serve as food for wolves (Wiedenhoeft and Wydeven 2005). However, it is also important to note that

white-tailed deer, another important prey item for wolves, numbers exceed management goals in many parts of the state.

1.3.7 Wolf Predation on Livestock and Pets

The ability of wolves to injure and kill cattle, sheep, poultry, game farm animals and other livestock is well documented (Young and Goldman 1944, Fritts 1982, Carbyn 1983*b*, Fritts et al. 1992, Treves et al. 2002, USDA 2005, WDNR 2007*b*). The economic impact of wolf depredation on livestock can be substantial for individual producers. Further, when wolves come into contact with people (Linnel et al. 2002) and kill or injure their pets there is both an economic and an emotional loss. There is the cost to replace a pet that has been killed or to care for one that has been injured. Also, many people are attached emotionally to their pets and have very strong feelings concerning their injury or loss.

Wolves are apex predators, social animals, and young of the year probably learn from the adults what acceptable prey items area (Fuller et al. 2003). An assessment of causative factors that may have attributed to increases in wolf depredations in Minnesota suggested that wolf colonization, range expansion, and learning seemed to attribute to depredation increases (Harper et al. 2005). Even though one or 2 pack members may actually depredate livestock, the adults often move the entire pack to farms and establish rendezvous sites where kills have been made at which point the entire pack including young of the year are exposed to livestock routinely which likely predisposes wolves to depredate livestock in the future. In addition, prey populations, such as white-tailed deer, are typically higher around agriculture areas, which may attract wolves to farms resulting in wolf/livestock conflicts.

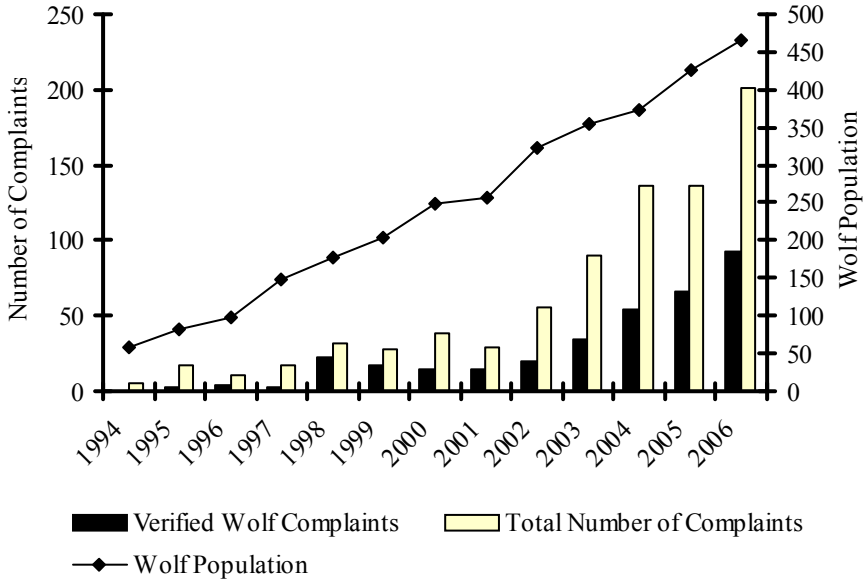


Figure 1-5. Total wolf complaints, verified wolf complaints and the annual minimum wolf population for Wisconsin, 1994-2006.

The number of wolf complaints reported to the WS and the WDNR has shown an increasing trend at the same time that State wolf population has increased (Willging and Wydeven 1997, Treves et al. 2002, Figure 1-5). One of the likely reasons for recent increases in wolf conflicts relates to the fact that the areas of suitable remote habitat are occupied by wolves, and much of the recent wolf

population expansion has occurred in agricultural areas within or at the edge of the northern forest. Opportunities for wolf-human interactions, including conflicts, are higher in these agricultural areas. The number of farms with verified wolf depredation has increased from 8 in 2002 to 14 in 2003, 22 in 2004, 25 in 2005 and 25 in 2006 (Table 1-1). As wolf conflicts increase, there is an increasing need for prompt professional WDM assistance and efforts to maintain public support and acceptance of wolves (WDNR 1999, Treves et al. 2002).

Not all complaints investigated by WS are verified as being caused by wolves. For example, in 2006, Wisconsin WS conducted 201 site investigations in response to wolf complaints, but only 46% of these complaints were actually confirmed as being attributable to wolves (WS MIS data 2006). In some instances, there was insufficient evidence or the evidence was not of sufficient quality to confirm the source of the problem. In other instances, the problem was determined to have been caused by other predators (e.g., coyotes or feral dogs), or the animal may have died from natural causes (e.g., disease, exposure, lightening).

Table 1-1. Regression analysis of independent variables compared to the growth of the WI wolf population, 2000-2006.

Independent Variable	*P* value	Adjusted R^2
Cattle Depredated	0.0032	0.883
Verified Wolf Complaints	0.0004	0.919
Total Wolf Complaints	0.0004	0.923
Compensation	0.1437	0.315
Farms with verified depredations	0.0013	0.872

Negative interactions associated with livestock depredation do not necessarily increase proportionately with wolf abundance, rather, they are localized events. In situations were there is suitable unoccupied habitat in locations that will not result in a high degree of interaction between wolves and livestock, there is little relationship between wolf density and wolf conflicts. Stronger relationships between wolf density and wolf conflicts, occur when wolf populations expand into areas where wolf habitat, agriculture and human development are mixed. This appears to have been the case in Wisconsin as the wolf population expanded from relatively remote areas in Wolf Management Zones 1 and 2 into the more heavily developed and agricultural areas in Zone 3 and portions of Zone 1 (Figs 1-6 and 1-7). Prior to 2000, there wasn't a clear trend between wolf population size and verified wolf complaints. In 2000, the Wisconsin wolf population approached 250 animals statewide which is the recovery goal established by the WDNR for removing wolves from their list of T/E species. This is also the time when WDNR and WS started seeing increased wolf activity in forest/agricultural/urban transitional habitats. Using regression analysis (Sokal and Rohlf 1996) for comparing the independent variables of cattle depredated, verified wolf complaints, total wolf complaints, and farms with verified livestock depredations from 2000 through 2006 to the growth of the WI wolf population shows a statistically significant positive correlation between the size of the wolf population and conflicts with wolves (Table 1-1). In 2003, wolves killed 26 calves from one farm. This level of conflict is an anomaly with most farms losing 1 or 2 calves per year to wolf depredation. For statistical analysis, 25 of the depredated calves were removed from the data set, that is, instead of 37 cattle depredated that year, for analysis purposes we used 12 calves.

In Bayfield County from 2004-2006, 7.6% of beef farms had at least one wolf depredation. From 2001 to 2006, the number of beef cattle in Wisconsin that calved increased from 225,000 to 250,000 (NASS 2001, NASS 2006). Dairy farmers who graze their cows (instead of feeding year-round) in northern Wisconsin tend to utilize pastures for calving during fair weather (Jeff Lehmkuhler, Extension Beef Cattle Specialist, University of Wisconsin-Madison, pers. comm.). These operations' calves may be more vulnerable to wolf depredations than other farms in Wolf Management Zone 1. As of 2003 there were approximately 1,000 dairy herds in the 17 northern

Wisconsin counties that can be considered to be primarily within Wolf Management Zone 1 (WAS 2004).

Domestic dogs and cats are occasionally killed and eaten by wolves (Fritts and Paul 1989, Treves et al. 2002, Wydeven and Wiedenhoeft 2005). In Wisconsin, hunting dogs used to pursue bear, coyotes, and bobcats are occasionally killed by wolves during training and hunting seasons (Treves et al. 2002). From 2000-2006 WS and WDNR verified that wolves killed an average of 13 dogs per year, range 5-24 dogs (this includes both companion and hunting dogs) (Table 1-2). In 2006, wolves depredated 24 and injured 10 dogs; the most recorded since wolves recolonized WI. Wolf complaints involving dog depredations usually involve one dog being killed by wolves, but WS has documented as many as 5 dogs killed during a single incident. Of the 24 dogs killed by wolves in 2006, 17 were pursuing bear, 3 coyote, 1 bobcat, and 1 rabbit, and 2 were companinion animals. There are probably other instances where wolves attacked dogs, but the incidents were not reported or the dogs just "went missing." Wolves may carry the carcass of a dog out of the yard and into the woods. Many hunters using hounds to pursue bear, coyotes, fox, and bobcat using radio tracking collars to monitor their dogs. Without the use of radio collars many wolf depredations on hunting dogs would go undetected. Wolf attacks on pets and hunting dogs raise public concerns about both pet and human safety.

Table 1-2. Wolf depredation on domestic animals in Wisconsin (verified losses only).

	Year															
Wolf Depredation				**'92**	**'93**	**'94**	**'95**	**'96**	**'97**	**'98**	**'99**	**'00**	**'01**	**'02**	**'03**	**'04**	**'05**	**'06**
Farms Affected				2	3	0	4	1	2	8	6	8	5	10	14	22	25	25
Wolf Population				45	40	57	83	99	148	178	205	248	257	323	335	373	425	465
Horses killed														3	-	-	2	-
Horses injured														-	-	-	1	3
Sheep killed				8	-	-	-	-	-	-	-	-	-	7	24	5	3	6
Sheep injured				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cattle killed				1	-	-	11	1	10	20	7	6	11	37	20	27	31	35
Cattle Injured				-	1	-	-	-	-	-	-	1	1	-	-	-	4	5
Farm Deer				-	-	-	-	-	-	4	19	3	-	5	1	6	-	-
Poultry Losses				-	27	-	-	-	-	-	44	4	74	-	-	-	-	50
Dogs killed				2	-	2	-	5	5	11	2	5	17	10	6	15	17	24
Dogs injured				-	-	-	-	2	1	5	2	-	1	4	4	3	6	10
Total Losses*				11	28	2	11	8	16	40	74	19	104	66	55	56	64	133

* Losses include killed & injured animals. This data only includes damage confirmed by WS. Confirmed loss figures usually represent only a fraction of total losses (Connolly 1992).

The WDNR provides compensation payments for all verified wolf depredations of domestic animals including bills for veterinary services for injured animals. Wolf damage compensation

payments made by WDNR from 1985 to 2005 have ranged from $0 in 1986 and 1988 to a maximum of $109,941 in 2004 (Table 1-3). The average annual compensation payment for the period of 2000 to 2005 was $55,914. Although the proportion of all farms in Wisconsin that have had verified wolf depredation is very low, the cost of wolf depredation is not spread out across all farms. The impacts on individual producers can be substantial (Breck and Meier 2004, Shelton 2004). For example, at one site in Wisconsin in 2004, WS verified that wolves had killed one calf, classified two additional calves as probably depredated by wolves (they were missing but wolf sign was present throughout the grazing area), and determined that three additional missing calves were probably killed by wolves. This producer had 32 calves during the reported grazing season; the loss of six calves on this farm from wolf predation was 19 % of the total production during that year. The producer was compensated for full market value of the animals; however, there was no compensation for time spent searching for missing animals or the increased anxiety of knowing wolves were present on the property causing damage (see comments on indirect impacts below).

Table 1-3. Wisconsin annual wolf damage payment summary. Prior to 2006, payment procedures including negotiations with landowners on the value of animals killed and injured by wolves which lead to delays in making payments, so the compensation payments listed below may include some payments for previous year's losses and will not necessarily be directly correlated to numbers in Table 1-1.

Resources ($)	2000	2001	2002	2003	2004	2005	2006	2007	Totals
Sheep	0	0	2,453	1,425	2,025	750	970	1,400	**9,023**
Cattle/calves	3,505	15,003	7,125	8,400	64,239	21,409	42,347	25,735	**187,763**
Cattle/adult	0	0	3,500	2,400	7,250	9,175	9,450	1,000	**32,775**
Turkeys	0	120	0	0	0	0	0	0	**120**
Pets	2,100	28,150	25,000	12,550	26,400	34,319	55,000	32,235	**215,754**
Commercial Game Animals	13,000	0	8,100	1,200	5,300	0	0	0	**27,600**
Chickens	25	3,731	0	0	0	0	350	0	**4,106**
Equine	0	0	10,000	2,250	0	4,750	0	6,500	**23,500**
Veterinary Services	0	449	819	1,882	4,727	1,952	6,682	2,038	**18,549**
Totals	**18,630**	**47,453**	**56,997**	**30,107**	**109,941**	**72,355**	**114,799**	**68,908**	**519,190**

Most depredation events in Wisconsin involve one or two animals, but the total number of animals WS has confirmed lost to wolf predation by an individual producer in one year has been as high as 26 animals (WS, Unpublished data). Actual livestock losses to wolf predation are likely to be higher than noted in Table 1-2. Livestock carcasses may be completely consumed or removed from the damage location resulting in missing livestock. Bjorge and Gunson (1983) in Alberta suggested that cattle dying from predation are less likely to be detected than cattle dying from other causes and their estimates of predation rates during their study were likely low. In a more severe example of rough terrain and large grazing areas than is likely to occur in Wisconsin, Oakleaf et al. (2003) reported that study personnel had a detection rate of 1:8 for calves depredated by wolves on a 30,000 ha grazing allotment in mountainous terrain in Idaho.

Indirect Impacts of Livestock Predation

Although direct losses of livestock due to predation are often conspicuous and economically significant, they likely underestimate the total impact on producers because they do not consider indirect effects of carnivores as a result of livestock being exposed to the threat of predation without being killed (Howery and DeLiberto 2004, Lehmkuhler et al. 2007). Shelton (2004) suggested that the value of depredated livestock from predators is the "tip of the iceberg" concerning the actual costs that predators impose on livestock producers including increased costs associated with efforts to mitigate predation which may include night confinement, improved fencing, early weaning, choice of grazing area, or increased feeding costs from a loss of grazing acreage.

The presence of predators near cattle can invoke a fear response in the cattle. Fear is a strong stressor (Grandin 1998). Stress can result in disease and weight loss, reduces the value of meat, and interferes with reproduction. Stress prior to slaughter is thought to cause "dark-cutters," meat which is almost purple (Fanatico 1999). Dark-cutters are severely discounted because they are difficult to sell (Fanatico 1999). Chronic stress inhibits immune responses, which increases illness and decreases performance of livestock and humans alike. Many infectious diseases result from a combination of viral and bacterial infections and are brought on by stress (Faries and Adams 1997). Harassment due to predators may directly cause weight loss due to increased energy expenditure associated with running and loss of sleep, but may also indirectly reduce the ability of ruminants to convert plant nutrients into weight gain due to decreased rumination time (Howery and DeLiberto 2004).

The stress of being repeatedly chased can cause cattle to abort calves, calf early or give birth to a weak calf (Lehmkuhler et al. 2007). Presence of wolves in pastures increases activity of cattle when cattle are chased by wolves and when cows chase after predators to protect their offspring. This increases heat stress during warm weather and risk of cold stress during cold periods from cattle that are sweated wet (Lehmkuhler et al. 2007). Chebel et al. (2004) discovered that heat stress (>29 degrees Celsius) prior to artificial insemination resulted in lowered conception rates for high producing dairy cows. Dairy cows exposed to high heat index values during peri-implantation may have a greater risk of pregnancy loss (Garcia-Ispierto et al. 2006). Depredations in Wisconsin from wolves appear to overlap the calving and subsequent breeding seasons of spring-calving beef herds. This increased stress during the breeding season could result in greater numbers of open cows and fewer calves born the following year reducing the economic viability of affected beef operations Lehmkuhler et al. 2007).

Harassment by predators may cause livestock to become nervous or aggressive. Aggressive or nervous animals may hurt humans and the other cattle that are around them. Not only are they dangerous but they will also stress other cattle and reduce their performance as well. Fear based behavior is likely to be the main cause of accidents due to a horse kicking or a cow or steer becoming agitated in a chute. Reducing fear improves both welfare and safety for humans and animals (Grandin). Harassment and predation by wolves can also affect the way cattle respond to livestock handling dogs and the ability of the dogs to control cattle movements (Howery and DeLiberto 2004).

Cows can be stampeded through fences when wolves are actively hunting/harassing livestock on a ranch. There are injuries to the cattle and many hours spent fixing fence. Regrouping cattle after they have been stampeded is difficult, time consuming and stressful to the animals. This takes time and money away from other needs on the farm (Lehmkuhler et al. 2007).

Producers with wolf problems spend extra hours on herd surveillance in addition to the many extra time dealing with the damage. Many hours may be spent trying to locate missing animals or remains to qualify for compensation. Time spent addressing predation problems comes at the cost of other work. Negative impacts from predators may affect the general mood of farm operators.

Livestock production typically is a small profit margin industry (Pope 1993). Increasing labor from greater surveillance of pastures increases cost of production (labor, equipment and fuel) resulting in reduced economic return (Lehmkuhler et al.2007).

The current recommendations to improve health in a cattle herd are to avoid overcrowding, rotate the cattle to fresh areas and avoid keeping them in the same areas year round (Lehmkuhler et al. 2007). Moving cattle too often results in increased stress, poorer performance and more sick cattle. Having to keep the cattle by the buildings to avoid predators is contrary to Best Management Practices for livestock production and may result in increased risk of exposure to pathogens (Lenehan et al. 2004), and, for some producers, increased need for supplemental feed. Concentrating cattle in small areas may increase the risk of transmitting food borne pathogens due to the increase in bacterial populations around the cattle and the immunosupression due to the stress of crowding (Lehmkuhler et al. 2007.). Recent research has shown that the prevalence of pathogens in the soil decreases as the distance from hay bale rings is increased (Lenehan et al. 2004). It is widely accepted that post-partum cows and newborn calves should be moved to "clean" pastures as soon as possible following parturition to decrease the risk of disease transmission (Lehmkuhler et al. 2007.).

In Wisconsin, most of the depredations occur during the spring and summer grazing season. Moving cattle closer to barns often requires pulling them off pastures and placing them in areas where increased foraging pressure may necessitate supplemental feeding. This may require use of feed that would ordinarily be used in the winter. Winter feed is the most costly feed input for cow-calf operations based upon Standardized Performance Analysis data. Producers forced to move cattle closer to barns and use winter feed during the grazing season will have lower financial returns (Lehmkuhler et al. 2007).

1.3.8 Other Types of Wolf Conflicts

There have been few reported wolf attacks on people. However, there are reports where wolves have been viewed as threatening to humans or have stalked and attacked people for unknown reasons (e.g., reasons unrelated to disease or injury; Linnel et al. 2002, McNay 2002). When wolves approach human residences and threaten or kill people's pets or exhibit bold behavior, people often become concerned for human safety. This is especially true if small children are present at those residences.

Linnel et al. (2002) reported several cases from around the world in which non-diseased wolves attacked people, but no humans were killed during the attacks; the wolves, in most cases, were later killed and examined. The wolves involved in those attacks seemed to have acclimated to the presence of people and became more aggressive (bold) toward people. Fortunately, in many of these incidents, others accompanied the person attacked and they were able to drive the wolf away. In many cases the person attacked received minor injuries and made a full recovery in a few days to weeks. There are no verified instances of wolves having attacked and injured people in the lower 48 United States. However, in January of 2005, an individual was attacked by a wolf while jogging near the community of Key Lake in northern Saskatchewan, Canada. The man was able to fight off the animal and later was flown to a hospital for stitches to non-life threatening

injuries. An attack by wolves was the apparent cause of death for a man near Wollaston Lake in Northern Saskatchewan, on November 8, 2005. A group of four wolves had been seen in the area for some time and appeared to be losing their fear of humans. There was also evidence that the victim and friends had been recently interacting with the wolves at close range (International Wolf Center 2005). The wolves involved in the attack may have become accustomed to humans and/or may have been deliberately or inadvertently (via improperly stored garbage) fed by humans. This is believed to be the first documented human mortality from wolves in North America. Wisconsin has not had any verified cases where wolves have stalked or attacked people. In July 2007, a kayaker in a remote area of the North Coast in British Columbia, Canada was attacked by an old female wolf (Pynn 2007). The kayaker was able to stop the attack by repeatedly stabbing the wolf with a knife. The individual called for help on his marine radio and the wolf was shot by the individuals who came to rescue the kayaker. In this instance, there was no indication that the wolf had been fed or otherwise habituated to humans.

McNay (2002) reviewed human-wolf interactions and analyzed case histories of incidents where wolves had behaved aggressively towards humans in Alaska and Canada. McNay notes that incidents of wolves behaving aggressively towards humans are extremely rare. For much of the 20th century there were no documented cases of wolves killing or seriously injuring a person in North America. McNay (2002) does provide case histories for 11 instances of what he considered unprovoked incidences of aggressive behavior of wolves which resulted in no injury (4) or minor injuries (7) over the period of 1969-1993. As wolf and human populations have increased, the opportunity for interaction between the species has also increased. Although wolves have a high aesthetic and cultural value and hearing and viewing wolves is extremely popular, not all of these interactions have been positive. McNay provided evidence of 7 cases of unprovoked wolf aggression over the period of 1994-2000, 5 of which involved wolves inflicting severe bites on humans.

Wolf familiarity with (habituation to) humans appears to be an important factor in aggressive behavior of wolves toward humans. Of the 18 unprovoked incidents of aggressive behavior reported by McNay for the period of 1969-2000, 11 were associated with what he defined as habituated wolves, (e.g. wolves which had lost their fear response to humans after repeated non-consequential encounters). Bites were inflicted in all 11 cases where habituated wolves displayed unprovoked aggressive behavior, but bites were inflicted in only 2 of the 7 cases where naïve wolves displayed aggressive behavior. All instances where wolves inflicted severe bites were associated with habituated wolves. Human behavior may have had an impact on the outcome of interactions between wolves and humans. In most instances where naïve wolves behaved aggressively toward humans, the humans defended themselves by hitting the wolf with a heavy object, firing a rifle into the air or, in two instances, killing the wolf. None of the individuals who were bit by habituated wolves defended themselves with anything other than their voices, hands or arms. It was difficult to determine if food conditioning (wolves learning to associate humans with the availability of food) played a role in all cases. However, 6 of the 11 aggressive habituated wolves were known to be food conditioned. It was unlikely that the naïve wolves were food conditioned because all of those incidents occurred at sites well away from human use areas. The data provided by McNay (2002) indicates the importance of human behavior management and public education programs in the prevention of adverse human-wolf encounters. These efforts coupled with nonlethal techniques designed to reduce or prevent wolf habituation to humans will likely prevent or resolve most situations where wolf behavior causes concern for human safety. However, there will be rare instances where removal of the problem wolf may be necessary.

In Wisconsin, instances of perceived risks to human health and safety from wolves are very rare and tend to occur in areas of fragmented habitat where wolves routinely have exposure to humans. There has been at least one situation where a wolf was acting aggressively towards automobiles that slowed or stopped in a certain area along a major northern highway. Acting on a request from WDNR, WS attempted to trap the animal but was unsuccessful. The wolf eventually left the area. In late winter and spring 2007 an adult male with mange, left the main portion of his territory, and along with a female pack mate, began to habituate to people in Florence County. After showing bold behavior toward a logger and frightening him from a timber sale, as well many other complaints, the wolves were captured and euthanized. With a growing wolf population and many people living in occupied wolf range, opportunities for wolves to become habituated to humans and risks of adverse interactions between humans increase.

Wild wolves rarely contract rabies, but it is possible, and there is a serious concern for humans or their pets should they be bitten. McNay (2002) reported 2 people that died as result of bites from wolves with rabies in Alaska in the 1940s. In 2007, a pack of wolves attacked a group of sled dogs and strays in Marshall, Alaska (Pemberton 2007). The one wolf that was killed by villagers during the attack tested positive for rabies. All dogs involved in the incident were euthanized as well as free roaming dogs that may have been involved in the incident. In response, villagers and government officials were working to increase use of rabies vaccine and fenced enclosures for dogs. However this type of incident is relatively uncommon,and rabies is rare in wolves south of the arctic in North America. Wolves could possibly spread other wildlife diseases to dogs (e.g., sarcoptic mange) should they have contact with a dog or their environment and *vice versa*. For example, in Wisconsin, wolf deaths attributed to infectious disease have been primarily attributable to mange (Thomas et al. 2005, Wydeven and Wiedenhoeft 2005)

The protozoan parasite, *Neospora caninum*, causes abortions in cattle and has been shown to be a large economic loss to the dairy and beef industry with infected animals being three to thirteen times more likely to abort than non-infected cattle (Hall et al. 2005 and Trees et al. 1999). Presently, domestic dogs and coyotes are the only two species that have been determined to be able to host and transmit *N. caninum* (Gondim et al. 2004*a*,*b*). Canids become infected by ingesting tissues (placenta, fetuses) contaminated with the organism. They then shed the organism in their feces. A cow grazing on a pasture contaminated with these feces can become infected with *N. caninum* (Dubey 2003).

It has been postulated that wolves are likely to be able to host and transmit *N. caninum* because of their phylogenic relationship to dogs and coyotes. Gondim et al. (2004*b*) indicated that 39% (n = 164) of wolves from Minnesota and 11% of coyotes in Utah, Colorado, and Illinois (n = 113) tested positive for exposure to *N. caninum*. Mech (2004, unpublished data) sampled 11 wolves from five counties in Minnesota from farms with a history of wolf depredation and 8 of 11 (73%) tested positive for exposure to *N. caninum*. Research in Minnesota is currently being conducted to determine if wolves can also transmit viable *N. caninum* in their feces. Although gray wolves may prove to be hosts capable of transmitting *N. caninum,* it is unclear whether the presence of wolves would add to the risk already posed by other canids, or possibly wolves may even play a role in reducing the potential of disease spread as suggested for other ungulate diseases however this relationship is unproven (Stronen et al. 2007). Data on the rate of seroprevelence of coyotes, dogs, and wolves needs to be defined for a particular geographic region before conclusions can be drawn (Gondim et al. 2004*b*).

1.3.9 Wolf-Dog Hybrids

A wolf-dog hybrid is the offspring of the mating of a wolf with a domestic dog (*Canis familiaris*). Normally these are bred in captivity because wild wolves rarely breed with dogs. These animals tend to be intelligent, semi-wild, and independent, and have, to varying degrees, retained normal "predatory behaviors" of wild wolves. However, like domestic dogs, hybrids usually lack a fear of humans. These characteristics can make wolf-dog hybrids highly unpredictable and difficult to manage. It is not uncommon for owners of wolf-dog hybrids to find themselves with an animal they lack the knowledge and skill to handle.

Injuries and deaths caused by wolf-dog hybrids have received national media attention. The death of a four year old in Florida in August, 1988 by a wolf that, just two hours earlier, had been adopted from an animal shelter set a national precedent for animal shelters/agencies: wolf-dog hybrids are to be put down or returned to their original owner, but are not to be adopted out to an uneducated, unsuspecting public. This policy makes it difficult for owners of hybrids to find good homes for animals they cannot manage. Unfortunately, many overwhelmed hybrid owners resort to "setting their wolf free" when they cannot find a suitable home for it. These freed hybrids generally lack the hunting skills and pack structure needed to survive by hunting wild prey. When these animals become hungry they instinctively return to humans for food, get into trouble, and often are shot by local enforcement officers. There were twenty-one cases of free-roaming wolf-dog hybrids in Wisconsin between 1989 and 1998 (WDNR 1999, 2007*b*).

Free-roaming hybrids, and the problems they cause give wild wolves a bad reputation, thereby adversely impacting the social carrying capacity for wild wolves. Additionally, wolf-dog hybrids interbreeding with wild wolves may dilute the wolf gene pool and wolf traits important to survival in the wild with the instincts and behaviors of domestic dogs (Hope 1994). Dog genes in a wolf population may reduce long term viability of the wolf population.

In the past, the WDNR has requested that WS remove wolf-dog hybrids either because the hybrids were causing a damage problem or a human health and safety risk, or because the animals were interbreeding with wild wolves and posing a risk to the genetics of the native Wisconsin wolf population.

1.3.10 Wildlife Services and Wisconsin Department of Natural Resources Efforts to Reduce Wolf Damage in Wisconsin

Since 1988, WS has cooperated with the WDNR concerning several aspects of wildlife damage management. Wildlife Services' and WDNR efforts to alleviate wolf problems have been based on a combination of technical assistance and operational damage management in an Integrated Wildlife Damage Management (IWDM) program (USDA 2004, 2006). WS conducts field investigations of potential wolf depredations within 48 hours of receipt of a complaint. In accordance with the WWMP (1999, 2006), WS categorizes each complaint into one of four categories: 1) confirmed depredation, 2) probable depredation, 3) confirmed non-wolf depredation, and 4) unconfirmed depredation. WS provides technical assistance to producers as appropriate, and has also provided operational assistance with WDM as allowed under federal and state regulations, permits and guidelines. WS also assists the WDNR with wolf population monitoring efforts. For example, in FY 2006, WS captured, radio-collared, and released at site 14 wolves to augment the WDNR' wolf population monitoring program.

Prior to 2003, while wolves were still classified as endangered, problematic wolves were trapped and relocated by WDNR and WS personnel. When wolves were reclassified as threatened (April

1, 2003 to January 30, 2005), the USFWS established a 4(d) rule under the ESA which allowed WDNR and their authorized agent (WS) to lethally remove wolves for damage management (USDA 2004). As discussed in Section 1.3.2, a decision by the United States District court in Oregon returned Wisconsin wolves to their previous status as "endangered" on January 31, 2005. After learning of the court ruling, WDNR ceased all lethal WDM activities including actions by their authorized agent, WS.

On April 1, 2005 the WDNR obtained a USFWS Section 10(a)(1)(A) permit which allowed WDNR and WS (as WDNR' authorized agent) to resume many of the wolf depredation control activities allowed under the previous 4(d) rule. All WDM activities allowed under the permit were enjoined by the U.S. District Court in the District of Columbia on September 13, 2005 because of procedural problems with the permit. Because the permit was enjoined for procedural reasons, the WDNR subsequently applied for a new permit to conduct similar damage management take activities in 2006. After USFWS, WS and WDNR completion of an EA (USDA 2006) and USFWS compliance with all ESA procedural requirements a new permit was issued to the WDNR on April 10, 2006. On August 9, 2006 a United States District Court in the District of Columbia enjoined the second permit and all lethal wolf damage management activities were discontinued.

Following the February 8, 2007 USFWS publication of their decision to delist wolves and return primary management authority for wolves to the WDNR and Tribes (Section 1.3.2), the WDNR started work on new wolf depredation control guidelines to allow for a more flexible system of managing wolves. The WDNR also requested continued assistance from WS in manage wolf conflicts in WI after the delisting. On March 13, 2007, WS issued a new FONSI announcing WS' decision to conduct wolf damage management activities in a manner similar to that proposed in the 2006 EA while wolves were federally listed as an endangered species until the WDNR finished revising its guidelines for wolf damage management and WS completed a new EA evaluating WS' wolf damage management alternatives under the new guidelines (USDA 2007).

1.3.11 Wolf Management Zones

Wisconsin is known as a traditional agriculture state with nearly half the land classified as agriculture. The WDNR has used a zoning approach toward wolf conservation and management. The establishment of management zones is frequently recommended as part of wolf recovery plans, wolf conservation and management plans (Mech 1995) and the establishment of protective areas helps assure long-term survival of small, disjunctive wolf populations (Haight et al. 1998). Use of management zones allows for differences in management depending on the quantity and quality of potential wolf habitat and the possibility of conflicts between wolves and humans. Fritts (1993) listed three assumptions inherent in zone management for wolves: 1) wolves belong in some areas and not others because of potential conflicts with humans, 2) adequate habitat to support a viable population should exist in the zones where the species is afforded the most protection, and 3) the

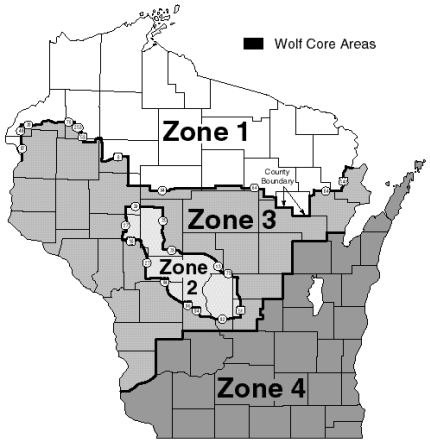


Figure 1-6. Wolf Management Zones

species should receive high priority in the areas of most suitable habitat.

Four Wolf Management Zones have been established to help guide management of wolves in Wisconsin (Figure 1-6, WWMP 1999). Wolf Management Zone 1 contains the best wolf habitat in Wisconsin and encompasses about 11,765,760 acres, Zone 2 contains suitable wolf habitat and encompasses about 2,893,440 acres, Zone 3 is a buffer zone and encompasses about 11,520,000 acres and Zone 4 has almost no opportunity for wolves to colonize and encompasses about 10,240,000 acres. Wolf damage management has always and continues to be the most restrictive in zones that contain the most suitable wolf habitats (Wolf Management Zones 1 and 2). Zones 3 and 4 represent the transition from the northern-forested region to agriculture lands and areas of extensive human use, and have the most flexible systems for WDM. During 2006, 18 wolf packs depredated livestock on 25 farms, 9 farms were located in either Zones 3 or 4. The remaining 16 farms were located in Zone 1. Nine of the 16 farms in Zone 1 with verified wolf depredations were located in northwestern Wisconsin (Douglas and Bayfield Counties) where there is a large area of agriculture land interspersed with forest land.

1.3.12 2007 Guidelines for Conducting Depredation Control on Wolves in Wisconsin Following Federal Delisting

The 2007 WDNR revised wolf depredation control guidelines (Appendix E) are intended to improve the ability of WS and WDNR personnel to provide prompt professional service to citizens of Wisconsin experiencing gray wolf damage and conflicts, and decrease negative public attitudes toward wolves while promoting a healthy viable wolf population. The new guidelines include both reactive and proactive WDM methods (defined below). The new guidelines also contain provisions for issuing permits to private landowners to shoot/trap wolves that have depredated domestic animals, establish Proactive Control Areas for chronic depredation sites, and provide the basis for a state statute which grants landowners the authority to shoot wolves in the act of attacking domestic animals without permits (see 1.8.2.8). Issuance of trapping and shooting permits and establishment of Proactive Control Areas are the sole responsibility of the WDNR. Although, depending on the alternative selected, WS may consult on the development of Proactive Control Areas and issuance of shooting permits. The new guidelines for wolf damage management establish two different strategies for addressing wolf predation and conflicts with wolves, reactive and proactive wolf damage management

The intent of the new depredation control guidelines is not to reduce the number of wolves to the WDNR' management goal of 350 wolves, but to more effectively resolve complaints where individual wolf packs cause depredations on multiple farms and where reactive WDM has not been successful in resolving complaints. Additionally, the process to resolve wolf depredations on chronic farms or in areas where chronic depredations have occurred will be more efficient.

Reactive Wolf Damage Management (RWDM): RWDM methods are those actions taken in response to a current damage problem/threat. The goal of RWDM is to quickly respond to wolf depredations soon after they occur and attempt to target specific individual wolves that injured or killed domestic animals on farms or near people's homes. It can include nonlethal methods like construction of fladry barriers, use of Remote Activated Guard (RAG) devices, capture and relocation, frightening devices, improving animal husbandry practices, and other nonlethal methods which can be promptly implemented to resolve a damage problem. Lethal RWDM methods are those techniques intended to remove specific individual wolves that have depredated domestic animals on private land at the time depredations are occurring or shortly after depredations have occurred. Reactive WDM has been implemented either under 4(d) rules or special permit 10(a)1(A) at various intervals since 2003. Under the original USFWS

rules/permits and WWDM guidelines, lethal wolf removal was only conducted if wolves were verified to have depredated domestic animals, or wolves were confirmed to have depredated livestock the previous year and were present the current grazing season and there was strong evidence the same pack members persisted in the area. Damage management actions were restricted to 0.5 miles around the damage site. Other requirements for lethal RWDM under the old (2005) guidelines are listed in Table 1-4.

The new (2007) WDM guidelines were established to improve the ability of WS and WDNR personnel to provide prompt professional service to citizens of Wisconsin experiencing gray wolf damage. All nonlethal reactive control measures allowed under the previous guidelines are still permitted and encouraged. Lethal RWDM can occur anywhere in the state as long as the wolf population remains above 250 wolves outside of Native American reservations. Use of lethal methods of RWDM have been expanded, via state statute, to allow landowners to use shooting to defend their domestic animals on their land at the time of a wolf attack. Landowners with verified wolf depredation on their property may be issued permits to trap and shoot any wolves on their land. Adjacent landowners within 1 mile of the depredation site who have domestic animals vulnerable to wolf predation may also be issued permits to take wolves.

One of the primary changes in the new WDM guidelines is an increase in the distance from the depredation site where agency (WS, WDNR) WDM actions may occur (Table 1-4). While wolves were a federally-protected species a 0.5 mile RWDM trapping distance limit was established to provide very conservative protections for wolves during their recovery period. The limits were intended to help ensure that lethal wolf removals only impacted wolves in the pack associated with the damage problem. Although the protections were deemed appropriate for a federally protected threatened/endangered species, at times they were an impediment to prompt and effective resolution of damage problems.

Wolf packs range widely, the mean territory size of 18 adult radio-collared wolves in Wisconsin during the winter of 2005-2006 was 32.4 square miles (WDNR wolf progress report 2006) which is comparable in size to Wisconsin townships. Average winter territories can extend up to 10 miles in one direction (Adrian Wydeven, WDNR, pers. comm.). In some areas, wolf packs have access to multiple farms within their territory. WS and the WDNR have documented instances of single wolf packs killing livestock on multiple farms during the same grazing season, but the core area of wolf activity was located between farms and outside the permitted trapping distances. The inability to conduct WDM activities in the core area complicated efforts to manage the depredation problems. For example, during the last three years there have been 24 different farms located in northwestern Wisconsin (Douglas and Bayfield Counties) that have had verified wolf depredations by 7 different wolf packs. WS WDM activities during 2003-2006 addressed these complaints reactively within the constraints of the 2005 guidelines for wolf damage management which often resulted in the wolf pack moving to a different farm where depredations were continued. Allowing more flexibility for reactive trapping could increase the effectiveness of removing offending animals and reduce depredations on multiple farms by the same pack.

The new WWDM guidelines extend the trapping distance to 1 mile for all lethal WDM projects in Wolf Management Zones 1 and 2 (primary wolf habitat) and include provisions to further extend the trapping distance in zones 1 and 2 based on case-by-case consultation with the WDNR. In these zones, the distance can be increased to over 1 mile if data indicate that expanding the trapping distance will not impact wolves in non-depredating packs (e.g., data from packs that have radio-tagged individuals, territories delineated using snow track surveys/observations). In Zone 3, the distance has be extended to 5 miles and trapping can occur at any distance of a verified complaint location in zone 4 (define zone 4). Trapping will only be conducted on lands

where written authorization has been obtained from the landowner/manager. Signs will be used to warn the public that WDM equipment has been placed in these areas. RWDM can occur on public lands within 1 mile or the agreed upon distance from a damage site if permission is obtained from the land management agency.

Proactive Damage Management Actions: Proactive wolf damage management (PWDM) actions are those actions taken to prevent the occurrence or reoccurrence of damage problems in specific areas with a history of damage problems that have occurred within a set period of time (WDNR 2007*b*). Nonlethal PWDM methods include most of the nonlethal methods that are used/mentioned as RWDM methods. The only PWDM methods that were permitted while wolves were federally protected were nonlethal methods. As discussed above, in certain areas, nonlethal PWDM and reactive wolf depredation management have been unsuccessful in resolving wolf depredations complaints. The new WDM guidelines allow for and encourage the use of all nonlethal PWDM methods, but also allow for the use of lethal methods of PWDM.

The WDNR established provisions for lethal PWDM to help reduce the risk of depredation on domestic animals in areas where previous depredations have been verified by reducing or eliminating the wolf packs that have been involved in these depredations. Lethal PWDM would only be permitted in specially designated Proactive Control Areas. A Proactive Control Area is defined as the area occupied by a wolf pack or group that depredate livestock on chronic farms (farms that have had at least 2 depredations in different years during the previous five year period) or depredates domestic animals on two different farms. The size and location of each Proactive Control Area would be defined by WDNR in consultation with WS, GLIFWC (if the Proactive Control Area includes ceded territory), and the public land manager (if the proposed Proactive Control Area includes public land) and/or Native American Tribes (if the Proactive Control Area includes land within 6 miles or other negotiated buffer area around recognized Native American reservations). Proactive Control Areas would encompass the territory of the wolf pack (determined using tracking, radio-collar data and/or local wolf reports/ observations) that has caused depredations using roadways, waterways, natural landscape features, and the state boundary.

In Wolf Management Zones 1-3, Proactive Control Areas could be only established when the winter wolf population outside Native American reservations is above the WDNR wolf population management goal of 350 wolves. In Wolf Management Zone 4, Proactive Control Areas could be used if the wolf population outside Native American reservations is over 250 individuals.[2] Proactive Control Areas would remain in effect until the wolf pack has been removed and or the maximum take for Wisconsin under this provision has been achieved. Proactive Control Areas will be reviewed each year after the mid winter wolf population census has been completed. Proactive Control Areas could consist of a mixture of public and private lands, although generally large blocks of public lands would be avoided as would state parks, state forests, national parks, and wildlife refuges. Permission would be obtained an all lands for controlling wolves. Control areas could be established within any incorporated village or city, if wolves in these areas pose unacceptable threats to human safety[3]. Proactive Control Areas will not be established in federal Wilderness Areas.

[2] Population thresholds for the use of proactive control areas are intended to insure that Wisconsin maintains a healthy, viable wolf population. The purpose of PWDM is to reduce damage *not* to reduce the wolf population to threshold levels.

[3] WDM conducted in an incorporated village or city would only be conducted by WDNR, WS, or local authorities. WDNR and WS will work with local officials regarding regulations on the use of WDM methods within village or city limits.

Within Proactive Control Areas, landowners could be issued permits by the WDNR to shoot or trap wolves if the landowner has domestic animals that are vulnerable to wolf depredation[2]. Landowners (and/or their designated agents) would be restricted to using these methods on their own property and permission for a landowner to use trapping would only be granted if it does not interfere with government trapping efforts. Government agents would be able to conduct lethal PWDM on any property within the Proactive Control Area if they have permission from the landowner/manager. WS will only conduct WDM on public lands after approval has been obtained from the agency with management authority for the site.

WS' potential role in WDM under the 2007 *Guidelines for Conducting Depredation Control on Wolves in Wisconsin Following Federal Delisting* (Appendix E) could include verifying the cause of livestock mortality, providing technical assistance with WDM, and conducting nonlethal and lethal reactive and proactive WDM within the areas stipulated in the WDM guidelines. Issuance of shooting permits and the establishment of Proactive Control Areas is the responsibility of the WDNR although WS may provide input on the delineation of specific Proactive Control Areas.

The WWMP, the Guidelines for WDM in Wisconsin, and the regulation which allows landowners to shoot wolves in the act of depredating on livestock (NR 10.02) have already been established by the WDNR which is not required to subject its management decisions to NEPA analysis. The WDNR will implement the management decisions in these documents with or without the involvement of WS. The purpose of this EA is to analyze the environmental impacts of WS involvement, if any, in the implementation of the WWMP and 2007 *Guidelines for Conducting Depredation Control on Wolves in Wisconsin Following Federal Delisting*.

Table 1-4. Comparison of WDM permitted under 2005 Wisconsin wolf damage management guidelines for wolves that were federally listed as threatened or endangered and new 2007 Wisconsin wolf damage management guidelines for wolves following federal delisting.

	2005 Guidelines and USFWS Regulations	**2007 Guidelines**
Nonlethal Reactive WDM	Permitted	Permitted
Lethal Reactive WDM by Government Agency Personnel or their Designated Agents	Permitted	Permitted
Lethal Reactive WDM by Individual in Response to Immediate and Demonstrable Risk to Human Safety	Permitted	Permitted
Lethal Reactive WDM by Individual in Response to Wolf in Act of Preying on Livestock	Not Permitted	Permitted
Damage threshold for lethal WDM to be used by Agency Personnel or their Designated Agents	Control may begin in any Wolf Management Zone after one significant loss during the current grazing season and there is reasonable expectation that the depredation at the site is likely to continue if the depredating wolves are not removed.	Same

	2005 Guidelines and USFWS Regulations	2007 Guidelines
	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: 1) Verified depredation occurred at the site or in the immediate vicinity during the previous year; 2) There is strong evidence one or more members of the depredating pack has remained in the area since the verified depredation; 3) Based on wolf behavior and other factors, depredations are likely to be repeated; and 3) Trapping is conducted in a location and in a manner to minimize the likelihood a wolf or wolves from a non-depredating pack is/are captured.	
Maximum Trapping Distance from Depredation Site	All Zones: 0.5 to 1 mile from depredation site (variable depending on protection status of wolves). 1999 WWMP allowed trapping to occur to occur up to 5 miles for WMZ's 3 and 4, but this increased radius for depredation management actions was never implemented.	Zones 1-2: 1 mile with possible increases after WDNR review of specific site. Zones 3: 5 miles Zone 4: No limit
Permits for individuals to take wolves on property with verified wolf damage.	Not Permitted	Permitted
Nonlethal Proactive WDM	Permitted	Permitted
Lethal Proactive WDM	Not Permitted	Permitted only in Proactive Control Areas
Lethal WDM for protection of free-ranging hunting dogs	Not Permitted	Not Permitted
Lethal WDM for protection of captive cervids	Permitted	Permitted
Protections for lactating females	Lactating females trapped before June 1 may be released near the point of capture except those involved with chronic depredation problems where all adult wolves captured at depredation sites would normally be euthanized. WS will consult	No special age and sex consideration will be made except on a case by case basis based on consultation with WS and DNR.

	2005 Guidelines and USFWS Regulations	2007 Guidelines
	with the WDNR prior to euthanizing lactating females trapped prior to June 1.	
Protections for young of the year	Young-of-year wolves trapped before August 1 must be released.	No special age and sex consideration will be made except on a case by case basis based on consultation with WS and DNR.
Lethal WDM on Public Lands	Permitted	Permitted

1.3.13 Lethal Wolf Damage Management Methods as a Component of Wolf Management Programs

There has been some question as to whether lethal removal of depredating wolves (e.g., those involved with confirmed cases of livestock depredation) can prevent or minimize the development of negative public attitudes, or even foster greater tolerance, toward wolves and therefore enhance the survival and recovery of the species. Although the liberal killing of wolves by humans caused wolves to initially become endangered in the U.S. south of Canada, and across much of Europe (Mech 1970, Lopez 1978, Thiel 1993), highly selective lethal removal of individual wolves or wolf packs by governmental agencies is considered by many professional biologists to be an important part of recovery and conservation programs for wolves (Sillero-Zubiri and Laurenson 2001, Boitani 2003, Breck and Meier 2003). For example, Dr. David Mech, has written that "lethal control will remain the ultimate means of curbing wolf damage to livestock and pets (Mech 1995)". He further states that, "Direct lethal control is still usually the only practical course under most conditions". Mech (1995) argued that a more flexible system of lethal controls could actually allow wolves to occur over much larger portions of North America, if problem animals can readily be controlled. The Wildlife Society, an international organization of professional wildlife biologists, especially focused on North America, stated in their technical review on the restoration of wolves in Western North America 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)." Musani et al (2004) noted that in Western North America, the rate of expansion of depredation has been less than the rate of wolf population growth, and attributed this trend to elimination of individuals and packs from the population that had learned to kill livestock.

Considerable information from prominent social theory and research shows that tolerance toward a wildlife species is influenced by the value of losses attributable to that species, the benefits attributable to the species by the affected individual, and by the perception of the risk of losses as controlled or voluntary (Slovic 1987). Risks considered involuntary by an individual are less likely to be viewed as acceptable whereas risks that can be controlled are generally considered to be more acceptable. Risk theory and associated research (e.g., Slovic 1987) suggest that a government which simultaneously imposes the risk of wolf depredation (i.e., supports wolf recovery) and prohibits individuals from effectively reducing those risks (i.e., no chance for removal of problem wolves) is creating an intolerance of the wolf presence. In effect, this situation lowers the social carrying capacity for wolves and could threaten the well being of the population, both presently and in the future if the situation persists. Livestock producers have the capability to resolve their own depredation problems, either legally or illegally, with or without assistance from the government (Dorrance 1983). If no government-sanctioned relief from the

loss of livestock is in sight, intolerant stakeholders will likely adopt anti-wolf behaviors including illegal killing (Fuller et al. 2003). In this scenario, social carrying capacity effectively will be lowered because stakeholders erroneously turn their attention to the wolf population at large as the primary cause of wolf problems.

Although it is the nature and frequency of positive and negative interactions with wolves that is most influential in determining the social carrying capacity for wolves in Wisconsin, the public often focuses on the number of wolves when positive interactions (e.g., sightings by wolf enthusiasts) are too low or negative interactions (e.g., livestock depredations) are too high. Negative interactions associated with livestock depredation do not necessarily increase proportionately with wolf abundance rather, they are localized events. In situations were there is suitable unoccupied habitat in locations that will not result in a high degree of interaction between wolves and livestock, there is little relationship between wolf density and wolf conflicts. Stronger relationships between wolf density and wolf conflicts, like those shown in Section 1.3.7, occur when wolf populations expand into areas with a high degree of interspersion of wolf habitat, agriculture and human development. This has been the case in Wisconsin as the wolf population has expanded from relatively remote areas in Wolf Management Zones 1 and 2 into the more heavily developed and agricultural areas in Zone 3 and portions of Zone 1 (Figs 1-6 and 1-7). An appropriate management response to depredation is to address the negative interactions and target problem wolves in a local area rather than implement broad population-level controls focusing on reducing overall numbers of wolves. Removing problem wolves can reduce the negative interactions that create intolerance for wolves among livestock producers.

Research indicates that public support for the presence of large carnivores largely depends on confidence that problems caused by individual animals will be resolved effectively. A public attitude survey of residents in Ninemile Valley, Montana found that 65 percent of wolf supporters might change their support for the presence of the population if wolves that kill livestock were not controlled quickly or effectively (Wolstenholme 1996). In a study that examined which factors would encourage residents of the Flathead Indian Reservation to support protection of grizzly bear habitat on private lands, Frost (1985) found that rapid assistance to bear-related problems was the most important factor, with 76 percent of respondents desiring that assurance. By contrast, only 42 percent of respondents felt that compensation for livestock losses was a valid incentive for supporting protection.

Studies have also shown that local acceptance of wolves is improved if government lethal controls are allowed on problem wolves. In a 1995 survey of American households, 60% of respondents supported removing of predators that preyed on livestock (Reiter et al. 1999). Prior to the 1995 reintroduction of wolves into Wyoming, a larger proportion of residents surveyed supported wolf recovery than opposed it (44 vs. 34.5%), but the majority of respondents supported killing of wolves (58.5%) that killed livestock (Thompson and Gasson 1991). Similarly, Wisconsin surveys indicate that residents, especially rural people in wolf range accept and expect control of wolves that kill livestock or pets on private land. In a 2001 survey of Wisconsin bear hunters, farmers, and residents in wolf range, 52.5 % expressed support for destroying wolves that had killed livestock or family pets (Naughton-Treves et. al 2003). Support for killing problem wolves was highest for bear hunters (77%), lowest for general residents (32%), and intermediate for farmers (45%; Naughton-Treves et al. 2003).

In a more recent Wisconsin opinion survey, a stratified random sample of zip codes was used to survey urban areas outside wolf range, rural areas outside of wolf range, urban areas in wolf range, and rural areas in wolf range (Naughton et al. 2005). Respondents were also compared by contributors to endangered resources programs verse non-contributors, as well as livestock

producers and non-producers. Non-contributors supported translocation of wolves slightly above lethal control on problem wolves (35% vs. 45%), but among endangered resources contributors there was a much lower preference for lethal control (14%), compared to translocations (53%). However, the survey asked persons if they preferred translocation of problem wolves to wilderness areas, compared to lethal control or other actions, but it was not clear if respondents were aware of feasibility and problems with translocations. When asked about reliability of killing only the problem wolves, only 5% of endangered resource contributors and 11 % of non-contributors said they opposed all lethal controls. Among livestock producers 46 % preferred lethal control. If lethal control of wolves was to be done, about 70% of respondents preferred government agents conducting the controls (Naughton et al. 2005).

A survey of random Wisconsin residents was conducted in 2003 of general attitudes toward wolves (Schanning et al. 2003). A total of 66.4% of respondents to this survey supported DNR shooting problem wolves, and 54.4% supported translocation of problem wolves. For problem wolves killing livestock, 43.7% of respondents agreed these wolves should be killed, and 19.9% were neutral on DNR killing of such wolves, but 63.2% of respondents agreed that farmers should have the right to kill wolves that kill or injury livestock. It does appear that with adequate justification, the majority of respondents support or do not oppose the killing of problem wolves.

In Minnesota, 80% of residents had positive attitudes toward wolves, including 60% of the farmers, but farmers (83%), and northern Minnesota residents (71%) expected wolves that killed livestock to be eliminated (Kellert 1999). Thus it appears that even where there is strong support for wolf conservation, most people in wolf range expect problem wolves to be removed.

1.4 SCOPE OF THIS ENVIRONMENTAL ASSESSMENT

1.4.1 Actions Analyzed

The scope of this EA is to evaluate the potential impacts of alternatives for WS involvement in WDM in Wisconsin. WDM could be initiated to protect agricultural resources, property, pets, human safety in Wisconsin, removal of wolf-dog hybrids, and wolf research and population monitoring. Prompt, professional response to wolf conflicts would help maintain and enhance local tolerance of wolves. Any direct action taken by Wisconsin WS to address wolf conflicts would be conducted at the request of the WDNR or a specific tribe. It should be noted that the Wisconsin Wolf Management Plan and the Guidelines for Wolf Damage Management in Wisconsin have been established by the WDNR which is not required to subject its management decisions to NEPA analysis. The WDNR will implement the management decisions in these documents with or without the involvement of WS. Therefore, the content and policies established in these documents are outside the scope of this EA. The purpose of this EA is to analyze the environmental impacts of WS involvement, if any, in the implementation of the WWMP and Guidelines for Wolf Damage Management.

Damage problems involving wolves can occur statewide resulting in requests for assistance to the WDNR or WS, but would more likely be from Management Zones 1, 2 and the northern edge of zone 3 (Figure 1-7. Section 1.3.7). Table 1-5 provides data on counties where WS responded to wolf damage complaints in FY 2006. Under the Proposed Action, wolf management could be conducted on private, Federal, State, tribal[4], county, and municipal lands in Wisconsin with the

[4] WS wolf damage management would only be conducted on tribal lands with the Tribes request/consent and only after appropriate documents had been signed by WS and the respective Tribe.

permission of the appropriate land owner/manager. Most wolf damage management activities would be conducted on private land. Wolf damage management activities are only likely to be conducted on public land if that land is within the damage management perimeter (set by the WDNR through the wolf science technical committee) around the site of a verified depredation event on private land or a Proactive Control Area (Section 1.3.10), in the unlikely instance that a wolf preys on livestock legally present on public lands[5], or in the rare instance that a wolf is exhibiting behavior that poses a threat to human safety. For example, of the 43 properties where WS conducted damage management actions (36 for the protection of livestock, 6 for the protection of pets, 1 for human safety) in FY 2005 and 2006, in only 3 instances (protection of livestock) was damage management conducted on adjacent public land. However, the development of Proactive Control Areas and the increased trapping distance from damage sites allowed in the new Wisconsin Wolf Damage Management Guidelines will increase the need for WDM to occur on public properties. Public lands will only be included in Proactive Control Areas after consultation with and with the consent of the land management agency. Signs will be used to warn the public that WDM equipment has been placed in these areas. WDM will not be conducted in designated Wilderness Areas unless there is a risk to human health and safety.

Wolf trapping and radio-collaring for wolf population monitoring and research could also be conducted on public land (state, county and national forest lands). The public lands where wolf trapping for the purpose of radio-collaring and population monitoring has been conducted include Great Divide Ranger District of the Chequamegon–Nicolet National Forest, as well as County and WDNR land in Bayfield, Douglas, Marinette, Sawyer, Lincoln, and Oneida Counties.

The WDNR and WS anticipate increases in WDM activities as the Wisconsin wolf population continues to grow and disperse into more forest/agricultural/urban transitional habitats (Table 1-5, Figure 1-5, 1-7). This EA takes the potential increase in future requests for assistance into account by considering potential needs for WDM and the number of wolves likely to be removed as a function of population size (Chapter 4). Through WS, and WDNR wolf monitoring and surveillance, any increase in wolf populations and damage management activities would be accounted for and any adaptive management adjustments would be considered to ensure wolf conservation.

Table 1-5. Wolf Complaints received by WS in FY 06.

COUNTY	COMPLAINTS NOT VERIFIED	COMPLAINTS VERIFIED	TOTAL COMPLAINTS
Adams	1	0	1
Ashland	3	2	5
Barron	5	1	6
Bayfield	14	23	37
Burnett	5	10	15
Chippewa	4	0	4
Calumet	1	0	1
Clark	1	0	1
Columbia	6	11	17
Dane	1	0	1
Douglas	9	13	22
Dunn	2	0	2
Florence	2	0	2

[5] WS is aware of a limited number of instances where livestock is or has been allowed to graze on State and county land.

COUNTY	COMPLAINTS NOT VERIFIED	COMPLAINTS VERIFIED	TOTAL COMPLAINTS
Forest	4	0	4
Iowa	1	0	1
Iron	2	0	2
Jackson	1	4	5
Juneau	7	0	7
LaCrosse	1	0	1
Langlade	2	0	2
Lincoln	2	3	5
Marathon	6	4	10
Marinette	0	3	3
Marquette	1	0	1
Monroe	1	0	1
Oconto	1	2	3
Oneida	2	2	4
Polk	3	0	3
Price	7	5	12
Rusk	6	4	10
Sauk	1	0	1
Sawyer	3	3	6
Shawno	0	1	1
St. Croix	1	0	1
Taylor	2	4	6
Washburn	1	1	2
Waukesha	1	0	1
Wood	1	0	1
TOTAL	**111**	**96**	**207**

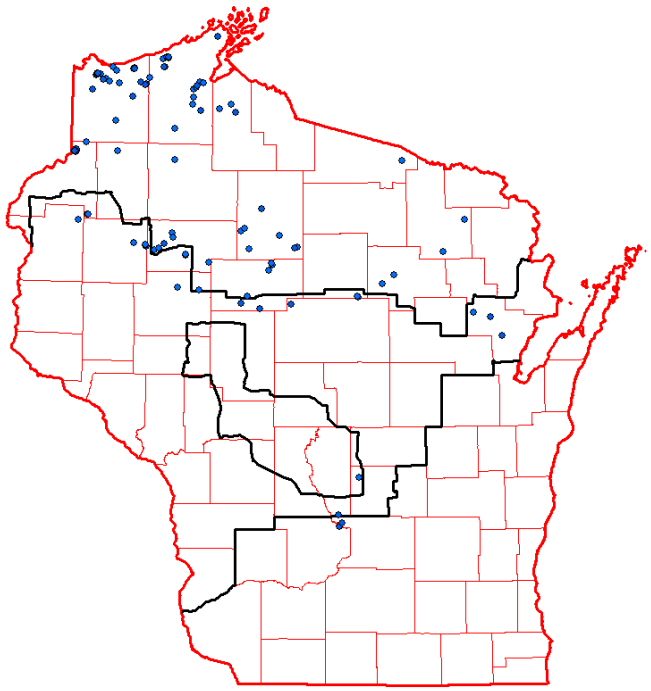


Figure 1-7. Seventy-six farms had verified wolf/livestock depredations in Wisconsin, 2001-2006.

1.4.2 Native American Lands and Tribes

Tribal wolf management decisions are outside the scope of this analysis and decisions made in this EA do not alter the tribes' authority or rights relating to wolf management. However, this analysis does include the types of assistance WS may offer the tribes, if requested. Wildlife Services would only conduct WDM activities on tribal lands at the request of the tribe and only after appropriate authorizing documents (including MOUs) were signed. Currently, Wisconsin WS does not have any MOUs for wolf damage management with any Native American Tribes. If WS enters into an agreement with a tribe for WDM, this EA would be reviewed and supplemented, if appropriate, to ensure compliance with NEPA. MOUs, agreements, and NEPA compliance would be conducted as appropriate before conducting WDM on tribal lands.

Wolves have an important role in tribal culture and religious beliefs and most tribes have expressed concerns over lethal control for wolves (Section 1.3.5). The WDNR and WS will continue to work with these tribes to address their concerns. Wolf Damage Management actions will be conducted in accordance with agreements and MOUs among WDNR and the tribes. Where appropriate, changes in WDM as a result of these ongoing discussions will be subject to additional analysis as required by NEPA.

On private lands within recognized reservation boundaries and in negotiated buffer zones around tribal lands, WS will ask the private landowner to allow a tribal representative to co-investigate wolf complaints. WS will inform the complainant of the cultural and spiritual importance of wolves to Native Americans. The private landowner may chose to not allow the tribe to co-investigate wolf complaints on their property. Copies of wolf project report including photos and other details of the incident may be provided to tribes by the WDNR regardless of the landowners decision concerning co-investigation. WS, WDNR and the tribe will consult regarding a course of action to address or resolve verified wolf complaints on these lands. In the ceded territory, WS and WDNR notify GLIFWC of verified wolf damage complaints including strategies that will be used to resolve verified complaints.

1.4.3 Period for which this EA is Valid

This EA is being prepared to consider the environmental effects of implementing new wolf depredation control guidelines for a state-managed wolf population. If it is determined that an EIS is not needed, this EA would be reviewed in five years, or if other appropriate agencies determine that new needs for action, changed conditions or new alternatives having different environmental effects must be analyzed. At that time, this analysis and document would be amended pursuant to NEPA. Monitoring and review of this EA will be conducted each year to ensure that the impacts of the program are within parameters analyzed in the EA.

This EA is written for management of damage by gray wolves and wolf-dog hybrids that are not listed as a federally protected species, and, once completed, replaces the 2006 EA on wolf damage management in Wisconsin (USDA 2006) and 2007 WS FONSI based on that EA (USDA 2007). We are aware that the USFWS decision to remove wolves from the federal list of threatened and endangered species has been challenged in court. If the court determines that wolves should be returned to the federal list of threatened and endangered species, the 2006 EA and associated 2006 Decision/Finding of No Significant Impact on wolf damage management written by WS (USDA 2006) would remain in effect for WS. Future examples of actions that could trigger revision of this analysis include: (1) WS is requested to take a higher proportion of

the wolf population than is proposed in this EA or cumulative impacts on the wolf population in WI (mortality from all known causes) exceeds that analyzed in this EA; (2) request for WS to conduct WDM to protect resources not analyzed in this EA; (3) requests for WS to change or add methods of conducting WDM that would result in greater impacts on the affected environment than those analyzed in this EA; or (4) mortality from all know causes results in a precipitous decline in statewide wolf populations. If this is the case, then WS will revise this EA in accordance with the NEPA.

1.4.4 Site Specificity

This EA analyzes the potential impacts of wolf damage management on all public and private lands in Wisconsin under MOU, Cooperative Agreement, and in cooperation with the appropriate public land management agencies. Information on the counties where WS has responded to WDM complaints and a description of the role of the Wisconsin Wolf Management Zones is provided in Section 1.4.1.

Planning for the management of wolf damage is conceptually similar to federal or other agency actions whose missions are to stop or prevent adverse consequences from anticipated future events for which the actual sites and locations where they will occur are unknown but could be anywhere in a defined geographic area. Examples of such agencies and programs include fire and police departments, emergency clean-up organizations, insurance companies, etc. Although some of the sites where wolf damage will occur can be predicted (Treves et al. 2004), all specific locations or times where such damage will occur in any given year cannot be predicted (Ruid et al. 2005). This EA emphasizes major issues as they relate to specific areas whenever possible, however, many issues apply wherever wolf conflicts and resulting management occurs, and are treated as such. The standard WS Decision Model (Slate et al. 1992) would be the site-specific procedure for individual actions conducted by WS in Wisconsin (see Chapter 3 for a description of the Decision Model and its application). The analyses in this EA are intended to apply to any action that may occur *in any locale* and at *any time* within the State of Wisconsin. In this way, WS believes the EA meets the intent of NEPA with regard to site-specific analysis and that this is the only practical way for WS to comply with NEPA and still be able to meet needs for assistance with WDM in a timely fashion.

The EA also addresses the impacts of WDM on areas where additional agreements may be signed in the future. Because the proposed action is to reduce damage and because the program's goals and directives are to provide services when requested, within the constraints of available funding and workforce, it is conceivable that additional wildlife damage management efforts could occur. Thus, the EA anticipates this potential expansion and analyzes the impacts of such efforts as part of the program.

1.4.5 Public Involvement/Notification

As part of the public involvement process, and as required by the Council on Environmental Quality (CEQ), APHIS-NEPA implementing regulations, a notice of availability of pre-decisional EA period has been published in *The Wisconsin State Journal* and has also been mailed directly to agencies, organizations, and individuals with probable interest in the EA. A copy of the pre-decisional EA and a notice regarding the opportunity for public comment on the EA was also made available at http://www.aphis.usda.gov/regulations/ws/ws_nepa_environmental_documents.shtml. Public notification procedures are in compliance with new NEPA implementation procedures published in the Federal Register March 21, 2007 (Vol. 72, No. 54: 13237-13238).

New issues or alternatives raised after publication of public notices will be fully considered to determine whether the EA should be revisited and, if appropriate, revised. Public notification regarding the availability of the final EA and Decision will be identical to that used for the predecisional EA.

1.5 DECISION TO BE MADE

WS is the lead agency in the preparation of this EA. This proposal would require the participation of other agencies that have management authority and expertise related to this project (cooperating and consulting agencies). The WDNR provides for the control, management, restoration, conservation and regulation of birds, fish, game, forestry and all wildlife resources of the state. The WDNR is a cooperating agency in the preparation of this EA. The tribes exercise similar authority on tribal lands, in addition to having retained the right to hunt, fish, and gather on lands and waters within the ceded territories. Wolves also have special cultural significance for Native American Tribes. The Wisconsin Ho Chunk Nation chose to be a consulting agency in the preparation of this EA. The Great Lakes Indian Fish and Wildlife Commission (GLIFWC) manages/represents tribal interests in wildlife management on lands in the ceded territories. GLIFWC also agreed to be a consulting agency in the preparation of the draft EA. The Lac Du Flambeau Tribe was a consulting agency in the production of the 2006 EA on wolf damage management in Wisconsin and comments and information provided by the Lac Du Flambeau Tribe are also included in this EA.

The lead, cooperating and consulting agencies worked together to address the following questions in the EA.

- How can WS best respond to the need to reduce conflicts with wolves and assist with wolf management in Wisconsin?
- What are the environmental impacts of alternatives for reducing damage by and conflicts with wolves and assisting with wolf management in Wisconsin?
- Would the proposed action have significant impacts on the quality of the human environment requiring preparation of an EIS?

1.6 OBJECTIVES FOR THE WISCONSIN WDM PROGRAM

- Respond to 100% of requests for wolf damage management assistance within 48 hours (investigate complaints within 48 hours).
- No significant adverse effects on the statewide wolf population or nontarget species populations.[6]
- Contribute to understanding, ecology, biology and health of the Wisconsin wolf population.

All WDM would be conducted in compliance with appropriate federal, state, and local laws and court-mandated restrictions.

[6] For purposes of this EA, a significant impact on the wolf population would be an impact which jeopardizes the viability of the state wolf population.

1.7 RELATIONSHIP OF THIS EA TO OTHER ENVIRONMENTAL DOCUMENTS

1.7.1 ADC Programmatic EIS. Wildlife Services has issued a final EIS (USDA 1997 Revised) and Record of Decision on the National APHIS-WS program. The FEIS contains detailed discussions of the potential environmental impacts from various wildlife damage management methods. Pertinent and current information available in the EIS has been incorporated by reference into this EA.

1.7.2 USDA-APHIS-WS Environmental Assessment: Management of Wolf Conflicts and Depredating Wolves in Wisconsin. Wildlife Services completed two EAs to evaluate a program to reduce gray wolf damage in Wisconsin. The first EA and a Decision and Finding of No Significant Impact (FONSI) was signed on October 31, 2004 (USDA 2004). The second EA and a Decision and Finding of No Significant Impact (FONSI) was completed in April 2007. The first EA analyzed impacts to a federally threatened wolf population while the second analyzed impacts to a federally endangered wolf population. In both cases, WS evaluated the need for wolf damage management in Wisconsin and the relative effectiveness of different alternatives to meet that need while accounting for the potential environmental effects (*i.e., issues analyzed in detail*) of each alternative. The alternative selected by WS in both EAs was an Adaptive Integrated Wolf Damage Management (AIWDM) approach, a strategy that uses a variety of methods either concurrently or sequentially, to reduce damage caused by wolves impacting livestock, pets, human health and safety, and other resources. The 2006 WS EA will be replaced by the current analysis.

1.7.3 USDA-APHIS-Wisconsin WS/WDNR Environmental Review. A consultation occurred between the WDNR and WS on March 23, 2002. The WDNR determined that WS current and proposed wolf damage management program would not adversely affect listed species in Wisconsin (S. Holtz, WDRN letter to D. Nelson, WS, March 23, 2002).

1.7.4 USFWS Eastern Timber Wolf Recovery Plan. This plan (USFWS 1992) outlines management strategies and population goals for recovery of wolf populations and provides recommendations for wolf depredation control. Pertinent information from this recovery plan is still being incorporated into this EA by reference.

1.7.5 Wisconsin Gray Wolf Management Plan (WWMP). The Wisconsin DNR initially listed wolves on the state list of endangered species in 1975. A State recovery plan, initiated in 1989 and signed in 1999, set a goal for reclassifying the wolf from State endangered to threatened once the population remained at 80 or more wolves for 3 consecutive years (WDNR 1989). The Wisconsin wolf population has been at 80 or more since 1995 and downlisted to state threatened species in 1999. The WWMP (WDNR 1999), developed by the Wisconsin Wolf Science Advisory Committee of the WDNR and ratified by the Wisconsin Natural Resources Board on October 27, 1999, outlines management of wolves in Wisconsin for the next 10-15 years. The WDNR, Wisconsin Wolf Advisory Committee in conjunction with the Wisconsin Wolf Stakeholders groups reviewed the 1999 WWMP and developed an addendum that was approved by the Natural Resources Board on June 28, 2006. The guidelines contained within the 1999 WWMP and the 2006 Addendum provide a conservation strategy for maintaining a healthy, viable gray wolf population in Wisconsin and contribute toward national recovery, while addressing problems that may occur with wolf depredation on domestic animals and human health and safety. The WDNR removed wolves from the state threatened species list in 2004 and

listed them as protected wild animals (nongame species). WS is cooperatively working with the WDNR and will comply with the policies and guidelines set forth in the WWMP (1999, 2006) whereby pertinent portions are incorporated by reference.

1.7.6 Gray Wolf (*Canis lupis*) Draft Post Delisting Monitoring Plan. Gray Wolf Western Great Lakes Distinct Population Segment (USFWS 2007). The USFWS has issued a draft post delisting monitoring plan for gray wolves in the Great Lakes Distinct Population Segment which outlines the post-delisting monitoring required by the ESA. The draft plan was made available for public comment from June 4, 2007 to July 5, 2007. The USFWS is preparing final documents based on review of comments provided on the draft plan.

1.7.7 2004 Chequamegon-Nicolet National Forest Land and Resource Management Plan. The Chequamegon-Nicolet National Forests' Land and Resource Management Plan (Forest Plan) was prepared in accordance with the Forest and Rangeland Renewable Resources Planning Act of 1974 as amended by the 1976 National Forest Management Act (NFMA), the 1969 National Environmental Policy Act (NEPA), and other laws and associated regulations. The Forest Plan provides guidance for all resource management activities on the Chequamegon-Nicolet National Forests. It establishes: forest-wide multiple-use goals and implementing objectives; forest-wide management requirements (known as Forest-wide Standards and Guidelines); Management Area direction, including area-specific standards and guidelines, desired future conditions and management practices; identification of lands suited/not suited for timber management; monitoring and evaluation requirements, and recommendations to Congress for additional Wilderness.

1.7.8 Guidelines For Conducting Depredation Control On Wolves In Wisconsin Following Federal Delisting: Wisconsin Department Of Natural Resources Guidelines For 2007-2008. The Wisconsin Wolf Science Committee developed written guidelines for dealing with wolf depredation to domestic animals (Appendix E). The guidelines are designed to be consistent with the 1999 WWMP, and 2006 WWMP Update. These are the guidelines that are currently used by the WDNR when responding to wolf depredations on domestic animals. Whether or not WS may implement any or all provisions of these guidelines will depend on the management alternative selected by WS.

1.7.9 Wisconsin Guidelines For Conducting Depredation Control On Wolves In Wisconsin While Federal Listed As "Threatened" Or "Endangered" Status: October 14, 2005. The Wisconsin Wolf Science Committee developed written guidelines for dealing with wolf depredation to domestic animals for use while wolves were federally protected as a Threatened or Endangered Species (Appendix F). The guidelines were designed to be consistent with the 1999 WWMP and recommendations of the USFWS. These guidelines are more restrictive than the 2007 guidelines that were designed for the management of wolves after federal delisting. These are the guidelines that are currently used by the WS when responding to wolf depredations on domestic animals. Whether or not WS implements all provisions of these guidelines will depend on the management alternative selected by WS.

1.8 AUTHORITY AND COMPLIANCE

1.8.1 Authority of Agencies involved in WDM in Wisconsin

Wildlife Services is the lead agencies in the preparation of this EA. Wolf damage management in Wisconsin requires the participation of other agencies that have management authority and

expertise related to this project (consulting agencies). The WDNR and the USFS, Chequamegon-Nicolet National Forest were cooperating agencies in the preparation of this EA. GLIFWC and the Wisconsin Ho-Chunk Nation were consulting agencies in the production of this EA. The Lac Du Flambeau Tribe was a consulting agency in the production of the 2006 EA on wolf damage management in Wisconsin and comments and information provided by the Lac Du Flambeau Tribe are also included in this EA.

1.8.1.1 Wildlife Services

The mission of the USDA/APHIS/WS program is to provide federal leadership in managing conflicts with wildlife. Wildlife Services' mission, developed through its strategic planning process (USDA 1999), is: 1) *"to provide leadership in wildlife damage management in the protection of America's agricultural, industrial and natural resources, and 2) to safeguard public health and safety."* Wildlife Services' Policy Manual[7] reflects this mission and provides guidance for engaging in wildlife damage management through:

- Training wildlife damage management professionals;
- Research, development and improvement of strategies to reduce losses and threats from wildlife;
- Collection, evaluation, and dissemination of management information;
- Informing and educating the public on how to reduce wildlife damage; and
- Providing a source for limited-use management materials and equipment, including pesticides.

The primary statutory authorities for the WS program are the Act of March 2, 1931 (46 Stat. 1468; 7 U.S.C. 426-426b) as amended, and the Act of December 22, 1987 (101 Stat. 1329-331, 7 U.S.C. 426c). WS recognizes that wildlife is an important public resource greatly valued by the American people. By its very nature, however, wildlife is a highly dynamic and mobile resource that can cause damage to agriculture and property, pose risks to human health and safety, and affect industrial and natural resources. WS conducts programs of research, technical assistance and applied management to resolve problems that occur when human activity and wildlife conflict.

WS has limited Federal authority in controlling wolf damage in Wisconsin, and must acquire State issued permits in order to collect, trap, or otherwise take wildlife in the State of Wisconsin.

Normally, individual wildlife damage management actions could be categorically excluded from further National Environmental Policy Act (NEPA) analysis, in accordance with implementing procedures for NEPA for the Animal and Plant Health Inspection Service (APHIS) (7 CFR 372.5(c), 60 Fed. Reg. 6,000, 6,003, (1995)). However, preparation of EAs serves to: 1) facilitate planning, interagency coordination, and the streamlining of program management; 2) clearly communicate to the public the analysis of individual and cumulative impacts of program activities; and 3) evaluate and determine whether there are any potentially significant or cumulative adverse impacts from the proposed program.

[7] WS' Policy Manual provides guidance for WS personnel to conduct wildlife damage management activities through Program Directives. WS Directives referenced in this EA can be found in the manual but will not be referenced as Literature Cited in Appendix A.

1.8.1.2 U.S. Department of Interior, Fish and Wildlife Service (USFWS)

The Mission of the U.S. Fish & Wildlife Service is to work with others to conserve, protect and enhance fish, wildlife, and plants and their habitats for the continuing benefit of the American people. Under the authority of the ESA, the USFWS acts to prevent the extinction of plant and animal species. It does this by identifying species at risk of extinction, designating ("listing") these species as threatened or endangered, providing protection for these species and their habitats, developing and implementing recovery plans to improve their status, and ultimately "delisting" these species and returning full management authority to the states and tribes. While a species is listed, most management authority for the species rests with the USFWS. However, the USFWS continues to work with other Federal agencies, states, and tribes along with private landowners to protect and recover the species. The USFWS helps ensure protection of listed species through consultations (section 7 of the ESA) with other Federal agencies. Under section 10 of the ESA, the USFWS also issues permits which provide exceptions to the prohibitions established by other parts of the Act. These permits provide for conducting various activities including scientific research, enhancement of propagation or survival, and incidental take while minimizing potential harm to the species. For species federally classified as threatened, the USFWS may also issue 4(d) rules which may allow for greater management flexibility for the species. The USFWS also issues grants for protection and enhancement of habitat and for research intended to improve the status of a listed species. 16 United States Code (U.S.C.) 1531 *et seq*., Endangered Species Act (ESA) of 1973, as amended; 16 U.S.C. 703-712.

1.8.1.3 United States Department of Agriculture, Forest Service, Chequamegon-Nicolet National Forest (USFS)

The Forest Service has the responsibility to manage the resources of federal lands for multiple uses including livestock grazing, timber production, recreation and wildlife habitat, while recognizing the state's authority to manage wildlife populations. The Forest Service recognizes the importance of reducing wildlife damage on lands and resources under their jurisdiction, as integrated with their multiple use responsibilities. These uses are outlined in the 2004 Chequamegon-Nicolet National Forest Land and Resource Management Plan. Occasionally, wildlife damage management actions may be taken on National Forest Service lands to protect resources on adjacent properties. For these reasons, the Forest Service has entered into a national MOU with WS to facilitate a cooperative relationship. Copies of the MOU are available by contacting the WS State Director's Office at 732 Lois Dr., Sun Prairie, WI 53590.

1.8.1.4 Wisconsin Department of Natural Resources (WDNR)

The WDNR, under the direction of a Governor appointed Natural Resources Board, is specifically charged by the Legislature with the management of the State’s wildlife resources. Although legal authorities of the Natural Resources Board and the WDNR are expressed throughout Wisconsin Administrative Code (WAC), the primary statutory authorities include establishment of a system to protect, develop and use the forest, fish and game, lakes, streams, plant life, flowers, and other outdoor resources of the state (s. 23.09 Wis. Stats.) and law enforcement authorities (s. 29.001 and s. 29.921 Wis. Stats.). The Natural Resources Board adopted mission statements to help clarify and interpret the role of WDNR in managing natural resources in Wisconsin. They are:

- To protect and enhance our natural resources: our air, land and water; our wildlife, fish and forests and the ecosystems that sustain all life.
- To provide a healthy sustainable environment and a full range of outdoor opportunities.
- To ensure the right of all people to use and enjoy these resources in their work and leisure.
- To work with people to understand each other's views and carry out the public will. And in this partnership consider the future and generations to follow.

1.8.1.5 Great Lakes Indian Fish and Wildlife Commission (GLIFWC)

The Great Lakes Indian Fish and Wildlife Commission is an agency of eleven Ojibwe nations in Minnesota, Wisconsin, and Michigan, with off-reservation treaty rights to hunt, fish and gather in treaty-ceded lands and waters. It exercises powers delegated by its member tribes. GLIFWC assists its member tribes in the implementation of off-reservation treaty seasons and in the protection of treaty rights and natural resources. GLIFWC provides natural resource management expertise, conservation enforcement, legal and policy analysis, and public information services. GLIFWC's member tribes include: the Bay Mills Indian Community, Keweenaw Bay Indian Community and the Lac Vieux Desert Band in Michigan; the Bad River, Red Cliff, Lac du Flambeau, Lac Courte Oreilles, Sokaogon and St. Croix Bands in Wisconsin; and the Fond du Lac and Mille Lacs tribes in Minnesota. All member tribes retained hunting, fishing and gathering rights in treaties with the U.S. government, including the 1836, 1837, 1842, and 1854 Treaties.

GLIFWC's Board of Commissioners, comprised of a representative from each member tribe, provides the direction and policy for the organization. Recommendations are made to the Board of Commissioners from several standing committees, including the Voigt Intertribal Task Force (VITF). The VITF was formed following the 1983 Voigt decision and makes recommendations regarding the management of the fishery in inland lakes and wild game and wild plants in treaty-ceded lands of Wisconsin.

1.8.1.6 Federally Recognized Native American Tribes in Wisconsin.

Since wolves are no longer protected under the ESA, the Wisconsin Native American tribes will have authority for wolf management on tribal lands. The federally recognized Native American tribes in Wisconsin at the time this EA was completed include the Bad River Band of the Lake Superior Tribe of Chippewa Indians of the Bad River Reservation, Forest County Potawatomi Community, Ho-Chunk Nation of Wisconsin, Lac Courte Oreilles Band of Lake Superior Chippewa Indians of Wisconsin, Lac du Flambeau Band of Lake Superior Chippewa Indians of the Lac du Flambeau Reservation of Wisconsin, Oneida Tribe of Indians in Wisconsin, Red Cliff Band of Lake Superior Chippewa Indians of Wisconsin, Sokaogon Chippewa Community, St. Croix Chippewa Indians of Wisconsin, Stockbridge Munsee Community, and the Menominee Indian Tribe of Wisconsin.

1.8.2 Compliance with Federal and State Statutes

Several federal laws, state laws, and state regulations regulate WDNR and WS actions. Wildlife Services, the WDNR comply with these laws and regulations, and consult and cooperate with other agencies as appropriate.

1.8.2.1 National Environmental Policy Act (NEPA). The National Environmental Policy Act (NEPA) of 1969 (42 USC Section 4231 et seq.) is implemented by Federal Agencies pursuant to Council on Environmental Quality (CEQ) Regulations (40 CFR Sections 1500-1508) and agency implementing regulations. WS prepare analyses of the potential environmental impacts of program activities to meet procedural requirements of NEPA and to facilitate planning, decision-making, and public and interagency involvement.

NEPA and its supporting regulations require that an EA be a concise public document that provides sufficient evidence and analysis to determine if an EIS should be prepared, aids in WS' compliance with NEPA, describes the need for action, alternatives, and environmental impacts, and includes a list of agencies/persons consulted.

Environmental documents pursuant to NEPA must be completed before work plans consistent with the NEPA decision can be implemented. Wildlife Services also coordinates specific projects and programs with other agencies. The purpose of these contacts is to coordinate any wildlife damage management that may affect resources managed by these agencies or affect other areas of mutual concern.

1.8.2.2 Endangered Species Act (ESA). It is Federal policy, under the ESA, that all Federal agencies seek to conserve threatened and endangered (T&E) species and utilize their authorities in furtherance of the purposes of the Act (Sec.2(c); Sec.7(a)(1)). Where appropriate, WS conducts Section 7 consultations with the U.S. Fish & Wildlife Service (USFWS) to ensure that "*any action authorized, funded or carried out by such an agency . . . is not likely to jeopardize the continued existence of any endangered or threatened species . . . Each agency shall use the best scientific and commercial data available*" (Sec.7(a)(2)). Wildlife Services obtained a Biological Opinion (BO) from USFWS in 1992 regarding the potential effects of the National WS program on T&E species and prescribing conservation measures and Reasonable and Prudent Measures for avoiding jeopardy (USDA 1997 Revised, Appendix F). Wildlife Services is in the process of initiating formal consultation at the programmatic level to reevaluate the 1992 BO and to fully evaluate potential effects on T&E species listed or proposed for listing since the 1992 USFWS BO.

Wisconsin WS has completed formal Section 7 consultations on wolf damage management May 9, 2001 and, and August 12, 2003 regarding potential effects of WDM in Wisconsin EA (J. Smith, USFWS, August 12, 2003; L. Lewis, USFWS, WS, May 9, 2001). Additionally, the USFWS determined, in an 2006 internal Section 7 consultation on the issuance of permits for wolf damage management, that, with the exception of wolves (the target species), the proposed wolf damage management methods would either have no effect on or might affect but were not likely to adversely affect federally-listed species in Wisconsin. Wolves are no longer federally listed as a T&E species.

1.8.2.3 National Historic Preservation Act (NHPA) of 1966 as amended. The National Historic Preservation Act (NHPA) of 1966, and its implementing regulations

(36 CFR 800), requires federal agencies to: 1) determine whether activities they propose constitute "undertakings" that can result in changes in the character or use of historic properties and, 2) if so, to evaluate the effects of such undertakings on such historic resources and consult with the State Historic Preservation Office regarding the value and management of specific cultural, archaeological and historic resources, and 3) consult with appropriate Native American Tribes to determine whether they have concerns for traditional cultural properties in areas of these federal undertakings. WS actions on tribal lands are only conducted at the tribe's request and under signed agreement; thus, the tribes have control over any potential conflict with cultural resources on tribal properties. All Native American tribes in Wisconsin and GLIFWC were invited to be cooperating agencies in the production of this EA. The Wisconsin Ho-Chunk Nation and GLIFWC chose to be consulting agencies in the preparation of this EA. The Lac Du Flambeau Tribe was a consulting agency in the production of the 2006 EA on wolf damage management in Wisconsin and the comments and information provided by the Lac Du Flambeau Tribe are also included in this EA. A copy of the draft EA was provided to each Native American tribe in the State to allow them opportunity to express any concerns that might need to be addressed prior to a decision.

A consultation occurred between WS and WSHPO on February 4, 2002 regarding the actions proposed in the 2004 WS EA on WDM in Wisconsin. It was determined that the *"Project as described will have no effect on significant cultural resources"* and the proposed action does not constitute a "Federal undertaking" as defined under Section 106 of the NHPA. Wisconsin WS would, as requested by WSHPO, halt work and contact the WSHPO if any cultural resources or human remains are discovered. The types of actions proposed in this EA are the same as for the 2004 WS wolf damage management EA, therefore, WS has determined that this finding is still valid.

1.8.2.4 Wilderness Act (Public Law 88-577 (USC 1131-1136)). The Wilderness Act established a national preservation system to protect areas "where the earth and its community of life are untrammeled by man" for the United States. Wilderness Areas are devoted to the public tor recreational, scenic, scientific, educational, conservation and historical uses. This includes the grazing of livestock, and activities to support grazing (e.g. WDM), where it was established prior to the enactment of the law (September 3, 1964). The Act also preserved the jurisdiction and responsibility of the States to manage fish and wildlife in federal wilderness areas. There are not any grazing allotments in Wisconsin wilderness areas.

1.8.2.5 Coastal Zone Management Act of 1972, as amended (16 USC 1451-1464, Chapter 33; P.L. 92-583, October 27, 1972; 86 Stat. 1280). This law established a voluntary national program within the Department of Commerce to encourage coastal states to develop and implement coastal zone management plans. Funds were authorized for cost-sharing grants to states to develop their programs. Subsequent to Federal approval of their plans, grants would be awarded for implementation purposes. In order to be eligible for federal approval, each state's plan was required to define boundaries of the coastal zone, to identify uses of the area to be regulated by the state, the mechanism (criteria, standards or regulations) for controlling such uses, and broad guidelines for priorities of uses within the coastal zone. In addition, this law established a system of criteria and standards for requiring that federal actions be conducted in a manner consistent with the federally approved plan. The standard for determining consistency varied depending on whether the federal action involved a permit, license, financial assistance, or a federally authorized activity.

In the 2006 EA, WS determined that the proposed action would not affect coastal resource and would, by default, be consistent with the State's Coastal Zone Management Program. The Wisconsin Coastal Management Program concurred with the determination that the actions addressed in this EA are unlikely to have a significant impact on the coastal zone. WS has determined that this determination remains valid for wolf damage management actions conducted in accordance with the WWMP and WDNR guidelines for wolf damage management.

1.8.2.6 Environmental Justice and Executive Order 12898 - *"Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations."* Executive Order 12898, entitled, "Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations" promotes the fair treatment of people of all races, income levels and cultures with respect to the development, implementation and enforcement of environmental laws, regulations and policies. Environmental justice is the pursuit of equal justice and protection under the law for all environmental statutes and regulations without discrimination based on race, ethnicity, or socioeconomic status. Environmental Justice is a priority for all Federal Agencies. Executive Order 12898 requires Federal agencies to make environmental justice part of their mission, and to identify and address disproportionately high and adverse human health and environmental effects of Federal programs, policies and activities on minority and low income persons or populations. APHIS implements Executive Order 12898 principally through its compliance with NEPA. All WS activities are evaluated for their impact on the human environment and compliance with Executive Order 12898. Wildlife Services personnel use only legal, effective, and environmentally safe wildlife damage management methods, tools and approaches. It is not anticipated that the proposed action would result in any adverse or disproportionate environmental impacts to minority and low income persons or populations**.**

1.8.2.7 Executive Order 13045 - *Protection of Children from Environmental Health and Safety Risks.* Children may suffer disproportionately from environmental health and safety risks for many reasons, including their development, physical and mental status. Because WS makes it a high priority to identify and assess environmental health and safety risks that may disproportionately affect children, WS has considered the impacts that this proposal might have on children. The proposed WDM would occur by using only legally available and approved methods where it is highly unlikely that children would be adversely affected. For these reasons, WS concludes that it would not create an environmental health or safety risk to children from implementing this proposed action.

1.8.2.8 Removal of Wild Animals and Authorization to Remove Wild Animals Causing Damage or Nuisance. Wisconsin regulations (Wis. Stat. 29.885) grants WDNR the authority to authorize the removal of wild animals causing damage or a nuisance. WDNR Code (WAC, Natural Resources (NR) 12.10) is established to administer Wisconsin regulations relating to the removal of wild animals causing damage or nuisance. This administrative rule defines criteria whereby landowner, lessees, or occupants may remove from lands under their control wild animals constituting a nuisance. WS assistance to those requesting assistance in reducing wolf damage, which could involve the removal of wolves, would be conducted under authority granted to WS, or landowners, lessees, or occupants by the WDNR.

1.8.2.9 Wildlife Damage and Nuisance Control – Subchapter III Wisconsin Administrative Code NR 12.5-12.55. This subchapter outlines the regulations for implementing and administering the payment of claims for damage associated with endangered and threatened species, especially gray wolves. Claimants for compensation must be in compliance with carcass disposal requirements of s. 95.50, Stats., for livestock claims and, for farm-raised deer claims, the farm-raised deer fencing requirements of ss. 90.20 and 90.21, Stats.

1.8.2.10 Game and Hunting-Wisconsin Administrative Code NR 10.
NR 10.02(1)(b) Wolves in the act of attacking domestic animals: On private land, the landowner, lessee or occupant of the land may shoot and kill any gray wolf in the act of killing, wounding or biting a domestic animal. Shootings shall be reported within 24 hours to a department conservation warden. The carcass of the wolf shall be turned over to the department.

CHAPTER 2: ISSUES

2.0 INTRODUCTION

Chapter 2 contains a discussion of the issues relevant to the analysis, including issues that received detailed environmental impact analysis in Chapter 4 (Environmental Consequences) and issues not considered in detail, with rationale. Pertinent portions of the affected environment are included in this chapter in the discussion of issues to be addressed in detail. Additional information on the affected environment is incorporated into the discussion of the environmental impacts in Chapter 4 and the description of the current program.

2.1 ISSUES CONSIDERED IN DETAIL IN CHAPTER 4

The following five issues have been identified as areas of greatest concern requiring consideration in this EA and were used to develop and analyze the alternatives:

- Effects on wolf populations in Wisconsin
- Effects on nontarget species populations, including T&E species
- Effects on public and pet health and safety
- Humanness of methods to be used
- Impacts to stakeholders, including aesthetics of wildlife

2.1.1 Effects on the Wolf Population in Wisconsin

Gray wolves have only recently been removed from the federal list of threatened and endangered species and are currently classified as a protected species by the state of Wisconsin. Some people may be concerned that WDM activities would result in the loss of local populations of wolves or have a cumulative adverse affect on the viability of Wisconsin's wolf population. As analyzed, WS and WDNR would remove only a small percentage of the wolf population in relation to the total Wisconsin wolf population. Immigration and reproduction will aid in the recolonization and maintenance of the Wisconsin wolf population. During 2003-2006 an average of 6% of the wolf population was removed through lethal WDM. Even with the removal of depredating wolves and other cumulative causes of wolf mortality, the Wisconsin wolf population increased from 248 to 467 (88% increase) wolves from 2003-2006 or an annual increase of 17% per year. At current levels of wolf removal for WDM and other sources of mortality, WS and WDNR anticipate that the Wisconsin wolf population will continue to increase, although this rate of increase is anticipated to slow as available habitat is occupied. Wolf population modeling suggests the carrying capacity for wolves in Wisconsin ranges from 262 to 662 using a wolf prey model and 324-461 using a wolf habitat probability model (Mladenoff et al. 1997).

2.1.2 Effects on Nontarget Species Populations, Including Threatened and Endangered Species

A common concern among members of the public and wildlife professionals, including WS and the WDNR is that the proposed action or any of the alternatives might have adverse impacts on

populations of native wildlife species, particularly state or federally-listed threatened and endangered species. Currently, there are 18 federally-listed threatened, endangered and candidate plant and animal species and 239 state-listed threatened and endangered plant and animal species in Wisconsin. Special efforts are made to avoid jeopardizing threatened and endangered species though biological evaluations of the potential effects of the alternatives and the establishment of special restrictions or standard operating procedures.

2.1.3 Effects on public safety and pet health and safety

A common concern is whether the proposed action or any of the alternatives pose an increased threat to public and pet health and safety. In particular, there is concern that the methods used for wolf removal (i.e., trapping, cable restraints, and shooting) may be hazardous to people and pets. Other individuals may be concerned that continued increases in wolf populations might threaten public and pet health or safety. Procedures for addressing risks to human health and safety from wolves are outlined in the WWMP (WDNR 1999, 2007*b*).

Firearm use is a very sensitive issue because of concerns relating to public safety and firearms misuse. To ensure safe use and awareness of firearms issues, WS employees who use firearms to conduct official duties are required to attend an approved firearms safety and use training program within 3 months of their appointment and a refresher course every 2 years afterwards (WS Directive 2.615). Wildlife Services employees who use firearms as a condition of employment, are required to sign a form certifying that they meet the criteria as stated in the *Lautenberg Amendment* which prohibits firearm possession by anyone who has been convicted of a misdemeanor crime of domestic violence.

2.1.4 Humaneness of methods to be used

The issue of humaneness, as it relates to the killing or capturing of wildlife is an important but complex concept. Kellert and Berry (1980) in a survey of American attitudes toward animals stated that 58% of their respondents, *". . . care more about the suffering of individual animals . . . than they do about species population levels."* Schmidt (1989) indicated that vertebrate pest control for societal benefits could be compatible with animal welfare concerns, if *" . . . the reduction of pain, suffering, and unnecessary death is incorporated in the decision making process."*. Suffering has been described as a *" . . . highly unpleasant emotional response usually associated with pain and distress*." However, suffering *" . . . can occur without pain . . .* ," and *". . . pain can occur without suffering . . ."* (American Veterinary Medical Association (AVMA) 2001). Because suffering carries with it the implication of a time frame, a case could be made for *" . . . little or no suffering where death comes immediately . . ."* (California Department of Fish and Game (CDFG) 1999), as in the case of shooting or drug-induced euthanasia.

Defining pain as a component of humaneness may be a greater challenge than that of suffering. Pain obviously occurs in animals. Altered physiology and behavior can be indicators of pain, and the causes that elicit pain responses in humans would *" . . . probably be cause for pain in other animals . . ."* (AVMA 1987). However, pain experienced by individual animals probably ranges from none to considerable (CDFG 1999). Wildlife Services acknowledges that some damage management methods, such as foot-hold traps and cable restraints, may cause varying degrees of pain in different animal species for varying lengths of time. However, at what point pain diminishes or stops under these types of restraint has not been measured by the scientific community.

Pain and suffering as it relates to tools used to capture animals, is often interpreted differently by professional wildlife biologists and lay people. People that receive damage or threats of damage may perceive humaneness differently, particularly if their pets or livestock are injured or killed and they contemplate the humaneness of having their pets or livestock killed by wolves. Wildlife managers and the public would both be better served to recognize the complexity of defining suffering, since *"* . . . *neither medical nor veterinary curricula explicitly address suffering or its relief"* (CDFG 1991, 1999). Therefore, humaneness, in part, appears to be a person's perception of harm or pain inflicted on an animal, which, in turn, is governed by the person's past experiences. Different people may perceive the humaneness of an action in different ways. The challenge in coping with this issue is how to achieve the least amount of suffering with the constraints imposed by current technology, funding, workforce and social concerns. Research suggests that with some methods, such as restraint in foot-hold traps, changes in the blood chemistry of trapped animals indicate "*stress*" (USDA 1997 Revised: 3-81). However, such research has not yet progressed to the development of objective, quantitative measurements of pain or stress for use in comparing the relative humaneness of WDM techniques.

The decision making process involves tradeoffs between the aforementioned aspects of pain from damage management activities and the needs of humans to reduce wildlife damage. An objective analysis of this issue must consider not only the welfare of wild animals but also the welfare of humans and prey animals if damage and losses are not stopped.

Wisconsin WS and WDNR personnel are trained professionals who strive to use the most humane methods available to them, recognizing the constraints of current technology, workforce, funding and social concerns. In determining the damage management strategy, preference would be given to practical and effective nonlethal methods. However, nonlethal methods may not always be applied as a first response to each damage problem. The most appropriate response could be a combination of nonlethal and lethal methods, or there could be instances where application of lethal methods alone would be the most appropriate strategy.

Wildlife Services has improved the selectivity and humaneness of many management devices through research and is striving to bring new, more humane tools and methods into use. Wildlife Services, through the combined efforts of the WS state programs and the USDA, APHIS, WS, National Wildlife Research Center, has been involved in the testing and development of a number of nonlethal WDM techniques including fladry (Section 3.3.1), pyrotechnics, livestock guarding animals, remote activated guard (RAG) devices, and light-siren devices (Appendix B). The NWRC has also been conducting research on tranquilizer devices to reduce stress and injuries to animals captured in traps. However, improved WDM methods are still needed. Until new methods and tools are developed, a certain amount of animal suffering could occur (e.g., when nonlethal damage management methods are neither practical, available, or effective). Whenever possible and practical, WS also employs euthanasia methods recommended by the AVMA (2001) or the recommendations of a veterinarian, even though the AVMA euthanasia methods were developed principally for companion animals and slaughter of food animals, and not for free-ranging wildlife.

2.1.5 Sociological Issues Including Impacts on Aesthetic Values

2.1.5.1 Variations in Perception of Wildlife Damage

During the last 200 years, broad-scale changes in land-use patterns have occurred as the increasing human population settled North America. Notable is the large-scale conversion of natural landscapes to agricultural and urban environments. As humans

encroach on wild habitats, they compete with wildlife for space and other resources, which increases the potential for conflicts. Concurrent with this growth and change is a desire by some segments of the public to completely protect all wildlife, which can create localized conflicts with resource managers and owners experiencing problems with some species. *The Animal Damage Control Programmatic Final Environmental Impact Statement* (EIS) (USDA 1997, Revised) summarizes the American perspective of the relationship between wildlife values and wildlife damage, as follows:

"*Wildlife has either positive or negative values, depending on varying human perspectives and circumstances . . . Wildlife is generally regarded as providing economic, recreational and aesthetic benefits . . . and the mere knowledge that wildlife exists is a positive benefit to many people. However . . . the activities of some wildlife may result in economic losses to agriculture and damage to property . . . Sensitivity to varying perspectives and value is required to manage the balance between human and wildlife needs. In addressing conflicts, wildlife managers must consider not only the needs of those directly affected by wildlife damage but a range of environmental, sociocultural and economic considerations as well*."

Biological carrying capacity is the limit of the land or habitat to support healthy populations of species without long-term degradation of either the health of the species or the associated environment (Decker and Purdy 1988). The wildlife acceptance capacity (also known as cultural carrying capacity) is the limit of human tolerance for wildlife, or the maximum number of a given species that can coexist compatibly with local human populations (Decker and Purdy 1988). These capacities are especially important in areas inhabited by humans because they define the sensitivity of a local community to a specific wildlife species/problem. For any given situation involving a wildlife conflict, individuals directly or indirectly affected by the damage will have varying degrees of tolerance for the damage and the species involved in the damage. This tolerance determines the "wildlife acceptance capacity," which is often lower than the "biological carrying capacity." For example, the biological carrying capacity of gray wolves (*Canis lupus*) in Wisconsin appears to be higher than their current population; however, for some individuals and groups, the state has as many or more wolves than can be tolerated (i.e., for these individuals, the wildlife acceptance capacity has been reached). Once the wildlife acceptance capacity of a species is reached or exceeded, humans will demand implementation of programs, both lethal and nonlethal to reduce damage or threats of damage.

The human attraction to animals has been well documented throughout history, an idea supported by prehistoric cave paintings and the domestication of wild animals. Today's American public is no exception, as evidenced by the large percentage of households that have pets or observe wildlife. Some people also may consider individual wild mammals and birds as "pets" and exhibit affection toward these animals. They may also want to have more wild animals in their immediate environment. Some people feel a spiritual bond with wild animals. Some examples of spiritual bonds with animals include the relationship between Native Americans and wolves discussed in Section 1.3.5, and Judeo-Christian beliefs that mankind should not second-guess the judgment of God in creating wolves and that it is morally inappropriate to destroy living creatures created by God just to protect the things of man. Conversely, some people have no emotional attachment to wildlife; some may even fear the presence of wild animals in their vicinity and demand their immediate removal. Conflicting wildlife values result in highly

variable public opinions about the best ways to manage conflicts between humans and wildlife, making the implementation and conduct of wildlife damage management programs extremely complex.

Ideas about how these programs are implemented and conducted are as unique as the almost infinite combinations of philosophies, psyches, aesthetic values, personal attitudes, and opinions found in humans. These differences of opinion result in concerns that the proposed action or the alternatives would result in the loss of aesthetic or cultural/spiritual benefits to the general public and resource owners.

2.1.5.2 Aesthetic and Sociological Values of Wildlife

Wildlife generally is regarded as a source of economic, recreational, and aesthetic benefits (Decker and Goff 1987), and the mere knowledge that wildlife exists is a positive benefit to many people. Aesthetics is the philosophy dealing with the nature of beauty, or the appreciation of beauty. Therefore, aesthetics is truly subjective, dependent on what an observer regards as beautiful. Wildlife populations provide a range of direct and indirect social and economic benefits (Decker and Goff 1987). Direct benefits are derived from a user's personal relationship or direct contact with wildlife and may include either consumptive (e.g., using or intending to use the animal such as in hunting or fishing) or non-consumptive use (e.g., observing or photographing animals) (Decker and Goff 1987). Indirect benefits, or indirect exercised values, arise without a human being in direct contact with an animal and are derived from experiences such as looking at pictures or videos of wildlife, reading about wildlife, or benefiting from activities or contributions of animals such as their use in research (Decker and Goff 1987). Two forms of indirect benefits exist according to Decker and Goff (1987): bequest and pure existence. Bequest benefits arise from the belief that wildlife should exist for future generations to enjoy; pure existence benefits accrue from the knowledge that the animals exist in the human environment (Decker and Goff 1987) or that they contribute to the stability of natural ecosystems (Bishop 1987).

Some people directly affected by problems caused by wolves insist on the lethal removal of the problem animal(s) from the area where the conflict occurs. Others have the view that all wildlife involved in conflicts should be captured and relocated to another area to alleviate the problem. Individuals not directly affected by a conflict may be supportive of affected humans, neutral, or totally opposed to any removal of wildlife from specific locations or sites.

Those who oppose removal of wildlife may do so because of emotional ties to the animals, which are similar to the bonds that may exist between a human and a pet. Some may totally oppose WDM, especially if lethal methods are used, and want WS and the WDNR to teach tolerance of wolves causing conflicts. These individuals generally believe that individual animals have inherent value and should not be killed to meet the desires of man-kind. They may also feel that individual animals have rights similar to those of humans and that, if it is inappropriate to treat a human in a given manner, then it is also inappropriate to treat an animal in that manner.

The goal of WDM is to provide relief from damage or threats of damage while minimizing the potential for negative impacts on the environment including aesthetic and social values. WS would only conduct WDM at the request of citizens, organizations, and others who are experiencing problems (i.e., where a need exists) and in coordination

with the WDNR. When requests for WDM assistance are received, WS, the WDNR and tribes, as appropriate, and the person or agency with the damage problem consult, issues/concerns are addressed, an appropriate plan of action is developed, and reasons for selecting the action are explained. Management actions are carried out in a dedicated, humane and professional manner and as outlined in the WWMP (WDNR 1999, 2007*b*).

2.2 ISSUES NOT CONSIDERED IN DETAIL AND RATIONALE FOR EXCLUSION

2.2.1 Impacts on Wisconsin's Biodiversity

No WS or WDNR project would be conducted to eradicate any native wildlife species or population, including wolves. Wildlife Services and the WDNR operate according to Federal, and State laws and regulations enacted to ensure species viability. The proposed action would be conducted on a relatively small percentage of the Wisconsin land mass. The take of any wildlife species analyzed in this EA is a small proportion of the total population and is probably insignificant to the viability and health of the population (see Section 4.3). In addition, any reduction in the local population is temporary because immigration from adjacent areas and reproduction by the remaining animals replaces the animals removed during damage management operations as long as suitable habitat exists. None of the alternatives proposed in this EA will affect the viability of wolf or nontarget wildlife species populations, and, consequently, the impacts of the current WS program on biodiversity statewide and nationwide are expected to be very minor (USDA 1997 Revised).

2.2.2 Appropriateness of Preparing an EA Instead of an EIS for Such a Large Area

Some individuals might question whether preparing an EA for an area as large as the State of Wisconsin would meet the NEPA requirements for site specificity. If a determination is made through this EA that the proposed action would have a significant environmental impact, then an EIS would be prepared in accordance with NEPA. In terms of considering cumulative impacts, a single EA analyzing impacts for the entire State should provide a better analysis of cumulative impacts than multiple EAs covering several smaller areas. In addition, WS and WDNR would only conduct WDM in a very small area of the state where damage is occurring or likely to occur.

2.2.3 There should be no lethal control in response to predation on free-roaming hunting dogs or for any predation on public lands even if dog is leashed.

The Standard Operating Procedures detailed in Section 3.5 state that lethal control would not be used if wolves kill dogs that are free-roaming, hunting, or training on public lands. WDNR will continue to provide information on areas where wolves have killed dogs to help owners of hunting dogs avoid problem areas. The use of lethal WDM methods in response to depredations on dogs is further clarified in the State's depredation control guidelines (Appendix E)

"9) Wolf Control for Depredation to Dogs----

a) Control could be conducted on wolves killing dogs that are leashed, confined, or under the owner's control on the owner's land if there is likeliness of additional depredation.
b) No reactive control trapping would be conducted on wolves killing dogs that are free-roaming, roaming at large, hunting, or training on public lands, and all other lands open to public hunting except land owned or leased by the dog owner.

c) *Other abatement or aversive conditioning will be considered on public lands where depredation occurs on dogs or other domestic animals.*
d) *Guard animals would be treated as other domestic animals for verification and control purposes.*"

Lethal control of wolves killing dogs would only occur on wolves attacking dogs in residential areas, and only if additional dogs exist that are at risk of attacks by wolves. Cats are safest when kept indoors and dogs are best protected when on a leash with owners. Unfortunately, wolf depredation on pets has also occurred in situations where the animals were under a reasonable degree of control by their owners. The agencies are aware of situations where dogs have been attacked in a yard when standing with the owner or out walking with owners. Although these instances are relatively uncommon, proximity to owner or residence is not necessarily sufficient protection from wolf depredation. These situations are of particular concern because they not only pose a risk to the pets being threatened but are also indicative of a wolf or wolves which have lost their fear of humans and which may pose a risk to human safety.

2.2.4 Impact of wolves on recreational and aesthetic opportunities enjoyed by hunters.

Some hunters are concerned about the impacts of wolf predation on big game populations, particularly white-tailed deer, elk and moose. This EA addresses management of wolf depredation on livestock and pets and risks to human safety from wolves and focuses on management of specific depredating individuals in accordance with the WWMP. At present, the WWMP does not include provisions for the management of wolves to protect prey populations. Wolf management to enhance prey populations, if warranted, would require large-scale population reduction efforts (National Research Council 1997). As such, the issue of wolf impacts on hunting and on deer populations in Wisconsin is beyond the scope of the EA. Admittedly, wolves have some limited control on local deer populations, but wolves are not likely to impact deer on a statewide or regional basis. Even Minnesota, with 3,000 wolves, is seeing record high deer numbers. WDNR has not seen any major negative impact of wolves on wild ungulates in the state.

2.2.5 If lethal control is implemented, every effort must be taken to target the individual wolf(ves) responsible for the depredation. How can you be certain only depredating wolves will be taken?

WS and WDNR personnel are highly trained in the methods of identifying wolf depredations, and use sound scientific information for assessing wolf depredation (Acorn, R. C. and M. J. Dorrance 1990). Agency personnel strive to target the specific wolves involved in depredation but cannot guarantee that the wolf taken is always the specific individual involved in the depredation. Identification of depredating individuals is complicated by the pack hunting behavior of wolves. In instances when a pack is involved in a depredation incident, multiple individuals may have been involved in the depredation event. Measures used to identify and target depredating wolves include but are not limited to careful analysis of wolf sign at the site by trained professionals, review of information on radio-collared wolves in the area near the depredation site and confining wolf capture efforts to a set radius around the depredation site.

Likelihood of capturing individuals or packs involved in the depredation is improved by restricting the placement of equipment to a set radius around the depredation site, placement of capture equipment based on sign and activity of wolves at the site. Sign from the depredation site can be used to determine if the depredation was caused by an individual wolf or a pack. Traps will be set close to kill sites, and normally wolf packs responsible for making the kills would be

the ones most likely visiting such kills. Because wolves are very territorial, with typical territories being 6 to 10 miles across, most farms occur within only one pack territory, and strange wolves would not likely enter another packs area or feed on kills made by other packs. Trapping near the depredation site would thus target the pack responsible for making the kill.

2.2.6 Producers should not expect to prevent all losses and must accept that at least some losses to predation are a cost of doing business.

The agencies do not expect to prevent all losses, nor are they proposing lethal WDM as a solution to all depredation incidents. WS uses an integrated approach to resolve wolf damage complaints. In certain situations the use of nonlethal methods maybe more effective for resolving wolf depredation complaints. Livestock producers in WI are only compensated for verified depredated and injured livestock and, if certain criteria have been met, missing livestock. Livestock producers are not compensated when wolves harass livestock, fences need repair after wolves chase livestock through fences, livestock dispersed by wolves have to be resorted, and when producers have to pay for feed because livestock are removed from grazing pastures to minimize risks from wolves.

2.2.7 Preying on wild-type cervids is a natural behavior and should not be punished with lethal control.

Game farm owners in Wisconsin must have fencing in accordance with applicable state regulations. Since game farm animals are classified as livestock by the state, owners of game farm animals are statutorily entitled to the same assistance with wolf predation as other livestock producers. However, in accordance with State regulations, compensation payments and financial assistance with damage prevention materials will not be available to game farms where fencing is not in compliance with state requirements. If wolf depredation control activities are conducted for game farms, all control activity will take place inside of the fence. Any wolves trapped after a first-time depredation will be radio-collared and released if suitable habitat exists nearby. Within the Ceded Territory if suitable habitat does not exist nearby, WS and WDNR, in consultation with GLIFWC will decide whether wolves caught in the game farm can be released in other locations or would need to be euthanized. Wolves captured a second time in response to repeated depredation may be euthanized.

2.2.8 What reason is there to believe that lethal WDM is needed to minimize negative attitudes and illegal wolf killing? Won't people who illegally kill wolves do so no matter what methods are available?

The agencies are aware that illegal killing does occur in all protected wolf populations and discuss the impact of illegal killing on the wolf population in Section 4.2.2. The agencies realize that a very small portion of the population will kill wolves no matter what WDM program is in place. However, we also believe that prompt, professional, effective resolution of conflicts with wolves will help maintain public tolerance of wolves and wolf population expansion, will prevent an increase in untrained individuals attempting WDM on their own, and should prevent an increase in anti-wolf behaviors by intolerant stakeholders. It is generally only when people feel they have no legal access to resolution of their problems that illegal options are considered. Most people would rather take advantage of an effective legal WDM program than take illegal action. The agencies believe that an integrated WDM program which includes access to lethal WDM methods would be the most effective in resolving conflicts with wolves. Social studies by Kellert (1999) in Minnesota and Shanning et al. (2003), Naughton-Treves et al. (2003), and Naughton et al.(2005) in Wisconsin show strong public support for lethal control of problem wolves by

government agents. Illegal lethal control actions by private individuals are less likely to be very specific or very humane, and could potentially have more adverse impacts on the wolf population than focused lethal actions by trained, authorized professionals. Any illegal lethal control by individuals is also less likely to be effective in reducing depredation events, as it would be less likely to target the specific depredating animals. State law enforcement personnel strive to prevent illegal killing of wolves, but the remote nature of much of Northern Wisconsin, which makes it desirable habitat for wolves also makes it difficult to protect wolves from illegal actions.

The Wildlife Society, an international organization of professional wildlife biologists, states 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). The International Union of Nature and Natural Resources or World Conservation Union has established a "Manifesto on Wolf Conservation". The "Manifesto" was published in International Wolf Magazine in 1994 (Anonymous 1994). The 7th Principle for wolf conservation stated "It is recognized that occasionally there may be a scientific established need to reduce non-endangered wolf populations; further it may become scientifically established that in certain endangered wolf populations specific individuals must be removed by appropriate conservation authority for the benefit of the wolf population." In an extensive literature review of strategies for reducing carnivore/livestock conflict by Norwegian biologists, it was concluded that lethal control should be considered on endangered carnivores such as wolves to prevent expansion into areas of high conflict (Linnell et al. 1996).

There is some indication that illegal killing was on the rise before an integrated WDM program was authorized in 2003 at which point illegal killing appears to have dropped off. In Wisconsin, the 15 illegal kills were detected in 2002, just prior to the establishment of the 4(d) rule for wolf management. The rate of collared illegal kill in 2005 and 2006 suggests that illegal kill may again be on the rise, possibly reflecting frustrations with delays in federal delisting of wolves and the federal court actions. In March 2005, poisoned dog food, probably set for wolves, was found in several locations in Ashland and Price Counties, Wisconsin suggesting attempts to reduce wolf numbers shortly after the 4(d) rule was eliminated and lethal control ceased. In 2006, illegal shooting was the greatest source of mortality in radio-collared wolves, with 6 of the 72 radio-collared wolves illegally killed , and overall total of 16 illegal wolf kills (uncollared and collared animals combined). This rate of illegal kill was the highest seen by WDNR in recent years and is similar to rates seen in the early 1980s (Wydeven and Wiedenhoeft 2007). Of the 70 known wolf mortalities in 2006 (collared and uncollared wolves), 16 (23%) were caused by illegal shooting, 23 (33%) to vehicle collisions, and 18 (26%) to damage management activities (Wydeven and Wiedenhoeft 2007). A total of 9 wolves were detected shot during the regular 9-day November deer firearm season, the most ever recorded (Wydeven et al. 2007). Concerns that illegal take may increase in the absence of an effective WDM program are part of the reasoning behind WDNR' inclusion of lethal methods in the WWMP.

2.2.9 Wolf damage management should not be conducted on National Forest Land, especially wilderness areas.

Some individuals feel that it is inappropriate to conduct WDM on public land and that predator removal, especially for the protection of livestock, is especially inappropriate for wilderness areas. Under the alternatives presented in this EA, the only time WDM would be conducted on wilderness areas is if there is a demonstrable threat to human safety from bold/aggressive wolves. However, WDM could be conducted on other federal land (e.g., USDA Forest Service) in response to damage that occurred on adjacent private land if the National Forest land is within the damage management perimeter (set by the WDNR through the wolf science technical committee)

around the site of a verified depredation event (Section 1.3.10); in the unlikely instance that a wolf preys on livestock legally present on public lands[8]; or in the rare instance that a wolf is exhibiting behavior that poses a threat to human safety. Public lands will only be included in Proactive Control Areas after consultation with and with the consent of the land management agency. Signs will be used to warn the public that WDM equipment has been placed in these areas. Private individuals would not have authority to conduct WDM on National Forest lands, all WDM would be conducted by state or WS personnel.

[8] WS is aware of a limited number of instances where livestock is or has been allowed to graze on federal, state and county land.

CHAPTER 3: ALTERNATIVES

3.0 INTRODUCTION

This chapter consists of six parts: 1) an introduction, 2) description of alternatives considered and analyzed in detail including the Proposed Action (Alternative 3), 3) a description of general WDM strategies and methodologies, 4) WDM methods that could be used or recommended by WS, 5) a description of alternatives considered, but eliminated from detailed analysis, and 6) a table of SOPs. Alternatives were developed for consideration using the WS Decision Model (Slate et al. 1992), "*Methods of Control*" (USDA 1997 Revised, Appendix J) and the *"Risk Assessment of Wildlife Damage Control Methods Used by the USDA Animal Damage Control Program"* (USDA 1997 Revised, Appendix P), and information provided by the public on previous WS EAs on wolf damage management in Wisconsin. Four alternatives were recognized, developed, and analyzed in detail; and six alternatives were considered but not analyzed in detail with supporting rationale.

3.1 DESCRIPTION OF ALTERNATIVES

The WDNR and tribes have management authority for wolves in Wisconsin. The WDNR has established its policy and procedures for wolf management in the WWMP (WDNR 1999, 2007*b*) and the 2007 *Guidelines for Conducting Depredation Control on Wolves in Wisconsin Following Federal Delisting* (Appendix E). The WDNR has stated that it intends to implement its wolf management policy with or without involvement by WS. The purpose of this EA is to examine the environmental impacts of various levels of WS involvement in WDNR wolf management. Wolf management policy in Wisconsin is not subject to the requirements of NEPA. Issues with the content and policies in the WWMP and Guidelines for Wolf Damage Management can only be addressed through the WDNR decision-making and public involvement processes and not this EA.

3.1.1 Alternative 1 - Nonlethal WDM Only.

Under this alternative, WS would only provide materials and advice for nonlethal damage management. Nonlethal methods used and recommended by WS would include but are not limited to animal husbandry practices, installation of fencing, electronic guards, fladry, aversive conditioning, nonlethal projectiles, and use of livestock guarding animals (Section 3.2.1, Appendix B). Wildlife Services would still investigate complaints to determine if complainants meet criteria for wolf damage compensation, and could assist the WDNR with radio-collaring wolves for monitoring the Wisconsin wolf population. WS could live-capture wolf-dog hybrids, but the animals would have to be taken to the WDNR which would probably euthanize the animals unless the animal had an identifying marker that enabled its return to an owner. As stated above, the WDNR intends to implement all facets of its wolf management policy and the WDNR or a designated agent would still have the authority to conduct lethal WDM similar to Alternative 3. The WDNR could also establish Proactive Control Areas and issue landowners or other designated agents permits to trap and shoot wolves when depredation on domestic animals has been verified. However, the decision making process for the establishment of Proactive Control Areas would occur without involvement by WS.

3.1.2 Alternative 2 - Integrated WDM (No Action).

The No Action alternative serves as the baseline against which the impacts of management alternatives can be compared and can be defined as being the continuation of current management practices (CEQ 1981). In this instance, this means WS would be able to participate in WDM

activities in accordance with the policies and procedures of the 1999 WWMP, and 2005 *Wisconsin Guidelines For Conducting Depredation Control On Wolves In Wisconsin While Federal Listed As "Threatened" Or "Endangered" Status*. WS' actions under this alternative would be the same as the preferred WDM alternative selected by WS in the March 13, 2007 FONSI on Wolf Damage and Conflict Management in Wisconsin (USDA 2007). Similar programs for WDM in Wisconsin have been used by WS at intervals from April 1, 2003 through present either under 4(d) provisions of the ESA or under special permit from the USFWS while wolves were federally classified as either threatened or endangered (Sections 1.3.1, 1.3.10, Table 1-3 and USDA 2003, 2006). Therefore, for purposes of analysis, we are using Alternative 2 as the "No Action" baseline when comparing the other alternatives to determine if the real or potential adverse affects are greater, lesser or the same (Table 4-4).

WS actions under this alternative would be similar to previous Wisconsin WDM programs. The IWDM strategy would encompass the range of legal, practical and effective methods to prevent or reduce damage and conserve the wolf population while minimizing harmful effects of damage management measures on humans, wolves, other wildlife species, domestic animals, and the environment. Under this action, WS would provide technical assistance and operational wolf damage management using nonlethal and lethal management methods selected after applying the WS Decision Model (Slate et al. 1992). WS would only use lethal methods for reactive wolf damage management (Section 1.3.10). Use of lethal WDM methods would be discontinued when the annual lethal take for WDM by any source equaled 10% of the previous seasons late-winter wolf population estimate. Wildlife Services would be able to assist with wolf research, wolf population monitoring and removal of wolf dog hybrids. Wolf pups captured by WS before 1 August would be released and trapping would be conducted only within one mile of damage sites. Lactating females trapped before June 1 would be released near the point of capture except those involved with chronic depredation problems where all adult wolves captured at depredation sites would normally be euthanized. WS would consult with the WDNR prior to euthanizing lactating females trapped prior to June 1.

The WDNR would still have the authority to implement WDM practices in addition to WS actions consistent with the new WDM guidelines (WDNR 2007*b*). For example, the WDNR may issue RWDM and PWDM permits to trap or shoot wolves to landowners (or their designated agents) who have domestic animals at risk of wolf depredation. Permittees may only trap and shoot wolves on their own property. Landowners with current wolf damage problems would also be able to qualify for RWDM permits to trap or shoot wolves on their property. Permits for RWDM would be limited to landowners 1 mile from the depredations site. Permits for PWDM could be issued to any landowner within the Proactive Control Area. With landowner/manager permission, WDNR would be able to use lethal PWDM methods on any property within a Proactive Control Area. However, the decision making process for the establishment of Proactive Control Areas would occur without involvement by WS. Unlike WS, WDNR employees and their designated agents would be able to conduct lethal RWDM activities within the expanded damage management perimeters around depredation sites as defined in the new 2007 wolf damage management guidelines (Appendix E Sections I.4 and II.4). The 2007 Guidelines for Wolf Damage Management do not provide any special protection for lactating females and pups captured prior to August 1.

Wolf damage management would be conducted on private property in Wisconsin when the resource owners/ managers (property owners/ land managers) request assistance to alleviate wolf damage, wolf damage is verified by WS, and an *Agreement for Control* or other comparable document has been completed. If permitted by the land management agency, WDNR could work within the expanded damage management perimeters on public land adjacent to depredation

sites. WS would also be able to use lethal WDM methods on public land adjacent to depredation sites but would be limited to a 1 mile radius around the depredation site. Wolf damage management activities are only likely to be conducted on public land if that land is within a 1 mile perimeter around the site of a verified depredation event on private land: in the rare instance that a wolf poses a threat to human safety; and/or in the unlikely event that there is wolf depredation on lawfully present livestock or livestock guarding animals. Wolf trapping and radio-collaring for wolf population monitoring is usually conducted on public land. WDM would only be conducted on public lands after notification of the land manager. Signs would be posted at public access points to areas where foot-hold traps or cable restraints are to be used.

The WWMP (WDNR 1999, 2007*b*) requires the producer/owner to sign a depredation management plan (farm plan) for the property which includes damage abatement recommendations prior to the use of lethal WDM methods to resolve livestock depredation complaints. The cooperator is also required to agree to (sign) the plan prior to receiving financial assistance with supplies for nonlethal WDM and before any operational WDM can be conducted. Individuals and agencies with wolf damage and/or concerns about wolves would receive technical assistance in the form of instructional sessions, demonstrations, loaning of equipment, and information on the availability and use of nonlethal and lethal methods (Section 3.3, Appendix B). In determining the damage management strategy, preference would be given to nonlethal methods when they are deemed practical and effective. Nonlethal methods used by landowners could include, but would not be limited to, changes in farm management practices and pet care/supervision, proper carcass disposal, frightening devices, exclusion, guarding animals, habitat modification, and behavior modification of problem wolves. Nonlethal methods used operationally by WS may include foot-hold traps and cable restraints (Olson & Tischaefer 2004) with "stops" (used to live capture wolves for attaching radio collars, and collars used to activate frightening devices), frightening devices and aversive conditioning (e.g., with modified dog training collars) and nonlethal projectiles (Appendix B). Aversive conditioning, nonlethal projectiles and other experimental damage management techniques would only be used by WS after consultation with the WDNR.

Lethal methods would be used to reduce damage after practical and appropriate nonlethal methods have been considered and determined to be ineffective or inappropriate in reducing damage to acceptable levels. Lethal methods would only be used if the wolf population outside Native American reservations remains above 250 individuals. In some instances, the most appropriate initial response to a wolf damage problem could involve concurrent use of a combination of nonlethal and lethal methods, or there could be instances where application of lethal methods alone would be the most appropriate strategy (e.g., some instances of risk to human safety from aggressive wolves or situations where the landowner has already implemented practical and effective nonlethal methods prior to contacting WS and is still experiencing damage problems). Lethal methods could include shooting, calling and shooting, cable restraints, and euthanasia of wolves live-captured in foot-hold traps, cable restraints or other live-capture devices.

The removal of wolf-dog hybrids that appear to be living in the wild and are unmarked could be conducted in any Wolf Management Zone regardless of depredation history. Wolf-dog hybrids that are marked will be held in captivity until the owner can be identified or euthanized after 14 days if no owner can be located.

3.1.3 Alternative 3 – Revised Integrated WDM (Proposed Action).

This is the proposed alternative for implementing WDM in Wisconsin. This alternative differs from the No Action Alternative (Alternative 2) because it gives WS greater flexibility in formulating damage management strategies to resolve individual wolf damage complaints as outlined in the WDNR 2007 *Guidelines for Conducting Depredation Control on Wolves in Wisconsin Following Federal Delisting* (Appendix E). A comparison of the differences between this alternative and Alternative 2 are summarized in Table 1-3, Section 1.3.10. As with Alternative 2, WS would be able to use the complete range of lethal and nonlethal WDM techniques. Landowners/managers will be held to the same requirements for farm plans, use of nonlethal methods and fencing standards as are required under Alternative 2. Wildlife Services would continue to assist the WDNR with radio-collaring and monitoring the Wisconsin wolf population and the removal of wolf-dog hybrids from the wild. Landowners, lessees or occupants of private property may kill wolves caught in the act of attacking a domestic animal.

Under this alternative, the distance from wolf depredation sites were WDM could be conducted would vary depending on the Wolf Management Zone (Table 1.4). The WDNR, in consultation with the tribes, land owners/managers, WS and GLIFWC, as appropriate, could also alter the area where WDM may be conducted on a case-by-case basis if there is evidence available that delineates the packs territory and available information indicated that members of non-depredating packs would not be impacted (Appendix E). Unlike Alternative 2, there are no special provisions for protecting lactating females and wolf pups.

As with Alternative 2, the WDNR may establish Proactive Control Areas and issue permits to trap or shoot wolves to landowners (or their designated agents) within Proactive Control Areas who have domestic animals at risk of wolf predation. Unlike Alternative 2, WS would be involved in the decision-making process for the establishment of Proactive Control Areas and would be able to conduct Lethal PWDM in Proactive Control Areas as described in Section 1.3.12.

Most WDM would be conducted on private lands; however, there would probably be more WDM work conducted on public lands under this alternative than under Alternative 2. The increase in work on public land would result from the increased distances from the damage location where WDM may be conducted. Trapping is limited to 1 mile from depredation sites in Zones 1 and 2, 5 miles from depredation sites in Zone 3, and there are no distance restrictions in Zone 4. If information exists for the home range of the depredating pack, the trapping distance may be extended in Zones 1 and 2 to encompass more of the wolf packs territory. Most farms with chronic wolf depredations occur near large blocks of public lands that contain suitable wolf habitat. Because trapping distances from damage sites are greater under this Alternative, implementing lethal WDM would occur more frequently on public lands. As with Alternative 2, Wolf trapping and radio-collaring for wolf population monitoring would usually be conducted on public land. WS WDM would only be conducted on public lands after notification of the land manager. Signs would be posted at public access points to areas where foot-hold traps or cable restraints are to be used.

3.1.4 Alternative 4 - No Federal WDM in Wisconsin.

If this alternative is selected, WS would not provide any assistance with wolf damage and conflict management in Wisconsin. All requests for WDM would be referred to the WDNR or the tribes as appropriate. The WDNR has stated that it intends to implement the WWMP (WDNR 1999, 2007*b*) and Wisconsin Wolf Damage Management Guidelines (Appendix E) similar to

Alternative 3 with or without assistance from WS. If permitted by the USFS, WDNR could work within the expanded damage management perimiters on public land adjacent to depredation sites.

3.2 WOLF DAMAGE MANAGEMENT STRATEGIES AND METHODOLOGIES

Wildlife damage management is defined as the alleviation of damage or other problems caused by or related to the presence of wildlife (USDA 1997 Revised). A general description of the wildlife damage management approaches that could be used is provided below:

3.2.1 Integrated Wildlife Damage Management

During more than 80 years of resolving wildlife damage problems, WS has considered, developed, and used numerous methods for reducing wildlife damage problems (USDA 1997 Revised). Wildlife Services' efforts have involved the research and development of new methods, improvement of existing methods, and the implementation of effective strategies to resolve and prevent wildlife damage. The Wisconsin WS program works closely with the researchers with the USDA, APHIS, WS, National Wildlife Research Center (NWRC). The NWRC is the research arm of the WS program. The NWRC Research Station at Utah State University is the leading predator research complex in the world. Scientists assigned to the facility are dedicated to the WS operational program. Research at this facility has been critical to the testing and development of nonlethal methods of WDM, and has improved the selectivity, humaneness and efficacy of capture devices (Appendix B). State WS programs assist the NWRC with research projects and, because of the close collaboration between NWRC and the state programs, the latest research findings are rapidly incorporated into state damage management programs. The WDNR also conducts research on the efficacy and impacts of WDM methods.

Usually, the most effective approach to resolve wildlife damage is to integrate the use of several methods simultaneously or sequentially. Integrated Wildlife Damage Management (IWDM) is the implementation and application of safe and practical methods for the prevention and reduction of damage caused by wildlife based on local problem analyses and the informed judgment of trained personnel. The WS Program applies IWDM, commonly known as Integrated Pest Management (IPM), to reduce damage by applying the Decision Model discussed in section 3.2.3 to develop site-specific management strategies (Slate et al. 1992). The philosophy behind IWDM is to implement effective management techniques in the most cost-effective[9] manner possible while minimizing the potentially harmful effects to humans, target and nontarget species, and the environment.

IWDM draws from the largest possible array of options to create a combination of techniques for the specific situations. IWDM may incorporate cultural practices, habitat modification, animal behavior modification, removal of individual animals, local population reduction, or any combination of these, depending on the characteristics of the specific damage problems.

3.2.2 Integrated WDM Strategies

3.2.2.1 **Technical Assistance Recommendations** (implementation is the responsibility of the requester):

[9] The cost of control may be a secondary concern because of overriding environmental, social, biological, health and legal considerations.

Technical assistance includes demonstrations on the proper use of some management devices (e.g., propane exploders, electronic guards, etc.) and information on animal husbandry, wildlife habits, habitat management and animal behavior modification. Technical assistance is generally provided following an on-site visit or verbal consultation with the requester. Typically, several management strategies are described to the requester for short and long-term solutions to damage problems; these strategies are based on the level of risk, need and practical application. Technical assistance may require substantial effort by agency personnel in the decision making process, but the actual implementation is the responsibility of the requester. Technical assistance also includes site visits and verification of the cause of damage as may be necessary for compensation and financial assistance (for WDM prevention equipment) programs.

Education is an important element of program activities because wildlife damage management is about finding "balance" or coexistence between the needs of people and needs of wildlife. This is extremely challenging as nature is not in static balance, but rather, is in continual flux. In addition to the routine dissemination of recommendations and information to individuals or organizations sustaining damage, lectures and demonstrations are provided to farmers, homeowners, and other interested groups. Wildlife Services frequently cooperates with other agencies in education and public information efforts. Education and public outreach activities by the WDNR and WS include a pamphlet for farmers, “Wolves and Farm Country”, (http://dnr.wi.gov/org/land/er/mammals/wolf/wolvesinfarms.htm), a pamphlet for hunters who hunt with dogs (http://dnr.wi.gov/org/land/er/mammals/wolf/ wolfhuntdog.htm), and periodic new releases, and presentations to farmers and hunters by DNR & WS. Additionally, technical papers are presented at professional meetings and conferences so that WS personnel, other wildlife professionals, and the public are updated on recent developments in damage management technology, laws and regulations, and agency policies.

3.2.2.2 Operational Damage Management:

Situations in which the WS specialist conducts the WDM activity are referred to as Operational damage management. WS specialists provide operational assistance when the problem cannot be resolved through technical assistance. The initial investigation defines the nature and history of the problem, extent of damage, and verifies whether or not the problem is caused by wolves. Professional assistance is often required to resolve problems effectively, especially if the problem is complex, or the management technique requires the direct supervision by or involvement of a WDM professional. Wolf biology and behavior and other factors are considered (WS Decision Model; Slate et al 1992) when developing site specific damage management strategies.

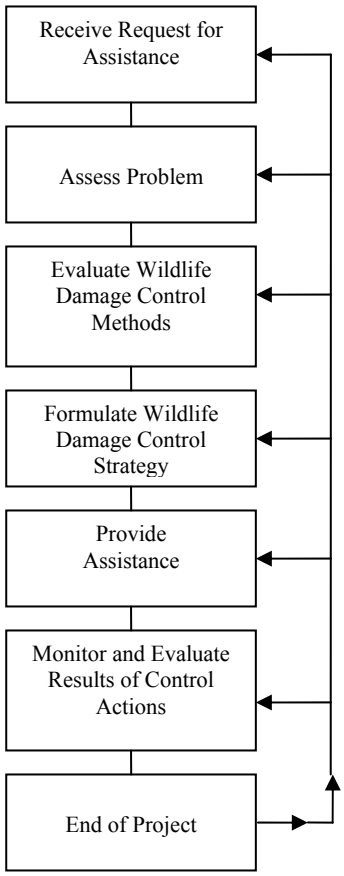
3.2.3 Wildlife Services Decision Model used for Decision Making.

WS and WDNR personnel use a thought process for evaluating and responding to damage complaints that is depicted by the WS Decision Model described by Slate et al. (1992) (Figure 3-1). The Decision Model is not a written documented process, but a mental problem-solving process similar to that used by all wildlife management professionals when addressing a wildlife damage problem. Trained personnel assess the problem, and evaluate the appropriateness and availability (legal and administrative) of damage management strategies and methods based on biological, economic and social considerations including:

- Species responsible for the damage (did wolves cause the problem or was it some other species?)
- Magnitude, geographic extent, frequency, historical damage and duration of the problem including review of animal husbandry practices and producer efforts at nonlethal WDM.
- Status of target and nontarget species, including T/E species
- Local environmental conditions
- Potential biological, physical, economic, and social impacts
- Potential legal restrictions
- Costs of damage management[10]

Following this evaluation, methods deemed to be practical for the situation are incorporated into a management strategy. After this strategy has been implemented, monitoring is conducted and evaluation continues to assess the effectiveness of the strategy. If the strategy is effective, the need for further management is ended. When damage continues intermittently over time, WS and/or WDNR personnel and the requester monitor and reevaluate the situation. If one method or a combination of methods fails to stop damage, a different strategy is implemented. In terms of the WS Decision Model (Slate et al. 1992), most damage management efforts consist of a continuous feedback loop between receiving the request and monitoring the results, with the damage management strategy reevaluated and revised periodically if necessary.

Figure 3-1. APHIS, WS Decision Model



3.2.4 Local Decision Making Process

The WDM program in Wisconsin follows the "co-managerial approach" to solve wildlife damage or conflicts as described by Decker and Chase (1997). Within this management model, trained personnel provide technical assistance regarding the biology and ecology of wolves and effective, practical, and reasonable methods available to the local decision maker(s) to reduce wildlife damage. These decision makers may include community leaders, private property owners/managers, and public property owners/managers. This includes nonlethal and lethal methods. Technical assistance on alleviating damage caused by wolves is also available from other State, Federal, and private organizations. Wildlife Services and other State and Federal wildlife or wildlife damage management agencies may facilitate discussions at local community meetings when resources are available, and make recommendations. Resource owners and others directly affected by wolf damage or conflicts have direct input into the strategies to resolve the problem(s). They may implement management recommendations provided by WS or others, or may request management assistance from WS, other wildlife management agencies, local animal

[10] The cost of management may sometimes be secondary because of overriding environmental, legal, public health and safety, animal welfare or other concerns.

control agencies, or private businesses or organizations. Local decision makers compare the benefits versus the damage when deciding which methods would be implemented. Local decision makers must weigh the cost of implementing each methodology or a series of methodologies. These decision makers may include community leaders, private property owners/managers, and public property owners/managers.

3.3 WOLF DAMAGE MANAGEMENT METHODS

USDA (1997 Revised, Appendix J) describes some methods currently available for WDM. Several of these were considered in this assessment because of their potential use in reducing wolf damage to agricultural and natural resources, property and pets, and human health and safety. A listing and more detailed description of the methods used for WDM is found in Appendix B of this EA.

A farm plan would be developed upon the first investigation of depredation by wolves. The plan includes recommendations for suitable nonlethal methods and other practices which may reduce depredation on the farm. A signed plan is required before any operational WDM could be conducted on the farm. In Wisconsin, a compensation program is available to cover cost of livestock lost to wolf depredation and veterinary bills for injured animals. A limited amount of financial assistance is available from WDNR to help producers pay for abatement practices when feasible. In some cases, financial assistance may also be available from private programs like the Defenders of Wildlife, Bailey Wildife Foundation Proactive Carnivore Conservation Fund.

3.3.1 NonLethal Methods Available to All

Some WDM methods are available to anyone. These consist primarily of nonlethal preventive methods such as cultural practices and habitat modification. Cultural practices and other management techniques are implemented by the domestic animal owner and property owners/managers. Livestock producers and property owners/managers may be encouraged to use these methods, based on the level of risk, need, and professional judgment on their effectiveness and practicality. Wildlife Services and WDNR involvement in the use of these methods is usually limited to providing technical assistance. As noted above, a State compensation program pays for the cost of animals lost to wolf depredation and veterinary bills for injured animals. The WMMP (WDNR 1999, 2007*b*) requires that before compensation can be given or lethal control can be used to address confirmed depredation problems, the producer has to sign a depredation management plan for the property and follow abatement/husbandry recommendations.

Farm Management Practices implemented by livestock producers to prevent or reduce wolf damage might include: 1) maintaining healthy, well-fed animals, 2) pregnancy testing cattle, 3) properly disposing of dead livestock carcasses through rendering, burying, liming, or burning, 4) conducting calving or lambing operations in close proximity to the farmyard, when practical, 5) penning vulnerable livestock at night where practical, 6) monitoring livestock on a regular basis to detect any disease, natural mortality, or predation, and 7) incorporating nonlethal methods. Property owners and land managers could implement their own farm management practices or request the assistance of other agencies or private organizations to implement them, or take no action.

Exclusion may be used to prevent or limit access by predators to livestock pastures, calving or lambing areas, or livestock confinement areas. Several designs of anti-predator fencing have been developed and tested. Where practical and cost effective, sheep, calves or other vulnerable livestock may be penned near farm buildings at night.

Fladry involves installing waving flags hanging about every 20 inches from thin rope or cable stretched about 30 inches above the ground. Fladry is installed around pastures or other areas where livestock are confined preventing or limiting wolf access to these areas.

Livestock guarding animals such as guarding dogs or llamas may be used to protect livestock from wolves. Livestock guarding animals may distract, deter, repel, or attack wolves that could depredate livestock.

Guarding and hazing involves guarding an area and then using pyrotechnics or other light/noisemaking devices to frighten wolves away from the site. It can be used as an aversive technique, but requires that the projectiles must be used every time the animal attempts to prey on the protected resource so they don't identify conditions when they can obtain prey without receiving a negative experience (Shivik 2004).

Frightening devices are methods that usually involve a light, sound, or motion device designed to deter wolves from a certain area. Strobe and flashing lights, propane exploders, sirens, and various combinations of these devices have all been used in attempts to reduce livestock losses to coyote, with wide ranging degrees of effectiveness (Linhart 1984*a*, Andelt 1987). Animal habituation (becoming accustomed) to the stimulus is one of the primary limiting factors for primary repellents. Moving the devices intermittently and randomly as well as alternating the stimuli (e.g. a different type of noise or light) may extend the effective period of the system (Shivik and Martin 2001). The period of efficacy may also be extended by using systems which are motion activated or only activated when a wolf wearing a transmitter collar comes into close proximity to the protected site (Appendix B). Systems which require capturing the wolf and installing a special transmitter collar to activate the device require specialized training and experience are not included in the methods available to anyone (Section 3.3.2).

Compensation for wolf damage in the form of monetary payments to livestock producers for full or partial value for domestic animals killed. Such payments are made by the WDNR for reimbursements for all verified wolf losses (confirmed or probable) on domestic animals. The Wisconsin wolf damage compensation program is funded by 3% of the state income tax return checkoff and 3% of license plate fees collected from the sale of endangered resources license plates. In some years the claims for wolf damage have exceeded the resources available from license plate revenue. Because the WDNR has been directed by the legislature to provide full compensation for wolf depredations, the WDNR Bureau of Endangered Resources has been forced to use additional program funds to make compensation payments. When this occurs, these funds are made available at a cost to other endangered species programs.

3.3.2 Nonlethal Methods Available to WS, the WDNR and Tribes

Some nonlethal methods and research projects (e.g., population monitoring) involve capture and handling wolves which may not be implemented by the general public. Methods that require capture and handling of live wolves would be conducted only by personnel from the WDNR, WS or other appropriately trained agents designated by WDNR and tribal biologists .

Frightening Devices that require placing a transmitter collar on a wolf are available to the WDNR and their designated agents. Overall efficacy and the period of efficacy of frightening devices may be improved by using systems which are motion activated or only activated when a wolf wearing a transmitter collar comes into close proximity to the protected site (e.g., a Radio

Activated Guard; Appendix B). Methods that do not require placing a transmitter collar or similar device on the wolf are available to anyone without a permit (Section 3.3.1).

Capture and relocation of problem wildlife species is a technique that is sometimes used to alleviate wildlife damage problems. The success of a relocation effort, however, depends on the potential for the problem individuals to be captured efficiently and the existence of an appropriate relocation site (Nielsen 1988). While relocation may be appropriate in some situations when the species population is small, wolves are found in much of the suitable habitat in Wisconsin and relocation is not necessary for the maintenance of viable populations. Wolves relocated into suitable habitat are very likely to encounter other wolves with established territories. Wolves are highly territorial and the newly introduced wolves may trespass into already established wolf territories and be attacked and killed by the resident pack (Mech 1970).

Relocated wolves may also disperse long distances from the release site (Fritts 1984, Bradley et al. 2005). Relocated wolves can return to damage sites from which they were removed (Fritts et. al. 1984), or after dispersal movements, cause damage problems at the dispersal site (Bradley et al. 2005). Fritts et al. (1984) who analyzed the fate of translocated wolves in Minnesota concluded that translocation was unsuccessful because all wolves traveled away from the release sites, some traveled through agriculture areas, and 42% of wolves with a known fate were recaptured at depredations sites. In the Northern Rockies, 27% of translocated wolves again caused depredations, and only 33% joined or formed new packs (Bradley et al. 2005). In this case, the original damage problem has simply been shifted from one property to another.

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, Sawyer, and Taylor Counties, and the Town of Mason in Bayfield County, have passed resolutions against release of problem wolves. These resolutions are not legally binding on the WDNR, but do serve as an indication of public sentiment toward and tolerance of wolves. With most suitable wolf habitat occupied by wolf packs, the Wisconsin DNR currently has limited places to relocate problem wolves and has not relocated wolves since 2002.

> ***Foot-hold traps*** can be effectively used to live capture wolves. When used as a live-capture device, wolves are either physcially restrained, chemically anestized and released on site (e.g., after receiving a radio-collar for research and monitoring) or may be relocated (see relocation above). Wolves live-captured by this method may also be euthanized (Section 3.3.4). Effective trap placement, pan-tension devices, and the selection and placement of appropriate lures and baits by trained WS personnel contribute to the foot-hold trap's selectivity. WS policy requires that foot-hold traps used for WDM have offset and laminated jaws or padded jaws to reduce foot injury to captured wolves (WS Policy Manual, WS Directive 2.335-Wolf Damage Management). Trap jaws may also be designed with protrusions often called "buttons" which may reduce trap related injury.
>
> ***Foot snares*** are devices consisting of a cable loop and a locking device that captures an animal around their foot or lower leg. The cable may be activated around the lower leg with a spring (Aldrich) or trap-type (Belisle) device. The foot snare can be modified with a stop on the cable. Careful snare placement, pan-tension devices, and the selection and placement of appropriate lures and baits by trained WS personnel contribute to the selectivity of this device. As with foot-hold traps, when foot snares are used as a live-

capture device, wolves are either released on site (e.g., after receiving a radio-collar for research and monitoring) or may be relocated (see relocation above). Wolves live-captured by this method may also be be euthanized (Section 3.3.2).

Dart guns are nonlethal capture devices that utilize a dart filled with tranquilizer fired from a specially designed rifle. Once tranquilized, the animal may be handled safely for research or relocation purposes. Under special situations, a tranquilized animal could also be euthanized if lethal removal is warranted. Use of dart guns would have no effect on nontarget species because positive target species identification is made before animals are shot. Thus, WS use of dart guns is expected to continue to be virtually 100% selective for target individuals and species, and would not pose a risk to nontarget species and individuals. Use of dart guns may sometimes be the only control option available if other factors preclude the setting of equipment. All WS staff involved in darting wolves or delivering immobilizing drugs have attended a 3 day accredited training course on immobilizing wildlife and they are required to receive 16 hours of continuing education every 5 years.

Cable restraints are snare-like devices designed to live-capture animals (Olson & Tischaefer, 2004). Cable restraints are being developed for live-trapping wolves and other carnivores (Olson & Tischaefer, 2004). These devices can be fairly selective due to loop size, height placement, and bait types. Appropriate use of lures and baits may also improve the selectivity and efficacy of these devices. Presently in Wisconsin, WS is only allowed to use cable restraints that meet the following criteria: constructed of 1/8" diameter , 7x7 cable, 10 feet or less in length, incorporate a reverse-bend lock with a minimum outside diameter of 1 ¼ inches, incorporate an inline swivel, have a fixed stop 14 inches from the cable end and are staked in such a manner to prevent the captured animal from entangling in rooted vegetation greater than ½ inch in diameter.

3.3.3 Nonlethal Methods which may Require Special Authorization from the WDNR

Some animal behavior modification systems involve capturing wolves and fitting wolves with collars used to deliver or trigger repellent stimuli (i.e., aversive conditioning). Other systems involve shooting wolves with nonlethal projectiles like rubber bullets. These nonlethal techniques involve intentionally using painful stimuli to manage wolf behavior, and the WDNR has determined that, while wolves are protected wild animals permits or other authorizations are required to use these methods and any other experimental WDM techniques. Methods that require capture and handling of wolves would be conducted only by personnel from the WDNR, WS or the tribes. The tribes have authority to use these methods on tribal lands without permission from the WDNR. Similarly, the WDNR may require permits for the development and testing of new WDM techniques.

Aversive Stimuli are stimuli that cause discomfort, pain and/or an otherwise negative experience paired with specific behaviors to achieve conditioning against these behaviors. One example would be using something like a dog training shock collar that is activated when wolves came into close proximity to a protected area such as livestock pens (Schultz et al. 2005).

Nonlethal Projectiles This involves guarding an area and then using rubber bullets or other nonlethal projectiles to prevent a predation event. It can be used as an aversive technique, but requires that the projectiles must be used every time the animal attempts to prey on the protected resource so they don't identify conditions when they can obtain prey without receiving a negative experience (Shivik 2004). Methods which require around-the-clock presence of a person to guard

the resource are most efficiently used when the landowner/resource manager assists with the implementation. The WDNR may agree to allow the use of these methods and WS to train and authorize private individuals to use this method.

3.3.4 Lethal Methods[11]:

These methods are specifically designed to lethally remove wolves in certain situations to stabilize, reduce, or eliminate damage. The amount of removal necessary to achieve a reduction in wolf damage varies according to the effectiveness of other damage management strategies, the damage situation, and the level and likelihood of continued depredations. Under alternative 2, WS would use WWMP (1999, 2006) and the *Guidelines for Conducting Depredation Control on Wolves in Wisconsin Following Federal Delisting* (2005 guidelines, May 24, 2007) to determine when lethal control can be used. However non-WS entities including the WDNR would use the criteria established by the WWMP (1999, 2006) and the *Guidelines for Conducting Depredation Control on Wolves in Wisconsin Following Federal Delisting* (2007 guidelines, May 24, 2007) (Appendix E) to determine when lethal control can be used. Under Alternative 3, WS and all non-WS entities would use lethal WDM in accordance with the 2007 guidelines). Under any of the Alternatives, private individuals may shoot a wolf in the act of attacking a domestic animal. Private individuals may also be issued permits to shoot or trap wolves in Proactive Control Areas established by the WDNR. The lethal WDM techniques that would be available to WS do not differ between alternatives 2 and 3 and are described below.

Shooting is selective for the target species and involves using firearms with or without night vision equipment, or a firearm may be used to euthanize live-captured wolves. In conjuction with shooting, calling is sometimes used to attract wolves within range of firearms.

Cable restraints and Snares are devices consisting of a cable loop and a locking device that are placed in travel ways. Cable restraints are a specialized form of snare designed specifically to live-capture animals (see also Section 3.3.2).

Foot-hold traps and foot snares are discussed in Section 3.3.2. When used as a lethal damage management technique, captured wolves are euthanized via shooting or administration of sodium phenobarbitol.

Dart guns are nonlethal capture devices that utilize a dart filled with tranquilizer fired from a specially designed rifle (see also Section 3.3.2). Under special situations, a tranquilized animal could also be euthanized if lethal removal is warranted.

Sodium Pentobarbital (Beuthanasia-D) is registered for euthanasia of dogs, but legally may be used on other animals if the animal is not intended for human consumption. Barbiturates depress the central nervous system in descending order, beginning with the cerebral cortex, with unconsciousness progressing to death. The primary advantage of barbiturates is the speed of action on the animal. Barbiturates induce euthanasia smoothly, with minimal discomfort to the animal (AVMA 1993) after an animal has been anesthetized.

[11] No toxicants are currently registered by the United States Environmental Protection Agency for wolf damage management in Wisconsin.

3.4 ALTERNATIVES CONSIDERED BUT NOT IN DETAIL, WITH RATIONALE

3.4.1 Bounties

Payment of funds for killing wildlife (bounties) suspected of causing economic losses is not considered effective to reduce wolf damage at this time. This alternative will not be considered in detail because:

- The WDNR has not authorized a bounty program for wolves.
- Bounties are generally not as effective in reducing damage because depredating individuals/local populations are not specifically targeted.
- Circumstances surrounding take of animals is largely unregulated.
- No effective process exists to prevent taking of animals from outside the damage management area for compensation purposes.

3.4.2 Eradication and Suppression

An eradication alternative would direct all WS program efforts toward planned, total elimination of wolves. This alternative will not be considered in detail because:

- The attempted eradication of established wolf populations is contrary to state and federal efforts to protect and conserve wildlife.

- Eradication of wolves is not acceptable to most members of the public. It is also not realistic, practical, or allowable under present WS policy to consider large-scale population suppression.

3.4.3 Damage Management through Birth Control

Under this alternative, wolf populations would be managed through the use of contraceptives. Wolves would be sterilized or contraceptives administered to limit their ability to produce offspring. A wolf contraceptive, chemosterilant or immunocontraceptive, if delivered to a sufficient number of individuals, could temporarily suppress local breeding populations by inhibiting reproduction. Additionally, there are no approved chemical or biological contraceptive agents for wolves.

Reduction of local populations would result from natural mortality and inhibited reproduction. No wolves would be killed directly with this method; however, treated wolves may continue to cause damage, but probably at a lower rate, because there would be no pups to feed.

Contraceptive measures for mammals can be grouped into four categories: surgical sterilization, oral contraception, hormone implantation, and immunocontraception (the use of contraceptive vaccines). These techniques would require that wolves receive either single, multiple, or possibly daily treatment to successfully prevent conception. The use of this method would be subject to approval by Federal and State Agencies. This alternative is limited because: (1) it may take a number of years of implementation before the wolf population would decline, and, damage may continue for a number of years; (2) surgical sterilization would have to be conducted by licensed veterinarians, which would therefore be extremely expensive; (3) it is difficult to effectively live trap or chemically capture the number of wolves that would need to be sterilized in order to effect an eventual decline in the population; (4) no chemical or biological agents for contracepting

wolves have been approved for use by State and Federal regulatory authorities. (5) sterilization or other forms of fertility control have an unknown impact on wolf social structure (Haber 1996), and (6) the impacts of this method could have devastating effects if a widespread disease began causing additive mortality to the wolf population.

Sterilization may be useful as an experimental technique to reduce depredation in some highly specialized situations in the future. In coyotes, breeding pairs with pups are most likely to depredate on sheep (Till and Knowlton 1983, Till 1992, Bromley and Gese 2001, Blejwas et al. 2002), and the same may be true for wolves and cattle (A. P. Wydeven, WDNR, pers. comm. 2003). Sterilized coyote (Bromley and Gese 2001) and wolf (Mech et al. 1996) packs continue to maintain territories, and do not seem to adversely affect survival of sterilized adults. In chronic areas, sterilization may reduce the need to remove problem wolves by keeping the wolf population low, and eliminating pup production (Haight and Mech 1997). Sterilization continues to be experimental and would only be done after approval from State and Federal regulatory agencies and if it can be carefully monitored.

Sterilization is not being used for WDM at this time, and would normally only be done as part of an experimental procedure, in which careful monitoring is done of the treated wolves. Any attempts to sterilize wolves would be initiated by and coordinated with WDNR.

3.4.4 Nonlethal before Lethal

Under this alternative, lethal techniques would not be used unless all reasonable nonlethal methods had been tried and failed to reduce damage. This alternative was not considered in detail because, the proposed alternative, Integrated Wolf Damage Management, as outlined in the EA is similar to a nonlethal before lethal alternative because WS and WDNR would encourage and consider the use of nonlethal methods before lethal methods (WS Directive 2.101, WDNR 1999). The WWMP further states that lethal WDM methods can only be used if the producer has a signed depredation management plan for the property and follows abatement/husbandry recommendations. Therefore, adding a nonlethal before lethal alternative and the associated analysis would not add additional information to the analysis for the public or decision maker.

3.4.5 Agencies Exhaust All Nonlethal Methods Before Attempting Lethal Methods.

Under the alternative all nonlethal methods would have to be attempted and proven ineffective prior to using lethal WDM methods even though, in the professional judgment of WS and WDNR personnel, some methods that would have to be attempted would be impractical (e.g., would incur costs in excess of value of stock protected), inappropriate (e.g., use of a light siren device in areas near other residences) or likely to be ineffective for the particular situation (e.g., situations where animal appears to have habituated to human activity). This alternative will not be addressed in detail for a number of reasons including that: 1) time and resources of agencies and individuals experiencing damage may be unnecessarily expended for purpose of proving methods ineffective; 2) The potential that additional losses could be incurred by animal owners while experimenting with nonlethal methods may be unacceptable to some and would likely result in an increase in individuals seeking to solve their own problems instead of working with the lead or cooperating agencies; and 3) experimenting with nonlethal approaches may not be the most appropriate answer in the rare instance of a wolf-related risk to human safety.

3.4.6 Lethal Only Program

Under this alternative, the WDNR and WS would only provide technical and operational assistance with lethal damage management techniques. Prohibiting the WDNR and WS from using or providing technical assistance on effective and practical nonlethal WDM alternatives is not in the best interest of the continued recovery of the species, is contrary to agency policy and directives (WS Directive 2.101), and will not be discussed further. In certain situations, nonlethal methods may provide a more effective long term solution to wolf damage problems than lethal methods.

3.4.7 Technical Assistance Only.

Under this alternative, WS would not conduct operational WDM in Wisconsin but could provide information to complainants about methods or techniques they could use to reduce wolf conflicts. Wildlife Services would also be able to conduct investigations of potential wolf depredation sites as required to administer the wolf damage compensation program. The WWMP was developed by the WDNR which has stated that it is committed to implementing the plan with or without operational assistance from WS. The WDNR could still use and authorize others to use nonlethal and lethal WDM techniques. Consequently, the environmental impacts of this alternative would be similar to impacts of Alternative 1, Nonlethal WDM. Consequently, the agencies have determined that detailed analysis of this alternative would not contribute substantive new information to the understanding of environmental impacts of damage management alternatives and have chosen to not analyze this alternative in detail.

3.4.8 Agencies should consider modified version of Alternative 2 that would require sequential use of nonlethal methods that starts with the least invasive to wolves and escalates to more invasive methods like nonlethal projectiles only if less invasive methods are proven ineffective should be used. Relocation should only be used as method of last resort. Using soft-release of relocated family groups would increase survivorship and decrease homing behavior of relocated individuals.

Appropriate WDM methods need to be used quickly and effectively. A gradual escalation can be costly, logistically difficult, very frustrating to producers, and may allow wolves to learn to adapt to frightening devices and become more effective predators on domestic animals. The WDM methods used should be the ones most likely to be effective based on landscape features, pack depredation history, logistical constraints, local wolf behavior, preference for practical and effective nonlethal methods, potential for a long-term solution, and experience and training of WS wildlife specialists. We agree that relocations should be used as a last resort and that soft-release practices may reduce some of the problems with relocation. However, habitat in areas where wolves would be less likely to cause problems with people is mostly saturated, and few places exist where wolves can be released in Wisconsin. We expect this practice to rarely be used in Wisconsin.

3.4.9 Agencies should consider using the minimally invasive capture system developed by the Eurasian lynx researchers in Switzerland. This system is accurate and has no effect on nontarget species. It also eliminates human interaction with conscious wolves so animals and handlers are at less risk of injury.

The method is currently too experimental to broadly apply. The MICS basically consists of a teleguided dart-gun used in conjunction with two cameras and a remote control system via radio-signal. Initial review of the system indicates that the estimated cost to produce such a unit is

approximately $4,000, and requires someone to be onsite during the capture event monitoring the scene in order to activate the dart gun. Based on WS and WDNR experience with wolf damage in Wisconsin, during some parts of the year multiple units would be needed at the same time. While this may work for more limited research applications, for WDM in Wisconsin this method is cost prohibitive, would require an inordinate amount of personnel time to monitor. In addition, it would appear that the target animal has to be conditioned to come to bait site. Wolves often visit farms infrequently or randomly making the utilization of this method for wild wolves impractical if they were not conditioned to a specific location. WS and DNR are interested in learning new methods as they become available, and will continue to monitor the development of this technique.

3.4.10 Agencies Should Encourage Producers to Take Action to Prevent Wolf Depredation from Occurring. Agencies Should Provide Funding for Damage Prevention Supplies and Equipment

WS routinely implements nonlethal abatement on farms prior to depredations occurring when wolves are present near cattle and calves. WS and the WDNR also routinely give talks and present materials to the public on ways to prevent conflicts with wolves (Section 3.2.2.1). During the past 3 years (2005 - 2007) WS has installed fladry, electronic guards and flashing lights on more than 30 different farms. The efficacy of some nonlethal methods declines as cattle are released onto grazing pastures and the herd begins to separate over a much larger area. WS provides literature and when applicable recommends the use of livestock guard animals. WS has referred several farmers to a reputable livestock guard dog owner for advice or purchase of guard dogs.

The agencies strive to prevent wolf damage and wolf damage management from becoming an undue burden on individual producers. However, there is a limit to the state's funding for WDM and most funds available for landowner assistance are used for the compensation program. In some instances the state has been able to provide limited assistance with damage prevention materials. WS and WDNR are aware of the Defenders of Wildlife, Bailey Wildlife Foundation Proactive Carnivore Conservation Fund and have worked with the organization to provide assistance for Wisconsin livestock producers. The Fund has provided donkeys, guard dogs, and alternate watering sources for Wisconsin livestock producers. Defenders of Wildlife has also provided funding for fladry in Wisconsin. WDNR and WS will continue to explore new control methods and alternate funding forces and will examine whether there would be possible resources available to WI producers in this program.

3.4.11 Wolf Damage Should be Managed by Hunters and Trappers

Now that wolves have been removed from the federal list of threatened and endangered species, the WDNR and tribes have authority to determine the role of hunters and trappers in wolf damage management. The WDNR has established its strategy for addressing wolf damage and conflicts in the WWMP and associated guidelines for wolf damage management (WDNR 1999, 2007*b*; Appendix E). There are no immediate plans to develop a public hunting and trapping season for wolves.

Other difficulties with the use of hunters and trappers include that they do not always have the time, resources, or training to promptly respond to site specific damage problems with wolves. Additionally, most WDM activities are conducted from April through September when pelts are not in prime condition which reduces the incentive for private hunters and trappers to participate in WDM. Also, wolves that are lethally taken by private citizens that have been issued permits to

trap or shoot wolves for depredation management have to surrender the carcass to the WDNR.

Wildlife Services provides professional wildlife damage management services at site-specific locations when requested by citizens and/or agencies experiencing a wildlife-human conflict. Wildlife Services personnel respond to requests for assistance in accordance with the Congressional direction provided to WS that authorizes the program. WS would be acting as agents of the WDNR when conducting WDM activities.

3.5 STANDARD OPERATING PROCEDURES FOR WILDLIFE DAMAGE MANAGEMENT TECHNIQUES

Standard Operating Procedures (SOPs) improve the safety, selectivity and efficacy of wildlife damage management techniques. SOPs used by the WS program are discussed in detail in USDA (1997 Revised, Chapter 5). The following SOPs apply to some or all of the alternatives, as indicated in the columns. These SOPs only describe actions by WS and do not include actions by WDNR. In some cases, if an action is not taken by WS, it may be implemented by the WDNR.

- Alternative 1. Nonlethal Damage Management.
- Alternative 2. Integrated WDM (No Action)
- Alternative 3. Revised Integrated WDM (Proposed Action)
- Alternative 4. No Federal WS WDM in Wisconsin

Standard Operating Procedures by Alternative	1	2	3	4
General Procedures and Conditions for Conducting WDM				
WS WDM would follow guidelines as specified and agreed upon in MOUs, the WWMP, and the WDNR Guidelines for Conducting Depredation Control.	X	X	X	
WS would conduct wolf damage management only when and where a need exists.	X	X	X	
WS could use lethal methods to take wolves in cases of non-immediate but demonstrable threats to human safety.		X	X	
Wolf-dog hybrids could be killed by WS if they appear to be living in the wild and are unmarked or they would be held in captivity for 14 days if they are marked and an attempt to locate the owner would be made. If no owner is identified with 14 days wolf-dogs hybrids would be euthanized.		X	X	
Lethal methods would not be used when wolves kill dogs that are free-roaming, hunting, or training on public lands.	X	X	X	X
WS would not initiate use of lethal WDM methods until a farm management plan has been signed by the producer.		X	X	

Standard Operating Procedures by Alternative	1	2	3	4
If a verified depredation has not occurred in the current calendar year, WS would only use lethal control when all of the following conditions are met: 1) verified depredation occurred at the site or in the immediate vicinity during the previous two years; 2) there is at least one chronic farm or two farms that have had depredations in the previous two years; 3) trapping is conducted in a location and in a manner to minimize the likelihood a wolf or wolves from a non-depredating pack is captured; 4) members of the same wolf pack remain in the area, and 5) there is a likelihood that depredations will occur.		X		
The development of Proactive Control Areas will include consultation between the WDNR wolf program coordinator, WS, GLIFWC (if in ceded territory), WDNR local wildlife biologist and tribal biologist if within 6 miles of a Reservation.			X	
Proactive Control Areas will be assessed annually to determine if they should be renewed or discontinued based on wolf presence and depredation trends after annual wolf population counts have been completed.			X	
Lethal depredation control activities would occur within specific distances of the depredation site as specified by the WDNR.		X	X	
All wolf related mortalities while conducting WDM and wolf population monitoring trapping will be reported to the WDNR' wolf program coordinator. While wolves are being monitored by the USFWS after delisting, the USFWS delisting coordinator will be notified of annual wolf mortalities related to WDM or wolf trapping for population monitoring.	X	X	X	
Wolves or wolf parts taken during WDM may be transferred to Native Americans for religious and/or cultural purposes, public educational use, or scientific research purposes. Specimens not suitable, or not needed, for such use will be destroyed or turned over to the WDNR.		X	X	
Animal Welfare and Humaneness of Methods Used by WS				
Nonlethal WDM methods such as guard dogs, scare devices, fladry and other methods, would be used and encouraged when appropriate.	X	X	X	
WS could authorize and train landowners and resource managers in the safe and effective use of nonlethal projectiles. These methods would not be available to landowners and resource managers without specific authorization from the WDNR and training from WDNR and/or WS personnel.	X	X	X	
Wolf capture, handling, and euthanizing (if permitted) would be carried out in a humane manner which may include the use of foot-hold traps, cable restraints, snares, shooting, calling and shooting, and lethal injection.	X	X	X	
Traps, snares, and cable restraints would be checked consistent with WDNR and WS policy. At present, this includes a requirement that traps be checked at least once every day.	X	X	X	
Research would continue to improve the selectivity and humaneness of management devices and these would be implemented into the WS Program.	X	X	X	

Standard Operating Procedures by Alternative	1	2	3	4
Foot-hold traps would be equipped with pan-tension devices to reduce the incidence of smaller nontarget animal captures.	X	X	X	
All WS Specialists would be trained in the trapping, chemical immobilization, and medical handling of animals, with emphasis on wolves, to minimize accidental injury and death of wolves.	X	X	X	
Nonlethal projectiles (e.g., rubber bullets and bean bag projectiles) may be used if authorized by the WDNR.	X	X	X	
Nonlethal projectiles would not be used in a manner that would cause permanent physical damage or death to a wolf.	X	X	X	
Personnel will be trained in the safe and appropriate use of WDM techniques and equipment.	X	X	X	
Safety Concerns Regarding Use of Traps and Cable Restraints				
The WS' Decision Model, designed to identify the most appropriate wildlife damage management strategies and their impacts, is used.	X	X	X	
Traps, snares, and cable restraints would be placed so that captured animals would not be readily visible.	X	X	X	
Warning signs would be posted on main roads and/or trails leading into any areas where traps, snares, or cable restraints were being used. These signs would be removed at the end of the damage management activities.	X	X	X	
No traps, snares, or cable restraints would be used by WS within 0.25 miles of any residence, community, or developed recreation site, unless granted permission from the owner of a privately-owned property or an official from the appropriate land management agency.	X	X	X	
Concerns About Impacts of WDM Activities on T/E Species, Other Species of Special Concern, and Cumulative Effects.				
Wildlife Services consulted with the USFWS on the impacts of the program to federally listed T/E species in Wisconsin and will adopt all Reasonable and Prudent Measures established by the USFWS for the protection of threatened and endangered species.	X	X	X	
Wildlife Services personnel are directed to resolve depredation problems by taking action against individual problem animals, or local populations or groups.	X	X	X	
Foot-hold traps or spring activated foot snares set near baits would incorporate tension devices to preclude capture of eagles and other nontarget species.	X	X	X	
No foot-hold traps or cable restraints would be set within 30 feet of any exposed bait or animal carcass to prevent capture of raptors.	X	X	X	
No pesticides would be used by WS during WDM operations.	X	X	X	

Standard Operating Procedures by Alternative	1	2	3	4
The appropriate land manager and the USFWS or WDNR, as appropriate, would be notified as soon as possible, if a state or federally listed threatened or endangered species is caught or killed.	X	X	X	
Cultural Resources/Native American Concerns.				
This EA has been provided to the Native American Tribes in a Pre-Decisional form to determine if all cultural issues have been addressed.	X	X	X	X
The Great Lakes Indian Fish and Wildlife Commission was a Consulting Agency in the preparation of this EA.	X	X	X	X
On private lands within recognized reservation boundaries or negotiated buffer zones around recognized reservation boundaries, WS will ask the affected landowner if the appropriate can co-investigate the complaint prior to the WS investigation. If allowed by the landowner, the tribe, at their discretion, may co-investigate the complaint. WS and the tribe will consult regarding a course of action to address or resolve verified wolf complaints on these lands.	X	X	X	
Wildlife Services will comply with requirements for notifying the GLIFWC and the tribes agreed upon by the WDNR.	X	X	X	
Public Land Issues				
On public lands, vehicle use would be limited to existing roads unless authorized by the land management agency.	X	X	X	
Proactive Control Areas will not be established on public land without the consent of the land manager.		X	X	
Proactive Control Areas will not be established in congressionally designated Wilderness Areas or in USFS Wilderness Study Areas	X	X	X	
WS will meet annually with the USFS to develop Work Plans which include delineation of areas where certain methods may not be used, for all or part of the year.	X	X	X	
Public land agencies will review work plans and agreements for control where applicable, for consistency with their land and resource management plans.	X	X	X	
Only WDM for the protection of human health and safety will be conducted in Wilderness Areas and Wilderness Study Areas.				

CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

4.0 INTRODUCTION

Chapter 4 provides information needed for making informed decisions on the WDM objectives outlined in Chapter 1, the issues and affected environment discussed in Chapter 2, and the alternatives discussed in Chapter 3. This chapter analyzes the environmental consequences of each alternative and consists of 1) analysis of environmental consequences, 2) analysis of each alternative against the issues considered in detail, and 3) summary of impacts.

Impacts of the alternatives are compared to the Current Program/ No Action alternative (CEQ 1981). CEQ guidance states that the "No Action" alternative can be defined as being the continuation of current management practices (CEQ 1981). The Current Program/No Action Alternative, has been in effect intermittently since April 2003 with occasional interruptions and changes depending on the legal status of wolves. Data are available on the environmental impacts of the Current Program/No Action Alternative. Therefore, for purposes of analysis we use Alternative 2, as the "No Action" baseline when comparing the other alternatives to determine if the real or potential adverse affects of the alternatives are greater, lesser or the same (Table 4-4).

4.1 SOCIAL AND RECREATIONAL CONCERNS, RESOURCE USE AND IMPACTS ON HISTORIC AND CULTURAL RESOURCES

4.1.1 Social and Recreational Concerns

Social and recreational concerns are discussed throughout the EA, in the WWMP (WDNR 1999, 2007*b*), and in USDA (1997 Revised) whereby pertinent portions have been incorporated by reference. Social and recreational concerns are also addressed in the analysis of impacts on stakeholders, including aesthetics of wildlife, and impacts on humaneness for each of the alternatives analyzed in detail in Section 4.2 of this EA.

4.1.2 Irreversible and Irretrievable Commitments of Resources

The following resource values within Wisconsin would not be adversely impacted by any of the alternatives analyzed in this EA: soils, geology, minerals, water quality/quantity, flood plains, wetlands, visual resources, air quality, prime and unique farmlands, aquatic resources, timber, and range. These will not be analyzed further.

Other than minor uses of fuels for motor vehicles and electrical energy for office maintenance, there are no irreversible or irretrievable commitments of resources. Based on these estimates, the Wisconsin WDM program produces very negligible impacts on the supply of fossil fuels and electrical energy.

4.1.3 Alternative Consistency with Forest Service LRMPs

Before an Alternative can be considered for implementation on National Forest Service (FS) lands, it must be consistent with the land management and/or resource management plans. These are termed Land and Resource Management Plans (LRMP) or more

commonly *"Forest Plans."* If the Alternative is consistent with the LRMP, no additional action would be necessary by the Forest Service.

If an alternative that is inconsistent with the LRMP is selected in the decision process, the Forest Service could amend the LRMP to be consistent with the EA. The decision would not be implemented on the Forest until the inconsistency is resolved either through amendment of the LRMP or modification of the alternative(s). Any inconsistencies would be identified and resolved before the wolf damage management project is conducted. A work plan would be developed by WS with each National Forest before any WDM would be conducted, or in the rare instance, under *emergency control only.* Wolf control trapping on USFS lands in Wisconsin would only be considered after consultation between the FS, WDNR, GLIFWC (if in ceded territory), and WS. Wolf damage management actions will not be conducted in Wilderness Areas or Wilderness Study Areas unless there is a specific threat to human safety.

4.1.4. Impacts on Cultural, Archaeological and Historic Resources

A consultation occurred between WS and WSHPO on February 4, 2002 regarding the actions proposed in the 2004 WS EA on WDM in Wisconsin. It was determined that the *"Project as described will have no effect on significant cultural resources"* and the proposed action does not constitute a "Federal undertaking" as defined under Section 106 of the NHPA (Dexter 2002). Wisconsin WS would, as requested by WSHPO, halt work and contact the WSHPO if any cultural resources or human remains are discovered. The types of actions proposed in this EA are similar to those proposed in the 2004 and 2006 WS wolf damage management EA (USDA 2004). The activities described under any of the proposed alternatives do not cause ground disturbances nor do they otherwise have the potential to significantly affect the visual, audible, or atmospheric elements of historic properties and thus are not undertakings as defined by the NHPA. Wildlife Services has determined that WDM actions are not undertakings as defined by NHPA because such actions do not have potential to result in changes in the character or use of historic properties. Each of the Wisconsin Native American Tribes and GLIFWC were invited to be a cooperating agency in the production of this EA. The GLIFWC and the Wisconsin Ho-Chunk Nation were consulting agencies and have expressed concerns regarding the use of lethal WDM methods. The Lac Du Flambeau Tribe was a consulting agency in the production of the 2006 EA on wolf damage management in Wisconsin and comments and information provided by the Lac Du Flambeau Tribe are also included in this EA.

4.2 ISSUES ANALYZED BY ALTERNATIVES

This section presents the expected consequences of each alternative on each of the issues analyzed in detail.

4.2.1 Alternative 1 - Nonlethal Damage Management Only

Effects on wolf populations. Under this alternative, WS would not use lethal methods for wolf damage management and there would be no intentional take of wolves for depredation management by WS. WS would continue to assist with the compensation program for wolf damage to domestic animals and could conduct nonlethal WDM. With special authorization from WDNR, WS could use nonlethal projectiles, aversive conditioning (e.g., dog training collars), and any other experimental nonlethal WDM

methods. Most nonlethal methods included in this alternative have been and are currently being utilized to reduce wolf depredation on domestic animals in Wisconsin. Improvements in animal husbandry practices and the utilization of other nonlethal WDM methods like livestock guarding animals have the potential to reduce wolf damage and landowners/mangers would be encouraged to implement these techniques if they have not done so already. However, these methods are not always effective. There are also situations where some nonlethal methods are not appropriate (e.g., the use of some noise-making frightening devices may be incompatible with land uses on adjacent properties). Bangs and Shivik (2001) reported that while nonlethal methods can be effective, many were expensive to implement and none available at the time were widely effective. Consequently, there are likely to be situations where the individual(s) experiencing damage would seek damage management alternatives in addition to or instead of those offered by WS.

The selection of this alternative by WS does not mean that lethal WDM would not occur. Wisconsin state law allows individuals to shoot wolves caught in the act of preying on domestic animals on the individual's property (NR10.02). People may also shoot wolves in defense of human life (NR10.02). The WDNR or their designated agents could take wolves in cases of non-immediate but demonstrable threats to human safety. The WDNR, tribes, federal land management agencies, or their designated agents, may take a wolf to aid a sick, injured, or orphaned wolf. In accordance with WDNR regulations and 2007 WDM guidelines, non-WS entities would be allowed to use lethal WDM methods.

If WS selects this alternative, the WDNR has indicated it would implement the lethal portions of its integrated WDM program as described for Alternative 3 and in Section 1.3.12. However, the WDNR has limited financial resources, and, assigning WDNR staff to conduct the lethal portions of their WDM program would likely come at the cost of other programs and projects. This would probably result in a shift of WDNR staff from wolf research and population monitoring to WDM. Wolf research would probably only be conducted to obtain the minimum information necessary to meet USFWS post-delisting monitoring requirements. While biologists with WDNR are trained wildlife management professionals, they do have multiple demands on their time and may not be able to respond to requests for help as promptly as the current WS program. The WDNR could designate other individuals or organizations to serve as agents of the state to aid with lethal WDM projects. The WDNR could also increase use of shooting and trapping permits for people who have lost domestic animals to verified wolf depredations, people with vulnerable domestic animals and livestock within 1 mile of depredation sites, and to people with vulnerable domestic animals and livestock within designated Proactive Control Areas. Permittees and Non-WS entities which may work as designated agents of the state may not have the same training, resources, or access to research assistance as WS, and may also have difficulties in responding promptly to damage problems. Capturing a specific set of wolves associated with a depredation problem can be difficult. Individuals with less experience than WS staff may not be as successful in removing wolves associated with damage problems. The impact of these changes on the wolf population would be that authorized take of wolves for WDM might be lower than for Alternative 2.

Nonlethal methods are not always effective, and funding and time constraints may limit the WDNR's ability to provide timely and effective lethal WDM. This could result in perceived difficulties with WDM assistance which may, in turn, reduce landowner tolerance of wolves and result in a potential increase in use of illegal WDM methods.

Illegal lethal control actions by private individuals are less likely to be very specific or very humane (i.e., poisons), and could potentially have more adverse impacts on the wolf population than focused lethal actions by trained, authorized professionals. Potential for increases in inappropriate/illegal WDM are relatively low for this alternative because WS would still be able to promptly respond to damage complaints and initiate the WDM process. Demands on WDNR resources and potential for problems with dissatisfied individuals would be less under this alternative than with Alternative 4 where the WDNR would provide all WDM assistance and are greater than Alternatives 2 and 3 wherein WS would be able to provide assistance with some or all components of WDM.

Use of techniques like nonlethal projectiles, aversive conditioning (e.g., dog training collars), and disruptive stimuli (remote activated frightening devices, fladry and guarding-and-hazing) by WS is likely to be slightly higher under this Alternative than Alternatives 2 and 3 because WS may be trying these techniques in situations where a lethal method might have been the preferred technique for resolving a damage problem. However, the increase will likely be relatively minor, because situations warranting the use of lethal methods would be referred to the WDNR. Any activity that involves the capture and handling of wolves involves a risk of unintentional death of the wolf. There is also a low chance that the use of nonlethal projectiles could result in the death or serious injury of a wolf. It is expected that the level of unintentional wolf mortality by WS under this alternative would be less than five wolves per year.

Cumulative Impacts

In summary, there will be no intentional lethal removal of wolves by WS, although an annual unintentional mortality of up to five wolves per year may occur. Depending upon the experience and training of the individuals conducting lethal WDM for the WDNR the level of intentional take of wolves would likely be similar to Alternative 3. Take could be slightly lower if less experienced individuals have more difficulty capturing wolves than WS and WDNR. Take could be slightly higher if the individuals are less selective in their trapping efforts which might result in greater take of wolves to resolve a damage problem. If WDNR has to move staff from wolf research to WDM, the wolf population will not benefit from any potential advances in wolf management that could have resulted from the research program. Additionally, there may be an increase in illegal take of wolves by frustrated private individuals that do not receive quick and efficient handling of wolf depredation complaints. The level of illegal take is difficult to predict because of the remote rural nature of much of the area used by wolves in Wisconsin, but risk of illegal action is lower for this alternative than for Alternative 4 where strain on WDNR resources is likely to be greatest. Overall impacts on the Wisconsin wolf population are likely to be similar to or slightly greater than for Alternative 3. For the same reasons as noted in Alternative 3, this impact may result in short-term local reductions in the wolf population but would not jeopardize the viability of the Wisconsin wolf population.

Effects on public and pet health and safety. There would be no lethal WDM activities conducted by WS thus minimizing potential threats to the public and pets through WS implementation of lethal WDM. WS would be using traps, snares, and cable restraints to capture wolves for population monitoring and other nonlethal WDM techniques which require handling of wolves (e.g., remote activated guard, shock collars). WS use of nonlethal methods like aversive conditioning and remote activated frightening devices that require a collar on a wolf may increase if access to lethal WDM is limited. This could increase the use of traps and cable restraints to capture wolves for nonlethal

techniques over that anticipated for Alternative 2, 3, and 4 but would likely not exceed the total agency use of traps and cable restraints (nonlethal and lethal WDM combined) anticipated for Alternative 2 and 3. As with Alternatives 2 and 3, WS would strategically place traps, snares, and cable restraints to minimize exposure to the public and pets. WS and WDNR post appropriate warning signs on properties where traps, snares, or cable restraints are set to alert the public of their presence. Under this alternative, WS use of traps, snares, and cable restraints would only be used with the specific intent of keeping the captured animal alive. Measures to prevent injuries and keep wolves alive will also reduce potential risks to pets and nontarget species. In general, WS impacts under this alternative are likely to be similar to or slightly lower than the risks from Alternatives 2 and 3.

Although risks of adverse impacts from WS use of lethal WDM methods would be lower under this Alternative, the WDNR, their designated agents, and individuals with WDM permits could implement a lethal WDM program. Landowners within 1 mile of depredation sites or in Proactive Control Areas could be issued trapping and shooting permits. If WS placed traps on properties to capture wolves for radio collaring or shock collars, signs would be posted at access points. The WDNR would likely have similar requirements for their staff and designated agents. The same would not be necessarily true for private individuals working under permits issued for WDM on their property. Consequently, cumulative risks to public and pet health and safety would likely be similar to or slightly greater than with Alternatives 2 and 3.

WS response to threats to and wolf predation on pets will be restricted to nonlethal methods. As discussed above, nonlethal methods are not always effective in reducing problems with wolves. The overall efficacy of this alternative will depend on whether or not the WDNR is able to establish an equally prompt and effective lethal WDM program in the absence of assistance with lethal WDM from WS. If there are perceived difficulties with the program, frustrated individuals may attempt to solve wolf damage problems through illegal shooting, trapping, snaring, or poisoning. As a result of these illegal actions, there could be increased risks to public and pet safety from improper or unscrupulous efforts to resolve perceived problems with wolves. Poisons, especially, have high risks of severe adverse impacts on public and pet health and safety, as well as on nontarget wildlife species.

Humaneness of methods to be used. Some people would consider WS' actions under this alternative more humane than Alternatives 2 and 3 because WS would not be killing wolves. Some people believe that foot-hold traps and cable restraints are inherently inhumane and their use to capture wolves for research and nonlethal WDM projects will cause some individuals to consider this alternative inhumane. When capturing wolves for population monitoring and nonlethal WDM efforts, wolves would be captured by experienced WS personnel trained in the humane and effective use of WDM methods. Tranquilizer trap devices (TTDs) can be used on wolf traps to reduce the incidence of self-inflicted injuries by captured animals (Appendix B). All activities would be conducted in accordance with WDNR wolf population monitoring guidelines and Wisconsin wolf trapping guidelines/laws which require that traps be checked at least once every day. Daily trap checks minimize the amount of time target and nontarget animals remain in traps, and improve the likelihood that a nontarget animal may be released unharmed. Some individuals would prefer that cage traps be used to capture wolves and would perceive this method as being more humane than traps and cable restraints. Unfortunately, the use of cage traps to capture wolves is usually impractical and

ineffective because it is extremely difficult to get a cage trap big enough for an adult wolf into remote locations, and because it is rare to capture an adult wolf in a cage trap.

Although WS' actions may be considered more humane because WS would not conduct lethal WDM, the methods used by the WDNR, their designated agents and individuals with permits for lethal WDM would be similar to what WS would use for Alternatives 2 and 3. If the entities conducting the lethal WDM lack the training, experience and resources of WS personnel, there may be greater risk of unnecessary injury or pain from less than optimal use of WDM techniques. If WDNR staff are moved from wolf research to WDM it will also decrease the amount of testing and development of new, more humane WDM methods that would be conducted. Depending on the efficacy of the lethal WDM assistance provided by the WDNR, there may be an increase in the use of illegal WDM methods like poisons which may be less humane than methods used by experienced agency personnel.

Impact to stakeholders, including aesthetics of wildlife. The impacts of this alternative to stakeholders would be variable depending on their values regarding wildlife and relationship to the problem. Individuals directly impacted by wolf depredation may be less tolerant of wolves than individuals whose property and pets are not at risk. Under this alternative WS would provide assistance with nonlethal WDM and the WDNR would try to implement lethal WDM in a manner similar to Alternative 3. If stakeholders experiencing wolf damage receive quick and efficient service from the WS/WDNR program they will probably be accepting of the program. However, if depredation complaints are not readilly addressed stakeholders experiencing WDM would likely oppose this alternative.

Some individuals would prefer WS' actions under this alternative because they believe it is morally wrong to kill animals for any reason. For these individuals, wolves have a high existence value and the knowledge that wolves are existing in peace in Wisconsin has value whether or not they actually see wolves. Some of these people may still be concerned about WS' use of traps and cable restraints to live-capture wolves for population monitoring and/or attachment of collars required for some nonlethal WDM methods. Additionally, WS selection of this alternative will not eliminate concerns regarding the use of lethal WDM methods because these methods would still be used by the WDNR, their designated agents, and/or individuals with permits for the use of lethal WDM from the WDNR.

Some people would support this alternative because they enjoy seeing wolves or having wolves nearby. These individuals may be opposed to the use of lethal WDM methods because they believe it would reduce their opportunity to see or hear wolves. Under this alternative, WS would be prohibited from utilizing lethal methods for resolving wolf damage complaints; however the WDNR would still implement a lethal WDM program to resolve damage complaints. The impact of local wolf removal from the WDNR's WDM activities would likely be similar to Alternatives 2 and 3. As discussed in the wolf population impacts sections of Alternatives 2 and 3, lethal WDM activities by non-WS entities could result localized reductions in wolf densities. However, as wolf densities are reduced near depredation sites other wolves will likely establish territories in the treatment areas and the impacts on the wolf population and wolf viewing opportunities are likely to be short term. Only approximatley 10% of Wisconsin's wolf packs are involved in domestic animal depredations, and the WDNR guidelines for the use of lethal WDM are set so that the overall health of the wolf population will not be jeopardized.

There would be numerous opportunities for people to experience wolves in other areas of the state. Most often wolves that would be targeted for lethal removal occur on private properties or marginal wolf habitats that are fragmented with private property. These damage locations are not ideal locations for people to hear and view wolves.

Effects on nontarget species populations, including T&E species. WS would use traps and cable restraints to capture wolves for radio collaring and fitting some individual wolves with collars for use with nonlethal WDM methods. WS would not implement lethal WDM activities. However, the WDNR, their designated agents and individuals with permits for lethal WDM from the WDNR would use lethal WDM methods. For WS, lack of access to lethal WDM techniques by WS would result in increased use of traps and cable restraints associated with nonlethal techniques over that anticipated for Alternative 2, but would likely not exceed the total agency use of traps and cable restraints (nonlethal and lethal WDM combined) anticipated for Alternative 2 and 3. As with Alternative 2 and 3, trap and cable restraint selection, settings (stops on cable restraints, pan tension devices, etc.), placement and lures will be designed to minimize risks to nontarget species. Unfortunately, despite these precautions, traps and cable restraints may occasionally capture nontarget species such as white-tailed deer (*Odocoileus virgianus*), black bear, bobcat (*Lynx rufus*), coyote and dogs (Table 4-3). Measures to prevent injuries and keep wolves alive will also reduce risks to nontarget species. These risks are very low and take is anticipated to be well below the sustainable harvest level for nontarget species populations. Measures to reduce risks to nontarget species are included in the SOPs described in Chapter 3 and discussed in Appendix B. All actions would be conducted in accordance with the Wisconsin wolf trapping guidelines/laws which require that traps be checked at least once every day. Daily trap checks minimize the amount of time target and nontarget animals remain in traps, and improve the likelihood that a nontarget animal may be released unharmed. Overall risks to nontarget species from WS use of nonlethal WDM actions would be similar to or slightly lower than Alternative 2. Under this alternative, traps and cable restraints would only be used with the specific intent of keeping the captured animal alive.

Some individuals frustrated with wolf management policies might attempt to illegally shoot, trap, snare, or poison wolves with potential detrimental effects on nontarget species including T/E species (Schueler 1993, USDA 1997, Revised). Illegal use of toxicants represents one of the cheapest forms of predator removal, but it also presents the greatest environmental risks (Allen et al. 1996). Under this alternative and while wolves are federally listed, risks to T/E and other nontarget species from illegal actions would probably be greater than Alternative 2.

In prior Section 7 consultations regarding WDM activities similar to those proposed in this EA, the USFWS concurred with WS that WDM activities would have no effect or would not likely adversely affect federally listed animal and bird species in Wisconsin (J. Smith, USFWS, WS, August 12, 2003; L. Lewis, USFWS, WS, May 9, 2001). In a 2006 Biological Opinion by the USFWS on the issuance of permits for the take of depredating wolves, the Service concluded that the methods proposed for use may affect but were not likely to adversely affect Bald Eagles (*Haliaeetus leucocephalus* – currently delisted but still protected by the Bald and Golden Eagle Protection Act) and Canada lynx (*Lynx canadensis*) and would have no effect on any other Federally-listed species other than wolves. Bald Eagles are no longer listed as a Threatened or Endangered Species under the ESA. WS has determined that the proposed action will have no effect on all other federally listed nontarget species and critical habitat in Wisconsin. In an August 23,

2006, consultation with the USFWS regarding the impacts of all Wisconsin WS program activities, including wolf damage management, on lynx, the USFWS also concurred with WS' determination that WS' wildlife damage management activities in Wisconsin may affect but are unlikely to adversely affect Canada lynx. The WDNR has also concurred that WDM actions similar to those proposed in this EA would have no effect or would be not likely to adversely affect State listed animal and bird T/E species (S. Holtz, WDNR, March 23, 2002). The WDNR has also concurred that WDM actions similar to those proposed in this EA would have no effect or would be not likely to adversely affect State listed animal and bird T/E species (S. Holtz, WDNR, March 23, 2002).

Based on the above analysis, we conclude the proposed action would not adversely affect nontarget species populations.

4.2.2 Alternative 2 - Integrated WDM (No Action)

Effects on wolf populations. This alternative has been used intermittently by WS for the period of April 1, 2003 to present either under 4(d) provisions of the ESA, permits from the USFWS, or authority granted by the WDNR (once wolves were federally delisted). The use of lethal WDM methods has been discontinued at intervals within this period in accordance with court decisions (Section 1.3.10). WS implementation and use of integrated WDM strategies and methods under this alternative would be similar to that implemented during the period from 2003-2007. WS would not be able to use the full range of methods for resolving wolf damage complaints that are allowed by the 2007 WDNR wolf depredation control guidelines (Appendix E). A comparison of the WDM procedures between this alternative and Alternative 3 is provided in Table 1-3, Section 1.3.12. WS would continue to operate as an agent of the WDNR and would provide technical and operational assistance with nonlethal WDM methods, and would conduct lethal reactive WDM as authorized under the 2005 *Guidelines for Conducting Depredation Control on Wolves in Wisconsin while Federally Listed as a Threatened or Endangered Species* (WDNR 2005). Although, WS would limit its use of lethal WDM to periods when total WDM take in the state is less than 10% of the mid-winter wolf population, cumulative wolf take by other entities could continue even if WS had discontinued use of lethal WDM for the year. The WDNR has stated that it would work to implement the additional WDM measures established in the WWMP and the 2007 wolf damage management guidelines (Appendix E).

Status of the Wolf Population

Wolves have exceeded the numerical recovery goals as listed in the Federal and State recovery plans and have been removed from the federal list of threatened and endangered species. The federal plan required that at least two viable wolf populations must exist within the eastern United States. One of these populations must be reestablished outside of Minnesota and Isle Royale. The Federal recovery plan provided two alternatives for reestablishing this second viable wolf population. If the wolf population was more than 100 miles from the Minnesota population, it must contain 200 wolves for at least 5 consecutive years (USFWS 2003). If the wolf population was less than 100 miles from the Minnesota population, it must contain a minimum of 100 wolves for at least 5 consecutive years (USFWS 2003). The Michigan/Wisconsin wolf population is less than 100 miles from Minnesota and recent surveys indicate more than 1,000 wolves exist in these two states. A minimum population of at least 100 wolves has been exceeded for thirteen consecutive years

(Fig 1-4). Also, while no numerical individual state recovery criteria for Michigan and Wisconsin are listed in the Federal plan, State subgoals were incorporated. For Wisconsin and Michigan, the subgoals are 80 and 80 – 90 wolves, respectively (USFWS 1992). The WWMP establishes a minimum population threshold of 250 wolves, outside of tribal lands, as the level below which no lethal WDM will be permitted. This level is greater than the minimum population level required for federal delisting. The Wisconsin wolf population exceeded this level in 2002 and reached its current level of 528 wolves outside of tribal lands in 5 years after the WDNR's recovery threshold was met. Consequently, a Wisconsin wolf population of 250 individuals appears to be a healthy and viable population level.

The Federal recovery plan also required that the wolf population in Minnesota be stable or growing, and that its continued survival must be assured. In Minnesota, the wolf population size is not surveyed or estimated annually, however during the winter of 2003-2004, the Minnesota Department of Natural Resources (MNDNR) conducted a new survey of wolf distribution and abundance in Minnesota (Erb and Benson 2004). The survey estimated that there could now be as many as 3,020 wolves (range 2,300 – 3,700) in the state, but cautioned that during 2001-2003 Minnesota's wolf population may have actually stabilized around 2,500 wolves due to wolf mortality from a significant outbreak of sarcoptic mange. A wolf depredation control program, similar to this alternative, has been conducted in Minnesota since 1978 when wolves were reclassified as threatened and a 4(d) regulation was promulgated. After 25 years of wolf damage management including lethal removal of 2,658 wolves, the Minnesota wolf population has still increased from 1,200 in 1978 to 3,020 in 2004 or by 151%.

Environmental Baseline for Wisconsin Wolf Population

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

Food

Prey density and vulnerability are important in determining what areas wolves inhabit and the number of wolves an area may support. It appears that, over time, absent severe human persecution, wolf numbers are mainly limited only by food (Fuller et al. 2003). Eventually in the core areas of wolf range in Wisconsin and Michigan, density of wolves will probably be limited by food availability (ungulate biomass). However, as wolf pack establishment occurs on the edge of the primary wolf range in more fragmented habitat the level of direct and indirect human related mortality is likely to increase (Jensen et al. 1986, Mech et al. 1988, and Mech 1989, Mladenhoff et al. 1999). Because the Wisconsin wolf population continued to grow at approximately 13% annually over the last 5 years (Figure 1-3), it is unlikely that prey is currently limiting the expansion of the wolf population in the state.

People

The unintentional (e.g., vehicle collisions) and intentional (e.g., poaching) 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 still occurs in Wisconsin. In Wisconsin, from 1 July 2000 - 30 June 2006 there were 56 known illegal wolf kills. Of 83 radio collared wolves with a know fate, 31% were illegally killed. Its plausible to assume other wolves are illegally killed that go undetected which are not represented in these data. A large percentage of illegally killed wolves occur during the 9 day deer gun season in Wisconsin.

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 affect on individuals, these activities seem to have little effect on the wolf population (Fuller et al. 2003). From 1 July 2000-30 June 2006, 95 (30% of know mortalities) wolves are known to have been killed in Wisconsin as a result of vehicle/train collisions. This level of mortality has not inhibited the continued increase of the Wisconsin wolf population over the same period (Figure 1-3).

Traditionally the landscape factor that seemed to correlate most closely to wolf pack presence in the Great Lakes region was road density (Thiel 1985, Fuller et al. 2003, Mladenoff et al. 1995, 1999, & 2005, Potvin et al. 2005). Early research suggested maximum road density of 0.6 km/ km^2 for suitable wolf habitat (Thiel 1985, Mladenoff et al. 1995), but recent research suggests road densities as high as 0.7 km / km^2 are suitable for wolf pack territories (Mladenoff et al. 1999, Potvin et al. 2005). Recent surveys in Minnesota indicate that road densities and forest cover appear to have stabilized the spread of the Minnesota wolf population (pers. comm. John Erb, April 2005). Human caused mortality tends to be higher near roads and in areas with higher road density (Wydeven et al. 2001). Wolves don't necessarily avoid roads,

and in fact readily use forest and logging roads for travel corridors, but road density apparently provides a good measure of human contact which can result in illegal wolf mortality. Higher levels of human contact apparently relate to higher levels of intentional and accidental killing of wolves by humans (Wydeven et al. 2001). Other measures of human contact/presence such as human population densities also correspond well to areas occupied by wolf packs (Fuller et al. 1992, Mladenoff et al. 1995). When wolves occur at low densities and large blocks of unoccupied suitable habitat are available, habitat and road density characteristics predict areas where wolves will occur (Mladenoff et al. 1995); however, as wolf densities increase vegetation and habitat characteristics do not predict wolf habitat as well as indices that measure human influence as long as prey is adequately abundant (Potvin et al. 2005).

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 Wisconsin has had a resident wolf population for over 30 years and is not presently subject to heavy harvesting or other forms of excessive mortality, connectivity with source populations in Michigan, Minnesota, and Canada is probably of lesser importance at this time. However, Wisconsin wolves are not an isolated population. Immigration and emigration of wolves among the Wisconsin, Michigan Upper Peninsula, Minnesota and Canada wolf populations occurs. Immigration from a source population in Minnesota was the basis for the re-establishment of the Wisconsin wolf population (Wydeven et al. 1995). Immigration may not have a large annual effect on the Wisconsin wolf population but it likely contributes to the long-term sustainability of the population.

Other Factors

Natural mortality is a factor affecting the Wisconsin wolf population. The two main sources of natural wolf mortality described by Fuller et al. (2003) were starvation and intraspecific strife. However, in Wisconsin, disease causes more natural mortality than intraspecific strife. Mange is the leading cause of natural mortality among wolves in Wisconsin (A. Wydeven, personal communication 2 July 2007). Natural mortality factors were responsible for 14% of all known wolf mortality in Wisconsin from 2002-2006. Natural mortality was responsible for 32% of all radio collared wolf mortalities which is probably more representative of the effects of natural mortality overall in a wolf population. Non-collared wolves that die from natural mortality are less likely to be detected than wolves with radio collars. From 2000 to 2004, WDNR documented that natural mortality resulting from mange was the cause of 26% of all radio-collared wolf deaths in Wisconsin. In Wisconsin, natural mortality of wolves does not seem to be adversely impacting the wolf population as it continues to increase by approximately 13% annually over the last 5 years.

It is unknown how the addition of human-caused mortality would affect natural mortality rates. At least some mortality from WDM would likely replace mortality by other sources (i.e., it would be compensatory to other mortality sources). Fuller et al. (2003) synthesized data from 19 studies concerning wolf mortality and the relationship between human caused and natural mortality and concluded that in the studied populations human mortality replaced 70% of the mortality that would have

otherwise occurred. The demonstrated annual rate of increase in the Wisconsin wolf population has occurred in spite of all causes of mortality including WDM.

Table 4-1. Causes of mortality for radio-collared wolves in Wisconsin 2002 - 2006 (WI Wolf Progress Reports). The number in parenthesis is the percentage of radio-collared wolves dying from various causes compared to total morality (natural and human caused) observed in radio-collared wolves.

Mortality Factor	2002	2003	2004	2005	2006	Total
Disease	2	7	3	3	3	18 (25)
Accident	1	0	0	0	0	1 (1)
Other wolves	2	1	1	0	0	4 (6)
Unknown	2	4	0	3	0	9 (13)
Vehicle	2	3	2	0	0	7 (10)
Illegal kill	4	4	4	6	6	24 (34)
Capture related	1	0	2	0	0	3 (4)
Depredation	0	1	1	3	0	5 (7)
Total	14	20	13	15	9	71 (100)

Intentional Take – WS

Under this alternative, WS could lethally take wolves to resolve damage problems until an annual maximum of 10% of the previous late-winter wolf population had been taken for all types of WDM[12]. For most of the period from 2003 until the court order in August 2006, the WDNR and WS operated a WDM program under the authority of a special 4(d) rule or 10(a)(1)(A) permits. The level of lethal take of wolves at depredation sites in Wisconsin from 2003 – 2006 was 4.8, 6.4, 7.5, and 3.9%, respectively of the late winter wolf population. The level of take in 2006 was somewhat lower than expected because the 10(a)1(A) permit was rescinded in August and more wolves would have potentially been lethally removed had the permit remained in effect. Ten farms had verified depredations in 2006 after the permit was rescinded. On average WS captured 1.9 wolves per pack/year (this includes pups that were released prior to 1 August). If lethal control had been implemented on the 10 farms with wolf problems that occurred after the 2006 permit was rescinded, it is possible that an additional 19 wolves may have been removed. The lethal take during 2006 most likely would have been 36 - 40 wolves. Using an estimate of 38 wolves, WS would have removed 8.1% of the mid winter wolf population estimate in 2006.

Some of the animals euthanized during the period of 2003-2006 were young of the year (pups) taken after August 1, and, thus, were members of a cohort not yet in existence at the time of the late-winter wolf count. Calculations that divide the total number of wolves taken for WDM by the previous late-winter wolf population estimate over-estimate the percentage of the population killed for WDM because the number of wolves taken includes individuals from a portion of the population that was not available during the late-winter wolf survey. The number of pups compared to wolves ≥ 1 year of age lethally taken was 8 of 17 in 2003, 4 of 24 in 2004, 9 of 29

[12] Includes take by designated agencies for the protection of human safety. Does not include euthanization of sick or injured wolves (injuries that are not related to actions proposed in this EA).

in 2005, 0 of 18 in 2006, 6 of 38 in 2007[13]. No pups were taken in 2006 when the permit for lethal control on wolves was removed early in August. Therefore, the number of wolves greater than one year of age 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 in 2005, 20 out of 435, or 4.6 percent. For the 5 years combined, lethal take represented approximately 4.5 percent of the individuals in the late winter population. Pup production coincides with the beginning of the livestock grazing season in Wisconsin. As pups are born it is possible for the wolf population in Wisconsin to double. For example, during the winter of 2006/2007 there were 138 wolf packs documented in the state. Approximately 70% of Wisconsin wolf packs reproduce annually (Wydeven et al. 2007) with an average litter size of 5 pups. Therefore, including pup production, the Wisconsin wolf population during April 2007 may have increased to 1,011 wolves {(0.7 breeding packs × 138 total packs) × 5 pups per litter + 528 wolves/mid winter count} = 1,011 wolves.

For a Wisconsin late winter wolf population of 540 individuals, WS' maximum annual intentional lethal take under this alternative would be 54 individuals. Actual annual take of wolves for WDM is anticipated to usually be lower than this level. However, as the wolf population in Wisconsin increases and wolves colonize most of the suitable habitat with minimal human development, the population will likely expand into more developed areas in Wisconsin. As this happens, WS and the WDNR anticipate that requests for WDM assistance will also increase. The annual maximum value of 10% was estimated based on review of a similar program which has been in effect in Minnesota since 1978. For the period of 1986 to 2006 intentional take for WDM in Minnesota ranged from 2.0 to 9.1% (average 5.0%) of the estimated state population (this includes pups taken after 1 August). This level of WDM did not prevent the Minnesota wolf population from expanding to its current level of approximately 3,000 wolves. Minnesota contains more suitable wolf habitat than Wisconsin (Mladenoff et al. 1997); consequently, there are fewer wolf conflicts per capita. The level of verified wolf depredations in Wisconsin during the past 5 years with an average of 388 wolves is comparable to Minnesota when their wolf population estimate was 1,100 – 1,200.

Unintentional Take – WS

Unintentional take is the unintentional injury or death of wolves as a result of management activities. Sources of unintentional take from nonlethal WDM methods include death or serious injury of a wolf from a poorly placed or close range shot from a nonlethal projectile, potential injuries associated with aversive conditioning methods like dog shock collars, and injury or death of wolves captured for population monitoring or attachment of collars used for nonlethal WDM methods like Radio Activated Guard (RAG) boxes. For WS purposes, under this alternative, incidental take associated with lethal WDM methods includes injury or death of young of year taken prior to 1 August; indirect injury or death of pups if lactating females are killed prior to 1 June. The fact that these individuals are considered "unintentional take" under this alternative is solely a function of the fact that WS actions under this alternative would be conducted under the 2005 WDNR guidelines in effect while

[13] Data for 2006 are not provided because the permit was rescinded on 9 August; only 9 days after removal of pups for WDM was allowed, so take of pups for 2006 does not include total take of pups that might have occured.

wolves were on the federal list of threatened and endangered species (Appendix F). The 2007 WDNR wolf damage management guidelines do not provide special protections for lactating females and young of the year, and these individuals would be included in intentional take for all other entities. The estimates of unintentional take provided below are based on past experiences combined with a prediction of future wolf depredation control needs and are the best estimates currently available.

Nonlethal projectiles (rubber bullets and bean-bag projectiles) are among the methods available under this alternative. Use of this method requires that the projectiles be used every time the wolf attempts to prey on the protected resource so the wolf does not identify conditions when they can obtain prey without receiving a negative experience (Shivik 2004). Consequently, this method is most effective when the landowner/resource manager(s) assist with the implementation. Anyone using this method would be required to go through a training course on the safe and effective use of this technique. These projectiles can be deadly at very close range or if a vulnerable spot on the body is hit, although the likelihood of this type of injury is very low (Bangs, USFWS, pers. comm., Bangs et al. (2004) Appendix B). In the Western U.S., the USFWS has issued approximately 200 permits to landowners for the use of nonlethal projectiles after the landowner had received special training in the use of the method. In that time, only a few dozen wolves have been shot at and less than 5 have been hit. All of the wolves ran away, and none of the wolves appeared to have been seriously injured (Bangs, USFWS, pers. comm.). In Wisconsin four wolves were shot at and two were hit with rubber bullets. The two wolves that were hit with rubber bullets responded by increasing their gait and did not appear to be injured. The same individual wolves appeared to return to the original damage location and exhibited the same behavior. Based on past experience, risks to wolves from this technique are considered to be extremely low (<1 wolf death/5 years).

Some nonlethal techniques like frightening with RAG boxes and aversive conditioning with dog training collars (Appendix B) require the placement of a transmitter collar on the wolf. Wolves are also captured and transmitter collars installed as part of WDNR wolf research and population monitoring. WDNR estimates that about 15-30 wolves annually will be collared in Wisconsin. Wolves are typically captured using foot-hold traps, anesthetized, collared, and then released. Use of cage-type live-capture devices is generally not effective and, because of the size of the trap required and the remote location of many trapping sites, it is often impractical. Although this activity is similar to trapping for lethal control of wolves, the intent of this activity is not to harm, but rather to gather information and release the animal unharmed. Injury to or death of a wolf from the capture, handling and anesthesia process can occur but incidence of these occurrences is very low. Wildlife Services has intensively assisted the WDNR with these activities since 2003. Since this time WS has not had a wolf die from captured related trauma/myopathy. Based on past experience and the use of highly trained personnel, WS does not anticipate more than 5 wolves dying per year from capture related trauma/myopthay for research and nonlethal WDM activities.

Although the occasional trapping of lactating females could cause incidental death of pups, if pups are near weaning age other pack members will help feed pups (Packard 2003). During early lactation, the female generally remains close to the den, reducing risk of capture (Packard 2003). Unintentional death of pups due to capture

of lactating females would be a relatively rare mortality factor for Wisconsin wolf pups. Records indicate that during 2003-2006 there have been 91 wolves euthanized during WDM efforts. Only two of the 91 wolves were lactating females. One was captured on June 19 when pups were likely to be able to survive without the female. One was captured on 22 May when the risk of pup mortality was higher. However, at this depredation site depredations reoccurred in July and two pups were captured on 17 July at this site indicating that at least some pups survived after the lactating female was euthanized.

Under this alternative, lactating females captured by WS prior to 1 June would be released unless the female was believed to be involved in repeat depredation. The average litter size in Wisconsin is 5 pups. If a lactating female was captured and intentionally euthanized because of repeat involvement in depredation or is unintentionally killed during capture and release, up to 5 pups may be unintentionally killed. Based on the WDM records for Wisconsin we anticipate that a maximum of 1 lactating female might be unintentionally killed per year before 1 June and that there will be years when no lactating females are lethally taken prior to 1 June.

WDNR records indicate that for the interval of 2003-2007, 0, 3, 3, 0, and 0 pups, respectively (average 1.2 pups/ year), were captured during WDM activities before 1 August. Incidental take associated with trapping young of year wolves would likely be in the form of harm and injury, but not death, as pups would be released within 24 hours. Based on previous records of total annual take of young of the year (before and after 1 August) and anticipated increases in the WI wolf population, we anticipate that no more than 10 young of year wolves may be captured prior to 1 August annually. Total annual take was used in this consideration because take of young of the year depends primarily on the location of the rendezvous site and not time of the year. Of the 10 young-of-the-year potentially captured prior to 1 August, only 5 pups are likely to be seriously injured or die. Because of their smaller size, risks to pups from WDM activities may be greater than those to adults. This represents a worst-case scenario and actual take of pups is likely to be lower. In the past four years only 2 pups were seriously injured during WDM efforts. Even though not all of the 5 young-of-the year are likely to be killed, for purposes of estimating cumulative impacts on the wolf population below, seriously injured wolves will be treated as if there were killed.

In general lactating females and pups are rarely captured on farms prior to August 1. Prior to mid-June the lactating female remains mainly at the den site with the pups. After mid June through the end of September, pups are kept mainly at rendezvous sites and have restricted movements. Lactation is normally completed by late June, and the females begin moving about more. Lactating females are likely to be captured on farms only if they have den sites very close to farms, and under such situations it may be important to remove the female to reduce high levels of livestock depredations. Pups captured prior to August are likely to have rendezvous or den sites on or near farms, and such pups are likely to readily learn to rely on livestock as food, and it is important to remove them from the population.

In summary, total unintentional mortality from implementing this alternative would not exceed 6 adult wolves (1 lactating female, 5 from nonlethal activities or capture myopathy) or 10 pups per year for a total unintentional take by WS of 16 wolves. Unintentional take in the form of death or serious injury (lethal take) to adult wolves

from the proposed action would result from one female per year unintentionally taken prior to 1 June, five adult wolves per year unintentionally taken from normally nonlethal WDM methods like RAG boxes and nonlethal projectiles or population monitoring activities. WS actions might also result in the unintentional mortality of 10 pups (5 associated with death of female prior to 1 June and 5 from capture prior to 1 August).

Intentional Take – Non-WS Entities

Although, WS would limit its use of lethal WDM to periods when total WDM take in the state is less than 10% of the previous season's late-winter wolf population estimate, cumulative wolf take by all entities could continue so long as total take did not reduce the population below the management thresholds established by the WDNR (Appendix E). The WDNR has stated that it would work to implement the additional WDM measures including issuing reactive control permits to shoot or trap wolves to private landowners with verified depredations and adjoining landowners within 1 mile of a depredation site, and proactive damage management permits to landowners within Proactive Control Areas if they have domestic animals vulnerable to wolf depredation. As with all other alternatives, landowners would be allowed to shoot wolves in the act of attacking domestic animals on their property or property they lease/manage and individuals would be able to kill wolves which pose an immediate and demonstrable threat to human life. WDNR staff and/or their designated agents could work to remove wolves at damage sites and in Proactive Control Areas.

The portion of the total annual take which may come from reactive or proactive lethal WDM by non-WS entities would vary depending on the statewide wolf population, the Wolf Management Zone where the problem occurred, and the alternative selected in this EA. In Wolf Management Zones 1-3, if the statewide off-reservation mid-winter wolf population estimate, minus known wolf mortality from all sources is in excess of 350 wolves then the WDNR could authorize reactive lethal WDM and use Proactive Control Areas. If the statewide off-reservation mid-winter wolf population estimate, minus known wolf mortality from all sources, is below 350 wolves but greater than 250 wolves then only reactive lethal WDM may be used. If the mid-winter wolf population estimate, minus known wolf mortality from all sources, is below 250 wolves then no lethal WDM may be used. In Wolf Management Zone 4, reactive WDM and Proactive Control Areas could be used if the statewide off-reservation mid-winter wolf population estimate, minus known mortality from all causes was greater than 250 wolves.

WDNR wolf depredation management guidelines and associated management actions are intended to be a means of addressing damage problems. The goal of WDM is to quickly and efficiently resolve localized wolf conflicts. The aim of WDM is not to annually remove the maximum number of wolves above an established threshold or to reduce the statewide wolf population but to resolve specific conflicts at specific sites. Although the new 2007 WDNR guidelines permit the use of Proactive Control Areas as long as the wolf population off of Native American Reservations is in excess of 350 wolves and reactive lethal WDM when the off-reservation wolf population is in excess of 250 wolves, neither WS or the WDNR anticipate that the maximum permitted wolf take would occur in any given year.

The relationship between the different forms of wolf take for damage management (take by WS, take by landowners/managers under permits and authorities of NR10.02 described above, and take by WDNR and/or their agents in Proactive Control Areas) is complex and highly interrelated. Take by one of these entities is likely to reduce the number of animals that will be taken by another entity. For example, if lethal WDM by WS successfully resolves a problem, there may be no need for a landowner to take wolves, so take under permits would decline. Conversely, landowner removal of a wolf caught in the act of depredation may reduce or eliminate the need for additional wolf removal by WS. To address this issue, we have estimated the number of wolves that may be taken in a typical year and discuss how the different sources of WDM mortality relate to total take. Similarly, in years where there is little need for the use of proactive control, and damage rates are low enough that WS could handle most or all depredation incidents warranting the use of lethal WDM, there may be little or no wolf take by WDNR or domestic animal owners through trapping/shooting permits and under NR10.02.

During the four-year period of 2003-2006, 30 different wolf packs plus 4 lone wolves have been involved in domestic animal depredations on private land or threats to human health and safety (these data exclude wolf packs that depredated free roaming hunting dogs). Of the 30 different packs, 12 packs have been involved in depredating domestic animals during multiple years. The number of wolf packs that have caused domestic animal depredations or threats to human safety was 6 in 2003, 10 in 2004, 19 in 2005, and 18 in 2006, so 7-17% of all wolf packs were involved in damage problems. As the Wisconsin wolf population increases and expands into areas with greater human development, the proportion of all packs involved in conflicts may increase.

Data from 2003-2007 WDNR wolf progress reports indicate the average wolf pack size involved in domestic animal depredations is 3.5 which is similar to the winter pack size of 3.5 to 4.0 wolves reported by Wydeven et al. (2004, 2007). Using the 2007 estimate of 138 wolf packs and the data from above on the proportion of packs involved in depredation, the number of packs that are involved in damage situations would be 10 – 24 packs (7 - 17%), or 35 to 84 yearling and adult wolves. Some yearling and adult wolves that are present during the midwinter population count die from various mortality factors prior to the depredation season. Wydeven et al. (1995) estimated from 1978-1985 mortality of wolves ≥ 1 year old was 39% and from 1986-1992 mortality was 18%. In more recent years (1995-2002), mortality was 23% of adult wolves and 27% for yearling wolves (Wydeven unpublished data). Wydeven et al. (1995) reported most (69%) of the yearling and adult mortality occurred from August through December, thus 31% of the total annual yearling and adult mortality occurred before and through the approximate midpoint of the annual depredation season (January – July). We use this figure to provide an estimate of the number of yearling and adult wolves surviving at the time depredations occur. Thirty one percent of a total annual mortality of 25% (combination of yearling and adult mortality) is 7.8% of yearling and adult wolves (3 – 7 wolves). Therefore, using the 2007 midwinter wolf population estimate, approximately 32 – 77 yearling and adult wolves may be involved in depredations.

This count only includes the individuals present during the winter wolf count and does not include any pups that may be present at the time the wolf removal is conducted. Most wolf depredation and WDM actions occur after pups are born, so

we add an estimate of the number of pups produced to the estimate of the number of wolves in a pack that may be involved in depredations. Not all packs successfully reproduce each year and not all pups survive the season. For analysis purposes we will apply a 70% coefficient to the number of packs that may have reproduced to calculate total number of wolves initially present in packs that were involved in domestic animal depredations (Wydeven et al, 2007). The greatest annual natural mortality rate for a wolf population exists within the young of the year cohort (Fuller et al. 2003, Mech 1970, Wydeven et al. 2007). Wydeven et al. (2007) reported that, during 2005-2007, young of the year survival averaged 31-32% by observing young of the year with adult wolves during aerial winter wolf tracking surveys. Fuller et al. (2003) reported that young of the year survival was high through the summer and was directly related to prey biomass availability. When pups actually die from various causes relative to the timing of WDM efforts would be speculation. For purposes of this analysis we are estimating a pup survival rate of 70%, an intermediate point between full survivorship and the annual survival rate of 32% estimated by Wydeven et al. (2007). Using the 2007 estimate of 138 wolf packs, the number of packs that are involved in damage situations would be 10 – 24 packs (7 - 17%) and the number of packs involved in damage situations that produced pups would range from 7 – 17 packs. Multiplying the number of packs that might reproduce by 5 (average litter size) and 0.7 (assumed pup survival during the normal wolf damage season – see below) gives the total number of young of the year associated with packs that caused damage which is 25 – 60 pups.

Consequently, using the 2007 late winter wolf count and the above estimates of yearling and adult wolves (32 – 77) and pups (25 – 60) that may be involved in depredations, the total number of wolves that could be involved in damage situations is estimated to range from 57-137 wolves. This is *not* the number of wolves likely to be taken for WDM. Lethal methods are not needed at all sites where damage is confirmed and, even when traps are set by experienced professionals, wolves are not captured at every site. WS generally captures wolves on only half the sites where trapping is attempted. From 2003-2006, WS captured 1.9 (53%) wolves per wolf pack involved in domestic animal depredations where lethal control was implemented (includes packs where no wolves were captured) or 2.7 (77%) wolves from packs where WS successfully removed wolves.

Given the increase in the trapping area around depredation sites, landowner permits, and the use of Proactive Control Areas, the proportion of sites where wolves are killed and take per pack is likely to be higher than the WS average of 53% that occurred under the more restrictive programs conducted while wolves were a federally protected species. Take at some sites, especially Proactive Control Areas, may include the entire pack, but there still will be other areas were no wolves are captured. The best estimate from WS biologists indicates that when anticipated increases are averaged across all packs, average take per pack may increase to approximately 75% of the pack. If the 75% take value is applied to the estimate of all wolves involved in damage, the number of wolves that might be lethally taken for damage management may range from 43 to 103 wolves per year.

Using similar assumptions of pup production and yearling and adult wolf mortality from January through July applied to the 138 wolf packs in the 2007 Wisconsin wolf population approximately 498 yearlings and adults would be alive during the depredation season and 338 pups would be added to the wolf population in spring

and summer (836 total wolves). Based on removal of 43 to 103 wolves, in 2007, we estimate that approximately 5 – 12 % of the spring/summer wolf population may be lethally taken per year to resolve damage problems by WS, the WDNR, agents of the WDNR and private individuals.

As stated above, each year WS will discontinue using lethal WDM when intentional lethal take for WDM by all sources exceeds 10% of the late winter population for alternative 2. Proactive WDM take and any reactive lethal WDM take needed in excess of 10% of the late winter population would have to be conducted by entities other than WS. The number of wolves killed annually by landowner shooting/trapping permits or under NR 10.02[14] is expected to be low. No data exist to determine how many wolves may be killed annually under these provisions; however, wolf depredation management personnel in Minnesota, annually remove 3-5 wolves per year that are caught in the act of depredating livestock. As of December 1, 2007. 25 shooting permits have been issued to private landowners in Wisconsin; no wolves have been killed under shooting permit provisions. To date, three Wisconsin landowners have each killed one wolf that was in the act of attacking domestic animals (1 dog, 2 calves). For comparison, from 12 March 2007 – 21 December 2007, there have been 6 wolves killed by livestock producers under provisions of the Minnesota Wolf Management Plan (Dan Stark, MNDNR, wolf program coordinator). Domestic animal owners who are routinely on their properties probably are more likely to encounter wolves and shoot wolves. It is expected that if landowners kill wolves under these provisions that the lethal take of wolves by WS will be reduced by some percentage because WS will not be asked to remove wolves from these sites. It has been our experience that most wolves are secretive in nature and opportunities to shoot wolves are rare. At current population levels, we expect that no more than 15 wolves (<2% of estimated population of 878 wolves) will be killed each year, under landowner shooting/trapping permits and provisions of NR10.02. This take may include pups and lactating females because the 2007 Wolf Depredation Management Guidelines do not restrict by sex and age classes of wolves, because of the difficulty of detecting these characteristics in the field, but the restricted movements of young pups and lactating female would rarely result in any being shot .

Cumulative Impact on the Wolf Population

The primary factors influencing the wolf population in Wisconsin are prey density, human related mortality, and natural mortality. The current rate of population increase will likely not continue into the foreseeable future. As the wolf population in Wisconsin expands to fill all available habitat, or as the ecological carrying capacity is approached, the rapid population growth rate is expected to slow and eventually stop. At that time, we would expect to see population fluctuations (declines and increases in the number of wolves) due to short-term fluctuations in birth and mortality rates. However, wolf monitoring programs, as identified in the WWMP (WDNR 1999), should identify excessively high mortality rates or low birth rates and would trigger timely corrective action (e.g., reductions in allowable take for WDM, measures to address the source of the high mortality rates or low birth rates) when necessary. If a long term decline in the wolf population occurred, there would

[14] NR 10.02 states, "On private land, the landowner, lessee or occupant of the land may shoot and kill any gray wolf in the act of killing, wounding or biting a domestic animal."

likely be a corresponding decrease in verified wolf depredation complaints resulting in a reduced take of wolves for WDM. For example, the WDNR has established a management goal of 350 wolves, in 2003 when the Wisconsin wolf population was estimated at 335 wolves the number of farms with verified depredations was much lower than in 2006.

Table 4-2. Wisconsin estimated wolf population, known mortality from all causes, and effects of mortality and WDM on the wolf population, 2002-2006.

Year	Estimated Wolf Population	Total Known Mortality (includes wolves euthanized for damage management)	Total % Known Mortality for Population	% Damage Management Mortality for Population	% Wolf Population Increase
2002	327	59	18.0	0	26
2003	335	53	15.8	5	4
2004	373	66	17.7	6	11
2005	435	68	15.6	7	14
2006	467	70	15.0	4	9
Average	387.4	63.2	16.3	5.5 ('03-06)	13

Impacts on the Wisconsin Wolf Population

We anticipate that WS' annual intentional lethal take of wolves would be equal to or less than 10% of the previous mid winter wolf population estimate and that cumulative intentional take for WDM would be 5 – 12% of the estimated summer wolf population (includes take by WS and private landowners). An additional 16 animals (2%) may be lost to unintentional mortality associated with WDM, research and nonlethal systems that require handling wolves. WS' unintentional take of females prior to June 1 and young of the year prior to August 1 is likely to be compensatory to intentional WDM take by other entities. Therefore, we are only adding unintentional mortality associated with nonlethal WDM techniques to cumulative take (i.e. 5 animals or <1% of the population). Using the 2007 population estimate (540 wolves) and including the take of pups that were not present during the late winter population survey (total population ~ 880 wolves), the maximum level of take (intentional and unintentional) that may occur under the proposed action ranges from 6 – 13% of the summer wolf population (9-21% of the previoius winter population).

From 2004 to 2005 the Wisconsin wolf population increased 13.9% even though 6.4% of the wolf population was taken for WDM. Similarly from 2005 to 2006, the Wisconsin wolf population increased 9.4% even though 3.8% of the population was taken for WDM. During the last 4 years that lethal WDM has been allowed in Wisconsin the wolf population has increased by an average of 9.6%. It is unclear if these depredating wolves had not been removed, whether there would have been a

greater increase in the population. Compensatory mortality suggests that if more wolves are killed for depredation control purposes, fewer wolves will die from starvation, interspecific strife, or other natural causes. Wolves in agricultural areas occupy areas of higher road densities, where risk of human-caused mortality can be fairly high (Wydeven et al. 2001). Also without governmental lethal controls available, retaliatory and illegal kill may have been higher, possibly causing even greater mortality. It would not be reasonable to add the percentage of wolves removed through depredation control activities to the subsequent year population and assume there would be that many more wolves in the population if not for lethal controls. The interactions and compensation factors affecting wolf mortality survival rates are too complex for making this kind of comparison. All that can be said with certainty is that while 3.8 to 6.4 % of the winter wolf population were removed, wolf numbers still increased by 13.9 and 9.4% in the following years.

Wolf populations are dynamic; they undergo drastic fluctuations in their annual abundance.
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, but other researchers have indicated declines may occur with human-caused mortality at 40% or less of fall wolf populations (Ballard et al. 1987, Peterson et al. 1984). Control in this instance means keeping the wolf population below the level to which it would rise without 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 both natural and human-caused mortality.
- Fuller (1989) observed stable or slight increases in the wolf population at an annual human caused mortality rate of 29%. It appears that 30 to 35 % human caused mortality of late fall or winter population can be tolerated by most wolf populations without causing population declines (Fuller et al. 2003).
- During the period of 1993-2002, the USDA WS program in Minnesota has lethally taken an average of 6.4% of the winter wolf population as part of implementing a depredation control program in Minnesota. Despite this level of take for WDM, the Minnesota wolf population increased from an estimated 1,500 wolves in 233 packs in 1988-89 to 2,445 wolves in 385 packs in 1997-1998 and 3,020 wolves in an estimated 485 packs in 2004. This increase occurred while WS was taking wolves for WDM, other natural and human caused mortality occurred, and while this population provided most, if not all, of the source wolves for Wisconsin and Michigan.
- 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 (Haber 1996).

- Haight et al. (2002) modeled the impacts of various wolf removal strategies for WDM including reactive removal (wolves removed after depredation occurs), preventive removal (wolves removed in winter from areas with a history of wolf conflicts); and population size management (wolves removed annually from all territories near farms). None of the strategies threatened wolf populations unless the wolf population was isolated because WDM was confined to the area near farms. For isolated populations, reactive removal was the only alternative that ensured damage reduction and population conservation. The model predicted that population could withstand a sustained harvest of 20-25%. The authors considered this to be a conservative estimate and that the model likely underestimated compensatory factors in wolf population biology.

  Stating that a population may sustain a certain level of human harvest generally implies that the population is stable. Increasing wolf populations can likely sustain higher levels of mortality. As discussed previously, compensatory mortality operates within the wolf population. The anticipated cumulative removal of up to 9-21 % of the winter population is below or within the range of sustainable harvest identified in the studies above. Therefore, we conclude that this alternative will not jeopardize the Wisconsin gray wolf population.

  A given wolf population's productivity is likely the most important factor in determining the annual percentage of a wolf population that can be killed by humans without reducing the population (Fuller et al. 2003). The higher the population's productivity, the higher the level of mortality the population may sustain. Given the current rate of population growth, the Wisconsin wolf population is highly productive.

  Furthermore, wolf mortality due to poaching may decrease with the implementation of a quick and efficient WDM program and the depredation compensation program. In the absence of a WDM and compensation 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 to curtail depredation activities. Hence, a reduction in poaching may off-set some of the mortality associated with the depredation control program.

  Although this alternative is not anticipated to result in a reduction in the state wolf population, this alternative could result in a localized decrease in the wolf population at the specific sites where WDM occurs. New wolves would likely recolonize removal sites as long as suitable habitat exists. Dispersing wolves can establish new territories if suitable areas and mates are available. Such areas are either unoccupied spaces or sections at the edge of existing territories. The amount of time until new wolves move into the area would vary depending on the habitat type, time of year, and the population density of wolves in nearby areas. Local population reductions as the result of depredation control activities would not result in a decline in the overall Wisconsin wolf population, but may decrease rates of growth. The cumulative and indirect impacts of this program are also discussed the Eastern Timber Wolf Recovery Plan (USFWS 1992).

  Population modeling that assessed 4 strategies for resolving wolf depredations concluded that preventative WDM could possibly reduce the number of wolves

that are removed annually if WDM is focused on areas where chronic depredations have occurred and wolves are removed before reproduction occurs (Haight et al. 2002). Haight et al. (2002) also concluded that none of the strategies threatened to extirpate the wolf population because only wolf packs that lived near farms were targeted for WDM, which is what would occur under Alternative 2 and 3. Wolf depredation management is and would only be conducted in areas where there is a demonstrated need for lethal control and nonlethal techniques are inadequate. Mech (2001) looked at 3 scenarios for the management of Minnesota's wolf population when the population was estimated at 2,450 wolves during the winter of 1997-1998, 1) population and range limitation, 2) sustainable harvest, and 3) population reduction. For population and range limitation, an additional number of wolves equal to the annual increase in the wolf population (statewide for population stabilization, in the periphery of occupied range for range limitation) as along as lethal WDM continued at its present or greater level. Using data from other regions of North America, winter harvests of wolves of 28-47% did not permanently reduce wolf populations for sustainable harvest. Wolf populations have been reduced in Canada and Alaska when 38-80% of the populations where removed during the winter. These populations quickly rebound after population reduction was ceased (Mech 2001).

The WDNR has established damage management thresholds to ensure that the state wolf population is not jeopardized by cumulative mortality sources. Under the 2007 guidelines for wolf depredation control, the annual cumulative maximum take of wolves from all damage management activities would be the number of wolves in excess of 250 wolves that are present during the mid winter population estimate (not including wolves on Native American reservations). If other mortality factors become apparent (increased illegal kill and natural mortality) these mortality factors would be considered by the wolf science advisory committee to estimate the allowable take for WDM. Lethal PWDM would not be permitted if the previous season's late-winter wolf population estimate for wolves off reservations minus known wolf mortality was below 350 wolves. State wolf population records indicate that wolf populations of 250 animals and 350 animals are viable populations. The late-winter total Wisconsin wolf population was at approximately 250 animals in 2001 and the population reached 350 animals between 2003 and 2004. The population increased from these levels to its current level of approximately 540 wolves in only 3-6 years.

Impacts on the Regional Wolf Population

One of the best predictors of the cumulative impact of WDM and all other factors on the Wisconsin wolf population is the impact of similar wolf damage management programs in Minnesota and Michigan. In Minnesota, the wolf population size is not surveyed or estimated annually, however in 2004 MNDNR estimated the wolf population had reached approximately 3,020 individuals. The previous estimate (for the winter of 1997-98) estimated a Minnesota wolf population of 2,445 wolves. A wolf depredation control program, similar to the one described for Wisconsin in this EA, has been conducted in Minnesota since 1978 when wolves were reclassified as threatened and a 4(d) regulation was promulgated. As discussed above, for the period of 1993 to 2002 intentional take for WDM ranged from 3.9 to 9.4% (average 6.4%) of the estimated state population. For most of the last 25 years of wolf damage management including

lethal removal of wolves, the Minnesota wolf population increased and it is only in the last few years that the population has stabilized. This level of take does not appear to have hindered the recovery of the gray wolf in Minnesota or the establishment and recovery of the gray wolf populations in Wisconsin and Michigan.

In Michigan, the wolf population has also been increasing (Figure 1-4). For most of the period from early 2003 until the court order in August 2006, the WDNR and the Michigan Department of Natural Resources (MIDNR) operated a wolf damage management program under the authority of a special 4(d) rule or a 10(a)(1)(A) permit. The level of intentional take of wolves at depredation sites in Michigan has been 1.2, 1.6, 0.5, and 1.4% of the late-winter Michigan wolf population for 2003 - 2006, respectively. During this same period, the Michigan wolf population has experienced annual growth rates of 15.5%, 12.2%, 12.8%, and 24.9%, respectively. The observed levels of population increase have occurred despite all known and unknown (cumulative) impacts on the wolf populations in these states.

Wolf populations in Michigan, Wisconsin and Minnesota have exceeded state and federal recovery goals and are expected to continue to increase until suitable habitat has been saturated. Recovery criteria in the Federal Wolf Recovery 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 Minnesota population, it must contain 200 wolves for at least 5 consecutive years (USFWS 1992, 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 1992). 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. The Michigan/Wisconsin wolf population is less than 100 miles from Minnesota and recent surveys indicate more than 1,000 wolves in these two states. The combined Michigan/Wisconsin population has contained over 100 wolves since 1994. 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 five times these numerical subgoals.

All indications from the literature and the analysis above indicate that implementation of this alternative will not threaten the continued persistence of the wolf population. During the previous 5 years (2002-2007?) 316 wolves are known to have died in Wisconsin; average annual mortality from all causes has been 17% of the population, wolf depredation management has accounted for 28% of all known mortality; and the Wisconsin wolf population has increased by 13% during this period (Table 4.2). During a similar time period, from FY '02-

03 to FY '06-07, 19 % of radio collared wolves (range 16-24%) died, which probably was more representative of the overall wolf population especially wolves ≥ 1 year old. Thus it was apparent that more wolves have died in Wisconsin than were detected by the overall sample of dead wolves, especially wolves dying of disease or killed illegally. About 8% of collared wolves dying were due to control actions by USDA-WS.. All wolves that have been removed through WDM are accurately accounted for; while wolves dying from other mortalities were probably under-represented.. What we do know is that the Wisconsin wolf population has sustained 16 -24%% mortality rates (all sources of mortality, not just WDM) during the previous five years and the population is continuing to expand. The estimates of the Wisconsin wolf population are minimum estimates, other wolves that are transients or new wolf packs that develop from pack splitting or budding may not be represented in the annual wolf population estimate. The current program has not slowed the growth of the wolf population, nor has it reduced the rate of increase in the number of wolf conflicts, farms with verified depredations, or the amount of funds required to compensate domestic animal owners. The addition of wolf shooting permits or provisions of NR 10.02 will not significantly increase the number of wolves that are removed annually for WDM. The impact of wolves legally shot/trapped by landowners, the WDNR, or removed by WS will likely be compensatory.

Based on the rate of increase for the Wisconsin wolf populations, the wolf population is large enough and healthy enough that even while the proposed action and all other mortality factors have adverse affects on individuals, they will not result in a reduction in the state wolf population. The following factors were of primary importance in this determination:

1) The wolf population in Michigan, Wisconsin, and Minnesota is estimated at over 4,000 and has surpassed recovery goals and the wolf population continues to increase in all three States.
2) The average annual rate of increase for the Wisconsin wolf population over the last 4 years is approximately 9.6%.
3) Based on literature and experiences from the Minnesota and the Northern Rockies wolf depredation control programs and assessments above, the proposed level of take is unlikely to cause a decline in the wolf population. The proposed level of take is less than the level of sustainable take identified in studies of wolf population dynamics noted above.
4) Continuation of current program will help to preserve current levels of human tolerance for the species in Wisconsin, which is expected to reduce illegal take of wolves that may otherwise occur in the absence of lethal control of depredating wolves. This action is expected to stabilize or reduce that component of the current mortality rate, which will partially off-set the additional mortality that will occur as a result of continuing the current program.
5) The WDNR has established population thresholds for the protection of the wolf population. Data from the Wisconsin wolf population indicate that the WI wolf population was viable and able to increase from these threshold population levels.

Effects on public and pet health and safety. WS conducted a formal risk assessment of

methods proposed for use in this EA (USDA 1997 Revised). The assessment concluded that when traps, cable restraints, firearms and frightening devices are used by appropriately trained and authorized personnel, in accordance with applicable laws, regulations and agency policy, the proposed WDM methods pose minimal or no risk to public health and safety. The greatest risks to human health and safety from the use of WDM techniques are incurred by the specialists who use these methods. There have been no reported injuries to WS or WDNR personnel or the public from wolf management activities in Wisconsin.

Firearm use is a very sensitive issue and a public concern because of fears regarding the potential for misuse of firearms. To ensure safe use and awareness, WS employees who use firearms to conduct official duties are required to attend an approved firearms safety and use training program within 3 months of their appointment and a refresher course every 2 years afterwards (WS Directive 2.615). All firearm safety precautions are followed by WS and WDNR when conducting damage management and WS and WDNR comply with all laws and regulations governing the lawful use of firearms. Shooting with shotguns or rifles would sometimes be used to reduce wolf damage when lethal methods are determined to be appropriate. Firearms would be used to euthanize captured wolves in a humane manner. Wildlife Services employees, who use firearms as a condition of employment, are required to certify that they meet the criteria as stated in the *Lautenberg Amendment* which prohibits firearm possession by anyone who has been convicted of a misdemeanor crime of domestic violence. Shooting is virtually 100% selective for target species and may be used in conjunction with spotlights and night vision equipment.

Wildlife Services' traps and cable restraints are strategically placed to minimize exposure to the public and pets. Appropriate warning signs are posted on access routes to properties where traps or cable restraints are set to alert the public of their presence. There may be some increased risk to the public and pets from traps in situations if WDM is conducted by non-WS entities who are less selective in their trap placement than WS. This risk is lower for this Alternative than Alternatives 1 and 4 because WDNR may have the resources to conduct WDM in the situations where WS cannot do so because of the constraints on WS actions in this alternative. Requests to WDNR for WDM assistance would be lower under this alternative than with Alternatives 1 and 4. Risk to public and pets from WDNR and WS damage management actions would be similar.

This alternative also could provide relief from damage or threats to public health and safety to people who would have no relief from such damage or threats if nonlethal methods were ineffective or impractical. Many people directly affected by wolf depredations on domestic animals, especially pets that are killed in their yards, express concern for human safety and insist upon the removal of wolves from their property when they cause damage. Wolves that have become habituated to humans (bold) are especially unpredictable (Section 1.3.8). In many situations where wolves may pose a risk to human health and safety, management of human behavior and nonlethal techniques may be sufficient to resolve the problem (Section 1.3.8) however, in some situations, removal of the problem individual may be the most appropriate solution. The WDNR also requires that it review and approve use of nonlethal and lethal methods to address cases of wolf depredation on pets and non-immediate risks to human safety, (See also Appendix E and the WWMP 1999, 2006).

Humaneness of methods to be used. Wildlife Services personnel are experienced and professional in their use of WDM methods. Under this alternative, wolves would be

trapped, captured by cable restraints, or shot by experienced WS personnel as humanely as possible using the best methods available. Tranquilizer trap devices (TTDs) can be used on wolf traps to reduce the incidence of self-inflicted injuries by captured animals. All activities would be conducted in accordance with the Wisconsin wolf trapping guidelines which require that traps be checked at least once every 24 hours. Daily trap checks minimize the amount of time target and nontarget animals remain in traps, and improve the likelihood that a nontarget animal may be released unharmed. Because of the limit on WS' ability to use the full range of WDM methods under this alternative, it's likely that at least some lethal WDM (e.g., PWDM) will be conducted by non-WS entities. WDM activities conducted by trained WDNR staff are likely to have impacts similar to actions by WS. However, some work is also likely to be done by landowners/managers. These individuals may lack the skills of WS and WDNR staff which could lead to increased risk of injury in target and nontarget animals. Individuals may perceive this increase in risks as being less humane than alternatives where the risks of injury is lowest (e.g., alternative 3).

Some individuals would consider this alternative inhumane because they oppose all lethal methods of damage management. Others will be opposed to this alternative because they object to specific lethal WDM methods like traps and cable restraints and perceive these methods as being unjustifiably cruel and inhumane. Some individuals would prefer that cage traps be used to capture wolves and would perceive this method as being more humane than traps and cable restraints. Unfortunately, the use of cage traps to capture wolves is both impractical and ineffective because it is extremely difficult to get a cage trap big enough for an adult wolf into remote locations, and because it is rare to captue an adult wolf in a cage trap. Individuals with animals that have been injured, threatened or killed by wolves may see this alternative as being more humane because it has the greatest likelihood of preventing futher injuries to their livestock and pets.

Impacts to stakeholders, including aesthetics of wildlife. Public reaction would be variable and mixed because there are numerous philosophical, aesthetic, and personal attitudes, values, and opinions about the best ways to reduce conflicts/problems between humans and wildlife. The impacts of this alternative to stakeholders would primarily depend on their values towards wildlife and their relationship to the damage problem. This alternative would likely be favored by property owners who are experiencing damage because this alternative has a high likelihood of successfully resolving wolf conflicts, but others would be saddened if wolves were lethally removed to resolve their damage problem. Individuals not directly affected by the threats or damage may be supportive, neutral, or totally opposed to any removal of wolves from specific locations or sites. Some individuals would strongly oppose this alternative because they believe it is morally wrong to kill or use animals for any reason or they believe the benefits from wolves outweigh the associated damage. Individuals totally opposed to lethal WDM methods want agencies to teach tolerance for wolf damage and threats to public and pet health or safety, and that wolves should never be killed.

As discussed in Section 2.1.5.2, wolves have high nonconsumptive (viewing, calling, photographing) and indirect values (e.g., spiritual, and existence values) for many people. The ability to view and aesthetically enjoy wolves at a particular site could be temporarily limited if the wolves are removed. New animals would most likely reoccupy the site in the future if suitable habitat exists, although the length of time until new wolves arrive is variable, depending on the habitat type, time of year, and population density of wolves in nearby areas. Given the increasing number of wolf packs in

Wisconsin and that this action is not anticipated to jeopardize the viability of the Wisconsin wolf population, other opportunties to view, call and aesthetically enjoy wolves will be available to people who make the effort to visit sites with adequate habitat outside of the damage management area.

The IWDM approach, which includes nonlethal and lethal methods as appropriate, provides relief from threats to public safety attacks on pets to people who would have no relief from such damage or threats if nonlethal methods were ineffective or impractical. Many people directly affected by problems and threats caused by wolves insist upon their removal from the property or public location when the wildlife acceptance capacity is reached or exceeded. Some people will have the opinion that wolves should be captured and relocated to a rural area to alleviate damage or threats. Some people would strongly oppose removal of wolves regardless of the nature of the damage problem.

Effects on nontarget species populations, including threatened and endangered species. Of the WDM methods proposed for use, foot-hold traps and cable restraints pose the greatest risk to nontarget species. Some nontarget animal species, such as raccoons, black bear, bobcat, dogs, and coyotes may be captured during WDM (Table 4-3). In hunted species, number of animals taken by WS relative to the number taken for sport harvest is negligible, and, for nonhunted species, take has also been extremely low. In many cases, WS has been able to release nontarget animals. Under this alternative WS' take of nontarget species is not expected to increase above current program levels. Using available harvest data and the annual take by WS, the magnitude of impact for the proposed action is considered extremely low (USDA 1997, Revised).

Not all coyotes reported as killed in Table 4-3 were unintentionally killed by the WDM method. Most coyotes were live captured and subsequently euthanized because the property also had a history of problems with coyote predation on livestock. In these instances, the livestock producer may request that WS euthanize all coyotes captured while WS is working to solve depredation problems with wolves.

The USFWS has concurred that WS' WDM methods are not likely to adversely affect the Bald Eagle, and may affect but are unlikely to adversely affect Canada lynx and are not anticipated to result in the incidental take of lynx (J. Smith, USFWS, August 12, 2003; L. Lewis, USFWS, May 9, 2001). On August 23, 2006, Wisconsin WS completed a new consultation with the USFWS Region 3 regarding the impacts of program activities, including wolf damage management, on lynx. Again, the USFWS concurred with WS' determination that WS' wildlife damage management activities may affect but are unlikely to adversely affect Canada lynx. WS has determined that the proposed action will have no effect on all other federally listed nontarget species and critical habitat in Wisconsin. WS and WDNR will adhere to all Conservation Measures, Terms and Conditions and other provisions for the protection of federally listed species provided in the 2001 and 2003 Section 7 consultations with the USFWS. The WDNR has also concurred that WDM actions similar to those proposed in this EA would have no effect or would be not likely to adversely affect State listed animal and bird T/E species (S. Holtz, WDNR, March 23, 2002).

Table 4-3. Number of Nontarget Species Taken by WS Personnel for WDM in Wisconsin (FY 04-FY07) Compared to Public Take (FY 03-FY 06).

Species	WS Take of Nontarget Species Killed(Released)				Fur Harvest / Public Take			
	FY04	FY05	FY06	FY07	2002-2003	2003-2004	2004-2005	2005-2006
Black Bear	(2)	1(4)	(1)	(2)	2,798	3,063	2,940	2,645
Coyote	25(2)	61	28(9)	54	13,597	17,837	23,148	14,474
Bobcat	0	(1)	0	(6)	253	371	364	497
Red Fox	0	2	0	(4)	5,196	7,743	7,527	5,472
Badger	(1)	(1)	(1)	(1)	-----	-----	-----	-----
Striped skunk	1	1	0	1	5,920	8,943	9,156	5,930
Raccoon	4(5)	5(3)	1(14)	2(9)	150,861	214,043	203,374	106,669
Wild turkey	1	1	1(1)	1	50,196	55,524	57,839	56,783
Common crow	0	1	0	0	74,080	74,007	59,218	56,341
Cow (calf)	0	(1)	0	0	-----	-----	-----	-----
Feral cat	1	0	(1)	0	-----	-----	-----	-----
Dog	0	(3)	(1)	(3)	-----	-----	-----	-----
White-tailed deer	0	0	1	1(2)	486,637	519,388	467,923	509,536
Sandhill Crane	0	0	0	(1)	-----	-----	-----	----

[1] Harvest seasons occur over 2 years for furbearers harvested in winter.

[2] Harvest estimates are from registered harvest for bear, bobcat, and turkey; Fur Trapper Harvest for furbearers; and Small Game Harvest for other species
http://dnr.wi.gov/org/land/wildlife/harvest/harvest.htm

The SOPs in Chapter 3 include measures intended to reduce the effects on nontarget species populations and to avoid jeopardizing T/E species' populations. Measures to reduce risks to nontarget species are also discussed in Appendix B. All activities would be conducted in accordance with the local, State, and Federal laws/guidelines for WDM which includes daily trap checks that minimize the amount of time target and nontarget animals remain in traps, and improve the likelihood that a nontarget animal may be released unharmed.

4.2.3 Alternative 3 – Revised Integrated WDM (Proposed Alternative)

This alternative is similar to Alternative 2 except it gives WS greater flexibility for managing wolf depredations. WS would be able to use the full set of measures in the 2007 guidelines for wolf damage management to more effectively address wolf depredations and conflicts with wolves in Wisconsin (Section 1.3.12).

Intentional Take - WS

WS intentional take under this alternative would be similar to the total intentional take discussed in the section on, "Intentional Take - Non-WS Entities" described for Alternative 2. Specifically, intentional take for WDM is likely to fall within the range of 8-20% of the winter population. Under the 2007 guidelines for WDM there are no special protections for lactating females and pups. This could include up to 1 female and 10 pups that were considered to be unintentional take for WS under Alternative 2. Total intentional take of wolves would be similar to Alternative 2.

Unintentional Take – WS

Under this alternative, take of lactating females prior to June 1 and pups prior to August 1 would not be considered unintentional take. WS would assist the WDNR with research and monitoring on the wolf population and could still use nonlethal WDM devices that require capture and handling of wolves. Risks of unintentional mortality from capture and handling of wolves would be the same as for Alternative 2, approximately 5 individuals per year (1 % of the winter population).

Intentional Take – Non-WS entities

Under this alternative, most lethal WDM take would be by WS. Landowners /leasees could take wolves under permits and the authorities of NR 10.02 in the same manner as in Alternative 2. As with Alternative 2, total take by private individuals under permits and NR 10.02 is not anticipated to exceed 15 wolves per year. Take by WS and private individuals for WDM is hightly interrelated. If WS is able to resolve the problem then private individuals are less likely to take wolves. Conversely, if a private individual takes a wolf, there may be less need for WS to conduct lethal removal. Consequently, we are including the number of wolves taken by private individuals in the estimate that 8-20% of the winter population will be taken for damage management.

Cumulative Impacts

Cumulative impact on the spring/summer wolf population would consist of 8-20% mortality from WDM plus 1% unintentional mortality associated with research and nonlethal WDM methods that require handling of wolves. Cumulative impact on the

wolf population would be 9-21% of the winter wolf population per year. As per analysis for Alternative 2, this level of mortality is not likely to adversely impact the Wisconsin wolf population. As with any of the alternatives, some level of illegal mortality will occur. However. illegal mortality is anticipated to be lowest for this alternative because professional assistance with WDM will be readily available.

WS would be the primary agency responding to requests for WDM. WDNR research and population monitoring would remain at their current high level. This research provides information on the size and location of wolf packs which improves the specificity and efficacy of WDM programs. WDNR research has also contributed significantly to the understanding and development of WDM alternatives including nonlethal techniques (Hawley 2005, Schultz et al. 2005, Rossler 2007).

Effects on public and pet health and safety. WS conducted a formal risk assessment of methods proposed for use in this EA (USDA 1997 Revised). The assessment concluded that when traps, cable restraints, firearms and frightening devices are used by appropriately trained and authorized personnel, in accordance with applicable laws, regulations and agency policy, the proposed WDM methods pose minimal or no risk to public health and safety. The greatest risks to human health and safety from the use of WDM techniques are incurred by the specialists who use these methods. There have been no reported injuries to WS or WDNR personnel or the public from wolf management activities in Wisconsin. The impacts of selecting this alernative would be similar to Alternative 2.

Risks to the public and pets from inexperienced and/or inappropriate use of lethal WDM methods would be lowest under this alternative because most WDM would be conducted by trained staff from WS. There would be no need for WDNR to designate other individuals as their agents to help meet requests for WDM, but the WDNR would still issue permits to landowners. However, given a readily avialable and effective source for WDM most individuals would use assistance from WS rather than attempting to use traps on their own. Risks would also be reduced because the revised guidelines for WDM would enable WS to locate wolves more efficiently which would reduce the amount time that WDM equipment is placed on the landscape. Cumulative risk of adverse impacts of this atlernative on public and pet health and safety are likely to be similar to or lower than Alternative 2.

Humaneness of methods to be used. Wildlife Services personnel are experienced and professional in their use of WDM methods. Under this alternative, wolves would be trapped, captured with cable restraints, or shot by experienced personnel as humanely as possible using the best methods available. Tranquilizer trap devices (TTDs) can be used on wolf traps to reduce the incidence of self-inflicted injuries by captured animals. All activities would be conducted in accordance with the Wisconsin wolf trapping guidelines/laws which require that traps be checked at least daily. Daily trap checks minimize the amount of time target and nontarget animals remain in traps, and improve the likelihood that a nontarget animal may be released unharmed. The impacts of selecting this alternative would be similar to or lower risk than Alternative 2.

Impacts to stakeholders, including aesthetics of wildlife. Public reaction would be variable and mixed because there are numerous philosophical, aesthetic, and personal attitudes, values, and opinions about the best ways to reduce conflicts/problems between humans and wildlife. The impacts of this alternative to stakeholders would primarily

depend on their values towards wildlife and their relationship to the damage problem. This alternative will more effectively and efficently resolve wolf damage conflicts and would be the most widely accepted by property owners who are experiencing damage because this alternative has the greatest likelihood of successfully resolving wolf conflicts, but others would be saddened if wolves were removed. Individuals not directly affected by the threats or damage may be supportive, neutral, or totally opposed to any removal of wolves from specific locations or sites. Some individuals would strongly oppose this alternative because they believe it is morally wrong to kill or use animals for any reason or they believe the benefits from wolves outweigh the associated damage. Individuals totally opposed to lethal WDM methods want agencies to teach tolerance for wolf damage and threats to public and pet health or safety, and that wolves should never be killed. Impact on the wolf population and associated opportunities to enjoy viewing or hearing wolves would be similar to Alternative 2. Cumulative impacts of this alternative would be similar to Alternative 2.

Effects on nontarget species populations, including threatened and endangered species. By selecting this alternative, the impacts to nontarget species would likely be decreased because WS would be able to locate wolves more efficiently which would reduce the amount time that WDM equipment is placed on the landscape. Of the WDM methods proposed for use, foot-hold traps and cable restraints pose the greatest risk to nontarget species. Under this alternative WS does not expect the rate of nontarget species taken to increase above current program levels. The take of nontarget animals by WS is well below the sustainable harvest level for the wildlife species captured. The number of animals taken by WS relative to the number taken for sport harvest is negligible. Using available harvest data and the annual take by WS, the magnitude of impact for the proposed action is considered extremely low (USDA 1997, Revised). Wildlife Services would have no direct impact on T&E species from the use of control methods.

4.2.4 Alternative 4 - No Federal WDM in Wisconsin

Effects on wolf populations. Under this alternative, WS would not implement a WDM program and would not have an impact on the wolf population. The WDNR would issue landowners trapping and shooting permits, establish Proactive Control Areas and would implement their own WDM program within the constraints of available time and resources. Landowners would still be allowed to kill wolves under provision of NR10.02. This alternative would place the greatest strain on WDNR staff and resources because there would be no assistance from WS. Limits on WDNR resources under this alternative will likely result in increased use of landowner permits and the need for WDNR to find other agents they can designate to assist landowners with wolf damage problems. It may be difficult to find and retain individuals with comparable training and experience in WDM as WS staff. Capturing specific wolves associated with depredation problems can be difficult. Depending on the experience and training of the individuals conducting the WDM, total authorized take under this alternative is likely to be similar to or lower than take under Alternatives 1-3.

This alternative is expected to result in a reduction in the efficacy and efficiency of WDM efforts; and it is reasonable to conclude will also result in a reduction in tolerance of wolves by the landowners and an increase in illegal kill. Frustration with wolf management and levels of wolf damage may be highest for this alternative because of what individuals may perceive as unnecessary obstacles to WDM assistance and an

agency refusal to respond to problems caused by wolves. In addition, illegal lethal control actions by private individuals are less likely to be very specific or very humane, and could potentially have more adverse impacts on the wolf population than focused lethal actions by trained, authorized professionals. Any illegal lethal control by individuals is also less likely to be effective in reducing depredation events, as it would be less likely to target the specific depredating animals.

Cumulative Impacts

Authorized take will be similar to alternative 1 and slightly lower than alternative 2 and 3. However, because of anticipated increases in illegal take discussed above, cumulative impacts on the wolf population from all sources of mortality are likely to be similar to or greater than Alternatives 1-3.

If WDNR wolf program personnel are forced to spend more time on nonlethal and lethal WDM control efforts for problem wolves, work on the state wolf population monitoring program and other natural resource management programs would suffer. Nonlethal and lethal control work by WDNR, without the aid of WS or other federal agents is likely to be very time consuming and very costly, and therefore may reduce flexibility of State wolf management. Thus the ability of the WDNR to determine wolf population size and distribution, changes in population growth rates, changes in mortality factors, and other characteristics of the wolf population would be reduced. If the WDNR does not maintain adequate surveys of the wolf population, proper management of wolves would be difficult and public confidence in wolf management by the WDNR would decline. Additionally, WS has assisted various research organizations, international countries, state and federal agencies with collecting biological samples from wolves captured at damage sites for a numerous research efforts to aid wolf conservation efforts. If WS selects this alternative, it is unlikely that an equivalent level of research assistance would be available.

Effects on public and pet health and safety. We anticipate that the WDNR would place the highest staff priority on responding to issues of risk to human health and safety and would not deligate response to these risks to personnel who lack the training and experience to effectively address these concerns. Consequently, risks to human health and safety from wolves would be similar to Alternatives 2 and 3.

It is reasonable to assume, that whatever WDM program the WDNR implemented in the absence of WS, there would be an increase in the number of individuals attempting to resolve WDM problems who lack the training and experience of WDNR and WS staff. There would be more trapping and shooting permits issued to landowners who had lost domestic animals to wolf depredation. Less experienced individuals may require more time to resolve a damage problem which would result in an increase in the amount of time traps and cable restraints are in use. The overall result of these changes would likely be an increase the number of pets that are captured in equipment placed for wolves. Private individuals who would be authroized to conduct WDM through shooting and trapping permits are not required to follow all federal policies that WS staff are required to follow which may also lead to increases in risks to pets and human safety.

Humaneness of methods to be used. This alternative would be considered humane by many people that are opposed to lethal WDM. However, WDNR would still use traps and cable restraints to capture and euthanize depredating wolves and to radio collar

wolves for population monitoring and nonlethal WDM techniques which require a collar on the wolf. When capturing wolves for population monitoring and nonlethal or lethal WDM efforts, wolves would be humanely captured by experienced WDNR personnel using the best methods available. However there would likely be a greater dependence on private landowners who would be issued trapping and shooting permits. These individuals would likely be less trained than WDNR or WS employess. Tranquilizer trap devices (TTDs) can be used on wolf traps to reduce the incidence of self-inflicted injuries by captured animals (Appendix B). Private individuals would not have access to TTD's.

Some property owners may take illegal action against localized populations of wolves out of frustration with continued damage occurs in the absence of a quick and effective WDM program. Some illegal methods, like poisons, may be less humane than methods used by experienced agency personnel.

Humaneness may decline for livestock and pets because overall efficacy in addressing damage problems would be lower than with Alternatives 2 and 3.

Impact to stakeholders, including aesthetics of wildlife. Some stakeholders would view this alternative unfavorably, and perceive it an an unwarranted restriction to their access to prompt professional assistance with wolf damage problems. The WDNR would continue to provide assistance with wolf damage problems, but the strain on WDNR resources and staff and costs to other WDNR programs would be greatest under this alternative. In addition to increased use of permits for landowners, it is likely that the WDNR would seek other individuals to use as designated agents who could respond to damage problems. It may be difficult for the WDNR ot obtain and retain individuals with the training and experience of WS staff. Consequently, damage problems may not be resolved as effectively or efficiently as Alternative 2. Farmers and pet owners with wolf depredation are likely to feel more frustrated because of lack of quick responses to losses by government agents. Individuals who feel that their aesthetic enjoyment is compromised by the knowledge that wolves could be killed for WDM will still be dissatisfied under this alternative.

Some individuals would prefer this alternative because they believe it is morally wrong to kill animals for any reason and don't want federal resources used for WDM. However, as discussed above, lack of WS involvement does not mean that lethal WDM will not occur.

As discussed above, this alternative is not anticipated to result in a decline in wolf density in Wisconsin and any difference in wolf viewing opportunities is likely to be neglible. Other opportunties to view, call and aesthetically enjoy wolves will be available to people who visit sites with adequate habitat outside of the damage management area.

Effects on nontarget species populations, including T&E species.

No operational WS activities would be conducted pursuant to this alternative so there would be no risks to nontarget or T/E species from WS. The WDNR and private citizens through trapping and shooting permits would still conduct lethal WDM activities. The WDNR would continue wolf trapping activities for population monitoring purposes and lethal and nonlethal WDM. WDNR actions are anticipated to have impacts and risks to nontarget species similar to those of WS. However, because of limits on WDNR staff and resources, this alterantive would require the WDNR to place increased emphasis on

use of landowner permits. Private citizens who are not trained in WDM and do not have to comply with all regulations pertaining to WDM would likely have a greater impact on nontarget and T/E species than WS. Also, private citizens would likely not report all nontarget species captured which would complicate monitoring and management of impacts on nontarget species. Any nontarget animals captured by private individuals while conducting WDM during the open regulated trapping season would likely be killed.

WS has assisted various research organizations, international countries, state and federal agencies with collecting biological samples from wolves captured at damage sites for a numerous research efforts to aid wolf conservation efforts. If WS selected this alternative, it is unlikely that private citizens involved in WDM would provide the same level of assistance with these efforts.

WDNR may also seek other individuals or organizations to serve as agents of the state in responding to WDM issues. The WDNR may have difficulty obtaining and retaining designated agents with the same level of training, experience and access to research and WDM resources as WS. If designated agents lack the training and resources of WS staff, there may be greater risks to T&E species. Overall risks to nontarget species would be greatest for this alternative.

4.3 SUMMARY OF IMPACTS

Table 4-4 highlights the potential impacts of each alternative for the issues that were analyzed in detail. Cumulative impacts are discussed in relationship to each of the alternatives and the environmental issues that were analyzed in this chapter. This EA recognizes that the total annual removal of individual animals from wildlife populations by all causes is the cumulative mortality. No single or cumulative adverse environmental consequences are expected to result from the proposed action. When used in accordance with all appropriate Federal, State and WS requirements and guidance, impacts on nontarget species from the proposed methods would be extremely low. None of the federally protected threatened, endangered, or candidate species listed by the USFWS or WDNR in Wisconsin would be jeopardized by the proposed action (J. Smith, USFWS, August 12, 2003; L. Lewis, USFWS, May 9, 2001). Economic and social impacts would primarily be beneficial, although some segments of the human population might be opposed to the killing of wolves. Negative impacts to the physical environment would be non-existent.

Any localized reduction of wolf populations would likely soon be replaced by wolves from surrounding areas, because WDM would only be conducted in specific pack areas near locations where conflicts have occurred. Lethal wolf take that would occur under the alternatives in this EA would be conducted to reduce specific depredation problems and would not be used as a means to reduce the regional wolf population. All non-WS agency actions would be conducted in strict compliance with the requirements set by the Wolf Depedation Control Guidelines, Appendix E, and associated policies and agreements between WDNR, WS, GLIFWC, Native American Tribes, the USFS and other public land managers. Depending on the alternative selected, WS actions will be conducted in accordance with the 2007 guidelines for wolf damage management or the more restrictive 2005 guidelines for wolf damage management (Appendix F). The proposed action may have negative effects on individual wolves but will not result in significant declines in the state wolf population. Availability of suitable habitat and suitable prey will eventually begin regulating the range and population expansion of the Wisconsin wolf population.

Table 4-4. Summary of Impacts

Issues/Impacts	Alternative 1: Nonlethal Only	Alternative 2: IWDM Program (Current Program/No Action)	Alternative 3: Revised IWDM Program (Proposed Action)	Alternative 4: No Program
Wolf populations	No lethal removal of wolves by WS. Increased risk that frustrated individuals may use illegal WDM methods. WDNR would implement a lethal WDM program. Increased use of trapping/shooting permits. Reduced efficacy to resolve complaints. Cumulative population impacts will likely be slightly less or similar to Alternative 2. Negative impacts to the WDNR wolf population monitoring program and other natural resource programs.	Possible temporary reduction in local populations, no reduction in statewide population. Risk of illegal action lower but still possible. WDNR might still conduct some lethal WDM program to implement sections of wolf management guidelines not covered by WS at cost of some wolf research and population monitoring. WDNR would also issue trapping and shooting permits. Development of Proactive Control Areas would occur.	Possible temporary reduction in local populations, no reduction in statewide population. WDNR would probably not conduct any lethal WDM. Shooting and trapping permits would be issued but fewer would likely be issued for this alternative. Result in greater acceptance of WDM by people suffering wolf damage and lowest level of illegal action toward wolves.	No WS involvement in WDM. Operational assistance with nonlethal and lethal control would be available from the WDNR. Greatest use of Proactive Control Areas and trapping and shooting permits by the public. Because of increased risk of illegal take, cumulative population impacts will be increased due to illegal take which will cause greater impacts to wolf population than Alternatives 2 and 3. Greatest negative impacts to the WDNR wolf population monitoring program and other natural resource programs.
Nontarget Species, Including T&E Species	Increased risk to nontarget species from use of traps and cable restraints by individuals with less experience that WS. Also individuals with trapping and shooting permits may not comply with same procedures for protecting nontargets as WS. Impacts to nontargets and T/E species greater for this Alternative than Alternative 2.	Low risks to nontarget species from WDM and research methods. No adverse impact to T&E or non- target species populations. Risk of illegal action still possible but reduced for this Alternative.	Low risk to nontarget species from WDM and research methods. Lowest use of trapping and shooting permits, so lowest risks from inexperienced use of WDM methods. Risk of illegal action still possible but lowest for this Alternative.	No effects by WS. Greatest risk to nontarget species from use of traps and cable restraints for nonlethal and lethal WDM and wolf population monitoring by individuals with less training and experience than WS. Risks to nontarget species from illegal actions likely higher than Alternative 2 and 3.

Public and Pet Safety	Risk from WS use of WDM methods lower than Alternative 2 and 3. WDNR would implement lethal WDM, overall risks would be similar to Alternative 2 and 3. Risks from permittees similar to or higher than alternative 3 depending on experience. Risks from wolves would likely be slightly higher than Alternative 2 and 3 because of restrictions in WDM methods and effectiveness. Increased risks from illegal actions.	Very low risk from WDM methods. Risks from wolves similar to or higher than Alternative 3. Low risks from illegal actions	Lowest risk of any alternative. to pets and human safety. Lowest risk caused by wolves. Lowest risk from illegal actions.	No effect by WS. WDNR would implement lethal WDM, overall risks would be similar to Alternative 2 and 3. Risks from permittees similar to or higher than alternative 3 depending on experience. Risks from wolves would likely be slightly higher than Alternative 2 and 3 because of restrictions in WDM methods and effectiveness. Highest risks from illegal actions.
Humaneness of Method	WS actions probably considered more humane by most people than lethal measures. There will still be concerns about WS use of traps and cable restraints for live capture of wolves. WDNR and others can still use lethal methods considered inhumane and will still implement use of Proactive Control Areas. Illegal use of lethal methods by others may increase depending on effectiveness of WDNR WDM activities. Less humane for livestock because problem wolves would not be as readily removed.	Agencies will use the most humane methods available. Some will perceive lethal methods and the use of traps and cable restraints for live capture of wolves as inhumane. WS will implement provisions for protecting lactating females and young of the year, but other entities are not required to protect these groups. WDNR will implement use of Proactive Control Areas. Low problems with illegal actions against wolves.	Use of methods will be similar to Alternative 2. Some people who are opposed to killing wildlife will feel this Alternative is the least humane because of Proactive Control Areas. There are no provisions for protecting lactating females or young of the year. However, risks to lactating females and young of the year from WS is minimal based on above analysis. This Alternative will likely minimize the use of illegal methods by public.	No WS involvement in WDM. Non-WS entities will be able to use methods considered inhumane including traps, cable restraints and Proactive Control Areas. Highest risk of illegal use of WDM by the public. Most use of public shooting and trapping permits. Less humane for livestock because problem wolves would not be readily removed.

Impact to Stakeholders, Including Aesthetics	Variable. Those with wolf conflicts may be glad to have some assistance but frustrated by difficulties in obtaining access to all WDM methods. Some may prefer this Alternative to Alternative 2 because no lethal WDM by WS. WDNR would work implement a WDM program similar to Alternative 3. No adverse impact on state wolf population, so opportunities to enjoy wolves would still be available. But might lead to higher rates of illegal kills by frustrated individuals.	Variable. Those receiving damage would probably favor this alternative over 1 and 4 but not 3. Some animal advocates would oppose this alternative because it includes use of lethal methods and WS (Federal) involvement in lethal WDM. No adverse impact on state wolf population, so opportunities to enjoy wolves would still be available.	Variable. Depending on viewpoint of WDM. Those who have wolf conflicts will benefit the most from this alternative. Those concerned about individual animal welfare and rights would be most opposed to this alternative. Most effective Alternative for resolving wolf conflicts while minizing impacts to the wolf population including illegal use of mehtods by the public. No adverse impact on state wolf population, so opportunities to enjoy wolves would still be available.	Variable. Those receiving damage probably oppose this alternative because of restrictions in access to WDM assistance. Some animal advocates may prefer this alternative because WS will not conduct any WDM. However, lethal WDM program including Proactive Control Areas will still be implemented by non-WS entities. No adverse impact on state wolf population, so opportunities to enjoy wolves would still be available. But might lead to higher rates of illegal kills by frustrated individuals.

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APPENDIX A

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APPENDIX B

METHODS EMPLOYED OR RECOMMENDED FOR WOLF DAMAGE MANAGEMENT

NONLETHAL METHODS

Some nonlethal WDM techniques can be used by anyone while other techniques require special permits from the WDNR. The list of nonlethal methods provided below describes the nonlethal methods available for WDM and the requirements for the method to be used by the public or agency personnel. If WS personnel are involved in the operational use of methods, an *Agreement for Control on Private Property* and/or similar document for public lands must be signed by the landowner or administrator authorizing the use of each damage management method. The WWMP (WDNR 1999) establishes that upon the first reported instance of conflicts with wolves, the landowner/manager must sign a depredation management plan (farm plan) for the property which includes damage abatement recommendations prior to obtaining operational or financial assistance with WDM.

Nonlethal Methods Available to All

Some WDM methods are available to anyone without a permit. These consist primarily of nonlethal preventive methods such as cultural practices and habitat modification. Cultural practices and other management techniques are implemented by the livestock producer and property owners. Livestock producers and property owners may be encouraged to use these methods, based on the level of risk, need, and professional judgment on their effectiveness and practicality. WS involvement in the use of these methods is usually limited to providing technical assistance. Technical assistance includes providing advice, recommendations, and information regarding wildlife damage management methods and techniques to individuals and groups. It also involves providing presentations or demonstrations on management techniques. These methods include:

- **Animal husbandry practices** involve the basic management practices used by farmers and ranchers in the care and production of livestock. The modification or use of certain animal husbandry practices has been reported to have some effectiveness in reducing depredations by coyotes and other predators (Robel et al. 1981, Linhart 1984*b*, Andelt 1996). These practices may include use of shed lambing, clearing of woody or brushy pastures, modifications to lambing or calving schedules, and proper dead animal disposal procedures. Fritts (1982) reported that many instances of wolf depredation on livestock in Minnesota were related to animal husbandry practices, such as the pasturing of cattle in extensive woodlots and allowing calving in woodlots or remote pastures. Fritts also wrote that improper carcass disposal may encourage or perpetuate depredations. Animal husbandry practices include, but are not limited to, the use of:

  Guarding animals include the use of dogs, donkeys, and llamas. These animals can effectively reduce coyote predation losses in some situations (Andelt 2001, Meadows and Knowlton 2000, Cavalcanti and Knowlton 1998, Green and Woodruff 1996). Several breeds of large dogs have been used for centuries by rural societies in the Old World to guard livestock from predators (Linhart 1984*b*). Studies conducted in the U.S. have shown the use of Old World guarding dog breeds, such as Great Pyrenees, Kangal, and Komondor, to be effective in the protection of livestock from coyote predation (Linhart et al. 1979, Coppinger et al. 1988, Andelt 1992). In most situations guarding dogs provide protection from coyote depredations by "warning" or chasing the coyote away (McGrew and Blakesley 1982). The effectiveness of guarding dogs for protection from wolves in

the U.S. has been questioned (Coppinger and Coppinger 1995), and may be complicated by the nature of farming and ranching practices in wolf habitat (i.e. large, remote, woody or brushy pastures) (Fritts et al. 1992). In addition, wolves may perceive guard dogs as "new" wolves and may kill these intruders into their territories (Shivik 2001).

Success in using guard dogs is highly dependent on proper breeding and bonding with the type of livestock the dog is to protect. Effective use of guard dogs depends on training, obedience, care, and feeding (Green and Woodruff 1996). The efficacy of guard dogs is affected by the amount of predation loss, size and topography of the pasture, acceptance of the dog by the livestock, training, compatibility with humans, compatibility with other predator damage management methods, and the species of predator. Guard dogs breeds mature at about 2 years of age and may begin protecting livestock at this age. Guard dogs generally have an effective working life of less than 3 years because of accidents, disease, and people misidentifying the guard dog as a threat to the livestock and shoot the dog (Lorenz et al. 1986, Green 1989). Guard dogs may kill, injure, harass, or try to breed sheep and goats (Green and Woodruff 1983).

Wolves avoided livestock guarding dogs initially, but over a period of a few weeks came closer and closer until near contact was made (Smith et al. 2000). The wolves eventually showed dominance over the dogs in direct confrontations. In addition, wolves have killed guarding dogs, including Anatolian Shepherds in Minnesota and Montana (Fritts and Paul 1989). Bangs et al. (1999) also identified guard dog mortalities attributed to wolves during the last five years of wolf recovery in the Rocky Mountains.

Guard donkeys have been used to protect livestock with mixed results. The reported most effective guard donkey is a jenny with a foal. Guard donkeys are probably more effective at deterring dog and coyote predation than wolf predation.

Guard llamas have also been used with mixed success to protect livestock. Some producers believe guard llamas are better at defending livestock from dogs than coyotes. Llamas are typically aggressive toward dogs and appear to readily bond with sheep (Cavalcanti and Knowlton 1998). Llamas are able to reduce coyote predation on sheep initially (Meadows and Knowlton 2000). Dogs and coyotes adapt to the protective nature of llamas thereby reducing their effectiveness over time (Meadows and Knowlton 2000). Further, in Montana during the last five fiscal years, wolves killed 12 llamas (Montana MIS unpubl. data FY98, FY99, FY00, FY01, FY02 (annual reports).

Guard animals may have more potential in the Great Lakes region because wolves are smaller, and occur in smaller packs. In the Northern Rockeies where large wolves occur in large packs, guard animals are more likely to be attacked. Pack size seems to be an important factor in wolf attacks on dogs in Wisconsin (Wydeven et al. 2004).

Carcass removal is burying, liming or incinerating dead livestock to remove an attractant for predators. However, Mech et al.(2000?) could find no clear relationship between the application of carcass removal and a reduction in wolf predation on livestock in Minnesota, but left open the possibility that larger farms tend to attract wolves by providing a more reliable food source in the form of carcasses.

Pasture selection is placing or moving cattle in pastures believed less likely to expose livestock to predation. Usually, moving livestock to pastures near human habitation is believed to expose livestock to fewer predators. Livestock producers eventually must

move livestock to distant pastures to graze, however, they may wait until calves are larger and older in the hope to reduce their vulnerability to predation.

- **Habitat modification** is used whenever practical to attract or repel certain wildlife species or to separate livestock from predators. For example, clearing brush from calving pastures or near residences reduces available cover for predators.

- **Physical exclusion** or fencing to protect livestock from wolf depredations is one of the earliest methods used to deal with wolf problems, and was used in early Europe as well as by American colonists (Wade 1978, Cluff and Murray 1995). Woven wire fencing with buried wire aprons were used in Texas sheep pastures to exclude coyotes but cost of materials and labor were generally prohibitive (Linhart 1984*b*). Electric fencing has shown some success in reducing coyote depredation on sheep (Gates et al. 1978, Linhart 1984*b*), but tests on wolves have not been reported (Cluff and Murray 1995). Widespread use of fencing as a nonlethal control technique for wolves has not occurred (Cluff and Murray 1995). Predator proof fencing may be effective in small, confined situations, or justified when protecting extremely high value animals. Wolves have the ability to jump over or dig under fences, so the fencing design must be of sufficient height and bottom repellency to deter wolves. Where practical, sheep or other vulnerable livestock may be penned near farm buildings at night to reduce the likelihood of wolf depredations. However, WS personnel have documented a number of instances where wolves have killed livestock in barnyards near farm buildings or entered open-sided barnyard shelter/loafing buildings. A predator-proof fence is possible to construct, but the initial cost of constructing such a fence usually keeps them from being built (Shivik 2001). If economically feasible, fencing is most appropriate in small areas, such as calving grounds and bedding areas (Shivik 2001).

  Fladry consists of attaching waving flags about every 20 inches from thin rope or cable stretched about 20 inches above the ground. Fladry may be used in addition to or in substitution of fences, as a new means to protect domestic animals from depredation by wolves. Fladry seems to work because it may be "novel" to wolves (Musiani and Visalberghi 2001), however, the length of time it may work is undetermined and variable (Shivik 2001). Fladry is likely to be limited to small and medium-sized fenced areas because the flags require maintenance, especially in areas with high winds (Shivik 2004).

  Compensation involves reimbursing individuals for the losses caused by wolves. Reimbursement provides producers monetary compensation for losses, it does not remove the problem nor does it assist with reducing future losses from predation. A compensation program may be helpful in reducing animosity towards wolves and in preventing the wolf population from being an economic burden on individuals. However, Naughton-Treves et al. (2003) reported on a public attitudes survey regarding the compensation program for wolf damage in Wisconsin. They found no difference in tolerance for wolves between compensated and non-compensated individuals, but the majority of people surveyed felt compensation should be provided for wolf depredation on domestic animals, especially livestock. The authors hypothesized that compensation programs may not improve individual tolerance of wolves but may be important for establishing broader political support for wolf conservation. Additional difficulties with compensation programs (Wagner et al. 1997, USDA 1997 Revised) include:

- Compensation is not practical for public health and safety problems.
- In addition to the money required to reimburse livestock producers, compensation programs also require expenditures of staff time and money to investigate and validate all losses, and to determine and administer appropriate compensation.
- In Wisconsin the compensation program pays for confirmed or probable losses, and under some circumsrances portions of missing livestock. In some cases it is not possible to conclusively ascertain that wolves caused the death of the animal or the animal/carcass is missing. Producers may feel that they are not beeing adequately compensated for the full value of their losses.
- Compensation may not be a satisfactory solution for individuals who feel responsible for the well-being of their livestock or in situations where there is an emotional attachment to the animal.

The Wisconsin wolf damage compensation program is funded by 3% of the state income tax return checkoff and 3% of license plate fees collected from the sale of endangered resources license plates. In most recent years the claims for wolf damage have exceeded the resources available from license plate revenue. Because the WDNR has be directed by the legislature to provide full compensation for wolf depredations, the WDNR Bureau of Endangered Resources has been forced to use additional program funds to make compensation payments. When this occurs, these funds are made available at a cost to other endangered species programs.

- **Animal Behavior Modification** refers to tactics that deter or repel predators and thus, reduce predation**.** Unfortunately, many of these techniques are only effective for a short time before wildlife habituate to them (Pfeifer and Goos 1982, Conover 1982, Shivik 2001). These nonlethal methods[15] have been described as consisting of two stimuli: disruptive stimuli and aversive stimuli (Shivik 2001). Disruptive stimuli are novel or otherwise undesirable stimuli that prevent or alter behavior of animal. Disruptive stimulus devices will usually be limited to the protection of small areas. Aversive stimuli interfere with behaviors by capitalizing on animal's innate dislike of novel, disagreeable stimuli and the more noxious the stimuli, the more aversive the stimuli are likely to be. With disruptive stimuli, learning decreases effectiveness, but with aversive techniques, effectiveness is dependent on learning. In general, use of multiple stimuli, moving and switching the type/source of stimuli helps reduce problems with learning and increases the lifespan of the method. Aversive stimuli are noxious stimuli that are paired with a specific behavior to condition an animal not to perform that behavior.

  Disruptive Stimuli Including Frightening Devices are methods that usually involve a light, sound, or motion device designed to deter wolves from a certain area. Strobe and flashing lights, propane exploders, sirens, and various combinations of these devices have all been used in attempts to reduce livestock losses to coyote, with wide ranging degrees of effectiveness (Linhart 1984*a*, Andelt 1987). Animal habituation (becoming accustomed) to the stimulus is one of the primary limiting factors for primary repellents. Moving the devices intermittently and randomly as well as alternating the stimuli (e.g. a different type of noise or light) may extend the effective period of the system (Shivik and Martin 2001). Coyotes readily adapt to most repellent devices (Wade 1978), and the response of wolves in probably similar (Cluff and Murray 1995). Blinking highway safety lights and flagging were used to reduce wolf predation at cattle farms in Minnesota

[15] Chemical repellents, projectile repellents, and visual and acoustic devices generally show little promise in reducing livestock depredation on a large-scale or long-term basis (Smith et al. 2000a).

but the effectiveness of these methods could not be adequately measured (Fritts 1982). Electronic guards (siren strobe-light devices) are battery powered units operated by a photocell. The unit emits a flashing strobe light and siren call at regular intervals throughout the night. Efficacy of strobe-sirens is highly variable and less than three weeks (Linhart 1984*a*). The device is a short-term tool used to deter predation until livestock can be moved to another pasture, brought to market, or other predator damage management methods implemented. Lights and flagging (fladry) may be most useful in wolf depredation situations where other control methods such as trapping are prohibited or impractical (Fritts et al. 1992).

Guarding and Hazing involves guarding an area and then using pyrotechnics, crackershells or other light/noisemaking devices to frighten wolves away from the site. It can be used as an aversive technique, but requires that the projectiles must be used every time the animal attempts to prey on the protected resource so they don't identify conditions when they can obtain prey without receiving a negative experience (Shivik 2004).

Nonlethal Methods Available to States with Cooperative conservation agreements with the USFWS

Some nonlethal methods and research projects (e.g., population monitoring) involve capture and handling wolves which may not be implemented by the general public. Methods that require capture and handling of live wolves would be only be conducted by personnel from WS, WDNR, the tribes or other appropriately trained individuals authorized by the WDNR or tribes.

- **Animal Behavior Modification** (General description provided above.)

  Remote Activated Frightening Devices. These devices are frightening devices like those described above under "Disruptive Stimuli Including Frightening Devices". The difference is that these devices work because a transmitter on a wolf collar or a motion detector activates frightening devices when wolves approach a protected area. It should take longer for wolves to habituate to these devices because they are only activated when a wolf, or in the case of motion detectors, another animal activates the system. Breck et al (2002) experimented with a Radio Activated Guard (RAG) device to protect livestock in small pastures. Results indicate the RAG device was effective for protecting livestock in small pastures. In addition, wolves exhibited no signs of habituation to the device. Limitations of the scare device include electronic complexity, area coverage, and price (Breck et. al. 2002). A similar Movement Activated Guard (MAG) device was effective in reducing consumption of deer carcasses by wolves (Shivik et al. 2003).

- **Capture, Collar and/or Relocate** includes capturing wolves and attaching a radio collar or collar that works as a part of a behavior modification system (discussed above). It also includes the practice of capturing a wolf or wolves and moving them to another location for release. Relocation may be effective in some situations, but success will vary depending on the trapping history of a problem wolf. Capture and relocation would only be conducted by authorized, specially trained personnel within the USFWS, WDNR or WS. Eventually relocation may be limited as the number of suitable release sites are occupied by wolves and lethal removal should be considered (Linnel et al. 1997). Identification of release sites and agreements with appropriate land owners/managers must be done before relocation efforts can be initiated. While federally listed, relocation sites would be agreed upon by the State.

Shivik (2001) and Linnel et al. (1997) stated, however, that the truth is that most predators that are relocated either return (even when displaced hundreds of miles), get into the same or worse trouble than they were already in, or die. Relocated wolves, after being taken out of their element, often die, either slowly by starvation, brutally by another pack or killed on a highway (Shivik 2001), and some resume depredation at the relocation site (Bangs et al. 1995, Bradley et al. 2005). The rate at which repeated depredation problems would occur is likely dependent on the conflict potential at the release site and the area through which the relocated animal(s) traveled after release. Bradley (2004) reported that in the greater Yellowstone area most translocated wolves did not form or join other packs, and 27% of translocated wolves resumed depredation activities. Translocated wolves also had lower survival rates than non-translocated wolves.

Between 1991-2002, of 38 problem wolves captured in Wisconsin, 32 were translocated long distances (52-277km), 3 were released locally (<10km), 2 died after capture, and 1 was euthanized (WDNR 2007*b*). Two of 3 short distant relocations resulted in return to depredations, and at least 4 of the long-ditance translocators caused livestock depredation at new locations.

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, Sawyer, Taylor and Winnebago Counties, and the Town of Mason in Bayfield County, have passed resolutions against release of problem wolves. These resolutions are not legally binding on the WDNR, but do serve as an indication of public sentiment toward and tolerance of wolves. With most suitable wolf habitat occupied by wolf packs, the Wisconsin DNR now has limited places to relocate problem wolves.

The following methods could be used during the process of capturing and collaring or relocating wolves

> Foot-hold traps can be utilized to live-capture a variety of mammals, and are effectively used within Wisconsin to capture wolves. Three advantages of the foot-hold trap are: 1) they can be set under a wide variety of conditions, and 2) pan-tension devices can be used to reduce the probability of capturing smaller nontarget animals (Turkowski et al. 1984, Phillips and Gruver 1996), and 3) nontarget wildlife can be released. Effective trap placement and the use of appropriate lures and baits by trained WS personnel also contribute to the foot-hold trap's selectivity. Lures are either natural or synthetic formulations that are used to attract wolves to sites where traps have been set. Baits consist of fetid meat or carrion and may also be used to concentrate wolf activity in specific sections of their home range (Hawley 2005 and Rossler 2007). Use of baits also facilitates prompt removal of wolves and can decrease the total time capture devices are used, thereby reducing risks to nontarget animals. To reduce the risk to nontarget species, WS would also not set traps within 30 feet of exposed bait (See Section 3.5).
>
> Foot-hold traps are difficult to keep operational during inclement weather and they lack selectivity where nontarget species are of a similar or heavier weight than the target species. The use of foot-hold traps also requires more time and labor than some methods, but they are indispensable in resolving many depredation problems. Foot-hold traps are constantly being modified and tested to improve the welfare of captured animals. Additionally, the NWRC has developed a Tranquilizer Tab Device (TTD) that can be used in conjunction with traps and cable restraints which can help reduce stress and injury of captured individuals (See TTD below). WS in Wisconsin only use offset

laminated jaw traps which have been found to reduce injury in captured coyotes (Phillips et al. 1996).

Cable restraints and foot snares may be used as live-capture devices. Cable restraints are a specialized type of snare intended to live capture wolves (Olson and Tischaefer 2004). Careful attention to details when placing cable restraints and the use of a *"stop"* on the cable can allow for live-capture of animals and can allow some nontarget animals to pull out of the device. Spring-activated foot snares could also be used to capture depredating wolves. As with traps, snare placement and, in the case of leg snares, the use of trigger tension systems reduce the risks to nontarget species. Size and height of the cable restraint loop above the ground can also reduce nontarget species risks. Careful placement of capture devices and the appropriate use of lures and baits by trained WS personnel also contribute to the selectivity of these methods. Lures are either natural or synthetic formulations that are used to attract wolves to sites where cable restraints or snares have been set. Baits consist of fetid meat or carrion and may also be used to concentrate wolf activity within a specific portion of their territory (Hawley 2005, Rossler 2007). Baits may be placed in areas where risks to nontarget species and risks other packs are at a minim, thereby increasing the selectivity of the capture method. To reduce the risk to nontarget species, WS would not set foot snares or cable restraining devices within 30 feet of exposed bait (See Section 3.5).

Presently in Wisconsin, WS is only allowed to use cable restraints that meet the following criteria: constructed of 1/8" diameter , 7x7 cable, 10 feet or less in length, incorporate a reverse-bend lock with a minimum outside diameter of 1 ¼ inches, incorporate an inline swivel, have a fixed stop 15 inches from the cable end and are staked in such a manner to prevent the captured animal from entangling in rooted vegetation greater than ½ inch in diameter.

Chemical Immobilization and handling of live-captured wolves could be conducted by using several drugs approved and authorized for this purpose. These methods would only be used by personnel who have received training in the safe use of authorized immobilization/ euthanasia chemicals and are certified by WS or WDNR. This training involves hands-on application of state-of-the-art techniques and chemicals. Immobilization drugs approved for use by WS and the WDNR include:

Ketamine hydrochloride is a cyclohexamine (dissociative) type drug that produces immobilization and analgesia by selective depression of the central nervous system. Ketamine produces a state of unconsciousness that interrupts association pathways to the brain and allows for the maintenance of the protective reflexes, such as coughing, breathing, swallowing, and eye blinking. It is supplied as a slightly acidic solution (pH 3.5 to 5.5) for intramuscular injection. Ketamine is detoxified by the liver and excreted by the kidney. Following administration of recommended doses, animals become immobilized in about 5 minutes with anesthesia lasting from 30 to 45 minutes. Depending on dosage, recovery may be as quick as 4 to 5 hours or may take as long as 24 hours. Recovery is generally smooth and uneventful. Ketamine is rarely used in a pure state due to possible negative side effects. For wolf immobilizations, Ketamine would be used in combination with Xylazine in order to minimize side effects.

Xylazine hydrochloride is a sedative which produces central nervous system depression and moderate analgesia and muscle relaxant properties. Xylazine HCL is most often used in combination with drugs such as Ketamine. Ketamine/Xylazine combinations can be

used to effectively and safely immobilize a variety of mammals. At high dose rates the margin of safety decreases greatly. Recommended dosages are administered through intramuscular injection allowing the animal to become immobilized in about 5 minutes and lasts for several hours, but can be reversed after 30 to 45 minutes.

Yohimbine is a useful and readily available antagonist used to reverse the effects of Xylazine.

Telazol is a combination of equal parts of tiletamine hydrochloride and zolazepam hydrochloride. The product is generally supplied sterile in vials, each containing 500 mg of active drug, and when dissolved in sterile water has a pH of 2.2 to 2.8. Telazol produces a state of unconsciousness in which protective reflexes, such as coughing and swallowing, are maintained during anesthesia. Schobert (1987) listed the dosage rates for many wild and exotic animals. Before using Telazol, the size, age, temperament, and health of the animal are considered. Following a deep intramuscular injection of Telazol, onset of anesthetic effect usually occurs within 5 to 12 minutes. Muscle relaxation is optimum for about the first 20 to 25 minutes after the administration, and then diminishes. Recovery varies with the age and physical condition of the animal and the dose of Telazol administered, but usually requires several hours.

Capture-All 5 is a combination of Ketaset and Xylazine, and is regulated by the FDA as an investigational new animal drug. The drug is available, through licensed veterinarians, to individuals sufficiently trained in the use of immobilization agents. Capture-All 5 is administered by intramuscular injection; it requires no mixing, and has a relatively long shelf life without refrigeration, all of which make it ideal for the sedation of various species.

Tranquilizer Tab Devices (TTDs) were developed by the NWRC as a means of sedating animals captured in foot-hold traps to reducing the potential for self-inflicted injuries to animals while held in the trap. Used properly the sedative, propiopromazine hydrochloride (Investigational New Animal Drug #9528) does not render the animal unconscious. The drug is administered via a rubber nipple (trap tab) fastened to the jaw of the trap. Upon capture the animal will instinctively bite on the trap tab and ingest the tranquilizer.

Nonlethal Methods which may Require Special Authorization from the WDNR

Some animal behavior modification systems involve capturing wolves and fitting wolves with collars used to deliver or trigger repellent stimuli (i.e., aversive conditioning). Other systems involve shooting wolves with nonlethal projectiles like rubber bullets. These nonlethal techniques are still in development and involve intentionally using painful stimuli to manage wolf behavior. The WDNR has determined that permits or other authorizations are required to use these methods and any other experimental WDM techniques. Methods that require capture and handling of wolves would be conducted only by personnel from the WDNR, WS, the tribes, and or individuals specially trained and authorized to do so by the WDNR or tribes.

- **Aversive stimuli** are stimuli that cause discomfort, pain and/or an otherwise negative experience paired with specific behaviors to achieve conditioning against these behaviors. These types of repellents involve animal learning to be effective (Shivik et al. 2002, 2003). Electric shock from

a modified dog training collar that was activated when wolves came into close proximity to livestock was tested by Shivik et al. (2002). Testing indicated potential, but numerous logistical obstacles to research design and operational must be overcome before this technique is likely to have operational value. Training collars used in captive situations did not show a detectible reduction in wolf predation in a subsequent study by Shivik et al. (2003). The authors reported numerous difficulties in use of the training collars.

Shultz et al. 2005 reported the results of using dog training collars on 2 different wolves over a 4 year period. Their observations indicated that remote-activated training collars do appear to deter predation by wolves. Shocking did not appear to reduce den or rendezvous site attendance but did appear to result in an increase in distances moved during the period immediately after the shock was administered. Long-term avoidance of the farms did not seem possible unless the aversive stimulus (shock) was linked to a signal, like the beepers which sounded before the shock was administered. When training collars were placed on wolves after depredations had started, it appeared to affect the behavior of the collared wolf but seemed less likely to affect other wolves in the pack. Authors concluded that under specific circumstances, use of collars to condition wolves to avoid certain sites may be preferable and more cost-effective than traditional removal efforts. However, additional information is needed on the long-term physical and behavioral impacts of the collars on wolves. In 2 follow-up studies, Hawley (2005) and Rossler (2007), both demonstartated that training collars could displace free-ranging wolves from specific portions of their home range areas. Rossler (2007) also found some evidence that non-collared wolves may be affected by the behavior of wolves wearing shock collars.

- **Nonlethal Projectiles** This involves guarding an area and then using rubber bullets or other nonlethal projectiles to prevent a predation event. It can be used as an aversive technique, but requires that the projectiles be used every time the animal attempts to prey on the protected resource so the animal doesn't identify conditions when it can obtain prey without receiving a negative experience (Shivik 2004). In general, this method is intended for use on wolves that spend time around houses/farms repeatedly trying to get livestock and pets, and wolves that are acting too bold around humans (E. Bangs, USFWS, pers. comm.).

  Methods which require around-the-clock presence of a person to guard the resource are most efficiently used when the landowner/resource manager assists with the implementation. The WDNR, and/or WS, as the designated agent of the WDNR, could train individuals in the use of this method. It is possible, although unlikely that this method could result in the death of or injury to a wolf if used at close range or if a shot unintentionally hits a vulnerable spot on the wolf. There is some concern that use of this method by private citizens could result in greater risk to wolves than if its use is restricted to WS and WDNR personnel. However, Bangs et al. (2004) reported that over 100 permits were issued for this method and, although several wolves were hit, none seemed seriously injured. Individuals using the method reported that wolves did seem more wary after the technique was used.

LETHAL WOLF DAMAGE MANAGEMENT METHODS

Lethal removal of depredating wolves can resolve damage problems but, in some instances, may provide a shorter period of relief from damage than some nonlethal techniques like fencing (Bradley 2004). Bradley (2004) noted that while lethal techniques used in Montana, Idaho and Wyoming generally reduced damage, the reduction was limited to the season when the removal occurred. Rate of recolonization for territories where entire packs were removed was high (70%) and generally occurred within the same year as the removal. Most new packs also depredated (86%). Similarly, Harper (2004) determined that in certain situations, killing wolves was an effective means of reducing depredation on

sheep and cattle in Minnesota. The 2005 and 2007 guidelines for WDM in Wisconsin set limits on when and how lethal WDM methods may be used to resolve damage problems (Appendix E and F).

- **Euthanization** of problem wolves caught or restrained by foot hold traps, cable restraints, or snares will normally be conducted with the use of appropriate type of firearm by trained personnel. This is the preferred method of euthanasia to reduce handling and stress to the animal. Euthanasia may also be accomplished through the administration of approved and authorized chemical euthanasia agents, such as sodium pentabarbitol for properly immobilized animals.

- **Cable Restraints/Foot-Snares** may be used as either lethal or live-capture devices. Cable restraints set to catch an animal by the neck are usually lethal, unless there is a *"stop"* on the cable to regulate the minimum size of the loop and the devices are set so that the animal cannot become entangled in surrounding vegetation. The specialized snares used for live-capturing are called "Cable Restraints" (Olson and Tischaefer 2004). Spring-activated foot snares could also be used to capture depredating wolves. Wolves captured by nonlethal restraint devices may be euthanized as described above. Careful placement of capture devices and the use of appropriate lures and baits by trained WS personnel contribute to the selectivity of these methods. Lures are either natural or synthetic formulations that are used to attract wolves to capture sites. Baits consist of fetid meat or carrion and may also be used to attract wolves to specific sites where cable restraints or snares have been set. To reduce the risk to nontarget species, WS would not set foot snares or cable restraining devices within 30 feet of exposed bait (See Section 3.5).

- **Foot-hold traps** can be utilized to live-capture a variety of mammals, and are effectively used within Wisconsin as nonlethal and lethal capture devices. When used as a lethal damage management method, captured wolves are euthanized using the methods described above. Three advantages of the foot-hold trap are: 1) they can be set under a wide variety of conditions, and 2) pan-tension devices can be used to reduce the probability of capturing smaller nontarget animals (Turkowski et al. 1984, Phillips and Gruver 1996), and 3) nontarget wildlife can be released. Effective trap placement and the use of appropriate lures and baits by trained WS personnel also contribute to the foot-hold trap's selectivity. Lures are either natural or synthetic formulations that are used to attract wolves to trap sites. Baits consist of fetid meat or carrion and may also be used to attract wolves to specific sites where foot-hold traps have been set. To reduce the risk to nontarget species, WS would not set traps within 30 feet of exposed bait (See Section 3.5).

  Foot-hold traps are difficult to keep operational during inclement weather and they lack selectivity where nontarget species are of a similar or heavier weight than the target species. The use of foot-hold traps also requires more time and labor than some methods, but they are indispensable in resolving many depredation problems. Foot-hold traps are constantly being modified and tested to improve the welfare of captured animals. Additionally, the NWRC has developed a Tranquilizer Tab Device (TTD) that can be used in conjunction with traps and cable restraints which can help reduce stress and injury of captured individuals (See TTD above). WS in Wisconsin only use offset laminated jaw traps which have been found to reduce injury in captured coyotes (Phillips et al. 1996).

- **Shooting** is selective for a target species and may involve the use of spotlights, night-vision, and predator calling. Removal of one or two specific animals by calling and shooting in the problem area can sometimes provide immediate relief from a predation problem.

  Firearm use is very sensitive and a public concern because of safety issues relating to the public and misuse. To ensure safe use and awareness, WS employees who use firearms to conduct

official duties are required to attend an approved firearms safety and use training program within 3 months of their appointment and a refresher course every 2 years afterwards (WS Directive 2.615). Wildlife Services employees, who carry firearms as a condition of employment, are required to certify that they meet the criteria as stated in the *Lautenberg Amendment* which prohibits firearm possession by anyone who has been convicted of a misdemeanor crime of domestic violence.

- **Dart guns** are nonlethal capture devices that utilize a dart filled with tranquilizer fired from a specially designed rifle. Once tranquilized, the animal may be handled safely for research or relocation purposes. Under special situations, a tranquilized animal could also be euthanized if lethal removal is warranted. Use of dart guns would have no effect on nontarget wolves because positive target species identification is made before animals are shot. Thus, use of dart guns is expected to continue to be virtually 100% selective for target individuals and species, and would not pose a risk to nontarget species and individuals. Use of dart guns may sometimes be the only control option available if other factors preclude the setting of equipment. Dart guns may be preferred in urban and residential areas where discharge of firearms are dangerous.

APPENDIX C

FEDERALLY LISTED ENDANGERED, THREATENED AND CANDIDATE SPECIES IN WISCONSIN

MAMMALS
Canada lynx (*Lynx Canadensis*) – Threatened

BIRDS
Kirtland's warbler (*Dendroica kirtlandii*) - Endangered
Piping plover (Great Lakes population - *Charadrius melodus*) - Endangered
Whooping crane (*Grus americanus*) - Non-essential Experimental Population

REPTILES
Eastern Massasauga (*Sistrurus catenatus*) – Candidate

CLAMS (Freshwater Mussels, Unionids)
Higgins eye pearlymussel (*Lampsilis higginsii*) - Endangered
Sheepnose (*Plethobasus cyphyus*) - Candidate
Spectaclecase (*Cumberlandia monodonta*) - Candidate
Winged mapleleaf (*Quadrula fragosa*) - Endangered

INSECTS
Hine's emerald dragonfly (*Somatochlora hineana*) - Endangered
Karner Blue Butterfly (*Lycaeides melissa samuelis*) - Endangered

PLANTS
Dwarf lake iris (*Iris lacustris*) - Threatened
Eastern prairie fringed orchid (*Platanthera leucophaea*) - Threatened
Fassett's locoweed (*Oxytropis campestris* var. *chartacea*) - Threatened
Mead's milkweed (*Asclepias meadii*) - Threatened
Northern wild monkshood (*Aconitum noveboracense*) - Threatened
Pitcher's thistle (*Cirsium pitcheri*) - Threatened
Prairie bush-clover (*Lespedeza leptostachya*) – Threatened

APPENDIX D

WISCONSIN LIST OF THREATENED AND ENDANGERED SPECIES

MAMMALS

ENDANGERED
American Marten *Martes americana*

BIRDS

ENDANGERED
Piping Plover *Charadrius melodus*
Trumpeter Swan *Cygnus buccinator*
Yellow-throated Warbler *Dendroica dominica*
Snowy Egret *Egretta thula*
Peregrine Falcon *Falco peregrinus*
Worm-eating Warbler *Helmitheros vermivorus*
Loggerhead Shrike *Lanius ludovicianus*
Red-necked Grebe *Podiceps grisegena*
Caspian Tern *Sterna caspia*
Forster's Tern *Sterna forsteri*
Common Tern *Sterna hirundo*
Bewick's Wren *Thryomanes bewickii*
Barn Owl *Tyto alba*
THREATENED
Henslow's Sparrow *Ammodramus henslowii*
Red-shouldered Hawk *Buteo lineatus*
Great Egret *Casmerodius albus*
Yellow Rail *Coturnicops noveboracensis*
Spruce Grouse *Dendragapus canadensis*
Cerulean Warbler *Dendroica cerulea*
Acadian Flycatcher *Empidonax virescens*
Yellow-Crowned Night-Heron *Nyctanassa violaceus*
Kentucky Warbler *Oporornis formosus*
Osprey *Pandion haliaetus*
Greater Prairie-Chicken *Tympanuchus cupido pinnatus*
Bell's Vireo *Vireo bellii*
Hooded Warbler *Wilsonia citrina*

REPTILES & AMPHIBIANS

ENDANGERED
Blanchard's Cricket Frog *Acris crepitans blanchardi*
Slender Glass Lizard *Ophisaurus attenuatus*
Queen Snake *Regina septemvittata*
Massasauga Rattlesnake *Sistrurus catenatus*
Ornate Box Turtle *Terrapene ornata*
Western Ribbon Snake *Thamnophis proximus*
Northern Ribbon Snake *Thamnophis sauritus*
THREATENED
Wood Turtle *Clemmys insculpta*
Blanding's Turtle *Emydoidea blandingii*
Butler's Garter Snake *Thamnophis butleri*

FISHES

ENDANGERED
Skipjack Herring *Alosa chrysochloris*
Crystal Darter *Crystallaria asprella*
Gravel Chub *Erimystax x-punctata*
Bluntnose Darter *Etheostoma chlorosomum*
Starhead Topminnow *Fundulus dispar*
Goldeye *Hiodon alosoides*
Striped Shiner *Luxilus chrysocephalus*
Black Redhorse *Moxostoma duquensnei*
Pallid Shiner *Notropis amnis*
Slender Madtom *Noturus exilis*
THREATENED
Blue Sucker *Cycleptus elongatus*
Black Buffalo *Ictiobus niger*
Longear Sunfish *Lepomis megalotis*
Redfin Shiner *Lythrurus umbratilis*
Speckled Chub *Macrhybopsis aestivalis*
River Redhorse *Moxostoma carinatum*
Greater Redhorse *Moxostoma valenciennesi*
Pugnose Shiner *Notropis anogenus*
Ozark Minnow *Notropis nubilus*
Gilt Darter *Percina evides*
Paddlefish *Polyodon spathula*

INSECTS

ENDANGERED
Pecatonica River Mayfly *Acanthametropus pecatonica*
Red-tailed Prairie Leafhopper *Aflexia rubranura*
Flat-headed Mayfly *Anepeorus simplex*
Swamp Metalmark *Calephelis mutica*
Northern Blue Butterfly *Lycaeides idas*
Giant Carrion Beetle *Nicrophorus americanus*
Powesheik Skipperling *Oarisma powesheik*
Extra-striped Snaketail Dragonfly *Ophiogomphus anomalus*
Saint Croix Snaketail Dragonfly *Ophiogomphus susbehcha*
Silphium Borer Moth *Papaipema silphii*
Phlox Moth *Schinia indiana*
Warpaint Emerald Dragonfly *Somatochlora incurvata*

Hine's Emerald Dragonfly *Somatochlora hineana*
Regal Fritillary *Speyeria idalia*
Knobels Riffle Beetle *Stenelmis knobeli*
Lake Huron Locust *Trimerotropis huroniana*
THREATENED
Spatterdock Darner Dragonfly *Aeshna mutata*
Frosted Elfin *Incisalia irus*
Prairie Leafhopper *Polyamia dilata*
Pygmy Snaketail Dragonfly *Ophiogomphus howei*

SNAILS

ENDANGERED
Midwest Pleistocene Vertigo *Vertigo hubrichti*
Occult Vertigo *Vertigo occulta*
THREATENED
Wing Snaggletooth *Gastrocopta procera*
Cherrystone Drop *Hendersonia occulta*

MUSSELS

ENDANGERED
Spectaclecase *Cumberlandia monodonta*
Purple Wartyback *Cyclonaias tuberculata*
Butterfly *Ellipsaria lineolata*
Elephant-Ear *Elliptio crassidens*
Snuffbox *Epioblasma triquetra*
Ebonyshell *Fusconaia ebena*
Higgins Eye *Lampsilis higginsi*
Yellow/Slough Sandshell *Lampsilis teres*
Bullhead *Plethobasus cyphyus*
Rainbow *Villosa iris*
Winged Mapleleaf *Quadrula fragosa*
THREATENED
Slippershell mussel *Alasmidonta viridis*
Rock-Pocketbook *Arcidens confragosus*
Monkeyface *Quadrula metanevra*
Wartyback *Quadrula nodulata*
Salamander Mussel *Simpsonaias ambigua*
Buckhorn *Tritogonia verrucosa*
Ellipse *Venustaconcha ellipsiformis*

PLANTS

ENDANGERED
Carolina Anemone *Anemone caroliniana*
Hudson Bay Anemone *Anemone multifida*
Lake Cress *Armoracia lacustris*
Purple Milkweed *Asclepias purpurascens*
Green Spleenwort *Asplenium trichomanesramosum*
Alpine Milk Vetch *Astragalus alpinus*
Prairie Plum *Astragalus crassicarpus*
Coopers Milk Vetch *Astragalus neglectus*
Prairie Moonwort *Botrychium campestre*
Moonwort *Botrychium lunaria*
Goblin Fern *Botrychium mormo*
Floating Marsh Marigold *Caltha natans*
Wild Hyacinth *Camassia scilloides*
Crow-spur Sedge *Carex crus-corvi*
Smooth-sheathed Sedge *Carex laevivaginata*
Hop-like Sedge *Carex lupuliformis*
Intermediate Sedge *Carex media*
Schweinitz's Sedge *Carex schweinitzii*
Brook Grass *Catabrosa aquatica*
Stoneroot *Collinsonia Canadensis*
Hemlock-parsley *Conioselinum chinense*
Beak Grass *Diarrhena americana*
Lanceolate Whitlow-cress *Draba cana*
Neat Spike-rush *Eleocharis nitida*
Wolf Spike-rush *Eleocharis wolfii*
Angle-stemmed Spikerush *Eleocharis quadrangulata*
Harbinger-of-Spring *Erigenia bulbosa*
Chestnut Sedge *Fimbristylis puberula*
Umbrella Sedge *Fuirena pumila*
Northern Commandra *Geocaulon lividum*
Pale False Foxglove *Agalinus skinneriana*
Bog Rush *Juncus stygius*
Prairie Bush Clover* *Lespedeza leptostachya*
Dotted Blazing Star *Liatris punctata*
Auricled Twayblade *Listera auriculata*
Fly Honeysuckle *Lonicera involucrata*
Smith Melic Grass *Melica smithii*
Large-leaved Sandwort Moehringia macrophylla
Mat Muhly *Muhlenbergia richardsonis*
Louisiana Broomrape *Orobanche ludoviciana*
Fassett's Locoweed* *Oxytropis campestris*
Small-flowered Grass-of- Parnassus *Parnassia parviflora*
Smooth Phlox *Phlox glaberrima*
Butterwort *Pinguicula vulgaris*
Heart-leaved Plantain *Plantago cordata*
Eastern Prairie White- fringed Orchid *Platanthera leucophaea*
Western Jacob's Ladder *Polemonium occidentale lacustre*
Pink Milkwort *Polygala incarnata*
Spotted Pondweed *Potamogeton pulcher*
Rough White Lettuce *Prenanthes aspera*
Great White Lettuce *Prenanthes crepidinea*
Pine-drops *Pterospora andromedea*
Small Shinleaf *Pyrola minor*
Small Yellow Water Crowfoot *Ranunculus gmelinii*
Lapland Buttercup *Ranunculus lapponicus*
Lapland Rosebay *Rhododendron lapponicum*
Wild Petunia *Ruellia humilis*
Sand Dune Willow *Salix cordata*
Satiny Willow *Salix pellita*
Hall's Bulrush *Scirpus hallii*
Netted Nut-rush *Scleria reticularis*
Small Skullcap *Scutellaria parvula*
Selago-like Spikemoss *Selaginella selaginoides*
Fire Pink *Silene viginica*

Blue-stemmed Goldenrod *Solidago caesia*
Lake Huron Tansy *Tanacetum bipinnatum ssp. huronese*
Hairy Meadow Parsnip *Thaspium barbinode*
Foamflower *Tiarella cordifolia*
Purple False Oats *Trisetum melicoides*
Dwarf Bilberry *Vaccinium cespitosum*
Mountain Cranberry *Vaccinium vitis-idaea*
Squashberry *Viburnum edule*
Sand Violet *Viola fimbriatula*

PLANTS

THREATENED
Northern Monkshood* *Aconitum noveboracense*
Muskroot *Adoxa moschatellina*
Round Stemmed False Foxglove *Agalinus gattingeri*
Yellow Giant Hyssop *Agastache nepetoides*
Small Round-leaved Orchis *Amerorchis rotundifolia*
Prairie Indian Plaintain *Arnoglossum plantagineum*
Dwarf Milkweed *Asclepias ovalifolia*
Wooly Milkweed *Asclepias lanuginosa*
Prairie Milkweed *Asclepias sullivantii*
Pinnatifid Spleenwort *Asplenium pinnatifidum*
Forked Aster *Aster furcatus*
Kitten Tails *Besseya bullii*
Sand Reed *Calamovilfa longifolia*
Large Water Starwort *Callitriche heterophylla*
Calypso Orchid *Calypso bulbosa*
Carey's Sedge *Carex careyana*
Beautiful Sedge *Carex concinna*
Coast Sedge *Carex exilis*
Handsome Sedge *Carex formosa*
Garbers Sedge *Carex garberi*
Lenticular Sedge *Carex lenticularis*
Michaux's Sedge *Carex michauxiana*
Drooping Sedge *Carex prasina*
Prairie Thistle *Cirsium hillii*
Dune Thistle* *Cirsium pitcheri*
Rams-head Ladys-slipper *Cypripedium arietinum*
Thickspike Wheatgrass *Elymus lanceolatus ssp. psammophilus*

Western Fescue *Festuca occidentalis*
Blue Ash *Fraxinus quadrangulata*
Yellowish Gentian *Gentiana alba*
Cliff Cudweed *Gnaphalium saxicola*
Round Fruited St. John's Wort *Hypericum sphaerocarpum*
Dwarf Lake Iris* *Iris lacustris*
Slender Bush Clover *Lespedeza virginica*
Bladderpod *Lesquerella ludoviciana*
Broad-leaved Twayblade *Listera convallarioides*
Brittle Prickly Pear *Opuntia fragilis*
White Ladys-slipper *Cypripedium candidum*
English Sundew *Drosera anglica*
Linear-leaved Sundew *Drosera linearis*
Pale Purple Coneflower *Echinacea pallida*
Beaked Spike Rush *Eleocharis rostellata*
Clustered Broomrape *Orobanche fasciculata*
Marsh Grass-of-Parnassus *Parnassia palustris*
Wild Quinine *Parthenium integrifolium*
Sweet Coltsfoot *Petasites sagittatus*
Tubercled Orchid *Platanthera flava*
Bog Bluegrass *Poa paludigena*
Braun's Holly Fern *Polystichum braunii*
Prairie-parsley *Polytaenia nuttallii*
Algal-leaved Pondweed *Potamogeton confervoides*
Sheathed Pondweed *Potamogeton vaginatus*
Seaside Crowfoot *Ranunculus cymbalaria*
Bald Rush *Rhynchospora scirpoides*
Hawthorn-leaved Gooseberry *Ribes oxyacanthoides*
Flat-leaved Willow *Salix planifolia*
Tussock Bulrush *Scirpus cespitosus*
Plains Ragwort *Senecio indecorus*
Snowy Campion *Silene nivea*
Dune Goldenrod *Solidago simplex var. gillmanii*
Clustered Bur Reed *Sparganium glomeratum*
False Asphodel *Tofieldia glutinosa*
Snow Trillium *Trillium nivale*
Spike Trisetum *Trisetum spicatum*
Marsh Valerian *Valeriana sitchensis*

APPENDIX E

GUIDELINES FOR CONDUCTING DEPREDATION CONTROL ON WOLVES IN WISCONSIN FOLLOWING FEDERAL DELISTING

Wisconsin Department of Natural Resources
Guidelines for 2007-2008

May 24, 2007

The gray wolf (*Canis lupus)* was listed as Endangered by the federal government in 1974, and listed as Endangered by the State of Wisconsin in 1975. The State of Wisconsin reclassified wolves to threatened status in 1999, and August 1, 2004 the gray wolf was removed from the threatened species list, and classified as a protected wild animal. The U. S. Fish and Wildlife Service federally reclassified wolves in Wisconsin as Threatened on April 1, 2003, but a district court decision on wolf reclassification in Oregon on January 31, 2005, caused wolves to be relisted as endangered. Wolves were removed from the federal list of endangered and threatened species on March 12, 2007.

The 1999 Wisconsin Wolf Management Plan prescribes wolf management in the state following federal and state delisting. The goal of wolf management will be to maintain a healthy and viable population in the state, while responding quickly to wolf attacks on domestic animals, allow landowners flexible tools to deal with wolf problems, and reduce losses of domestic animals The following guidelines were developed by the Wisconsin Wolf Science Committee to determine appropriate depredation control actions that are consistent with the 1999 Wolf Plan, and 2006 Wolf Plan Update. These guidelines are intended for dealing with wolf depredation to domestic animals. **Wolves that show any demonstrable threat to human safety would be dispatched by DNR, WS, other government agents, or local law enforcement officers**.

This document is intended solely as guidance and does not constitute any mandatory requirements except where requirements are referenced in statute or administrative rule. This guidance does not establish or affect legal rights or obligations, and is not finally determinative of any of the issues addressed. This guidance cannot be relied upon and does not create any rights enforceable by any party in litigation with the State of Wisconsin or the Department of Natural Resources. These guidelines will be reviewed annually with scientists and stakeholders, and will be revised as necessary.

Authority

Authority to control and manage problem wolves in Wisconsin will be held by the Wisconsin Department of Natural Resources (DNR). The Wisconsin DNR authorizes USDA-APHIS-Wildlife Services (WS) to act as agents of the DNR, and consult with Great Lakes Indian Fish and Wildlife Commission (GLIFWC), tribal agents on Indian reservations, and other federal, state and tribal agents.

Definitions

Abatement—Techniques for reducing risk of depredation, e.g., creating exclusions, establishing barriers, or using scare devices.

Aversive Conditioning—Conditioning of animals to eliminate undesired behavior by associating such behavior with a disagreeable stimulus.

Chronic Farm—Farm with verified wolf depredation in 2 or more years in the past 5 year-period.

Control—Attempt to capture or shoot problem wolves, and may include translocating, placing in captivity for study or research, euthanizing, or dispatching.

Depredation—Refers to predation on domestic animals resulting in death or injury.

Depredation Site----**Location where depredation has occurred. On private land this includes contiguous** property under the same ownership or lease of the affected landowner or lessee.

Dispatch—Actions that humanely kill an animal in field situations.

Domestic Animal— (ATCP 10.02) The following animals are considered domestic animals under s. 169.01 (7), Stats., and are not considered wild animals:

(1) Livestock.
(2) Poultry.
(3) Farm-raised game birds, except farm-raised game birds that have been released to the wild.
(4) Ratites.
(5) Farm-raised fish, except fish that have been released to waters of the state
(6) Foxes, fitch, nutria, marten, fisher, mink, chinchilla, rabbit or caracul that are born, bred and raised in captivity and are not endangered or threatened species.
(7) Pet birds.
(8) Animals of any species that has been domesticated by humans.

Euthanize—Humane killing of an animal.

Guard Animal----Use of one species of domestic animal to provide predator protection for another species of domestic animal, and may include Guarding dogs, llamas, donkeys, and other animals. Guarding dogs are dogs specifically bred for the protection of livestock, and have historically been used for this purpose; specific breeds include Maremma, Shar Planinetz, Anatolian shepherd, Komondor, Great Pyrenees, Akbash, and various crosses of these breeds.

Livestock--- (ATCP 10.0162) Bovine animals, equine animals, goats, poultry, sheep, swine other than wild hogs, farm-raised deer, farm-raised game birds, camelids, ratites and fish.

Maximum Take for Proactive Controls—The maximum number of wolves that could be removed by proactive control activities by government trappers and land owner permits.

Proactive Depredation Controls—Depredation controls intended to reduce abundance of wolves in pack areas with historical or previous verified depredations on livestock or pets near homes on private land. Proactive controls would include control actions conducted a year or two

after verified depredations on a farm when the depredating pack continues to occur nearby, and control actions in response to imminent threats of depredation to domestic animals.

Proactive Control Area—Area of land where proactive control on wolves would occur and would generally represent the area occupied by a wolf pack or group that has caused depredations on two or more farms or residential areas or one or more chronic farms.

Reactive Depredation Controls—Depredation controls intended to remove specific individual wolves that have depredated on domestic animals on private land shortly after depredations have occurred.

Significant Loss—The verified killing or maiming of one or more domestic animals by wolves where the imminent threat of attacks on additional domestic animals is probable. For poultry or other small animals, loss of $250 or likely to exceed $250 would be considered a significant loss.

Verified Depredation—Depredation verified by USDA-WS or DNR, and defined either as **Confirmed,** clear evidence that one or more wolves were responsible, or **Probable**, sign strongly suggesting that one or more wolves were responsible.

I. REACTIVE DEPREDATION CONTROL GUIDELINES

A. Government Reactive Wolf Depredation Management

The goal of reactive wolf depredation controls by government agents is to quickly respond to wolf depredations soon after they occur and attempt to target specific individual wolves that have injured or killed domestic animals on farms or near people's homes. Lethal controls can occur anywhere in the state as long as the wolf population remains above 250 wolves outside of Indian reservations.

1) Use of Aversive Conditioning or Other Nonlethal Methods

a) Where appropriate, WS will offer suitable nonlethal alternatives.
b) Upon the first verification of depredation by wolves, a depredation management plan will be made for the farm, which will include recommended suitable nonlethal methods and other practices that may reduce depredation on the farm. A signed plan will be required before any control actions can proceed on the farm.
c) If cost effective abatement is feasible, cost-shared abatements will be offered by DNR if funds are available; DNR and WS will jointly determine suitable practices. Funds for abatement practices may also be available from private organizations as well.
d) A depredation management plan would be developed on farms before cost-share abatements are offered; DNR and USDA-WS will develop the plan in consultation with county and state agriculture specialists.
e) Experimental nonlethal abatement measures, such as the use of shock collars, will be done by either the DNR or WS after consultation; control trapping will normally not be conducted in areas where experimental abatement measures are being conducted.

2) Verifications Necessary to Begin Wolf Control

a) Control may begin in any zone after one significant loss during the current year (except as provided below under 9b).

3) Determination to Begin Wolf Control

a) On private land outside of Indian reservations or negotiated buffer zones around reservations, WS determines when trapping will begin, and will notify the local DNR wildlife biologist or other DNR representative.

b) On public lands, WS, the local DNR wildlife biologist, and the manager of the public land, will determine if trapping will occur on such land. In the ceded Chippewa Territory, consultation will occur with GLIFWC before conducting control work on public land.

c) On private lands in Indian Reservations, and any area surrounding the reservation negotiated between tribes and State, WS and DNR will consult with the tribe before trapping and dispatching of wolves. WS will attempt to co-investigate wolf complaints with designated tribal representatives.

d) On tribal lands, wolves will only be trapped by WS if requested by the tribe.

4) Maximum Distance Trapping Will Occur From Livestock and Pet Depredation Site:

a) Trap up to 1.0 mile from a depredation site within Wolf Management Zones 1 & 2 or a designated greater distance through consultation with DNR (see proactive controls below).

b) Trap up to 5.0 miles from a depredation site within Wolf Management Zone 3

c) Trap anywhere that depredating wolves occur in Wolf Management Zone 4

5) Duration of Trapping at a Depredation Site

a) WS will use its discretion to determine trapping effort needed to effectively resolve depredation problems and will generally trap up to 10 to 15 days for first time depredation, and up to 21 days for chronic farms. Trapping efforts may be extended if additional verified depredations occur.

6) Treatment of Special Sex/Age Group

a) No special age and sex consideration will be made except on a case by case basis based on consultation with WS and DNR.

7) Treatment of Radio-Collared or Tagged Wolves

a) Radio-collared or tagged wolves will be treated as any other depredating wolf (dispatch or translocate as appropriate), except as noted in 7b.

b) Consultations on radio-collared or tagged depredating wolves will be made with tribal officials when such wolves are clearly from an Indian reservation or negotiated buffer zones when trapping within 6 miles of any reservation.

8) Capture of Dogs or Wolf-Dog Hybrids

a) Dogs caught at depredation sites will be turned over to town chairman, dog owner, animal shelter, or released on site.

b) Wolf-dog hybrids that appear to be living in the wild and caught at depredation sites will be dispatched by WS or DNR if no collar or other identifying mark occurs on the animal.

c) Wolf-dog hybrids that are marked will be held in captivity until the owner can be contacted, or dispatched after 14 days if no owner is found. The owner of a dog is liable for the full amount of damages caused by a dog injuring or causing injury to a person, domestic animal or property (WI Statue 174.02).

9) Wolf Control for Depredation to Dogs

e) Control could be conducted on wolves killing dogs that are leashed, confined, or under the owner's control on the owner's land if there is likeliness of additional depredation.

f) No reactive control trapping would be conducted on wolves killing dogs that are free-roaming, roaming at large, hunting, or training on public lands, and all other lands open to public hunting except land owned or leased by the dog owner.
g) Other abatement or aversive conditioning will be considered on public lands where depredation occurs on dogs or other domestic animals.
h) Guard animals would be treated as other domestic animals for verification and control purposes.

10) Wolf Control on Deer Farms, Wild Fur Farms, Bird Hunting Preserves and permitted Hound Dog Training Enclosures.

a) Wolf control may be conducted within a registered deer farm enclosure using the guidelines listed above if the fence is in compliance with s. 90.20 or 90.21, Stats., minimum standards. If the enclosure contains farm-raised white-tailed deer, the owner shall also hold a valid DNR fence inspection certificate for the fence. Wolf control may be conducted within a hound dog training enclosure which meets the minimum requirements of NR 17.045, Wis. Adm. Code and the owner holds a valid permit for the enclosure.

   Note: ATCP 10.01(62) defines "Livestock" to include farm-raised deer and farm-raised game birds (domestic animals)
b) Normally, trapping would only be allowed within the fenced area of the deer farm or hound dog training enclosure, unless unusual circumstances make it necessary to trap up to 100 yards beyond the fence. Trapping outside fence areas would only be considered following additional consultation among WS, DNR, and adjacent landowners.
c) Wolf control would not normally be conducted for depredation on free roaming game on a licensed bird hunting preserve or wild fur farm. A wild fur farm license is not issued for enclosed lands, and all fur-bearing animals on a licensed wild fur farm are considered free-roaming wild animals until they have been trapped by the licensee.
d) Wolf control for depredation on other captive wild animals which are all required to be maintained within enclosures to prevent the animals escape, and other animals from entering, should be handled in the same manner as a depredation which occurs on livestock or other domestic animals.

11) Information Sharing-----

a) DNR will share radio locations of wolves with USDA-WS
b) DNR will notify landowners and publish information of wolf depredation problems through local news releases when appropriate.
c) DNR will share information with tribes on wolves that travel onto Indian reservation lands.
d) USDA-WS will turn all wolves euthanized at depredation sites over to the Wisconsin DNR or tribes for final designation. Wolf carcasses will be used for research, education, and cultural purposes.
e) DNR will develop publications and educational materials on wolf depredation focused toward specific organizations or groups most affected by wolf depredation.
f) DNR will provide press releases to explain lethal and nonlethal forms of control.
g) DNR will provide timely response to depredations with news releases.
h) DNR will cooperate with USDA-WS and other organizations to test and research nonlethal methods of control, including methods of exclusion and aversive conditioning; results of such research will be published in scientific reports and in popular media.
i) DNR will cooperate with USDA-WS and others to conduct cooperative research on wolf/livestock relationships and will attempt to determine means of preventing wolf

depredation on pets and livestock and share this information with affected landowners and the public.

j) DNR will provide GLIFWC and tribes, when appropriate, information pertaining to verified wolf complaints and wolf complaint project reports.

B. Landowner Reactive Controls

The goal of landowner reactive controls is to allow people to defend their domestic animals on their land at the time of a wolf attack.

1) Wolves in the act of attacking domestic animals

NR 10.02(1)(b)

On private land, the landowner, lessee or occupant of the land may shoot and kill any gray wolf in the act of killing, wounding or biting a domestic animal. Shootings shall be reported within 24 hours to a department conservation warden. The carcass of the wolf shall be turned over to the department.

II. PROACTIVE DEPREDATION CONTROLS

A. Government Proactive Depredation Controls

The goal of proactive control by government agents would be to reduce the risk of depredation to domestic animals in areas where previous depredations have been verified by lowering the abundance of wolf packs or wolf groups that have been involved in these depredations.

1) Use of Aversive Conditioning or Other Nonlethal Methods----Where appropriate, WS will offer suitable nonlethal alternatives (See I,A,1 above

2) Wolf population levels that would allow proactive controls.

a.) In Zone 4 proactive controls can be considered if the statewide wolf population exceeds 250 outside of Indian reservations.

b.) In Zones 1-3, proactive controls can be considered if the statewide wolf population exceeds 350 outside of Indian reservations.

3) Determination of maximum take for proactive controls.

a.) In Zone 4 no maximum take will be set as long as the state wolf population exceeds 250 wolves outside of Indian reservations.

b.) In Zones 1-3, maximum take would be the amount of wolves above the population goal of 350 wolves outside of Indian reservations. For example in winter 2006-2007, a minimum of 540 wolves were counted statewide in Wisconsin, and 12 wolves lived on reservations, thus the minimum outside reservations was 528 wolves. Thus the wolf population above the management goal of 350 wolves outside reservations was a minimum of 178 wolves, and this would be the **maximum take for proactive controls** by government controls and landowner permits from 2007 through spring 2008. In spring 2008, a new survey would completed and a new maximum take would be set for the next 12 month period. If other mortality factors become more important to wolves in the future, these may be incorporated into designation of maximum take by the wolf science committee.

4) Designation of Proactive Control areas

a.) Control areas will be designated by USDA-WS district supervisors, DNR wolf

program coordinator, local DNR wildlife biologist, GLIFWC biologist (if in Chippewa ceded territory), and tribal biologists if within 6 miles or other negotiated buffer area around recognized Indian reservations.

b.) Control areas would have at least one chronic farm, or two or more farms that had wolf depredations within the last 2 years within the same pack area.

c.) Boundaries of proactive control areas would be determined, using roads, waterways, natural landscape features, and state boundary to designate the control area where a problem pack is assumed to roam based on radio tracking, track surveys, and/or local reports of wolf observations.

d.) Control areas could consist of a mixture of public and private lands, although generally large blocks of public lands would be avoided as would state parks, state forests, national parks, and wildlife refuges. Permission would be obtained on all lands for controlling wolves.

e.) Control areas could be established within any incorporated village or city, if wolves establish in these areas regardless of depredation history.

5) Control Methods for Proactive Controls

a.) Government agents with USDA-WS and WDNR would control wolves through shooting, trapping, and cable restraints.

b.) Landowners, their agents or persons designated by the landowner as provided under s. NR 12.10(3)(a), Wis. Adm. Code, in designated control areas could be issued permits to shoot or trap wolves regardless of depredation history, if they have domestic animals at risk of wolf attacks, following guidelines listed above under B.

6) Duration of Proactive Controls

a.) Proactive control actions may continue until a problem wolf pack appears to be eliminated or the maximum take for the state has been achieved.

b.) All proactive control areas will be established and re-examined annually after new population counts have been completed.

B. Landowner Proactive Controls.

The goal of proactive control by landowner permits would be to reduce the risk of depredation to domestic animals in areas where previous depredations have been verified.

1**) Landowner wolf control by permit.**

a.) DNR wildlife biologist can issue permits for up to 90 days using form 2300-109 (s. NR12.10, Wis. Adm. Code and s. 29.885, Stats.) if one of the following exists:

i.) at least one verified depredation has occurred within the last 2 years on owned or leased land.

ii.) a verified depredation has occurred within 1 mile of the applicant's property with vulnerable animals within the current calendar year.

iii.) a landowner's property exists within a Proactive Control Area created by DNR (II, A, 4 above).

b.) The permit may allow the taking of up to as many wolves as are known to exist in the local wolf pack.

c.) Wolves can be shot with firearms that are lawful for hunting big game in Wisconsin.

d.) Trapping may be allowed by the landowner if it does not interfere with government trapping.

e.) Wolves can only be shot or trapped on land under the control of the landowner occupant or lessee of the land.

f.) In areas where it is not possible to discharge firearms, landowners may be issued nonlethal tools to scare off wolves.
g.) All wolves trapped, shot, or injured must be reported to the local WDNR conservation warden, wildlife biologist or Mammalian Ecologist within 24 hours of shooting or capture.
h.) No wolves may be transported dead or alive to other locations.
i.) All wolves killed under the permit shall be turned over to the WDNR as required in the permit.
j.) Permits can be renewed for additional periods, and additional take can be increased if wolf problems persist.
k.) DNR reserves the right to rescind permits at any time.
l.) If the maximum take is reached in the state, all permits will be rescinded.
m.) WDNR may add additional conditions as necessary.
n.) Copies of all permits will be sent to the DNR wolf program coordinator and USDA-WS
o.) All other Wisconsin hunting and trapping regulations must be followed.

APPENDIX F

WISCONSIN GUIDELINES FOR CONDUCTING DEPREDATION CONTROL ON WOLVES IN WISCONSIN WHILE FEDERAL LISTED AS "THREATENED" OR "ENDANGERED" STATUS.

By the Wisconsin Department of Natural Resources

October 14, 2005

The gray wolf (*Canis lupus)* was listed as Endangered by the federal government in 1974, and listed as Endangered by the State of Wisconsin in 1975. In 1999 the State of Wisconsin reclassified wolves to threatened status, and in on August 1, 2004 was removed from the threatened species list, and classified as protected wild animal. The U. S. Fish and Wildlife Service federally reclassify wolves in Wisconsin as Threatened on April 1, 2003, but a district judge decision on wolf reclassification in Oregon on January 31, 2005, caused wolves to be relisted as endangered.

The 1999 Wisconsin Wolf Management Plan prescribes how wolves should be managed in the state following federal and state reclassified to Threatened and delisted status. The following, more specific, guidelines were developed by the Wisconsin Wolf Science Advisory Committee to determine appropriate depredation control activity when and while listed as a **Threatened or Endangered Species** by the federal government, but delisted by the state. These guidelines will need to be updated when wolves are federally de-listed.

Note: *These guidelines will be reviewed annually with scientists and stakeholders, and will be revised as necessary.*

Authority

Authority to control and manage problem wolves will be held by the Wisconsin Department of Natural Resources (DNR), USDA-APHIS-Wildlife Services (WS), U. S. Fish and Wildlife Service (USFWS), tribal agents on Indian reservations, and other federal, state and tribal agents authorized by DNR and USFWS.

Definitions

Abatement—Techniques for reducing risk of depredation by creating exclusions, establishing barriers, or using scare devices.

Aversive Conditioning—Conditioning of animals to eliminate undesired behavior by associating such behavior with a disagreeable stimulus.

Chronic Farm—Farm with verified wolf depredation in 2 or more years in the past 5 year-period.

Control—Attempt to capture or shoot problem wolves, and may include translocating, placing in captivity for study or research, euthanizing, or dispatching.

Depredation—Refers to predation on domestic animals.

Depredation Site----Location where depredation has occurred. On private land this includes contiguous property under the same ownership or lease of the affected landowner renter.

Dispatch—Attempting to humanely kill an animal in field situations.

Domestic Animal—Animal owned by people.

Euthanize—Humane killing of an animal.

Guard Animal----Use of one species of domestic animal to provide predator protection for another species of domestic animal, and may include Guarding dogs, llamas, donkeys, and other animals. Guarding dogs are dogs specifically bred for the protection of livestock, and have historically been used for this purpose; specific breeds include Maremma, Shar Planinetz, Anatolian shepherd, Komondor, Great Pyrenees, Akbash, and various crosses of these breeds.

Significant Loss—The killing or maiming of one or more domestic animals by wolves where the imminent threat of attacks on additional domestic animals is apparent. For poultry or other small animals, loss of $250 or likely to exceed $250 would be considered a significant loss.

Verified Depredation—Depredation verified by trained personnel from an authorized agency, and defined either as **Confirmed,** clear evidence that one or more wolves were responsible, or **Probable**, sign strongly suggesting that one or more wolves were responsible.

Wolf Depredation Management Guidelines

1) Use of Aversive Conditioning or Other Nonlethal Methods----

e) Where appropriate, WS will offer suitable nonlethal alternatives.

f) Upon the first verification of depredation by wolves, a depredation management plan will be made for the farm, which will include recommended suitable nonlethal methods and other practices that may reduce depredation on the farm. A signed plan will be required before any control actions can proceed on any farm.

g) If cost effective abatement is feasible, cost-shared abatements will be offered by DNR if money is available; DNR and WS will jointly determine suitable practices.
h) A depredation management plan would be developed on farms before cost-share abatements are offered; DNR and USDA-WS will develop the plan in consultation with county and state livestock specialists.
e) Experimental nonlethal abatement measures, such as the use of shock collars will be

done by DNR in consultation with WS; control trapping will normally not be conducted

by WS in areas where DNR is conducting experimental abatement measures.

2) Verifications Necessary to Begin Wolf Control —

a) Control may begin in any zone after one significant loss during the current grazing season if authorized by the USFWS.

3) Determination to Begin Wolf Control —

e) On private land, WS determines when trapping will begin, and will notify the local DNR wildlife biologist or other DNR representative, and DNR will notify tribes where appropriate, that trapping has begun.
f) On public lands, WS, the local DNR wildlife biologist or other DNR representative, and the manager of the public land to be trapped, will jointly determine if trapping will occur on such land, and will notify affected tribes.
g) On private lands in Indian Reservations, and any area surrounding the reservation negotiated between tribes and State: WS and DNR will consult with the tribe before trapping and dispatching of wolves.
h) On tribal lands will only be trapped by WS if requested by the tribe.

4) Maximum Distance Trapping Will Occur From Depredation Site:

d) Trap to 0.5 or 1.0 mile or whatever distance from depredation site is permitted by the U.S. Fish and Wildlife Service throughout the state.

5) Duration of Trapping at a Depredation Site---

b) WS will use its discretion to determine trapping effort needed to effectively resolve depredation problems and will generally trap up to 10 to 15 days for first time depredation, and up to 21 days for chronic farms.

6) Treatment of Special Sex/Age Group---

b) Prior to August 1, all pups will be released at site.
c) On certain areas of highly suitable wolf habitat, the local DNR wildlife biologist, after being notified by WS that depredation control trapping has begun, may request that lactating females be released nearby. Such actions would only be done with consultation with the affected landowner and if an effective abatement or aversive conditioning method is available to keep the wolf off the depredation site. Lactating females would not be released near chronic farms after June 15.

7) Treatment of Radio-Collared or Tagged Wolves---

c) Radio-collared or tagged wolves will be treated as any other depredating wolf (dispatch or translocate as appropriate).

d) Consult with tribal officials on any wolves that are clearly from an Indian reservation in areas near such reservations or near Indian lands.

8) Capture of Dogs or Wolf-Dog Hybrids---

d) Dogs caught at depredation sites will be turned over to town chairman, dog owner, or animal shelter.

e) Wolf-dog hybrids caught at depredation sites will be dispatched by USDA-WS or DNR if no collar or other identifying mark occur on the animal.

9) Wolf Control on Depredation to Dogs----

i) Control could be conducted on wolves killing dogs leashed, confined, or under the owner's control on the owner's land if there is likeliness of additional depredation.

j) No control trapping would be conducted on wolves killing dogs that are free-roaming, roaming at large, hunting, or training on public lands, and all other lands except land owned or leased by the dog owner.

k) Other abatement and aversive conditionings will be considered on public lands where depredation occurs on dogs or other domestic animals.

l) Guard animals would be treated as other domestic animals for verification and control purposes.

10) Wolf Control on Deer or Game Farms----

e) Wolf control would be conducted on deer and game farms using the guidelines listed above.

f) Normally, trapping would only be allowed within the fenced area of the game farm, unless unusual circumstances makes it necessary to trap up to 100 yards beyond. Trapping outside fence areas would only be considered following additional consultation among WS, DNR, and adjacent landowners.

11) Information Sharing-----

k) DNR will share radio locations of potential depredating wolves with USDA-WS

l) DNR will notify landowners and publish information of wolf depredation problems through local news releases when appropriate.

m) DNR will share information with tribes on wolves that travel onto Indian reservation lands.

n) USDA-WS will turn all wolves euthanized at depredation sites over to the U. S. Fish and Wildlife Service, who will normally turn these carcasses over to the Wisconsin DNR or tribes for final designation. Wolf carcasses will be used for research, education, and cultural purposes.

o) DNR will develop publications and educational materials on wolf depredation focused toward specific organizations or groups most affected by depredation by wolves.

p) DNR will provide press releases to explain lethal and nonlethal forms of control.

q) DNR will provide timely response to depredations with news releases.

r) DNR will cooperate with USDA-WS and other organizations to test and research nonlethal methods of control, including methods of exclusion and aversive conditioning; results of such research will be published in scientific reports and in popular media.
s) DNR will cooperate with USDA-WS and others to conduct cooperative research on wolf/livestock relationships and will attempt to determine means for preventing and educating landowners on wolf depredation on pets and livestock.