Pre-Decisional

ENVIRONMENTAL ASSESSMENT

Black Bear
Nuisance and Damage Management
in Wisconsin

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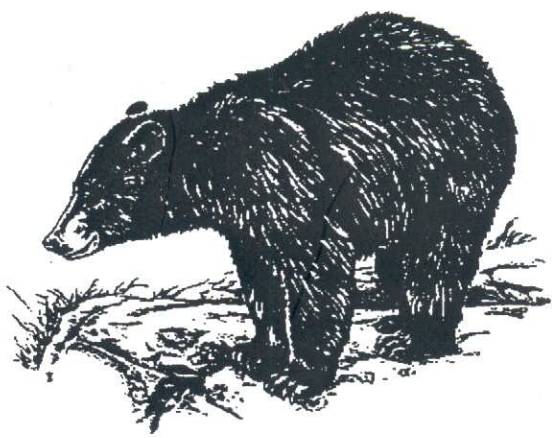

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SUMMARY OF CURRENT AND PROPOSED ACTION

The United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Wildlife Services (WS) in cooperation with the Wisconsin Department of Natural Resources (WDNR) and in accordance with a cooperative agreement between WS and WDNR has implemented a black bear damage and nuisance management program that consists of technical assistance (educational/extension) supplemented by selective trapping and relocation of bears causing problems bears in Wisconsin. The current program provides resource protection from black bear damage and responds to bear complaints. The current black bear damage management program is being conducted under an existing Environmental Assessment (EA). The types of black bear problems that WS is requested to alleviate or prevent include: 1) predation on livestock, 2) damage to crops and property, 3) threats to human health and safety, and 4) general nuisance complaints.

The proposed program is to implement an Integrated Wildlife Damage Management (IWDM) program. The selected damage management strategy would be integrated into recommendations to cooperators and used by personnel employed or supervised by WS. Under the proposed action, WS would continue to provide technical assistance, however, increased operational assistance to resource owners or citizens experiencing damage or nuisance problems caused by black bears, and requesting such assistance could be provided. The WS Decision Model would continue to be used to develop site-specific damage-reduction strategies, which may incorporate non-lethal or lethal methods depending on the specific situation. Non-lethal methods would be given first consideration. However, lethal damage management could be utilized for site specific situations when deemed appropriate (i.e., safety risks to people or severe livestock depredation).

Technical assistance would be provided in the form of brochures, other written information, personal or telephone consultations, or workshops. WS may also conduct demonstrations, lend equipment such as frightening devices (when equipment is available), provide information on animal husbandry and the use of livestock guarding dogs. Resource owners would be responsible for implementing many non-lethal methods and, therefore, WS would have limited or no control over the implementation of the recommendations.

Operational programs would be implemented and conducted by WS in accordance with a cooperative agreement between WS and WDNR, and related policies. Operational programs conducted by WS would include live trapping and relocation, and live trapping and euthanasia when deemed appropriate. A nuisance complaint protocol would be followed prior to any operational activity for general nuisance complaints. Complainants would be required, in most cases, to implement alternative abatement methods, such as removal of food sources, prior to consideration of WS operational activities. Live trapping and euthanasia would be considered for bold or aggressive bears that present a human health and safety risk or threat, or bears habituated to preying on livestock or other domestic animals.

WS personnel would strive to minimize adverse effects on non-target animals and the environment by utilizing selective and effective methods. Lethal methods could be used to reduce damage after practical and appropriate non-lethal methods have been considered, but failed to reduce damage to acceptable levels or are inappropriate for the situation. When lethal damage management is necessary, black bears would be removed as humanely as possible using approved methods. WS may also choose to use newly-developed or experimental tools provided by researchers or other interested parties after consulting with the WDNR.

ACRONYMS /ABBREVIATIONS

APHIS	Animal and Plant Health Inspection Service
AVMA	American Veterinary Medical Association
CDFG	California Department of Fish and Game
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
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
FONSI	Finding of No Significant Impact
IWDM	Integrated Wildlife Damage Management
MIS	Management Information System
MOU	Memorandum of Understanding
NEPA	National Environmental Policy Act
NR	Natural Resources
SOP	Standard Operating Procedure
T&E	Threatened and Endangered
TWS	The Wildlife Society
USC	United States Code
USDA	U.S. Department of Agriculture
USDI	U.S. Department of Interior
USFS	U. S. Forest Service
USFWS	U.S. Fish and Wildlife Services
WAC	Wisconsin Administrative Code
WDACP	Wildlife Damage Abatement and Claims Program
WDATCP	Wisconsin Department of Agriculture, Trade and Consumer Protection
WDNR	Wisconsin Department of Natural Resources
WHSDHP	Wisconsin Historical Society, Division of Historic Preservation
WS	Wildlife Services
WSA	Wisconsin Statutes Annotated

Chapter 1 PURPOSE OF AND NEED FOR ACTION

1.0 INTRODUCTION

During the last 150 years, broad-scale changes in land use patterns have occurred as human populations have increased and spread across North America. One of the most significant changes has been the large-scale conversion of natural landscapes to agricultural and urban environments. As humans convert wild habitats, they compete with wildlife for space and other resources, which increases the potential for conflicts. In addition, some species and individuals of wildlife have adapted and thrived in the presence of people, while others have not. This in combination with today's economic pressures and heightened awareness of environmental issues has increased the complexity of wildlife management and specifically wildlife damage management. Concurrent with this growth and change is a movement by some segments of the public to completely protect all wildlife from harm, which can create localized conflicts with resource managers and owners experiencing problems with wildlife. The U.S. Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Wildlife Services (WS) program has expertise in resolving conflicts between people and wildlife and has been directed by Congress to reduce damage caused by wildlife (Act of March 2, 1931, as amended 46 Stat. 1486; 7 USC. 426-426c and the Rural Development, Agriculture, and Related Agencies Appropriations Act of 1988, Public law 100-102, Dec. 27, 1987. Stat. 1329-1331 (7 USC 426C). The USDA Animal Damage Control Programmatic Final Environmental Impact Statement (EIS) (USDA 1997) summarized the relationship of 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."*

With this said, the *"wildlife acceptance capacity"* and *"biological carrying capacity"* factors must be applied to resolving wildlife damage management problems. The wildlife acceptance capacity, or 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). Biological carrying capacity is the land or habitat's ability for supporting healthy wildlife populations without degradation to the species' health or their environment over an extended period of time (Decker and Purdy 1988). These phenomenon are especially important because they define the sensitivity of a community to a wildlife species. For any given damage situation, there will be varying thresholds by those directly and indirectly affected by the species and any associated damage. However, the minimum tolerance, or threshold, determines the wildlife acceptance capacity, which is often lower than the biological carrying capacity. While Wisconsin may have a biological carrying capacity to support more black bear *(Ursus americanus)* in some cases the wildlife acceptance capacity is lower or has been met. Once the wildlife acceptance capacity is met or exceeded, people begin to implement population or damage reduction methods, including lethal methods, to alleviate damage and public health or safety threats.

Wildlife damage management is a specialized field within the wildlife management profession. Wildlife damage management is the science of reducing damage or other problems caused by wildlife and is recognized as an integral part of wildlife management (The Wildlife Society 1990, 1992, Berryman 1991). The mission of the Wildlife Damage Management Working Group of The Wildlife Society is *to promote better understanding of the challenges of managing human-wildlife conflicts and to provide a forum for TWS members to advance their skills*

and knowledge of wildlife damage management practices. During the last 150 years, with settlers migrating west, the introduction of domestic livestock, water development, urbanization, and other modern agricultural and cultural practices, wildlife management has also changed. It is generally recognized that responsible management, not passive preservation is necessary when managing agricultural and natural resources, or protecting property and human health and safety.

WS is the federal agency directed by Congress 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 and the Rural Development, Agriculture, and Related Agencies Appropriations Act of 1988, Public law 100-102, Dec. 27, 1987. Stat. 1329-1331 (7 USC 426C). To fulfill this Congressional direction, WS conducts activities to prevent or reduce wildlife damage or threats of damage to resources, property, and human health and safety. Work could be conducted on private and public lands and in cooperation with federal, state and local agencies, American Indian tribes, private organizations, and individuals. Wildlife damage management is not conducted to punish offending animals but to prevent or reduce damage.

WS generally uses an Integrated Wildlife Damage Management (IWDM) approach to resolve wildlife-related conflicts. This strategy is also known as Integrated Pest Management and is described in USDA (1997, Chapter 1:1-7). In short, IWDM seeks to prevent, reduce, or stop wildlife damage by integrating a combination of methods sequentially or concurrently. These methods may include alteration of cultural practices, habitat manipulation, or behavioral modification people or of the offending species. Implementation of IWDM may require the relocation of the offending animal(s) or the reduction of the local populations by lethal means. WS uses a Decision Model (Slate et al. 1992) to determine how IWDM would be conducted. This approach allows IWDM strategies to be customized for each wildlife/human conflict that is encountered by WS personnel (Owens and Slate 1991).

WS is a cooperatively-funded, service-oriented program that provides assistance to requesting public and private entities. WS responds to requests for assistance when valued resources or human health and safety are damaged or threatened by wildlife. Responses can be in the form of technical assistance or operational damage management. The degree of WS involvement varies, depending on the severity and complexity of the problem. WS activities are conducted in accordance with applicable federal, state, and local laws, cooperative agreements, *"Agreements for Control,"* memoranda of understanding (MOU), and other applicable documents. These documents establish the need for the requested work, legal authorities allowing the requested work, and the responsibilities of WS and its cooperators.

WS' mission, developed through a strategic planning process, is: 1) *"to provide leadership in wildlife damage management in the protection of Americas agricultural, industrial and natural resources, and 2) to safeguard public health and safety."* WS' Policy Manual[1] reflects this mission and provides guidance for engaging in wildlife damage management through:

- Training of wildlife damage management professionals;
- Development and improvement of strategies to reduce damages and threats to humans from wildlife;
- Collection, evaluation, and dissemination of management information;
- Inform and educate the public on how to reduce wildlife damage;
- Providing data and a source for limited-use management materials and equipment, including pesticides (USDA 1989)

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[1] The WS Policy Manual provides WS personnel guidance in the form of program directives. Information contained in the WS Policy Manual and its associated directives has been used throughout this document, but has not been cited in the text or referenced in Appendix A.

This environmental assessment (EA) documents the potential impacts to the quality of the human environment from the proposed Wisconsin WS black bear damage management program. The program that would be conducted to reduce damage and achieve a balance between the biological and wildlife acceptance capacities in cooperation with the Wisconsin Department of Natural Resources (WDNR). This analysis relies mainly on existing data contained in published documents (Appendix A), including (USDA 1997), to which this EA is tiered.

Normally, individual wildlife damage management actions are categorically excluded from further National Environmental Policy Act (NEPA) analysis, in accordance with implementing regulations for NEPA for APHIS (7 CFR 372.5(c), 60 Fed. Reg. 6,000, 6,003, (1995)). WS is preparing this EA 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 if there are any potentially significant or cumulative adverse impacts from the proposed program. All black bear damage management conducted in Wisconsin would be undertaken in compliance with relevant laws, regulations, policies, orders and procedures, including the Endangered Species Act (ESA) of 1973, as amended (16 USC 1531-1543).

Newspaper notices and letters to interested parties were used to solicit public and agency input and identify issues and concerns. Comments received by WS pertaining to the effects that social and legal, biological, economic, and physical elements may have on the proposed program or the effects this proposal may have on the quality of the human environment have been incorporated into this EA. Notice of Availability of this EA will be made, consistent with APHIS's NEPA procedures to allow interested parties the opportunity to obtain and review the document and comment on the proposed management program.

1.1 Black Bear Biology

Black bears have always been a part of Wisconsin's forested habitats. They are powerful animals that have few natural enemies and are typically nocturnal, although occasionally they are active during the day. In the southern United States, black bears tend to be active year-round; but in northern areas, they undergo a period of semihibernation during winter (Kolenosky and Strathearn 1987). Bears spend this period of dormancy in dens, such as hollow logs, windfalls, brush piles, caves, and holes dug into the ground. Bears in northern areas may remain in their dens for 5 to 7 months each year, foregoing food, water, and elimination. The black bear's ability to inhabit a wide variety of habitat types is partly a result of its ability to den or *"hibernate"* during winter, a season of food scarcity.

1.1.1 Reproduction

With the exception of breeding pairs and mothers with young, black bears are solitary animals (Pelton 1982). Males travel extensively in search of receptive females and both sexes are promiscuous (Kolenosky and Strathearn 1987). Fighting occurs between rival males as well as between males and unreceptive females. Dominant females may suppress the breeding activities of subordinate females. The age when females first produce cubs is related to available food supply (Kolenosky and Strathearn 1987) and annual fluctuations in food availability can dramatically affect bear reproduction. It appears that nutritional factors are primarily responsible for limiting populations to levels that can be sustained through years of scarce food (Rogers 1976). In areas with adequate food, or in captivity, females may become sexually mature at age two and produce their first litters at age three. In most sections of North America, however, females produce their first litters at age three or four (Kolenosky and Strathearn 1987).

Breeding generally takes place from mid-June through mid-July (Elowe 1987, Rogers 1987). In Wisconsin, (Kohn 1982) reported that no captured females were in estrus prior to June 4 or later than July

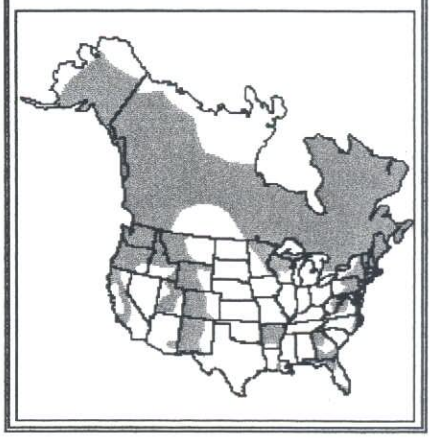
22. After mating, the fertilized egg does not implant immediately, but remains unattached in the uterus until fall. Most cubs are born between late December and early February, while the female is still in the den (Erickson et al. 1964, Alt 1983). After giving birth, the sow may continue her winter hibernation while the cubs are awake and nursing. Lactating females do not come into estrus, so females generally breed only every other year. Kohn (1982) reported a mean litter size of 2.4 cubs/litter (surviving until the following fall) in Wisconsin. Parental care is solely the female's responsibility as males will kill and eat cubs if they have the opportunity. Cubs are weaned in late summer but usually remain close to the female throughout their first year. Anderson and Fleming (1995) reported an 83% first-year survival rate for cubs in Wisconsin. This social unit breaks up when the female comes into her next estrus (Kolenosky and Strathearn 1987).

1.1.2 Mortality

Female black bears are good mothers, and the survival rate of cubs is high (Kolenosky and Strathearn 1987). In east-central Ontario, first-year survival of cubs was about 80%. That contrasted with a survival rate of only 30% for cubs orphaned during spring (Kolenosky and Strathearn 1987). Although some black bears may live for 20–25 years, they are subject to a variety of mortality factors. The survival rate of cubs is closely linked to the physical condition of the female and food supply (Elowe 1987, Rogers 1987). In most years, cub mortality is around 20% but may be as high as 70% during food-scarce years or as low as 5% when food is abundant (Elowe 1987). The most critical period of a bear's life is when it first becomes independent at 16–17 months old (Jonkel and Cowan 1971). Not only must it find adequate food, it must also avoid larger bears. Young bears are often forced into less preferred habitat by older, more dominant bears. Although mortality rates for subadults are difficult to determine, studies in east-central Ontario suggest they may be in excess of 35% (Kolenosky 1987). In unhunted and lightly hunted populations the annual survival rate of adult females is about 80–90%; adult male survival is slightly less. As hunting pressure increases, the number of males decreases more rapidly than that of females because of their greater vulnerability to hunting (Fraser et al. 1982). For most black bear populations, the mean age of females is greater than that of males (Rogers 1977, Lindzey and Meslow 1980, Kolenosky 1987).

Unlike most ungulates, black bears are more sensitive to hunting and other population mortality because of their inherently low reproductive rate (Jonkel and Cowan 1971). This is because they are normally several years old before they start to reproduce and normally reproduce only every other year (Jonkel and Cowan 1971, Beecham 1980). Since normal litter size is two to three (2.4 in Wisconsin), each adult female produces an average of only 1 to1.5 cubs/year. Thus, if a female lives to be 15, she will probably produce a maximum of six litters in her lifetime. If conditions are not always favorable, her total production will be lower (Lindzey and Meslow 1980).

Figure 1-1. Distribution of Black Bear in North America.

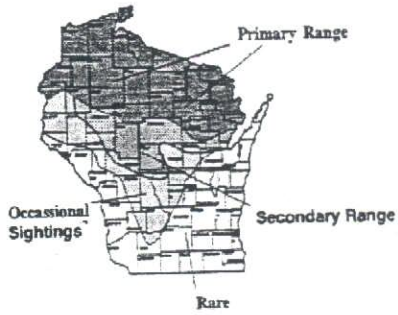


1.1.3 Distribution

The black bear is the smallest and most widely distributed of the North American bears (Figure 1-1). Black bears historically ranged throughout most of North America except for the desert southwest and the treeless barrens of northern Canada. In the United States, substantial populations occurring over wide geographic areas are found only in the extreme Northwest, the Rocky Mountain states, northern Minnesota, Wisconsin (Figure 1-2), Michigan, Maine, and

most of Alaska (Kolenosky and Strathearn 1987). Currently, black bears are commonly found in the northern third of Wisconsin and occur to a lesser extent in the central and forested portion of the state (Figure 1-2). In recent years, bears have been expanding their range into southern portions of Wisconsin. The quality of black bear habitat, and ultimately their distribution, is a function of the availability of food, water, concealment, escape cover (Hugie 1979) and human tolerance. Patterns of habitat use by bear vary seasonally with changes in the growth and fruiting of various plants (Rogers 1987).

Figure 1-2. Black Bear Distribution in Wisconsin.



1.1.4 Movements

Use of a local site for 2–4 days, followed by a lengthy movement, is a recurring pattern for both adult and subadult males; bears have been known to travel 50 miles to feed on high quality mast crops. Although both sexes are capable of traveling great distances, males regularly go on longer journeys than females. Somehow black bears are able to orient homeward from unfamiliar areas, but how they navigate their return remains unknown. Most ranges are used by more than one bear. Although ranges overlap, specific areas are rarely used at the same time. Younger bears usually try to avoid older bears and the mechanisms of avoidance are not well understood, but the use of scent and signs is undoubtedly important.

1.1.5 Densities and Home Range

In North America, black bear densities range from 0.3 to 3.4 bears/miles^2 depending on region and habitat. Densities are greatest in highly diverse forests at a relatively early stage of development because of the high diversity of habitats. The home range of black bears is dependent on the type and quality of the habitat and the sex and age of the bear. In mountainous regions, bears encounter a variety of habitats by moving up or down in elevation (Jonkel and Cowan 1971). In regions where the terrain is flatter, more lengthy lateral movements are required and bears typically range more widely in search of food, water, cover, and space (Rogers 1977, Alt et al. 1980, Young and Ruff 1982). Most adult females have well-defined home ranges that vary from 6 to 19 miles^2. Adult females with ranges smaller than 3 miles^2 may not reproduce (Rogers 1977). Ranges of subadult females and yearlings are usually smaller than those of adults and vary from 4–8 miles^2. Ranges of adult males are usually several times larger than those of adult females. In Wisconsin, black bears densities are about one bear/1.6 miles^2 of suitable habitat and subadult and adult female bears have home ranges of about 7 miles^2 (Kessler 1994, Massopust and Anderson 1984), while adult males have a home range of about 36 miles^2.

1.1.6 Food Habits

Black bears, although classified as carnivores, are omnivorous, foraging on a wide variety of plants and animals (Seton 1929 as cited in Kolenosky and Strathearn 1987). Their diet is typically determined by the seasonal availability of food. Typical foods include grasses, berries, nuts, tubers, wood fiber, insects, small mammals, eggs, carrion, and garbage. Food shortages occur occasionally in northern bear ranges when summer and fall mast crops (berries and nuts) fail. In addition, for a 2 to 4 week period that young wild ungulates (deer in Wisconsin) are vulnerable, they may be preyed on by bears (Franzmann et al. 1980, Ozoga and Verme 1982). However, like most feeding, the practice appears to be a learned behavior and once started may continue to form part of the feeding regime. The extent to which predation on young ungulates occurs is only now starting to be investigated in several areas of North America. During

such years, bears become bolder and travel more widely in their search for food. Human encounters with bears are more frequent during such years, as are complaints of crop damage and livestock losses. Food conditioning occurs most often at garbage dumps, camp-grounds, and sites where people regularly feed bears. Habituated, food-conditioned bears pose the greatest threat to humans (Herrero 1985, Kolenosky and Strathearn 1987).

1.2 Black Bear Damage Management in Wisconsin

1.2.1 Black Bear Damage in Wisconsin

Wisconsin has long recognized damage bears cause to agriculture, and has had an agriculture damage compensation program since 1931 (Hyngstrom and Hauge 1989). Bears can present problems concerning property damage, threats to public safety and nuisance situations anywhere in Wisconsin, but are most common in the northern part of the State. In the early years of damage programs compensation claims averaged less than $50 per claim (Stowell and Willging 1992). Bear nuisance problems in Wisconsin intensified in the 1980's, with increased human development, recreational activity, and agricultural expansion in northern Wisconsin, and included complaints about bears feeding on garbage (at residences, restaurants, and campgrounds), apiaries (beehives), crops, livestock and property damage, and general nuisance (Massopust and Anderson 1984); this increase has continued. An increasing bear population, coupled with an expansion of corn production in northern Wisconsin due to the development of shorter maturing corn varieties, has caused bear damage to agriculture to rise sharply in recent years (Stowell and Willging 1992).

Damage caused by black bears is quite diverse, ranging from trampling and destroying field crops and tearing up turf to destroying apiaries and even (rarely) injuring or potentially killing humans. Black bears are noted for nuisance problems such as scavenging in garbage cans, breaking in and demolishing the interiors of cabins, and raiding camper's campsites and food caches. Black bears also become a nuisance when they forage in garbage dumps and landfills. Field crops, such as corn and oats, are damaged as bears feed in preparation for winter hibernation. Large, localized areas of broken, smashed stalks show where bears have fed in cornfields. In Wisconsin bear damage to corn peaks when the corn is in the *"milk"* stage, but may continue until harvest. Bears can also cause extensive damage to trees, especially in second-growth forests, by feeding on the inner bark or by clawing off the bark to leave territorial markings. Black bears damage orchards by breaking down trees and branches in their attempts to reach fruit. They will often return to an orchard nightly once feeding starts. Due to the perennial nature of orchard damage, losses can be economically significant. A few black bears also learn to kill livestock, and the behavior, once developed, usually persists. The severity of black bear predation makes solving the problem very important to the individuals suffering the losses. Resources reported damaged in 2000 included field and sweet corn, sunflowers, apiaries, berry and orchard crops, oats, and livestock (Table 1-1).

Table 1-1. Black Bear Damage to Livestock.

FY	Reported	Verified
1995	$1,240	$ 469
1996	$1,150	$5,214
1997	$2,845	$5,053
1998	$3,350	$1,728
1999	$1,030	$1,176
2000	$3,160	$4,555

The current compensation program has a $250 deductible and has a $15,000 claim limit per individual, so actual damage in 2000 was higher. In 2000, the WDNR received 85 damage compensation claims for bear damage and paid $110, 393 for bear damage to eligible agriculture resources. In 2001, WDNR reported 922 bear complaints of which 73% involved a nuisance complaint, 17% damage to agriculture,

and 10% involved property damage.

1.2.2 Black Bear Predation on Resources and Threats to Human Health and Safety.

In a court declaration, Connolly (1992) suggested that only a fraction of damage is reported to and confirmed by WS, and that fraction could be expected to be between 5-20%. WS personnel do not try to find every head of livestock reported to be killed or other resource damaged by wildlife, but rather damage reports are investigated to verify whether or not wildlife damage has occurred, and if so, what species is responsible. Table 1-1 provides information on the livestock losses reported to and verified by WS because of black bear predation. Table 1-2 provides information on other agricultural resources, natural resources and property that were damaged by black bears, and human health and safety risks from black bears in Wisconsin (Management Information System (MIS) 1995, 1996, 1997, 1998, 1999, 2000). This information represents only a small percentage of the total losses, but does provide information on what types of black bear losses occurred in Wisconsin.

Table 1-2. Black Bear Damage ($) by FY.

Resource	1995	1996	1997	1998	1999	2000
Agriculture	49,156	36,241	170,956	34,906	24,185	38,658
Health & Safety[1]	--	--	--	--	--	--
Natural Resources	0	200	0	1,800	300	0
Property	15,084	8,842	10,345	9,640	13,442	9,807

[1] It is difficult to place a dollar value on human health and safety situations.

The potential for people/bear conflicts remains, as expanding human populations move into bear habitat. Black bears occasionally threaten human health and safety. Herrero (1985) documented 500 injuries to humans resulting from encounters with black bears from 1960 to 1980. Of these, 90% were minor injuries (minor bites, scratches, and bruises). Only 23 fatalities were recorded from 1900 to 1980 due to black bear attacks. These are remarkably low numbers, considering the geographic overlap of human and black bear populations. Ninety percent of all incidents were likely associated with habituated, food-conditioned bears. Injuries to humans caused by black bears have been rare in Wisconsin. However, in August, 1999 a bear at the [redacted], located in Washburn County, Wisconsin, caused extensive injuries to a camper.

Black bear predation in Wisconsin primarily involves cattle and calves, but has also involved sheep and lambs, poultry, swine, and domestic rabbits. Cattle and calves are most vulnerable to predation at calving time and less vulnerable as they get older and larger (Horstman and Gunson 1982). Calves remain vulnerable to the black bear predation during the spring through autumn if they are grazed in areas that typically represent suitable habitats for bears.

1.3 Wisconsin Black Bear Management

Wisconsin's current black bear management philosophy has evolved during the past several decades as public attitudes toward bears have changed. Once hunted for bounty in Wisconsin, bears are now highly valued and the population carefully monitored. Bear populations have increased since the 1970's resulting in increased

complexity of some management issues, including human-bear interactions, bear damage, and user-group conflicts.

Black bear populations in Wisconsin are managed in *"zones"* (Figure 1-3) that are based on habitat suitability and human tolerance. The WDNR goal is to have a bear population that balances habitat capabilities with human tolerance and provides a broad array of recreational opportunities. Currently, WDNR bear research and management activities are directed towards managing bear populations within these zones and developing harvest strategies to maintain populations at or near prescribed goals. The age structure of bear populations is one indicator of population health. Because bears are relatively long-lived animals, bears in the older age classes should be found in a healthy population. All harvested bear must be registered with the WDNR so that biological information from each bear can be used to estimate population densities through a population model (Garshelis and Snow 1988) and determine population health. In addition, the WDNR conducts bait station surveys, and incorporates field research and mark/recapture studies into the model as data is collected. The model incorporates information about population parameters that affect population size in known ways. These include sex and age composition of harvested bears, age-specific reproductive rates, and rates of natural mortality. The model, which combines estimates of these parameters, is used to estimate population size and therefore impacts to the population. The model is then used to assess the effects of various harvest strategies to avoid adverse affects to the black bear population in Wisconsin. Bear population estimates indicate a healthy and secure population that is gradually expanding its range southward. The goal of the WDNR is to achieve a somewhat higher bear population in each management zone that would be compatible with various stakeholders in the zones.

Figure 1-3. Bear Hunting Zones in Wisconsin.

Current bear range in Wisconsin covers approximately 22,144 miles², the majority found in the forested northern one-third of the State (Figure 1-2). However, bear range has expanded southward in recent years due to dispersal of bears from northern regions, changes in land use practices, and increased human understanding/tolerance of black bears. Black bear management in Wisconsin is divided into management zones (Figure 1-3) for the purpose of regulating harvest and population levels (Wisconsin Administrative Code (WAC) Natural Resources (NR) §§10.102). Restricted bear harvests (WAC NR §§10.101, §§10.102) have allowed the bear population to increase from 5,000 - 6,000 bears in 1986 to approximately 11,800 in 2002 (Table 1-3).

Table 1-3. Bear Population Estimates and Goals (WDNR unpubl. data).

Year	Zone A	Zone A1	Zone B	Zone C	State
1999	5,600	5,200	2,200	1,150	14,150
2000	5,400	4,950	2,200	1,150	13,700
2001	5,000	4,450	2,100	1,200	12,750
2002	4,450	4,200	2,000	1,150	11,800
Goals	4,600	3,300	2,200	800	11,300

These estimates equate to 2002 densities of 1 bear/1.2 mi² of bear range in

1.3.1 WS and WDNR Efforts to Reduce Black Bear Damage.

WDNR has used a variety of strategies to address bear damage through the years including information and education, harvest regulation, agricultural damage programs which provided abatement materials

(i.e., electric fencing) as well as damage compensation payments, live trapping and relocation of problem bears, and limited lethal removal of individual bears (Hyngstrom and Hauge 1989, Stowell and Willging 1992).

WDNR has relocated problem bears at least since the 1960's (B. Kohn, WDNR, pers. comm. 2002). Since 1988, WS has cooperated with the WDNR concerning several aspects of wildlife damage management. In 1990, because of WDNR wildlife management workload concerns, WDNR added bear relocation work to an existing cooperative agreement with WS to reduce damage cause by black bear (Stowell and Willging 1992). Black bear damage management was addressed in the cooperative agreement in the section regarding *"Nuisance Wildlife"*, and is in accordance with Wisconsin Statutes Annotated (WSA) s.29.59 stats. Under terms of the cooperative agreement, WS and WDNR mutually agree that nuisance wildlife complaints, including bear complaints, will be directed to WS for the delivery of technical assistance, trapping and relocation, and/or abatement services. Therefore, WS is responsible for responding to all bear nuisance and damage complaints statewide. Every effort is to be made to handle complaints with advice and recommendations. However, WS is currently authorized by WDNR to capture and relocate problem bears when necessary. The primary capture method is a culvert trap, and much less frequently a spring-activated foot snare, or hand captured. Since 1995, WS has ear tagged between 50-200 captured bears annually using standard chemical immobilization and tagging techniques.

1.4 NEED FOR BLACK BEAR DAMAGE MANAGEMENT IN WISCONSIN

Where black bear populations exist they often cause damage to apiaries, field crops, fruit and nut crops, livestock, timber, and property, as well as direct conflicts with humans at campgrounds, resorts, and residences (Davenport 1953, Gunson 1977, Merrill 1978, Singer and Brahon 1980, Tardell 1982, Mason and Adams 1987, Vaughn and Scanlon 1990).

The need for action in Wisconsin is based on the necessity to protect agriculture, including livestock and crops, property, and human health and safety, as well as respond to nuisance complaints (See Section 1.2). The challenges in conducting damage management while protecting black bear populations in Wisconsin to provide adequate game for hunters, cultural resources for Native Americans, and opportunities to non-hunters are considerable. Good science and a solid footing in a balanced conservation ethic is required to achieve the desired results. Wildlife managers, confronted with conflicting public perceptions of bears as both a nuisance and a valued game animal, are faced with a dilemma: how to maintain healthy populations of black bears while minimizing conflicts between bears and humans. Males, particularly subadults, are more frequently involved in nuisance problems than females (Erickson et al. 1964, Harger 1967). The wide-ranging movements of males increase their probability of encountering unnatural food sources such as garbage. The potential for conflict between bears and humans is much greater than it is with other big game species (Kolenosky and Strathearn 1987).

WS' efforts to alleviate black bear problems have been and would continue to be based on technical assistance and operational damage management. This is because the magnitude of black bear conflicts have increased the need to implement operational damage reduction projects. These projects have involved the live capture and relocation of problem bears, but may involve the lethal removal of specific problematic or habituated bears in the future.

1.5 SCOPE AND PURPOSE OF THIS EA

Damage problems involving black bears can occur statewide resulting in requests for assistance to WS, but would primarily occur in WDNR Management Zones A, A1, and B, where bear populations are highest (Figure 1-3). The scope and purpose of this EA is to evaluate the potential affects of black bear damage management conducted by WS to protect agricultural resources, property, and human health and safety in Wisconsin.

Black bears in Wisconsin frequently conflict with humans by causing general nuisance problems at campsites, restaurants, resorts, and residences. Nuisance complaints are generally food related. Bears also, at times, prey upon livestock and other domestic animals, damage property and potentially pose a threat to human health and safety. As black bear densities increased in Wisconsin, increased bear nuisance and damage complaints have occurred (Table 1-4). Under the Proposed Action, black bear damage management could be conducted anywhere in Wisconsin with the proper permissions, agreements and authorities. Requests for assistance in the future, both technical and operational, are expected to increase (Table 1-5).

In 1996 the WS program prepared an EA which addressed the need to conduct black bear damage management and the potential impacts of various alternatives for responding to bear damage problems in Wisconsin. Since that time, the WS program has reviewed and compared that analysis with more current program monitoring information to determine whether the original Finding of No Significant Impact (FONSI) was still appropriate. The primary purpose of this EA is to address current issues and concerns, and to once again assess the potential impacts of various program alternatives, based on the most recent monitoring and population information available. This review will make use of WS program data and will also consider WDNR and new scientific information that has become available since the 1996 EA was completed.

Table 1-4. Black Bear Complaints Received by WS.

Resource	1996	1997	1998	1999	2000
Agriculture	251	379	276	298	296
Health & Safety	740	722	503	785	930
Natural Resources	2	0	2	1	0
Property	134	100	106	117	101

This EA analyzes planned and future black bear damage management related to the protection of agricultural resources, apiaries, property, and to protect human health and safety on public and private lands within Wisconsin. Of the area of Wisconsin (34.8 million acres (Wisconsin Blue Book 2001-2002)), Management Zone A contains about 7,020,160 acres, Zone B contains about 3,319,040 acres, and Zone C contains about 3,832,960 acres. WS activities were conducted on only about 113,381 acres in FY 01 (MIS 2001), 234,274 acres in FY00 (MIS 2000), 292,400 acres in FY99 (MIS 1999) and 96,950 acres in FY98 (MIS 1998). The analysis area encompasses federal lands under the administration of the USDA-Forest Service (Forest Service), U.S. Fish and Wildlife Service (USFWS), as well as tribal, state, county and private lands. In many cases, WS spends only a few hours in a specific location and often on just a few acres under agreement trying to resolve a particular problem.

Table 1-5. Technical Assistance (TA) Provided by WS.

FY	TA Projects	Participants	Leaflets Distributed
1996	1,195	1,211	553
1997	1,263	1,279	572
1998	933	1,023	475
1999	1,264	1,322	733
2000	1,390	1,419	854

This EA addresses WS' activities in Wisconsin bear nuisance and damage management, including technical assistance, bear capture, immobilization, relocation and possible euthanasia activities. A nuisance bear problem is defined in this document as a bear problem without significant damage, such as raiding garbage cans or tearing down bird feeders. A damage bear problem is defined as a bear problem where significant damage is caused by bears to agricultural resources or property.

1.6 PROPOSED ACTION

The proposed action is to implement an integrated black bear damage management program to protect agricultural resources, property, and human health and safety on all lands in Wisconsin where a need exists and a request is received, and when all legal and financial requirements have been met. An IWDM approach considers using all legally available methods, either singly or in combination to alleviate or stop black bear-caused damage. Resource owners, citizens, and resource managers would continue to receive technical assistance in the form of instructional sessions, demonstrations, equipment loans, and information on the availability and use of non-lethal and lethal tools. Non-lethal methods recommended by WS could include, but would not be limited to, habitat modification, environmental manipulation, cultural practices, behavior modification (e.g., bear and people), and use of techniques and methods such as scaring devices. WS may also trap and relocate problem bears, with the use of culvert and cage traps, spring activated foot snares, or hand capture. Chemical immobilization methods would be utilized when necessary to handle bears for research or safety considerations, and would include use of standard, approved immobilization agents (Appendix C). Lethal measures may be conducted by WS in accordance with applicable agreements, policies, and laws and regulations, and may include shooting and chemical euthanasia. (See Chapter 3 for a more detailed description of the current program and the proposed action).

1.7 OBJECTIVES FOR WISCONSIN WS BLACK BEAR DAMAGE MANAGEMENT

1.7.1 Acceptance of the program by cooperators.

1.7.2 Response to 100% of requests for black bear damage management assistance within 48 hours.

1.7.3 No adverse impact on the statewide black bear population.

1.8 RELATIONSHIP OF THIS EA TO OTHER ENVIRONMENTAL DOCUMENTS

1.8.1 **Animal Damage Control Programmatic EIS.** WS has issued a final EIS (USDA 1997) and Record of Decision on the National APHIS-WS program. This EA is tiered to that EIS.

1.8.2 **USDA-APHIS-WS/USFWS Biological Opinion.** A programmatic biological opinion was prepared on the WS program to comply with Section 7 of the ESA (USDI 1992) and to determine if WS' action would adversely affect any listed species. WS will comply with the terms and conditions and reasonable and prudent measures that the USFWS provided to reduce any risk to T&E species.

1.8.3 **USDA-APHIS-Wisconsin WS/USFWS Biological Assessment.** Wisconsin WS conducted a Section 7 Consultation for federally listed species in Wisconsin. Concurrence for the consultation is pending USFWS review. WS will abide by *"Reasonable and Prudent Measures"* that the USFWS may deem appropriate.

1.8.4 **USDA-APHIS-Wisconsin WS/WDNR Biological Assessment.** Wisconsin WS conducted a T&E species consultation for state listed species in Wisconsin. WDNR has concurred with the WS assessment of *"not likely to adversely affect"* any listed species in Wisconsin (R. Jurewicz, WDNR pers. comm 2002).

1.9 DECISION TO BE MADE

Based on the scope of this EA, the decisions to be made are:

- Should WS continue the current non-lethal damage management program?
- Will the proposed action affect the viability of the state black bear population, threatened and endangered (T&E), and non-target species?
- Would the proposed action have significant impacts on the quality of the human environment requiring preparation of an EIS?

1.10 RELATIONSHIP OF AGENCIES DURING PREPARATION OF THE EA

Based on agency relationships, MOUs and legislative authorities, Wisconsin WS is the lead agency for this EA, and therefore responsible for the scope, contents and decisions made. The WDNR, Wisconsin Department of Agriculture, Trade and Consumer Protection (WDATCP), USFWS, and Forest Service had input during the EA preparation to ensure a multi-agency approach in compliance with NEPA and agency mandates, policies, and regulations.

1.11 SCOPE OF THIS ENVIRONMENTAL ASSESSMENT ANALYSIS

1.11.1 Actions Analyzed.

This EA evaluates planned black bear damage management to protect: 1) property, 2) agricultural resources and 3) human health and safety in Wisconsin. Protection of other resources or other program activities will be addressed in other NEPA analyses, as appropriate.

1.11.2 American Indian Lands and Tribes.

Currently, Wisconsin WS does not have any MOUs with any American Indian tribe. If WS enters into an agreement with a tribe for black bear damage management, this EA would be reviewed and amended if appropriate to insure compliance with NEPA. MOUs, agreements and NEPA compliance would be conducted as appropriate before conducting black bear damage management on tribal lands.

1.11.3 Period for which this EA is Valid.

This EA would remain valid until Wisconsin WS and 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 EA is sufficient.

1.11.4 Site Specificity.

This EA analyzes the potential impacts of black bear damage management and addresses these activities on all lands in Wisconsin under MOU, cooperative agreement, or in cooperation with the appropriate land management agencies. It also addresses the impacts of black bear damage management on areas where additional agreements may be signed in the future. The proposed action is to reduce damage by black bears and WS' goals and directives are to provide services when requested within the constraints of available funding, technology and workforce. Therefore, it is conceivable that additional black bear damage management efforts could occur. This EA anticipates the potential expansion of services and analyzes the impacts of such efforts as part of the program. It also emphasizes, to the degree possible, major issues as they relate to specific work areas. The WS Decision Model (Slate et al. 1992) is 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).

1.11.5 Summary of Public Involvement.

WDNR, WDATCP, USFWS, and Forest Service were invited to participate in the development of this EA and were asked to provide issues and concerns for consideration by WS. An invitation for public comment letter containing issues, objectives, preliminary alternatives, and a summary of the need for action, was sent to 342 individuals, agencies, or organizations identified as interested in Wisconsin WS projects. Notice of the proposed action and invitation for public involvement were placed in eight newspapers with circulation throughout Wisconsin. An invitation for public comment letter also was sent to the Red Cliff, Lac Courte Oreilles, Bad River, Lac du Flambeau, St. Croix, and Soskaogon Chippewa Bands, Ho Chunk Nation, and Stockbridge-Munsee Band of Mohican Indians. None of the individual Tribes in the analysis area identified or provided any cultural or other concerns relating to WS' current or proposed program. WS did receive 18 public comments concerning the preparation of the EA. All responses were reviewed for issues and concerns to be analyzed in the EA, and these letters are maintained in the administrative file located at the Wisconsin WS District Office, P.O. Box 1064, Rhinelander, WI 54501.

1.12 PREVIEW OF THE REMAINING CHAPTERS IN THIS EA

The remainder of this EA is composed of four (4) chapters and three (3) appendices. Chapter 2 discusses and analyzes the issues and affected environment. Chapter 3 contains a description of each alternative, alternatives not considered in detail, mitigation and standard operating procedures (SOP). Chapter 4 analyzes environmental consequences and the environmental impacts associated with each alternative considered in detail. Chapter 5 contains the list of preparers, reviewers and consultants of this EA. Appendix A is the literature cited used during the preparation of the EA, Appendix B lists the authorities for conducting wildlife damage management in Wisconsin, and Appendix C is a detailed description of the methods used for black bear damage management.

CHAPTER 2: ISSUES AND AFFECTED ENVIRONMENT

2.0 INTRODUCTION

Prior to preparation of this EA, WS solicited input from citizens, tribes, organizations, and governmental agencies so that: 1) issues and concerns could be identified and considered and 2) adverse environmental impacts could be avoided, minimized, or mitigated. This chapter discusses important environmental components that could be affected by the different black bear damage management alternatives analyzed in this EA.

2.1 AFFECTED ENVIRONMENT

The area of the proposed action includes all private and public lands in Wisconsin where black bear damage is occurring or could occur (Figure 1-2) and a request for assistance is received. The proposed action could be conducted on urban/suburban sites, campgrounds, farms, seasonal residences or other sites. Cultural, economic, social, legal, and other components of the affected environment are given further consideration in Section 2.3 of this chapter, and in Chapters 3 and 4.

2.2 ISSUES ANALYZED IN DETAIL IN CHAPTER 4

Several issues were identified by WS, WDNR, WDATCP, and Forest Service during preparation of this EA. Some were used to prepare the detailed impact analyses of the alternatives in Chapter 4. Some issues were also used to identify mitigation measures and develop SOP's for reducing or eliminating the likelihood of adverse environmental impacts from implementation of the proposed action. Some issues, however, did not receive detailed analyses because WS black bear damage management would not have any adverse affect on the legal, social, or economic environment from program implementation. The following issues were determined to be relevant by WS, WDNR, WDATCP, and Forest Service based on public and other agency comments, and analyzed in detail in Chapter 4:

- Viability of black bear populations in Wisconsin.
- Public health and safety from black bear management.
- Maintain effective and selective resource protection methods and tools.
- Potential for some WS methods to take non-target animals.

2.3 ISSUES CONSIDERED IN THIS EA BUT NOT ANALYZED IN DETAIL

Issues herein are defined as public concerns or conflicts. These concerns/conflicts often reflect opposing views and were identified through, and as a result of, discussions with potentially affected and interested parties. These issues have been consolidated into the following:

2.3.1 Humaneness of WS Activities and Methods.

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

Pain and suffering as it relates to damage management tools used by WS to capture animals, is often interpreted differently by professional wildlife biologists and lay people. Others that receive damage or threats of damage may perceive humaneness differently, particularly if their pets or livestock are injured or killed by bears. Wildlife managers and the public would both be better served to recognize the complexity of defining suffering, since "*. . . neither medical or 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, and workforce.

Therefore, 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 or other animals if damage and losses are not stopped.

Wisconsin WS 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. WS 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. Until new methods and tools are developed, a certain amount of animal suffering could occur (e.g., when non-lethal damage management methods are neither practical, available, nor effective). Whenever possible and practical, WS also employs euthanasia methods recommended by the AVMA (1993) 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.

2.3.2 Appropriateness of Preparing an EA (instead of an EIS) for Such a Large Area, Rather Than Preparing Multiple EAs for Smaller, More Site-Specific Areas.

Federal agencies have the discretion to determine the geographic scope of their NEPA analyses (*Kleppe v. Sierra Club,* 427 U.S. 390, 414 (1976)) and WS has determined that preparation of this EA to address

black bear damage management in Wisconsin is appropriate. The Council on Environmental Quality (CEQ) regulations state that a significant impact may be determined depending on the degree to which the *effects* on the quality of the human environment are likely to be highly controversial. The effects of WS' black bear damage management *are not highly controversial* among wildlife biologists. This is supported by the interagency consultations, cooperative agreement with WDNR, and review process employed during the preparation of this EA. If in fact a determination is made through this EA that the proposed action would have a significant impact on the human environment, then an EIS would be prepared. In terms of considering cumulative impacts, one EA covering the entire State of Wisconsin may provide a better analysis than multiple EA's covering smaller zones. A more detailed and more site-specific level of analysis would not substantially improve the decision-making process, and pursuing a more site-specific and more detailed analysis might even be considered inconsistent with NEPA's emphasis on reducing unnecessary paperwork (Eccleston 1995).

2.3.3 Impacts of Predator Removal on the Public's Aesthetic Enjoyment of Bears .

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 humans also claim that they have a spiritual bond with wild animals. 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. Consequently, public opinion about the best ways to reduce conflicts between humans and wildlife is highly variable, 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 benefits to the general public and resource owners.

Wildlife generally is regarded as providing economic, recreational, and aesthetic benefits (Decker and Goff 1987), and the mere knowledge that wildlife exists is a positive benefit to many people. Some members of the public have expressed concerns that bear damage management could result in the loss of aesthetic benefits to the public, resource owners, or local residents. Aesthetics is the philosophy dealing with the nature of beauty, or the appreciation of beauty. Therefore, aesthetics is truly subjective in nature, dependent on what an observer regards as beautiful.

Wildlife populations also provide a range of direct and indirect social and economic benefits. 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 hunting) or nonconsumptive use (e.g., observing or photographing bears). 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 benefitting 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 (e.g., ecological, existence, bequest values) (Bishop 1987).

WS black bear damage and nuisance management activities primarily occur across the northern third of the state, but can occur statewide (Figure 1-2). Black bears may be live trapped and relocated to areas of suitable bear habitat to reduce damage or threats to human health and safety. Under the proposed alternative some bears may be lethally removed. In areas where WS does live trap and relocate black bears, or lethally remove individual bears, dispersal from adjacent areas typically contributes to repopulation of the area, depending on the level of removal and population levels in nearby areas. Black bear populations potentially affected by WS activities are relatively abundant, but are not commonly observed because of their secretive and nocturnal behavior. The likelihood of getting to see a black bear in some localized areas could be temporarily reduced as a result of WS activities, but because there is already a low likelihood of seeing a black bear, this temporary local reduction in public viewing opportunity would not likely be noticeable in most cases. Impacts on overall populations would be relatively low and opportunities to view, hear, or see evidence of black bears would still be available. The potential minor reduction in local opportunity to view black bears must be weighed against the potential economic harm suffered by livestock or property owners or others affected by black bear damage, if damage management were not implemented.

IWDM provides relief from damage or threats of damage to people who would have no recourse if other damage management methods are ineffective or impractical. Wisconsin WS only conducts black bear damage management at the request of citizens, organizations, and others who are experiencing problems. When requests for black bear damage management assistance are received, WS addresses the issues/concerns, develops an appropriate plan of action, and explains the reasons for selecting the action that is implemented. Management actions are then carried out in a dedicated, humane and professional manner.

2.3.4 Public Concern About the Use of Pesticides.

Much of the public concern over the use of pesticides for wildlife damage management is based on an erroneous perception that WS uses excessive quantities of non-selective, outdated chemicals. To the contrary, WS uses an IWDM approach to managing wildlife damage, which often does not employ chemicals as a damage management tool. Chemicals used by WS are registered with both U. S. Environmental Protection agency (EPA) and WDATCP and used them in accordance with federal and state law and label restrictions. WS Directives and MOU's with cooperators also regulate the use of chemical damage management tools by WS personnel. Social and legal concerns and selectivity of available methods are also considered in the WS decision-making process before chemicals are used on any damage management project. In a Risk Assessment of the WS program (USDA 1997, Appendix P), APHIS determined that, when used according to label directions, chemical damage management tools are selective for target species and have negligible impacts on the environment. Furthermore, no pesticides or chemical damage management methods are being proposed for use under any of the alternatives analyzed in this EA.

2.3.5 Cultural and Social Issues.

NEPA requires that all aspects of the environment be considered in terms of environmental impacts, not only those related to biological resources. While the proposed action will have little impact on these other resources, they are included as part of the WS analysis of the affected environment.

2.3.5.1 Archaeological/Historical Site Protection.

The National Historic Preservation Act of 1966, as amended, requires federal agencies to

evaluate the effects of any federal undertaking on cultural resources and to consult with appropriate American Indian Tribes to determine whether they have concerns for cultural properties in areas of these federal undertakings. In addition, Wisconsin law protects prehistoric or historic artifacts and sites on lands owned by the state or any of its political subdivisions (Wisconsin Statutes Annotated (WSA) §§44 40). Black bear damage management has little potential to adversely affect sensitive cultural resources. Work areas are relatively small, therefore, ground disturbance would be minimal. The Wisconsin Historical Society, Division of Historic Preservation (WHSDHP) was consulted about the proposed action and concluded that the, *"Project as described will not adversely affect culturally or historically sensitive sites/resources, and therefore do not constitute "Federal undertakings" as defined in Section 106 of the National Historic Preservation Act (NHPA)"* (WSHPO letter to file dated February 12, 2002). Wisconsin WS would, as requested by WSHPO, halt work and contact the WSHPO if any cultural resources or human remains are discovered.

2.3.5.2 American Indian Concerns.

The Native American Graves and Repatriation Act of 1990 provides for protection of American Indian burial sites, human remains, funerary objects and sacred objects, and establishes procedures for notifying Tribes of any new discoveries.

In consideration of American Indian cultural and archeological interests, the Wisconsin WS program solicited input from the following Tribes within Wisconsin: Red Cliff, Lac Courte Oreilles, Bad River, Lac du Flambeau, St. Croix, and Soskaogon Chippewa Bands, Ho Chunk Nation, and Stockbridge-Munsee Band of Mohican Indians.

2.3.6 Impacts on Wisconsin's Biodiversity.

No Wisconsin WS project is conducted to eradicate any wildlife population, including black bear. In fact, some projects are conducted to provide a species protection from direct threats from other wildlife (e.g., trout habitat degradation from beaver). WS complies with international treaties, federal, state, and local laws, and regulations enacted to ensure species protection and viability.

Although WDNR does not have a formal biodiversity policy, an agency policy exists. The WDNR issued a strategy entitled *"Biodiversity as a Management Issue"* in July 1995 (Wisconsin Administrative Code (WAC) Natural Resources (NR) §§1.01). The strategy contains broad recommendations and possible actions specific to each of the biological community types. The state also passed a forest diversity bill that adds native biological diversity as a purpose of state forests, and requires the WDNR to *"assure that the management of the State forests is consistent with . . . the long-term maintenance of sustainable forest communities and ecosystems"* (1995 Wisconsin Act 257). In addition, it is public policy by statute to protect forest resources and wildlife (WSA §§26.30).

Wisconsin also uses the Natural Heritage database, GAP and other inventory systems to monitor the state's habitat types and biodiversity (Defenders of Wildlife and Center for Wildlife Law 1996). Other projects include the Inland Waterways Environmentally Sensitive Areas Mapping Project and the Longterm Resource Monitoring Program (Defenders of Wildlife and Center for Wildlife Law 1996). In addition, a comprehensive survey of systematic terrestrial and aquatic communities and rare plants is being developed (Defenders of Wildlife and Center for Wildlife Law 1996). Further, state agencies are required to manage some lands for biological sustainability. By statute, agencies who own certain

property must develop long-range management plans for the preservation and improvement of the land (WSA §§44.41)

Wisconsin also has an endangered species law that protects animals and plants (WSA §§29.65, 29.415; WAC NR §§27.01 et seq). Listings are based on scientific evidence, commercial data and consultations.

The impacts of the current WS program on biodiversity are very minor and not significant, either statewide or nationwide (USDA 1997). WS operates on a relatively small percentage of the Wisconsin land mass (see Section 1.2 of this EA). The take of any wildlife species analyzed in this EA is a small proportion of the total population and is insignificant to the viability and health of the population (see Section 4.2). In addition, any reduction in the local population is temporary because immigration from adjacent areas and reproduction by the remaining animals would replace the animals removed during damage management operations.

2.3.7 Educational Programs Should be Developed and Implemented

Education is an important element of WS' program activities because wildlife damage management is about finding *"balance"* or co-existence between the needs of people and needs of wildlife. This is extremely challenging as nature has no balance, but rather, is in continual flux. In addition to the routine dissemination of recommendations and information to individuals or organizations sustaining damage, WS is available to provide lectures and demonstrations to ranchers, farmers, homeowners, and other interested groups. WS frequently cooperates with other agencies in education and public information efforts. 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.

Wisconsin WS provides informational leaflets about black bear damage management, biology, and ecology. In federal FYs 1997, 1998, 1999 and 2000, the WS program in Wisconsin provided 475, 733, 854 and 604 leaflets, respectively, to the public about black bear damage management (MIS 1997, 1998, 1999, 2000).

2.3.8 Compensation Should be Used for Black Bear Damage Management

Bear damage to agricultural resources may be compensated for by the State of Wisconsin under the provisions of the Wisconsin Wildlife Damage Abatement and Claims Program (WDACP). The WDACP was enacted by the state legislature in 1983 (WSA s. 29.598 stats.) and revised in 1998 (s. 29.889 stats.) and is administered by the WDNR and participating counties. The program is funded through a $1.00 surcharge on all hunting licenses sold in the state annually, as well as the proceeds from the sale of *"bonus"* antlerless deer tags (currently at $12.00 each). The statutes define specific eligibility requirements, including notification procedures, eligible crops, and maximum compensation amounts. The program requires that participants comply with wildlife damage abatement measures. Abatement measures most commonly used for agricultural bear damage under the current program include live trapping and relocation of individual bears causing damage, and the use of electric fencing for apiary damage. A producer who meets all eligibility requirements may receive compensation for up to $15,000 of appraised losses, after a $250 deductible. After the deductible is met damage is compensated at 100% up to $5,000, and at 80% above $5,000 up to the $15,000 maximum. The program is designed to alleviate conflicts between producers and huntable wildlife species. The state currently has no program for compensation for property damage or other losses.

2.3.9 Relocated Bears Simply Return to Their Original Home Ranges

Most of the bears trapped and relocated by WS in Wisconsin are done so for crop protection, primarily to reduce bears consuming and trampling corn while it is in the "milk" stage. By removing a bear for a short period of time from the damage site, the corn is allowed to mature and thus less susceptible to bear damage Massopust and Anderson (1984). Wisconsin WS generally tries to relocate bears about 20-40 miles from the capture site to lower transportation costs, decrease labor costs, and reduce stress on the relocated bear. Fies et al. (1987) reported that bears moved 10-50 miles were successfully transplanted 93% of the time. They further state that although the distance relocated undoubtedly affects the frequency of bears returning, human activity and land use patterns appear to be more important factors affecting bear movement. In addition, available data indicates that relocation does not greatly increase natural mortality among bears ≥ 2 years old (Rogers 1986). Harger (1970) found a similar mortality pattern of relocated (41%) and nonrelocated (38%) bears, suggesting that relocation did not increase natural mortality in Michigan. Alt et al. (1977) and McLaughlin et al. (1981) in Pennsylvania, and Massopust and Anderson (1984) in Wisconsin reported similar results. Furthermore, Rogers (1986) indicated that relocated bears typically leave release sites within a few days and move widely, whether they return home or not indicating that they should have little effect on resident bears and no more than do dispersing bears and bears foraging naturally outside of their usual ranges. In addition, Rogers (1986) reported that if relocated bears return home they do so within a month, but many that return are not seen or recaptured until the following year or not at all (Harger 1970, Alt et al. 1977, McLaughlin et al. 1981, Massopust and Anderson 1984). Furthermore, McLaughlin et al. (1981) stated that relocated nuisance bears reduced their nuisance activity, regardless of the relocation distance and bears that continued their nuisance behavior were usually recaptured at a different site for the same type nuisance activity about a year after the original capture. Fies et al. (1987) summarized their work by stating that short relocation distances can be effective, concluding that relocation of nuisance bears appeared to be a feasible solution to human-conflicts in Virginia.

CHAPTER 3: ALTERNATIVES

3.0 INTRODUCTION

This chapter consists of four parts: 1) an introduction, 2) description of alternatives considered and analyzed in detail including the Proposed Action (Alternative 5), 3) a description of alternatives considered, but eliminated from detailed analysis, and 4) a table of mitigation measures and SOP. Alternatives were developed for consideration using the WS Decision Model (Slate et al. 1992), *"Methods of Control"* (USDA 1997, Appendix J) and the *"Risk Assessment of Wildlife Damage Control Methods Used by the USDA Animal Damage Control Program"* (USDA 1997, Appendix P). Five alternatives were recognized, developed, and analyzed in detail; three alternatives were considered but not analyzed in detail with supporting rationale. The five alternatives analyzed in detail are:

- Alternative 1. No Federal WS Black Bear Damage Management in Wisconsin.
- Alternative 2. Technical Assistance Only.
- Alternative 3. Non-lethal Black Bear Damage Management Only (Current Program) (No Action Program).
- Alternative 4. Lethal Only Program
- Alternative 5. Adaptive Integrated Black Bear Damage Management (Proposed Action).

3.1 DESCRIPTION OF ALTERNATIVES

3.1.1 Alternative 1. No Federal WS Black Bear Damage Management in Wisconsin.

This alternative would eliminate all WS or any other federal program for black bear damage management (operational and technical assistance) on all lands within Wisconsin. However, state and county agencies and private individuals could conduct some degree of black bear damage management. WS would not be available to provide technical assistance or make recommendations to individuals or entities experiencing bear damage.

A *No Control* alternative was analyzed by the USFWS (USDI 1979) and was dismissed because it was considered an invalid alternative. A *No Control* alternative was also evaluated in USDA (1997) and was also dismissed as an invalid alternative. However, due to interest in this option, an analysis of this alternative has been included.

3.1.2 Alternative 2. Technical Assistance Only.

Under this alternative, WS would not conduct any operational black bear damage management in Wisconsin. The entire WS program would consist of technical assistance with WS making recommendations.

This "technical assistance only" alternative would place the immediate burden of operational black bear damage management on WDNR. If Alternative 2 was selected, WS could not participate in how a state agency or individuals would implement black bear damage management. Some agencies or individuals

may choose not to take action to resolve black bear damage. Other situations may warrant the use of legally available management methods because of public demands, mandates, or individual preference. Damage management methods and devices might be applied by people with little or no training and experience, and with no professional oversight or monitoring for effectiveness. This in turn could require more effort and cost to achieve the same level of problem resolution, and could result in more non-target animals being captured or killed.

3.1.3 Alternative 3. Non-lethal Black Bear Damage Management Only (Current Program) (No Action Program).

The No Action alternative is a procedural NEPA requirement (40 CFR 1502.14(d)), is a viable and reasonable alternative that could be selected, and serves as a baseline for comparison with the other alternatives. The No Action Alternative, as defined here, is the current program and consistent with CEQ definitions (CEQ 1981). Selecting the No Action Alternative would not result in the cessation of existing practices; that result would be achieved by selection of Alternative 1.

Under this alternative, WS would only provide technical assistance regarding non-lethal techniques, conduct investigations, and trap depredating or nuisance black bears when requested by the WDNR or individuals experiencing black bear damage in accordance with the WS-WDNR cooperative agreement and applicable policies and protocol. This alternative would preclude WS from any lethal removal of problem black bears. Captured black bear would be relocated to suitable areas in accordance with applicable regulations and policies. WS would encourage resource owners to use non-lethal methods which could include environmental manipulation, animal husbandry changes, habitat modification, fencing, and harassment.

The current program is governed by a cooperative agreement between WDNR and WS which details the cooperative bear damage management program. WS personnel in Wisconsin conduct technical assistance, and corrective (in response to current loss or hazard) operational black bear damage management using live trapping or spring-activated foot snares to relocate nuisance/problem bears in accordance with bear damage management protocols. WS activities have been conducted on private lands as requested by landowners and managers under *"Agreements for Control."*

Education/extension programs would be conducted by Wisconsin WS to provide individuals with assistance and information concerning the use and effectiveness of non-lethal black bear damage management methods. Resource owners would be responsible for implementing non-lethal methods, except for operational methods such as trapping and relocation.

3.1.4 Alternative 4. Lethal Only Program

Under this alternative, only lethal operational black bear damage management and technical assistance would be provided by WS. Requests for information regarding non-lethal management approaches would be referred to WDNR. Individuals or agencies might choose to implement WS lethal recommendations, implement non-lethal methods or other methods not recommended by WS, contract for WS damage management services, use contractual services of private businesses, use volunteer services, or take no action. WS damage management services would be conducted as authorized by various federal and state regulations. This alternative would not allow WS to consider the use of physical exclusion, livestock guarding dogs, fencing, electronic frightening devices or other non-lethal devices, even where these non-lethal methods may be beneficial. Lethal methods used by WS would include trapping and euthanasia, and shooting.

3.1.5 Alternative 5. Integrated Adaptive Black bear Damage Management (Proposed Action).

This alternative would allow for a WS Program where black bear damage management would be closely coordinated with the WDNR or other appropriate state agency. The damage management program would be designed to meet management objectives balanced with the needs of multiple resource managers (agricultural, property owners, and public health and safety). The damage management program analyzed in this alternative would operate according to and in compliance with the conservation goals established for black bear in Wisconsin and strategies outlined in approved state or federal conservation or management plans.

WS personnel would minimize the effects on non-target animals, T&E species and the environment by utilizing the most selective and effective non-lethal and lethal methods available. Lethal methods would only be used as necessary to prevent or reduce damage and in compliance with WDNR policies and guidelines.

3.2 INTEGRATED WILDLIFE DAMAGE MANAGEMENT

USDA (1997, Appendix J) describes methods currently used by the WS program. Several of these were considered in this assessment because of their potential use in reducing black bear damage. A listing and more detailed description of the methods used by Wisconsin WS for black bear damage management is found in Appendix C of this EA.

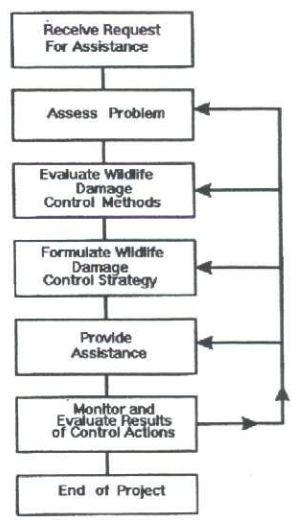
3.2.1 Introduction.

During more than 85 years of resolving wildlife damage problems, WS has considered, developed, and used numerous methods for reducing wildlife damage problems (USDA 1997). WS' efforts have involved the research and development of new methods, improvement of existing methods, and the implementation of effective strategies to reduce and prevent wildlife damage.

Usually, the most effective approach to reducing wildlife damage is to integrate the use of several methods simultaneously or sequentially. 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 judgement of trained personnel. The WS Program applies IWDM, commonly known as Integrated Pest Management, to reduce damage through the WS Decision Model (Slate et al. 1992) discussed in section 3.2.2 (Figure 3-1).

The philosophy behind IWDM is to implement effective management techniques in a cost-effective manner while minimizing the potentially harmful effects to humans, target and non-target 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.

Figure 3-1. WS Decision Model



3.2.2 WS Decision Model used for Decision Making.

USDA (1997) and Slate et al. (1992) describe the decision making procedures used by WS personnel to determine management strategies or methods applied to specific damage problems (USDA 1997: pages 2-20 to 31, Appendix N).

The WS decision making process is a procedure for evaluating and responding to damage complaints (Figure 3-1). WS personnel are frequently contacted only after requesters have tried several non-lethal techniques and found them to be inadequate for reducing damage to an acceptable level. WS personnel evaluate the appropriateness of strategies, and methods are evaluated for their availability (legal and administrative) and suitability based on biological, economic and social considerations. Following this evaluation, the methods deemed to be practical for the situation are formed into a management strategy. After the management 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 management is ended.

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 management strategy reevaluated and revised periodically.

3.2.3 Integrated Black Bear Damage Management Strategies used by WS:

3.2.3.1 Technical Assistance Recommendations (implementation is the responsibility of the requester): Wisconsin WS personnel provide information, demonstrations and advice on available black bear damage management techniques. Technical assistance includes demonstrations on the proper use of some management devices (propane exploders, electronic guards, pyrotechnics, electric fencing) and information on environmental manipulation, animal husbandry, wildlife habits, life history, habitat management and animal behavior modification. Technical assistance is generally provided over the phone or following an on-site visit with the requester. Generally, 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 WS personnel in the decision making process, but the actual management is the responsibility of the requester.

3.2.3.2 Operational Damage Management (assistance conducted or supervised by WS personnel): Operational damage management assistance is implemented when the problem cannot be resolved through technical assistance and when Cooperative Agreements enable WS to conduct operational damage management. The initial investigation defines the nature and history of the problem, extent of damage, and the species responsible for the damage. Professional skills of WS personnel are often required to resolve problems effectively, especially if the problem is complex, requiring the direct supervision of a wildlife professional. WS considers the biology and behavior of the damaging species and other factors using the WS Decision Model (Slate et al 1992). The recommended strategy(ies) may include any combination of preventive and corrective actions that could be implemented by the requester, WS, or other agency personnel, as appropriate. Two strategies are available:

3.2.3.2.1 Preventive Damage Management is applying wildlife damage management strategies before damage occurs, based on historical problems and data. All non-lethal methodologies, whether applied by WS or resource owners, are employed to prevent damage from occurring and therefore fall under this heading. When requested, WS

personnel provide information and conduct demonstrations, or take action to prevent additional losses from recurring. For example, in areas where calf depredations have occurred historically, WS may provide information about livestock guarding animals, fencing or other husbandry techniques, or if requested and appropriate, conduct black bear damage management before calving begins.

3.2.3.2.2 Corrective Damage Management is applying black bear damage management to stop or reduce current losses, to resolve verified, chronic nuisance complaints, and respond to human health and safety threats. As requested and appropriate, WS personnel provide information and conduct demonstrations, or take action to prevent or reduce current bear damage or nuisance complaints. For example, in areas where verified and documented livestock depredations are occurring, WS may provide information about livestock guarding animals, fencing or husbandry techniques, or conduct operational damage management to stop losses.

3.3 ALTERNATIVES CONSIDERED BUT NOT IN DETAIL, WITH RATIONALE

3.3.1. Bounties.

Payment of funds for killing wildlife (bounties) suspected of causing economic losses is not considered effective. This alternative will not be considered by WS in detail because:

- WS does not have the authority to establish a bounty program.
- Bounties are generally not as effective in reducing damage because depredating individuals/local populations are not specifically targeted.
- Circumstances surrounding take of animals is completely unregulated.
- No effective process exists to prohibit taking of animals from outside the damage management area for compensation purposes.

3.3.2 Damage management through birth control.

Under this alternative, black bear populations would be managed through the use of contraceptives. Bears would be sterilized or contraceptives administered to limit their ability to produce offspring. However, at present, there are no approved chemical or biological contraceptive agents for bears. A black bear contraceptive, chemosterilant or immunocontraceptive, if delivered to a sufficient number of individuals, could temporarily suppress local breeding populations by inhibiting reproduction. Reduction of local populations would result from natural mortality and inhibited reproduction. No bears would be killed directly with this method, however treated bears may continue to cause damage.

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 bears 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 regulatory agencies. This alternative was not considered in detail because: (1) it would take a number of years of implementation before the black bear population would decline, and, therefore, damage could continue for a number of years; (2) surgical sterilization would have to be conducted by licensed veterinarians, which would therefore be extremely expensive; (3) populations of dispersing bears would probably be unaffected; (4) no chemical or biological agents for contraception in bears has been approved for use by state and federal regulatory authorities and are thus not legal or practical for use on bears. If

agents are developed and as alternative methods of delivering sterilants are developed, sterilization may prove to be a more practical tool in some circumstances (DeLiberto et al. 1998).

Potential environmental concerns with chemical sterilization still need to be addressed, including safety of genetically engineered vaccines to humans and other wildlife. At this time, chemical sterilization is controversial among wildlife biologists and many others. Should any become registered in the future, WS could consider them among the methods to be used. Any additional NEPA analyses deemed necessary at that time would be conducted. The use of contraceptives is not realistic at this point, since effective and legal methods of delivering contraceptives to bears are not yet available for operational use.

3.3.3 Black Bear Damage Should be Managed by Sport Hunters (i.e., volunteer services).

WS provides professional wildlife damage management services at site-specific locations when requested by citizens or resource managers experiencing a wildlife/human conflict. Personnel respond to requests for assistance in accordance with the Congressional direction provided to WS that authorizes the program and in consultation with the WDNR. The response by hunters is based on a desire to sport hunt. Most sport hunters cannot afford to provide long-term, site-specific black bear damage management services to a complainant, who often requires the type of commitment and expertise that WS provides.

In addition, the jurisdiction for managing resident wildlife rests with the WDNR (Appendix B). The WDNR currently manages black bears as a protected game species with many restrictions on their management (WAC NR §§10.101, WAC NR §§10.102). WDNR recognizes the importance of hunters in bear management. Hunters are utilized to assist with bear management in accordance with a policy that seeks to use hunters with valid bear harvest tags to take bears at agricultural bear damage situations. The WDNR, through the Wisconsin legislature, has the option to increase the numbers of bear tags issued to hunters or to increase the length of the hunting season for bear damage management purposes.

3.4 MITIGATION AND STANDARD OPERATING PROCEDURES FOR WILDLIFE DAMAGE MANAGEMENT TECHNIQUES

Mitigation measures are any features of an action that serve to prevent, reduce, or compensate for impacts that otherwise might result from that action. The current WS program, nationwide and in Wisconsin, uses many mitigation measures and these are discussed in detail in USDA (1997, Chapter 5). The following mitigation measures apply to some or all of the alternatives, as indicated in the columns.

- Alternative 1. No Federal WS Black Bear Damage Management in Wisconsin.
- Alternative 2. Technical Assistance
- Alternative 3 Non-lethal Damage Management
- Alternative 4. Lethal Management Only
- Alternative 5. Integrated Adaptive Black Bear Damage Management

Mitigation Measures by Alternative	1	2	3	4	5
Animal Welfare and Humaneness of Methods Used by WS					
Research would continue to improve the selectivity and humaneness of management devices and these would be implemented into the Wisconsin WS Program.		X	X	X	X
Pan-tension devices would be used to reduce the incidence of smaller non-target animal capture in spring activated foot snares traps.			X	X	X
Chemical immobilization and euthanasia procedures that do not cause pain would be used.			X	X	X
All culvert and cage traps, and foot snares would be checked by WS or cooperators every 24 hours.			X	X	X
Safety Concerns Regarding WS' Use of Traps and Snares and Lures					
The WS Decision Model (Slate et al. 1992), designed to identify the most appropriate wildlife damage management strategies and their impacts, would be used when planning black bear damage management.		X	X	X	X
Traps and snares would be placed so that captured animals would not be readily visible from any designated recreation road or trail or from federal, state, or county roads.			X	X	X
Lure and bait use would be as selective for bears as possible while still maintaining effectiveness.			X	X	X
WS' Impacts on T&E Species and Other Species of Special Concern					
The use or recommendations of non-lethal methods such as livestock guarding dogs, scare devices, and other methods, would be encouraged when appropriate.		X	X	X	X
WS has consulted with the USFWS regarding the Wisconsin WS program and would continue to implement all applicable measures identified by the USFWS to ensure protection of T&E species.		X	X	X	X
WS consulted with WDNR regarding impacts on state listed T&E species		X	X	X	X

Chapter 4: ENVIRONMENTAL CONSEQUENCES

4.0 INTRODUCTION

Chapter 4 provides information needed for making informed decisions on the black bear damage management program and 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. The analysis of environmental effects which could be expected from each action alternative takes into account WS decision making process (Slate et al. 1992) and guidance provided from WS' directives.

4.1 ENVIRONMENTAL CONSEQUENCES

This section analyzes the environmental consequences using Alternative 3 (No Action) as the baseline for comparison. Table 4-3 summarizes the five alternatives and the impacts each alternative could have on the issues analyzed in detail identified in Chapter 2.

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

4.1.1 Social and Recreational Concerns.

Social and recreational concerns identified during public involvement are discussed in this EA and in USDA (1997). No social or recreational resources will be adversely affected by the proposed alternative.

4.1.2 Cumulative and Unavoidable Impacts.

Cumulative and unavoidable impacts from each alternative to black bears and non-target populations are discussed and analyzed in this chapter (Section 4.2). This EA recognizes that the total annual removal[1] of individual black bears from their population by all causes is the cumulative mortality. Analysis of Wisconsin WS' black bear "*take*" from 1997 through 2001, combined with other mortality, indicates that cumulative annual impacts are not significant, and through close coordination and consultation with the WDNR black bear mortality is not expected to adversely affect black bear populations. The Wisconsin WS program is not expected to have any adverse cumulative affects on non-target wildlife, including other T&E species (see Section 1.8.3 and 1.8.4). Furthermore, black bear damage management, as implemented by WS, would not jeopardize public health and safety.

4.1.3 Irreversible and Irretrievable Commitments of Resources.

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 WS program produces very negligible impacts on the supply of fossil fuels and electrical energy.

4.2 ALTERNATIVES & ISSUES ANALYZED IN DETAIL

The "*Magnitude*" analysis for alternatives and issues analyzed in this EA follows the process described in USDA

[1] It is recognized that the other mortality of wildlife (i.e., road kills, disease, natural mortality, etc.) occurs throughout Wisconsin but no reliable system exists for recording this information.

(1997:Table 4-2). Magnitude is defined in USDA (1997) as *". . . a measure of the number of animals killed in relation to their abundance."* Magnitude may be determined either quantitatively or qualitatively. Qualitative analysis is based on population trends and harvest data or trends and modeling. "*Other Harvest*" includes the known sport harvest, and other information obtained from the WDNR. "*Total Harvest*" is the sum of the Wisconsin WS kill combined with the "*Other Harvest.*"

Estimating wildlife densities is not precise and often dynamic, and professional judgement is required to account for unknowns and variables, such as the ability of certain habitats to support higher densities of animals than others and habitat variability affects on population stability and recruitment. Wildlife populations can change considerably from one year to the next due to factors such as drought, food shortages or disease. As a result, any population estimate would be for a given point in time and population levels can change rapidly. Therefore, adverse affects assessments are based on conservative estimates to better insure that no adverse wildlife population impacts occur.

4.2.1 Alternative 1. No Federal WS Black Bear Damage Management in Wisconsin.

The no action by WS alternative would result in WDNR personnel having to respond to all nuisance and damage bear complaints, including trapping and relocating problem bear, as they did prior to 1990. Since 1990 WDNR has faced reorganization and significant budget and personnel reductions, and would likely not be able to effectively handle the increased workload demands. Inadequate response to bear complaints would probably reduce public tolerance of current bear numbers, lower the status of bears in the eyes of the public, and require WDNR to reevaluate bear population goals (B.Mytton, WDNR, pers. comm. 2002).

This alternative would generate public dissatisfaction with problem bear management in Wisconsin, and would not be supported by WDNR, the agricultural community, sportsman, or conservation groups, recreationists, or the general public (B. Mytton, WDNR, pers. comm. 2002). In addition, increased bear damage abatement workload would force WDNR wildlife managers to re-prioritize work projects and would lead to a reduction in effort for other wildlife management activities, such as habitat management and restoration, causing a negative impact on other species (B. Mytton, WDNR, pers. comm. 2002).

A thorough review of the potential impacts of this alternative can be found in USDA (1997). USDA (1997) summarized the biological impacts of the No WS Program Alternative as follows:

"Biological impacts that would be expected under the No Action Alternative (Alternative 1 in this EA) *include all impacts that occur under the Current Program Alternative* (Alternative 3 in this EA) *plus impacts that relate to the reasons listed previously. Taking of some species would be more variable (i.e., lower for some species in some areas and higher in other areas). However, taking of non-target species probably would be higher, and for some small populations, could become biologically significant. This would be especially important if the species was threatened or endangered. Species diversity could be significantly affected. The indirect impacts on non-target species affected through the food chain or by uncontrolled releases of toxicants into the environment also could increase. In some areas, people could use unapproved chemical methods. Misuse of chemicals could increase and thereby adversely affect certain wildlife populations and public health and safety."*

4.2.1.1 Viability of Black Bear Populations in Wisconsin.

Alternative 1 would result in no Wisconsin WS technical assistance or operational black bear damage management program. Some type of damage management would most likely be

conducted by resource owners, various state or local governmental agencies, or other entities. Black bear damage management would certainly be handled differently in certain situations without WS' assistance. This alternative could have more adverse affects to the statewide black bear population than the other alternatives analyzed in this EA because there would be limited coordination of black bear damage management activities or consultation with the WDNR (B. Mytton, WDNR pers. comm. 2002). However, the impact on the statewide population would be of a low magnitude of impact.

Reduced public tolerance of problem bears would probably result in an increase in illegal bear kill, as individuals would attempt to resolve bear complaints by shooting or other means of removing offending animals. There would also be an increase in demand for WDNR to issue shooting permits for problem bears (B. Mytton, WDNR, pers. comm. 2002). Lethal removal of large numbers of nuisance or damage causing bears is unacceptable to the general public (Gunson 1977, Gourley and Vomicil 1987).

4.2.1.2 Public Health and Safety from Black Bear Management.

This alternative would result in no WS black bear damage management program in Wisconsin and would probably result in increased risks to public health and safety when compared to the other alternatives. This is because the public would not have WS' professional assistance to resolve or reduce threats posed by human habituated bears or from the potential illegal use of some methods (Schueler 1993, USDA 1997). In addition, the WDNR would need to re-prioritize management objectives and personnel, and devote more time to resolving bear safety risks. Increased work loads on the WDNR would result in other wildlife management responsibilities being postponed or terminated, or bear damage management responses delayed until personnel could respond. Lacking professional assistance or a situation where assistance was delayed could result in some resource owners resorting to illegal methods, including pesticides (Schueler 1993, Allen et al. 1996, USDA 1997) to reduce damage or the threat of damage from black bears. Pesticides are a cheaper form of damage management that represents one of the greatest threats to the environment, T&E species, and domestic pets. Consequently, increased jeopardy to human and pet health and safety could occur under this alternative.

4.2.1.3 Maintain Effective and Selective Resource Protection Methods and Tool.

Under this alternative WS would not conduct any black bear damage management and therefore concerns about effectiveness and selectivity of methods used by WS are not relevant. Some type of black bear damage management would most likely be implemented by resource owners or state agencies, or possibly by private or sport trappers or hunters. However, this alternative would probably greatly increase response time for bear damage complaints, and result in an increase in bear damage (B. Mytton, WDNR, pers. comm. 2002). Prompt, efficient response to bear complaints is important in maintaining rural landowner tolerance of bears (Clark et al. 1991). In addition, the methods used under this alternative would not be directed by WS and thus could be less selective and effective than WS' employed methods. Damage management efforts by individuals with limited training and experience would be less likely to take offending individual black bear and more likely to take non-target species. Therefore, this alternative would provide lower efficacy and selectivity than Alternative 3 or 5.

4.2.1.4 Potential for Some WS Methods to Take Non-target Animals.

No technical assistance or operational WS activities would be conducted pursuant to this alternative and therefore, there would be no risks to non-target or T&E species from WS program recommendations or actions. However, some type of damage management would most likely be implemented. Any actions initiated by individuals with limited training and experience would be more likely to affect non-target species. Lacking professional assistance, some resource or property owners, or those believing there are human health and safety risks might use illegal pesticides (Schueler 1993, Allen et al. 1996, USDA 1997), a cheaper form of control that represents one of the greatest threats to the environment, non-target and T&E species, domestic animals, and public health and safety. This alternative would probably result in low impacts to non-target species populations, but higher impacts than Alternatives 3 or 5.

4.2.2 Alternative 2. Technical Assistance Only.

The majority of nuisance bear complaints are currently resolved through public education and extension methods and WS effectively handles many general nuisance complaints with technical assistance. However, *"Technical Assistance Only"* is not usually effective for most property or agriculture damage situations, or chronic nuisance problems. Impacts of this alternative would be similar to Alternative 3 since many of bear complaints received by WS are resolved through public education and extension methods (technical assistance and information transfer).

4.2.2.1 Viability of Black Bear Populations in Wisconsin.

Currently, black bear populations in Wisconsin are expanding southward and bear populations would remain stable or continue to increase where legal and restricted population harvest was low. Resource owners in these areas may allow sport hunters to harvest bears on their property during the regular hunting season. Resource owners may also obtain permits from the WDNR to allow them to reduce damage caused by depredating black bears by removing bears outside of the regulated hunting season (WAC NR §§12.15). These resource owners could receive technical assistance from WS regarding black bear damage management methods. Some resource owners may take illegal or unsafe actions against local populations of black bears out of frustration or ignorance (Schueler 1993, Allen et al. 1996, USDA 1997). However, this alternative would likely result in low impacts on black bear populations, but potentially higher impacts than Alternatives 3 or 5.

4.2.2.2 Public Health and Safety from Black Bear Management.

Under this alternative, WS would only provide technical assistance to those requesting black bear damage management assistance from WS in Wisconsin. Lacking professional operational assistance, some resource and property owners might resort to using illegal pesticides (Schueler 1993, Allen et al. 1996, USDA 1997) to reduce damage or the threat of damage from black bears. There could be some increased risk to public and pet health and safety from improper or inexperienced use of pesticides, and no pesticides are currently registered to resolve black bear damage problems. This alternative could result in increased risks to public health and safety when compared to Alternative 3 or 5, however the risks are still considered low.

4.2.2.3 Maintain Effective and Selective Resource Protection Methods and Tools.

Under this alternative WS would not conduct any operational black bear damage management and only provide technical assistance to resource owners to reduce black bear damage.

Implementing of damage management methods under this alternative would be the responsibility of the resource owner or their agent, and therefore WS would have limited influence on the effectiveness and selectivity of methods used by others, thus this alternative could be less effective and selective. Some type of black bear damage management would most likely be implemented by resource owners or state agencies, and possibly by private or sport trappers or hunters. Damage management efforts by individuals with limited training and experience would be less likely to take offending individual black bears and more likely to take non-target species. No involvement by WS in operational bear damage management would result in WDNR wildlife personnel having to respond to all nuisance and damage bear complaints, including trapping and relocating problem bear, as they did prior to 1990. Since 1990 WDNR has faced reorganization and significant budget and personnel reductions, and would likely not be able to effectively handle the increased workload demands. This alternative would greatly increase response time for bear damage complaints, and result in an increase of bear damage to property, apiaries, crops, and livestock and threats to human health and safety. Workload and funding requirements for WDNR wildlife personnel will greatly increase under this alternative, leading to negative impacts as described in Alternative 1. In some cases, damage management methods applied by non-agency personnel could be used contrary to their intended or legal use, or in excess of what is recommended or necessary.

Prompt, efficient response to bear complaints is important in maintaining rural landowner tolerance of bears (Clark et al. 1991). Inadequate response to bear nuisance complaints will reduce public tolerance of current bear numbers, lower the status of bears in the eyes of the public, and may require WDNR to reevaluate bear population goals (B. Mytton, WDNR, pers. comm. 2002). Lower population goals would reduce opportunity for recreational uses of the bear resource, including wildlife viewing and hunting. Reduced public tolerance of problem bears could result in an increase in illegal bear kill, as individuals would resolve bear complaints by illegally shooting offending animals. There would also be an increase in demand for WDNR to issue shooting permits for problem bears (B. Mytton,WDNR, pers. comm. 2002). Lethal removal of large numbers of nuisance or damage causing bears is unacceptable to the general public (Gunson 1977, Gourley and Vomicil 1987).

4.2.2.4 Potential for Some WS Methods to Take Non-target Animals.

No operational WS activities would be conducted pursuant to this alternative and therefore, there would be no risks to non-target or T&E species from WS program actions. Some type of damage management would most likely be implemented by resource and property owners. However, any such actions initiated by individuals with limited training and experience would be more likely to capture or kill non-target species. Lacking professional operational assistance, some individuals may use illegal pesticides (Schueler 1993, Allen et al. 1996, USDA 1997), a cheaper form of predation damage management that represents one of the greatest threats to the environment, non-target and T&E species, domestic animals, and public health and safety. However, this alternative, if implemented, would likely pose low risks to non-target species

4.2.3 Non-lethal Damage Management Only (Current Program) (No Action Program).

The affects of WS providing technical assistance have been discussed under Alterative 2. Additional affects could result from WS implementation of non-lethal operational damage management. Under this alternative, WS would capture, immobilize and ear tag, and relocate problem bears as described in management plans and agreements with the WDNR . Trapping and relocating problem bears involves a

considerable expenditure of time (Kohn 1982). Workload and funding requirements for WDNR wildlife personnel would greatly increase if this alternative or a similar alternative were not selected.

Table 4-1. Black Bears Captured by WS.

FY	Cage Trap[1]	Leg-hold Trap[2]	Leg Snare	Non-chemical[3]	Chemical[4]
1995	592	2	0	1	0
1996	481	0	0	8	0
1997	537	0	1	1	0
1998[5]	325	1	1	0	0
1999	482	0	1	6	2
2000	370	0	0	0	2

[1] Includes culvert traps and smaller cage traps used for cubs.
[2] Leg-hold traps used to capture cubs while WS personnel present, or non-target bears caught and released on site.
[3] Catch poles used to capture cubs.
[4] Chemical immobilization.
[5] One bear was killed in 1998.

4.2.3.1 Viability of Black Bear Populations in Wisconsin.

Because this alternative would not allow WS to conduct any lethal operational black bear damage management, there would be a very low, to no, direct WS impact to the statewide black bear population. During the last 6 years, WS has only lethally removed one bear (Table 4-1). There could, however, be different impacts to black bears from other entities that implement damage reduction strategies to reduce black bear damage. As the bear population expands southward and into more populated areas, increased damage complaints are expected resulting in more pressure to remove problem or nuisance bears (Figure 4-1). Black bear nuisance/damage problems would probably increase where lethal/legal harvest was low. Black bears would continue to disperse to areas with low populations (i.e., generally southward), or populations would be maintained stable to increasing through a regulated sport harvest (see Section 1.3 for WDNR Black Bear Management); Figure 4-2 depicts black bear harvest trends in Wisconsin. Some resource owners may remove black bear by themselves, or allow sport hunters during the legal harvest season. Resource owners may also obtain permits from the WDNR to allow them to remove problem black bears outside of the regular season (WAC NR §§12.15), but WS would be restricted to only implementing non-lethal methods. Some resource and property owners may take illegal, unsafe, or environmentally harmful action against local populations of black bear out of frustration or ignorance. The current WS' program results in a very low magnitude of impact on the viability of Wisconsin's black bear population.

Figure 4-1. Black Bear Distribution in Wisconsin.

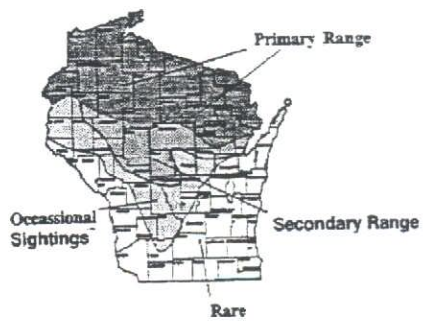
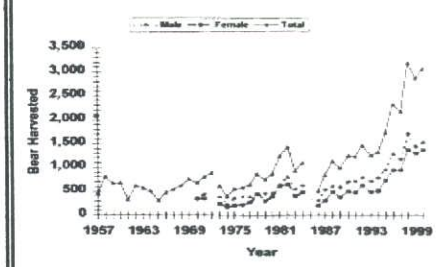


Figure 4-2. Black Bear Harvest Trend in Wisconsin.



4.2.3.2 Public Health and Safety from Black Bear Management.

This alternative would result in no federal lethal operational black bear damage management program in Wisconsin, therefore the use of lethal methods would be at the discretion of individuals or agencies that conduct the black bear damage reduction activities. The low risks associated with WS' use culvert traps, cage traps, spring-activated foot snares, or hand capture would remain the same under this alternative. However, WS could not make recommendations on lethal methods if non-lethal methods failed to reduce damage, and implementation of lethal methods would be by some other entity. Increased use of some methods by less skilled individuals or resource owners, and greatly reduced restrictions on how wildlife damage management would be conducted may result in an increased risk to the public and pets. In addition under this alternative, WS could only use non-lethal methods if a situation occurs where black bears are presenting a risk to public or pet health and safety. This Alternative would have low risks, but likely result in slight increased risks to human and pet safety for some situations over those identified in Alternative 4 or 5.

4.2.3.3 Maintain Effective and Selective Resource Protection Methods and Tools.

Under this alternatives, WS would not conduct any lethal operational black bear damage management but only provide technical assistance or conduct trap and relocation activities for problem black bears to reduce damage. Therefore, WS would not be able to respond with all the methods or possibly the appropriate methods under this Alternative in comparison to Alternative 5. Implementation of lethal damage management methods would be the responsibility of the resource owner or their agent, and therefore concerns about effectiveness and selectivity of lethal methods used by WS are not relevant. The methods used by others would not be directed by WS and thus could be less selective and effective than WS' use of the same methods.

WS could be less effective at keeping black bear losses as low as could be expected for Alternative 5. By restricting damage management methods, WS would not be able to as effectively resolve some damage or nuisance problems. Decreased effectiveness is tied to the logistics of getting to areas with damage problems and possibly having to use less effective damage management methods.

4.2.3.4 Potential for Some WS Methods to Take Non-target Animals.

Under this alternative, WS would implement damage management activities (i.e., capture and relocate bears) and hence very limited direct mortality risk to wildlife populations, including T&E species from WS activities. The methods used to capture black bear are extremely selective (Table 4-2). The majority of bears captured by WS in Wisconsin are trapped in culvert traps. A total of 183 non-target species were captured from 1995 to 2000. Raccoons accounted for

Table 4-2. Non-target Animals Captured During WS Black Bear Damage Management.

Species	1995	1996	1997	1998	1999	2000
Raccoon	34-f[1] 2-k[1]	51-f 1-k	27-f	27-f	5-f 1-k	12-f
Fisher	1-f	1-f	5-f	0	1-f	0
Skunk, striped	0	0	0	0	2-f	1-f
Badger	0	0	1-f	0	0	0
Coyote	0	0	0	0	0	1-f
Dogs	0	1-f	0	0	0	0
Porcupine	0	0	0	0	1-f	0

[1] (f-freed, k- killed).

91% of non-target catches, due to their ability to enter traps and pull on bait cans. Ninety-eight percent of raccoons were released unharmed. Overall, only 2% of non-target animals caught were killed. Without WS' operational assistance, some resource owners may be motivated to consider use of more economical forms of control than those practiced by WS (Schueler 1993, USDA 1997). Illegal use of toxicants represents one of the cheapest forms of damage management, but it also presents the greatest environmental risks (Allen et al. 1996). Risks to non-target and T&E species would probably be greater under Alternative 1 and 2, than Alternative 3 or Alternative 5.

4.2.4 Alternative 4. Lethal Only Program

Under this alternative only lethal damage management methods would be used by WS. WS would only become involved in bear damage management if lethal control is required. This alternative would preclude WS from providing technical assistance, as well as the live trapping and relocation of problem bears. This alternative may result in a larger number of bear removed from the population than other alternatives and therefore, have the greatest impact on the black bear population in Wisconsin. All requests to WS for assistance would be responded to with the methods previously described, however, any bears captured in culvert or cage traps, or spring-activated foot snares, or hand captured would be dispatched by AVMA (1993) approved euthanasia methods.

4.2.4.1 Viability of Black Bear Populations in Wisconsin.

Black bears occupy forested habitats through areas in North America and in about the northern third of Wisconsin (Figure 4-2). The moist forests in the northern part of the state are considered the most productive black bear habitat. No long-term adverse affects to black bears would occur to the statewide population because WS activities would only be conducted on a request basis and only in situation were damage management actions are warranted. However, this alternative could result in localized decreases in the black bear population at the specific sites where lethal damage management occurs. WS and the WDNR would conduct and monitor activities and coordination between WS and the WNDR would occur. Bears would only be lethally removed in accordance with WDNR bear damage management policies and guidelines. However, lower populations could reduce opportunities for recreational uses of the bear resource, including wildlife viewing and hunting. Dispersing black bears would eventually re-inhabit the sites were black bears were removed as long as suitable habitat exists.

WS' lethal bear removal efforts would have a moderate impact to the statewide black bear population. This alternative also would result in WDNR taking on increased bear damage management responsibilities, as conducted prior to 1990, in order to resolve bear nuisance complaints with non-lethal methods. This may lead to impacts as described in 4.2.2.3, and may reduce effectiveness of response to bear complaints. Prompt, efficient response to bear complaints is important in maintaining rural landowner tolerance of bears (Clark et al. 1991).

4.2.4.2 Public Health and Safety from Black Bear Management.

This alternative would result in only WS lethal black bear damage management[2] in Wisconsin. The low risks associated with WS' use culvert and cage traps, spring-activated foot snares, or hand capture and euthanasia methods would not increase risks to public health or safety, and in

[2] A more complete description of these methods is available in Appendix C of this EA and in USDA (1997, Appendix J).

some situations lethal damage management may provide for a safer environment for the public or pets. Firearm safety precautions are followed by WS when conducting damage management and WS complies with all laws and regulations governing the use of firearms[3]. Shooting with shotguns, pistols or rifles could be used to reduce black bear damage when lethal methods are determined to be appropriate. WS' traps and snares would be strategically placed to minimize exposure to the public and pets. Appropriate signs are posted on all properties where traps are set to alert the public of their presence.

Increased use of the same methods by less skilled trappers or resource owners could result in an increased risk to the public and pets.

4.2.4.3 Maintain Effective and Selective Resource Protection Methods and Tools.

Under this alternatives, WS would only conduct lethal operational black bear damage management and not provide technical assistance or non-lethal damage management to resource and property owners to reduce damage. Therefore, WS would not be able to respond with all the methods or possibly the appropriate methods under this Alternative in comparison to Alternative 5. Implementation of non-lethal damage management methods would be the responsibility of the resource and property owners or their agent, and therefore concerns about effectiveness and selectivity of non-lethal methods used by WS are not relevant. Some non-lethal-type of black bear damage management would be appropriate, in many instances, to implement to resolve black bear problems. Non-lethal methods used by others would not be directed by WS and thus potentially not in an appropriate manner, and some research developments could not be implemented as timely. Shooting is selective for target species and may be used in conjunction with night vision equipment. WS could also use firearms to humanely euthanize captured black bears.

WS could also be less effective at keeping black bear losses as low as could be expected when compared to Alternative 5. By restricting damage management methods to only lethal methods a full array of possible damage management methods would not be available. Decreased effectiveness is tied to the logistics of getting to areas with damage problems and possibly having to use less effective.

4.2.4.4 Potential for Some WS Methods to Take Non-target Animals.

Under this alternative, WS would only implement lethal damage management methods. However, WS would use pan-tension devices to exclude non-target animals from traps or snares; hand capture and shooting are species selective. Damage management efforts by individuals with limited training and experience would be less likely to reduce the damage or threat of damage and could have great adverse impacts on non-target species. Hence it is not expected that adverse mortality to non-target wildlife populations or T&E species would occur from WS activities and a low magnitude of impact is expected if this alternative were implemented.

4.2.5 Alternative 5 Adaptive Integrated Black Bear Damage Management (Proposed Action).

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[3] 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 3 years afterwards (WS Directive 2.615). WS employees who use firearms as a condition of employment, are required to certify that they meet the criteria as stated in the *Lautenberg Amendment*.

This alternative describes the proposed Wisconsin WS black bear management program. The proposed action is designed for WS to reduce or alleviate site-specific black bear damage through the use of an adaptive IWDM strategy that combines technical assistance and operational (lethal and non-lethal) damage management when requested and as coordinated with the WDNR. Alternative 5 would allow WS to provide black bear damage management assistance to reduce or eliminate the negative effects of bear losses agricultural resources, property and reduce any potential risk to human health and safety in the most effective, humane, and comprehensive manner. All or some of the described non-lethal and lethal damage management methods would be incorporated into program activities, as appropriate (see Appendix C). By integrating a variety of methods, resource protection goals are more easily and effectively attainable.

This integrated approach alternative would reduce damage more than any other alternative considered in this EA while reducing risks to non-target and T&E species, and human health and safety. Negative effects resulting from this alternative would be minimal with respect to humans and other environmental components. Alternative 5, the proposed action, would reduce the use of inconsistent, haphazard, and possibly harmful black bear damage management practices.

4.2.5.1 Viability of Black Bear Populations in Wisconsin.

Under this Alternative, WS would use an IWDM approach to reduce black bear damage or the threat of bear damage to resource and property owners and threats to public health and safety. The current program (Alternative 3) only allows for the trapping and relocation of problem/nuisance black bears as coordinated with the WDNR to areas where damage problems are less likely. Unlike Alternatives 1 and 4, the use of exclusion, habitat modification, behavior modification, etc. could be used as part of an IWDM approach and these methods would have little or no effect on statewide black bear populations. However, lethal removal of black bears could reduce populations in localized areas. All damage management activities would be closely coordinated with the WDNR, and the viability of black bears in Wisconsin would not be adversely affected. It is estimated that no more than 15 black bears would be removed annually from the population under this alternative (B. Mytton, WDNR pers. comm. 2002). In addition, non-lethal methods would be given first consideration, but may not always be implemented based on the damage/nuisance situation (i.e., particularly human health and safety).

Black bear harvest and population information for WDNR Bear Management Zones statewide suggest that populations are healthy and stable to increasing (Table 1-3). The population trend appears that the Wisconsin black bear population is expanding to southern Wisconsin and into more populated areas. The impacts to the black bear population from WS proposed action would be a *low magnitude* of impact.

4.2.5.2 Public Health and Safety from Black Bear Management.

WS would implement a statewide program of black bear damage management based on an IWDM approach described in Chapter 3 of this EA. Based on the risk assessment from USDA (1997, Appendix P) the environmental, human health and safety risks associated with WS' wildlife damage management are low. The greatest risks to human health and safety from WS' use of chemical methods (immobilization) are incurred by the WS Specialists who use these methods. Likewise, the greatest risk to human health and safety from WS' use of mechanical damage management methods are incurred by the WS Specialists who use methods. WS

methods of shooting[4] and trapping pose minimal or no threat to public and pet health and safety. During the FY95 through FY 01 analysis period, there were no reported injuries to WS personnel or members of the public related to WS' use of any chemical or mechanical damage management method. WS' traps and snares would be strategically placed to minimize exposure to the public and pets. Appropriate signs are posted on all properties where traps are set to alert the public of their presence. Mitigation measures that address safety concerns about WS' use of traps, snares and shooting are listed at the end of Chapter 3.

This alternative would more effectively reduce threats to public health and safety by removing black bears that could potentially pose a threat to humans or pets

4.2.5.3 Maintain Effective and Selective Resource Protection Methods and Tools.

The IWDM approach to reducing damage is the implementation and application of safe and practical methods for the prevention and reduction of damage based on local problem analyses and the informed judgement of trained personnel. Wisconsin WS Program would apply IWDM through the WS Decision Model (Slate et al. 1992) discussed in section 3.2.2.

The philosophy behind IWDM is to implement effective management techniques in a cost-effective manner while minimizing the potentially harmful effects to humans, target and non-target 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. Thus, this alternative would allow Wisconsin WS the best opportunity to resolve and reduce black bear damage conflicts in a timely and effective manner.

4.2.5.4 Potential for some WS Methods to Take Non-target Animals.

Under this alternative, WS would implement a statewide program of black bear damage management based on an IWDM approach described in Chapter 3 of this EA. Of the black bear damage management methods proposed for use, spring-activated foot snares pose the greatest risk to non-target species. However, pan-tension devices are used on all equipment set for black bears, and domestic pets that may be inadvertently captured in these devices and accompanied by humans can be released unharmed.

Wisconsin WS conducted an informal Section 7 consultation with the USFWS and WDNR regarding the potential impacts of the current program and the proposed action. The WDNR concurred with WS' assessment that neither the current program nor the proposed action are likely to adversely affect any state listed species (R. Jurewicz, WDNR pers. comm 2002). WS would comply with any reasonable and prudent measures or alternative that the USFWS deem necessary to insure T&E species protection. Mitigation measures to address concerns about

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[4] Firearm safety precautions are followed by WS when conducting damage management and WS complies with laws and regulations governing the lawful use of firearms. WS could also use firearms to humanely euthanize captured black bears. 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 3 years afterwards (WS Directive 2.615). WS employees who use firearms as a condition of employment, are required to certify that they meet the criteria as stated in the *Lautenberg Amendment*.

impacts to T&E species are discussed in the list of mitigation measures at the end of Chapter 3. In addition, based on the risk assessment from USDA (1997, Appendix P) the environmental and non-target risks associated with WS' wildlife damage management are low. Therefore, the adverse risk from this alternative to non-target or T&E species are probably as low or lower than Alternative 3 and the magnitude of impact is low.

4.3 Summary of Wisconsin WS' Impacts

Table 4-3 highlights the potential impacts of each alternative to the issues that were analyzed in detail. No single or cumulative adverse environmental consequences are expected to result from the proposed action. Since the methods used by WS would be selective for black bears, impacts on non-target species would be extremely low. None of the state listed T&E species or sensitive species would be jeopardized by the proposed action (R. Jurewicz, WDNR pers. comm 2002). WS also consulted with the USFWS, and that consultation is pending. WS would comply with the reasonable and prudent measures and mitigations deemed necessary to protect federally listed species. Economic and social impacts would primarily be beneficial, although some segments of the human population might be opposed to the killing of black bears. Negative impacts to the physical environment would be non-existent.

Based on the diversity and distribution of the affected environment, the above analysis failed to identify any cumulative impacts nor are any impacts expected because of Adaptive Integrated Black Bear Damage Management conducted by WS in Wisconsin. Any localized reduction of black bear populations would soon be replaced and habitats reoccupied as WS personnel could only conduct activities on areas where a request for assitance has been received, *Agreements for Control* is signed, or *Cooperative Agreements* are in place. Currently this is only a very small percent of the area occupied by black bear in Wisconsin. In addition, black bears are managed by the WDNR, and WS responds to damage complaints with close cooperation with WDNR. The effects to black bear populations from the proposed action or other take are low and would not have any long-term adverse impact on the Wisconsin black bear population.

Table 4-3. Summary of the Analysis

Issues/ Impacts	*Alt. 1 No Program*	*Alt 2 Tech. Asst. Only*	*Alt. 3 Current Program*	*Alt. 4 Lethal Only*	*Alt. 5 Adaptive Management*
Cumulative impacts to black bear	low, but higher than Alt. 3 or 5	low	low	moderate	low
Risks to public and pets	low risks	low risks	low risks but higher than Alt 5	low risks	low risks
Effectiveness and selectivity of methods	poor effectiveness and selectivity	moderate effectiveness and selectivity	good selectivity but lower effectiveness than Alt. 5	lower effectiveness than Alt 3 or 5 but good selectivity	best selectivity and effectiveness
Impacts to non-target & T&E species	low impacts, but higher than Alt 3 or 5	low risk	lower risks than Alt 1 or 2	low risks	lowest risks

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APPENDIX B

AUTHORITY AND COMPLIANCE

USDA-APHIS-Wildlife Services

The USDA is directed by law to protect American agriculture and other resources from damage associated with wildlife. The primary statutory authority for the WS program is the Act of March 2, 1931, as amended (7 U.S. C. 426-426c; 46 Stat. 1468), which provides that:

> *"The Secretary of Agriculture is authorized and directed to conduct such investigations, experiments, and tests as he may deem necessary in order to determine, demonstrate, and promulgate the best methods of eradication, suppression, or bringing under control on national forests and other areas of the public domain as well as on State, Territory or privately owned lands of mountain lions, wolves, coyotes, bobcats, prairie dogs, gophers, ground squirrels, jackrabbits, brown tree snakes and other animals injurious to agriculture, horticulture, forestry, animal husbandry, wild game animals, furbearing animals, and birds, and for the protection of stock and other domestic animals through the suppression of rabies and tularemia in predatory or other wild animals; and to conduct campaigns for the destruction or control of such animals. Provided that in carrying out the provisions of this Section, the Secretary of Agriculture may cooperate with States, individuals, and public and private agencies, organizations, and institutions."*

Since 1931, with the changes in societal values, WS policies and its programs place greater emphasis on the part of the Act discussing *"bringing (damage) under control", rather than "eradication" and "suppression"* of wildlife populations. In 1988, Congress strengthened the legislative mandate of WS with the Rural Development, Agriculture, and Related Agencies Appropriations Act. This Act states, in part:

> *"That hereafter, the Secretary of Agriculture is authorized, except for urban rodent control, to conduct activities and to enter into agreements with States, local jurisdictions, individuals, and public and private agencies, organizations, and institutions in the control of nuisance mammals and birds and those mammals and birds species that are reservoirs for zoonotic diseases, and to deposit any money collected under any such agreement into the appropriation accounts that incur the costs to be available immediately and to remain available until expended for Animal Damage Control activities."*

Wisconsin Department of Natural Resources (WDNR) Legislative Authority

The WDNR, under the direction of the Governor appointed Natural Resources Board, is specifically charged by the Legislature with the management of the state's wildlife resources. Although many legal authorities of the Natural Resources Board and the Department are expressed throughout the Wisconsin Administrative Code, 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 (WSA §§23.09) and law enforcement authorities (WSA §§§29.001 and WSA §§29.921). 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.

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APPENDIX B

U.S. Forest Service

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. For these reasons, the Forest Service has entered into MOUs with WS to facilitate a cooperative relationship. Copies of these MOUs are available by contacting the WS State Director's Office at 750 Windsor Street, Room 101, Sun Prairie, Wisconsin 53590.

U. S. Fish and Wildlife Service

The USFWS is charged with implementation and enforcement of the ESA. The USFWS cooperates with the WDNR and WS by recommending measures to avoid or minimize take of T&E species. The term *"take"* is defined by the ESA (section 3(19)) to mean *"to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct."* The terms *"harass"* and *"harm"* have been further defined by USFWS regulations at 50 Code of Federal Regulations (CFR) section 17.3, as follows: 1) harass means an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering; 2) harm means an act which actually kills or injures wildlife. Such acts may include significant habitat modification or degradation when it actually kills or injures wildlife by significantly impairing essential behavioral patterns including breeding, feeding or sheltering.

COMPLIANCE WITH FEDERAL LAWS.

WS consults and cooperates with other Federal and State agencies as appropriate to ensure that all WS activities are carried out in compliance with all applicable Federal laws.

National Environmental Policy Act All Federal actions are subject to NEPA (Public Law 91-190, 42 U.S.C. 4321 et seq.). WS will follow the Council on Environmental Quality (CEQ) regulations implementing NEPA (40 CFR 1500 et seq.), USDA (7 CFR 1b), and the APHIS Implementing Guidelines (7 CFR 372) as a part of the decision-making process. These laws, regulations, and guidelines generally outline five broad types of activities to be accomplished as part of any project: public involvement, analysis, documentation, implementation, and monitoring. NEPA also sets forth the requirement that all major Federal actions be evaluated in terms of their potential significant impact on the quality of the human environment for the purpose of avoiding or, where possible, mitigating and minimizing adverse impacts. Federal activities affecting the physical and biological environment are regulated in part by CEQ through regulations in Title 40, Code of Federal Regulations, Parts 1500-1508. In accordance with CEQ and USDA regulations, APHIS Guidelines Concerning Implementation of NEPA Procedures, as published in the Federal Register (44 CFR 50381-50384) provide guidance to APHIS regarding the NEPA process.

Pursuant to NEPA and CEQ regulations, this EA documents the analysis of a proposed Federal action's impact, informs decision-makers and the public of reasonable alternatives capable of avoiding or minimizing adverse impacts, and serves as a decision-aiding mechanism to ensure that the policies and goals of NEPA are infused into Federal agency actions. An EA is prepared by integrating as many of the natural and social sciences as may be warranted based on the potential effects of the proposed action. The direct, indirect, and cumulative impacts of the proposed action are analyzed.

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Endangered Species Act (ESA) Under the ESA, all Federal agencies are charged with a responsibility to conserve endangered and threatened species and to utilize their authorities in furtherance of the purposes of the Act (Sec.2(c)). WS conducts Section 7 consultations with the FWS to utilize the expertise of the FWS 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 . . .* " (Sec.7(a)(2)). WS conducts formal Section 7 Consultations with the FWS at the National level and informal consultations with the FWS at the local level as appropriate.

National Historical Preservation Act (NHPA) of 1966 as amended The NHPA requires Federal agencies to: 1) evaluate the effects of any Federal undertaking on cultural resources, 2) consult with the State Historical Society regarding the value and management of specific cultural, archaeological and historic resources, and 3) consult with appropriate American Indian tribes to determine whether they have concerns for traditional cultural resources in areas of these Federal undertakings. In conjunction with preparation of this EA, WS consulted with the Wisconsin State Historical Society and received that office's concurrence that WS' proposed activities would be unlikely to have any adverse effects on cultural, archeological, or historic resources. WS also sought input from the Red Cliff, Lac Courte Oreilles, Bad River, Lac du Flambeau, St. Croix, and Soskaogon Chippewa Bands, Ho Chunk Nation, and Stockbridge-Munsee Band of Mohican Indians. None of the individual Tribes in the analysis area identified or provided any cultural or other concerns relating to WS current or proposed program. In most cases, wildlife damage management has little potential to cause adverse effects to sensitive cultural resources. The areas where wildlife damage management would be conducted are small and pose minimal ground disturbance. In addition, any WS activities conducted on tribal lands would only be conducted at the request of the tribe and after appropriate authorizing documents were signed.

Executive Order 12898 - Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations Environmental Justice (EJ) is a movement promoting the fair treatment of people of all races, income and culture with respect to the development, implementation and enforcement of environmental laws, regulations and policies. Fair treatment implies that no person or group of people should endure a disproportionate share of the negative environmental impacts resulting either directly or indirectly from the activities conducted to execute this country's domestic and foreign policies or programs. EJ has been defined as the pursuit of equal justice and equal protection under the law for all environmental statutes and regulations without discrimination based on race, ethnicity, or socioeconomic status.

All WS activities are evaluated for their impact on the human environment and compliance with Executive Order 12898 to ensure EJ. WS personnel use wildlife damage management methods as selectively and environmentally conscientiously as possible. All chemicals used by WS are regulated by the EPA through FIFRA, by the IDA, and by WS Directives. Based on a thorough Risk Assessment, APHIS concluded that when WS program chemicals are used following label directions, they are selective to target individuals or populations and such use has negligible impacts on the environment (USDA 1997, Appendix P). The WS operational program, analyzed in this document, properly disposes of any excess solid or hazardous waste. It is not anticipated that the proposed action would result in any adverse or disproportionate environmental impacts to minority or low-income persons or populations.

Executive Order 13045 - Protection of Children from Environmental Health and Safety Risks Children may suffer disproportionately from environmental health and safety risks, including their developmental physical and mental status, for many reasons. Because WS makes it a high priority to identify and assess environmental health and safety risks, WS has considered the impacts that alternatives analyzed in this EA might have on children. All WS predator damage management is conducted using only legally available and approved damage management methods where it is highly unlikely that children would be adversely affected.

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Appendix C - Bear Damage Management Methods

NON-LETHAL METHODS

Before any damage management actions are taken, it is important to attempt to determine the motivation of the offending bears. Habituated, food-conditioned bears can be very dangerous. Aggressive behavior toward a black bear should not be carried so far as to threaten the bear and elicit an attack causing death or injury to the individual(s) implementing the action, or others in the area.

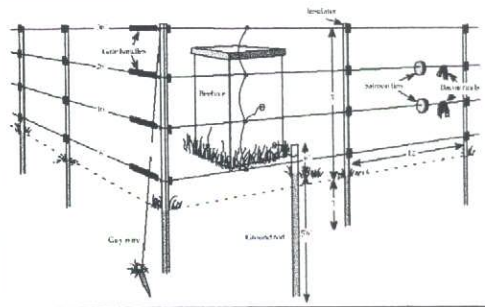
Cultural Methods

Prevention could be the best method of reducing black bear damage and nuisance problems. Sanitation and proper solid waste management are key considerations. Storing food, organic wastes, and other bear attractants in bear-proof containers is generally an effective method to deter bears from coming to an area, especially if they are searching for food. Use garbage can for non-food items only, as bears can easily gain access to their contents. In addition, implement regular garbage pickup and practice incineration; eliminate unfenced open garbage dumps.

To protect livestock and beehives, place pens and beehives at least 50 yards from wooded areas or other protective cover. When possible, confine livestock in buildings and pens, especially during lambing or calving seasons. Also, remove carcasses from areas where livestock are housed or grazed and dispose carcasses by rendering or deep burial.
When possible, plant susceptible crops (corn, oats, fruit) away from areas of protective cover. Pick and remove all fruit from orchard trees when ripe to remove the attraction of the fruit from bears.

Remove protective cover from a radius of 50 yards around occupied buildings and residences. If necessary, modify the habitat near campgrounds, campsites, and hiking trails to minimize people/bear encounters in areas where bears frequent. Where possible, clear hiking trails to provide a minimum viewing distance of 50 yards down the trail.

Figure C-1. Polytape Electric Fence to Exclude Bears.

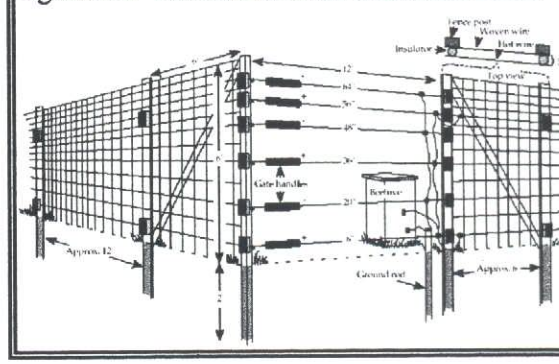


Exclusion

Electric Fencing and Maintenance

Electric fencing has proven effective in deterring bears from landfills, trash dumpsters, apiaries, cabins, and other high-value properties. Fencing, however, is a relatively expensive abatement measure. When developing a damage prevention program, consideration is given to the extent, duration, and expense of damage in relation to the expense of using fencing. Numerous fence designs have been used with varying degrees of success. Electric fence chargers increase effectiveness. Depending on the amount of bear pressure, use of an electric polytape portable fence (Figure C-1), or a welded-wire permanent fence can be effective. (Figure C-2).

Figure C-2. Permanent Fence to Exclude Bears.



To energize the fences, a 110-volt outlet or 12-volt deep cell (marine) battery is connected to a high-output fence

charger. The fence charger and battery should be protected against weather and theft. Warning signs should be used to protect human safety. Electric fences must deliver an effective shock to repel bears. Bears can be lured into licking or sniffing the wire by attaching attractants to the fence, such as peanut butter, in accordance with state regulations pertaining to bear baiting.

Fence voltage should be checked each week at a distance from the fence charger; it should yield at least 3,000 volts. To protect against voltage loss, the battery and fence charger should be kept dry and their connections free of corrosion. Make certain all connections are secure and check for faulty insulators (arcing between wire and post). Also clip vegetation beneath the fence. Each month, check the fence tension and replace baits or lures as necessary. Always recharge the batteries during the day so that the fence is energized at night.

Platforms

Food, supplies, and beehives can be stored 15 to 20 feet above ground on elevated platforms or bear poles. Support poles should be at least 6 inches in diameter and wrapped with a 4-foot-wide piece of galvanized sheet metal, 6 to 7 feet above ground. You can also place one or two hives on a flat or low-sloping garage roof.

Frightening Devices and Deterrents

Black bears can sometimes be frightened from an area (such as buildings, livestock pens, orchards, etc.) by the extended use of night lights, strobe lights, loud music, pyrotechnics, exploder canons, scarecrows, and trained livestock guarding dogs. The position of such frightening devices should be changed frequently because over a period of time, animals usually become used to scare devices (Pfiefer and Goos 1982). However, bears often become tolerant of human activity, too. At this point, scare devices are ineffective and human safety becomes a concern. Black bears are occasionally encountered on hiking trails or at campsites and can sometimes be frightened away by shouting, clapping hands, throwing objects, etc., but extreme care must be taken not to be put at risk of attack or injury from the bear attacking. In addition to the above tactics, if bears are encountered in campground or other similar settings, the noise of pots banging, gunfire, pyrotechnics, gas-propelled boat horns, and engines revving, etc. may be useful if allowed and legal in the area. Black bears can be deterred from land-fills, occupied buildings, and other sites by the use of 12-gauge plastic slugs or 38-mm rubber bullets. Aim for the large muscle mass in the hind quarters. Avoid the neck and front shoulders to minimize the risk of hitting and damaging an eye. Firearm safety training is recommended.

Repellents

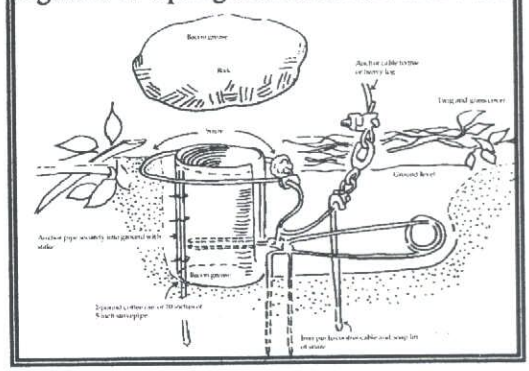
Capsaicin or concentrated red pepper spray has been tested and used effectively on black bears. The spray range on most products is less than 30 feet, so capsaicin is only effective in close encounters. Counter Assault , a repellent pepper spray, is registered as a bear repellent in Wisconsin under EPA Reg. No. 55541-2.

Live-trapping

The capture of bears would be limited to five methods: 1) culvert traps, 2) cage traps, 3) spring activated foot (Aldrich-type) snares, 4) catch poles for young cubs, and 5) chemical immobilization. Culvert traps are expensive and their size limits their use to areas accessible by road (Johnson and Pelton 1980). In addition, bears may show reluctance to enter the trap despite the attractiveness of the bait (Stickley 1961). In contrast to culvert traps, Aldrich foot snares are inexpensive, portable, easily hidden, and adaptable to a variety of sets (Johnson and Pelton 1980). Also, snares do not present a danger to non-target species (Kolenosky and Strathearn 1987).

Appendix C - Bear Damage Management Methods

Figure C-3. Spring Activated Foot Snare Set.



Live trapping and removal of the offending bears to remote areas is a common method of dealing with individual nuisances. This is not always effective because bears have a strong homing instinct and may return to the area from which they were removed. Even if a bear does not return it can become a nuisance in the area in which it was released (Kolenosky and Strathearn 1987).

Culvert traps have been used by wildlife managers to safely capture wild bears at least since the 1950's (Erickson 1957, Black 1958). The trap itself rarely injures the animal and trap mortality is rare (Erickson 1957). Occasionally, non-target animals are caught in culvert traps, such as raccoons (*Procyon lotor*), fisher (*Martes pennanti*), and domestic dogs (*Canis familiaris*). Non-target animals would be released unharmed.

Cage traps are similar to culvert traps, however they are smaller and would be used to safely capture small cubs.

The spring activated (i.e., Aldrich-type) **foot snare** would be used in situations that preclude the use of culvert traps (Figure C-3). Foot snares are a safe and effective capture device when properly set and inspected (Miller et al 1973, Johnson and Pelton 1980). Bears captured in this manner can be tranquilized, released, relocated, or destroyed. WS uses bait as described previously to attract bears to foot snare sets.

Catch poles consist of a long pole with a cable noose at one end. The noose end is typically encased in plastic tubing. Catch poles can be used to safely catch and restrain small bears, such as cubs.

Chemical Immobilization/Euthanasia.

Remote delivery of chemical immobilization drugs would be used to capture free-ranging bears in situations where bears pose a threat to human health and safety or are in danger of injuring themselves. Chemical immobilization may also be used as a method for restraining bears for ear tagging or other procedures, or as a method for destroying captured bears when necessary. Several chemicals are authorized for immobilization and euthanasia by WS. Selected Wisconsin WS personnel have received training in the safe use of authorized immobilization/euthanasia chemicals and are certified by WS. This training involves hands-on application of state-of-the-art techniques and chemicals.

Immobilization

Captured bears may be chemically immobilized and ear tagged prior to their release to provide information for damage and population management. Bears may also be immobilized using remote delivery methods, using standard delivery systems such as those by Pneu-Dart or Palmer. A 5:1 mixture of ketamine hydrochloride and xylazine hydrochloride, would typically be used to immobilize bears, using accepted dosages for bear (Addison and Kolenosky 1979, Nielsen and Amaas 1993). This mixture has a wide margin of safety in bears (Nielsen and Amass 1993), and drug related mortality has been low. For bears restrained in culvert or cage traps, or foot snares, drugs would be administered by use of an inject pole or dart fired by a CO^2 pistol. Bears not restrained, such as in immediate human health and safety threats, would be immobilized using standard darts fired from CO^2 pistols or rifles, or rifles using a powder charge. Free ranging bears would be immobilized in accordance with policy that ensures the safety of people. As other drugs are approved by the FDA and WS, they could be incorporated into the program within the analysis area.

Ketamine hydrochloride (Ketaset) is a rapid acting, non-narcotic, non-barbiturate injectable anesthetic agents, having a wide margin of safety. It produces unconsciousness known as "dissociative" which in general terms means reflexes needed to sustain life (breathing, coughing, swallowing, etc.) are not affected by the drugs. Ketaset is supplied as a slightly acidic solution (pH 3.5 to 5.5) for intramuscular injection. Ketaset also 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. Ketaset 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.

Xylazine is a sedative which produces a transitory hypertension followed by prolonged hypotension, and respiratory depression. Recommended dosages are administered through intramuscular injection allowing the animal to become immobilized in about 5 minutes and lasting from 30 to 45 minutes.

Capture-All 5 is a combination of **Ketaset** and **Xylazine**, and is regulated by the Food and Drug Administration 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. However, drugs can be mixed on an individual bottle basis as well in accordance with WS policy.

Telazol is a mixture of tiletamine and zolazepam. Tiletamine is 2.5 - 5 times more potent than ketamine, and therefore works faster and lasts longer than Ketamine. Telazol is sold in a powdered form, and when reconstituted has a relatively short shelf life. For trapped bears that are translocated soon after immobilization, such as bears ear tagged, a long sedation time is undesirable. Telazol may be used in situations where a fast induction time is desirable, such as for free ranging bears in human health and safety situations.

Relocation

Live-trapping and relocation of problem bears is a component of most bear management programs in the U.S. (Alt 1980, Fies et a l 1987, Garner and Vaughn 1989, Vaughn and Scanlon 1990, O'Pezio et al 1984). The effectiveness of relocation to resolve bear nuisance and damage problems has sometimes been questioned by bear researchers and managers. Concerned about the percentage of relocated bears returning to their home ranges, percentage that cause damage again, and mortality of relocated bears.

In Virginia, only 10% of relocated nuisance bears returned to their home ranges (Fies et al 1988). Comly (1993) found that none of 43 relocated radio collared nuisance bears returned to capture areas during another Virginia study. In British Colombia, Rutherglen and Herbison (1977) found 23% of 236 relocated nuisance bears were recaptured or sighted at least once. Only 16% were recaptured at the original capture location.

In Minnesota, Rogers (1986) found that the majority of bears relocated greater than about 40 miles did not return. In Wisconsin, Massopust and Anderson (1984) found that 72% of relocated bear in their study area returned to their original home area. However, of 187 nuisance bear tagged by the WDNR, approximately 50% returned (B. Kohn, WDNR, pers. comm. 2002).

It is clear that some relocated bear exhibit strong homing tendencies. The degree to which a bear will home apparently varies with age and sex. The literature suggests that adult bears, and possible adult males, are more likely to return to their area of capture than females and/or subadults (Rutherglen and Herbison 1977, Massopust and Anderson 1984, Rogers 1986). Also, adult females separated from cubs have an extremely strong homing

instinct (Harger 1970, Alt 1980). According to McArthur (1981) the effectiveness of relocations can be enhanced through consideration of terrain, as well as distance between capture and release sites, and availability of natural foods.

Despite the tendency of some relocated nuisance bears to return to areas of capture, relocation remains an effective and beneficial means to address bear problems (Rogers et al 1976, Alt 1980, Fies et al 1987). Relocated nuisance bears often do not immediately resume nuisance activity, if at all (McLaughlin et al 1981, Alt 1980, Rogers 1986, Fies 1987, Garner and Vaughn 1989), perhaps due to the negative conditioning of the capture and the relocation, ripening of wild foods, or onset of hibernation (Rogers 1986).

In Virginia, Fies et al (1987) found that 3% of 99 relocated nuisance bears resumed nuisance activity, and Comly (1993) found that only 4% of 43 relocated nuisance bears resumed nuisance activity. In northeastern Pennsylvania, McLaughlin et al (1981) found 15% of 75 relocated nuisance bears resumed nuisance activity. In Wisconsin, though approximately 50% of relocated nuisance bears returned to their original home ranges, only 13% resumed nuisance activity (B. Kohn, WDNR pers. comm. 2002). More recently, of 190 nuisance bear relocated in Wisconsin during 1995, only 10% resumed nuisance activity.

Relocated bears that do resume nuisance activity may do so at a much later date. Rutherglen and Herbison (1977) observed delays as long as a year between translocation date and date of resumption of nuisance activity. Alt (1980) reported delays of possibly two or more years for some bears. Stowell and Willging (1992) reported that the delay between translocation and the return of the bear and resumption of damage activity was important for farmers experiencing crop damage as it allowed time for corn to mature past the vulnerable milk stage, making the corn less susceptible to bear damage.

Relocations preserve bears that may otherwise be killed on damage permits issued by the State, or killed illegally by frustrated landowners. Bears killed on damage permits by landowners provide little recreational sporting opportunity and are seldom used for meat (Rogers et al 1976, Fies et al 1987). Relocations preserve some adult females for additional reproductive cycles and preserve the majority of bears moved at least until fall hunting seasons (Rogers 1986).

The potential negative impact translocation has on individual bears may include increased mortality and injury. Translocation did not increase mortality from natural causes in Michigan (Harger 1970). A review of 32 relocations from Alberta, Minnesota, Pennsylvania, and Wisconsin by Rogers (1986) revealed no increase in natural mortality. Rogers (1986) also found no reports of injuries among recaptured relocated bears.

Relocation may increase mortality from hunting and vehicle collisions (Hughie 1982, Massopust and Anderson 1984, Stiver 1991, Comly 1993). However, Harger (1970), found no difference in human-induced mortality between relocated and non-relocated nuisance bears in Michigan. In Wisconsin, Kohn (1982) found no significant difference in harvest rates between bears trapped and tagged at damage sites and wild trapped bears.

Relocated bears could adversely impact individual bears at the release site by increasing competition for food, however evidence indicates that they should have little more effect on resident bears than do dispersing bears or bears foraging naturally (Rogers 1986). Bears typically range over large home range areas, and frequently forage extensive distances outside their usual ranges (Rogers 1977).

LETHAL METHODS

Ground shooting using firearms of sufficient caliber to effectively and humanely kill a bear is highly selective for target species and may involve the use of and trailing dogs and/or night vision equipment. Removal of one or two

specific bears by shooting in the problem area can sometimes provide immediate relief from a problem. Shooting may also be one of the only damage management options available when factors preclude the setting of equipment or use of remote deliver chemical immobilization methods or there are other safety risks (i.e., bear that attacked a human).

Bears restrained in culvert traps or foot snares may also be removed by shooting in certain situations. In accordance with WS and WDNR policy bears that pose a direct human health and safety concern, a threat to livestock, or are injured to a degree that precludes release into the wild may be removed by shooting.

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 3 years afterwards (WS Directive 2.615). WS 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.

Potassium chloride, a common laboratory chemical, is injected by WS personnel as a euthanizing agent after an animal has been anesthetized.

Sodium pentabarbitol is a WS approved euthanizing agent and could be used to destroy bears restrained in traps or foot snares.