United States
Department of
Agriculture

Marketing and
Regulatory
Programs

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USDA-APHIS-WILDLIFE SERVICES
BSMARCK, NORTH DAKOTA

ENVIRONMENTAL SUPPLEMENT
for the
"WILDLIFE DAMAGE MANAGEMENT in NORTH DAKOTA for the PROTECTION of LIVESTOCK, PUBLIC HEALTH and SAFETY, PROPERTY and WILDLIFE" EA

Fiscal Year 2003 through Fiscal Year 2010

Introduction

The US Department of Agriculture (USDA) - Animal and Plant Health Inspection Service (APHIS) - Wildlife Services (WS) is a cooperatively funded, service-oriented program authorized by Congress and directed by law to reduce damage caused by wildlife (Act of March 2, 1931, as amended [46 Stat. 1468; 7 U.S.C. 426-426c], and the Rural Development, Agriculture, and Related Agencies Appropriations Act of 1988, as amended [Public Law 100-202, Stat. 1329-1331][1]). The alleviation of damage or other problems caused by or related to the behavior of wildlife is termed wildlife damage management and is recognized as an integral component of wildlife management (Conover 2002, The Wildlife Society 2010). WS generally uses or recommends an adaptive Integrated Wildlife Damage Management (IWDM) approach (WS Directive 2.105[2]), where a combination of methods may be implemented to reduce damage. IWDM is the application of safe and practical methods for the prevention and reduction of damage caused by wildlife based on local problem analyses and the judgment of trained personnel (Slate et al. 1992). The imminent threat of damage or loss of resources is often sufficient for actions to be initiated and the need for the reduction of human-wildlife conflicts is derived from the specific threats to resources. However, before any WS action is taken, a request must be received and an "*Agreement for Control*" must be signed by the landowner/administrator or other comparable documents must be in place[3]. When requested, WS cooperates with land and wildlife management agencies to effectively and efficiently reduce human-wildlife conflicts according to applicable federal, state and local laws, regulations, policies, orders, and procedures, including the Endangered Species Act of 1973 (ESA) as amended (16 USC 1531-1543) (WS Directive 2.210). None of WS' human-predator conflict reduction activities have resulted in habitat modifications.

Background

The North Dakota WS program conducts wildlife conflict reduction activities using various methods, as analyzed in the "Wildlife Damage Management in North Dakota for the Protection of Livestock, Public Health and Safety, Property, and Wildlife" Environmental Assessment (EA), on various land classes (USDA 1997a). The EA addressed the need to reduce human/predator conflicts, known as predator damage management (PDM), and the potential impacts of six alternatives for responding to predator damage in North Dakota. The EA

[1] WS is directed by Congress to respond to and attempt to reduce damage caused by wildlife, when funding allows.

[2] The WS Policy Manual provides WS personnel guidance in the form of program directives. Information contained in the WS Policy Manual (http://www.aphis.usda.gov/wildlife_damage/WS_directives.shtml) have been used in preparation of this report, but have not been cited in the Literature Cited.

[3] The majority of requests for management are for predatory species whose populations are relatively high or are considered "anthropogenic abundant" (Conover 2002).

analyzed the North Dakota WS program as it involves conflict resolution with predatory species, such as coyote (*Canis latrans*), red fox *(Vulpes vulpes*), raccoon (*Procyon lotor*), badger (*Taxidea taxus*), mink (*Mustela vison*), bobcat (*Lynx rufus*), and striped skunk (*Mephitis mephitis*) to protect livestock, agriculture, property, and wildlife, and to reduce any predator threat to public health and safety. The "Integrated Wildlife Damage Management for Multiple Resources and Land Classes" Alternative was selected and a Decision was issued and a FONSI was signed March 20, 1997 and later supplemented on June 25, 2003.

The 2003 supplement determined the analysis conducted in USDA (1997a) was still valid and monitoring and the supplement Decision and FONSI concluded that a new EA was not warranted (USDA 2003). USDA (2003) concluded that the issues addressed in the original EA were best addressed by continuing Alterative 3 (Integrated Wildlife Damage Management for Multiple Resources and Land Classes) and articulated that WS continue to coordinate with the North Dakota Game and Fish Department (NDGFD) to monitor the WS take of predators to insure species viability.

In 2008 a five-year review was initiated to: 1) report the results of WS' PDM activities conducted in North Dakota during FY04 to FY08 and evaluate the accuracy of the analyses, 2) determine if the 2003 FONSI was still appropriate, and 3) take appropriate action if the affected environment or impacts have significantly changed from the data analyzed in USDA (1997a). It was determined, through analysis in the 5-year review, that a revision of USDA (1997a) was not necessary and the 2003 FONSI remained appropriate (USDA 2009).

This supplement to USDA (1997a) pertains to the analyses of North Dakota WS PDM activities from FY03 through FY10. The issues considered in this supplemental analysis have also been analyzed in relation to the current program.

Alternatives Analyzed in Detail in USDA (1997a)

The six alternatives analyzed in detail in the North Dakota Wildlife Damage Management in North Dakota for the Protection of Livestock, Public Health and Safety, Property, and Wildlife EA were and continue to be the six alternatives for this supplement:

1) Alternative 1 - Continue the Current North Dakota WS Program: (No Action). This alternative consists of the current program of technical assistance and operational IWDM (WS Directive 2.105) by North Dakota WS on the Sheyenne National Grasslands, Tribal, State, county, municipal, and private lands under Cooperative Agreement and Agreement for Control with North Dakota WS. The current program direction is primarily for the protection of agricultural resources and public health and safety.

2) Alternative 2 - No Federal North Dakota WS Program. This alternative would terminate the Federal Predator Damage Management program in North Dakota.

3) Alternative 3 - Integrated Wildlife Damage Management for Multiple Resources and Land Classes: (Proposed Alternative). This alternative would allow for predator damage management based on the needs of multiple resources (livestock, wildlife, property, and public health and safety) and would be implemented following consultations with the NDGF, NDDA, Federal agencies or Tribes, as appropriate. The alternative would allow for a program to protect multiple resources as requested on lands owned or managed by the USFWS, BLM, USFS, BOR, CE, Tribal, State, county, municipal or private lands if a Cooperative Agreement, Agreement for Control, MOU and/or Wildlife Damage Management Work Plans with North Dakota WS are in place, as appropriate.

4) Alternative 4 - Nonlethal Damage Management Required Prior to Lethal Control. This alternative would require that nonlethal damage management be implemented before the initiation of lethal predator damage management by North Dakota WS.

5) Alternative 5 - Corrective Damage Management Only. This alternative would require that livestock depredation occur before the initiation of lethal damage management. No preventive lethal control would be allowed.

6) Alternative 6 Technical Assistance Only. Under this alternative, North Dakota WS would not conduct operational predator damage management in North Dakota. The entire program would consist of only technical assistance.

Purpose of this Supplement

The purpose of this supplement is to: 1) report the results of WS' PDM activities conducted in North Dakota during Federal fiscal year (FY) 03 to FY10 and evaluate the accuracy of the current analyses, 2) determine if the USDA (1997a, 2003, 2009) analyses are still appropriate, 3) take appropriate action if the affected environment or impacts have significantly changed from the data analyzed in USDA (1997a), as amended (USDA 2003, 2009) and 4) provide an updated report and opportunity for the public to review program activities. This review uses the most currently available information which in most cases is FY03 to FY10 data. Copies of the EA, supplements, Decisions/FONSIs and previous monitoring reports are available from the North Dakota WS State Office, USDA, APHIS, 2110 Miriam Circle, Bismarck, North Dakota 58501-2502.

Affected Environment

Actions under the current program could be conducted on private, federal, state, tribal, and municipal lands in North Dakota to protect resources from predator damage, as requested. The affected environment includes, but is not necessarily limited to, areas in and around agricultural and industrial areas, livestock facilities, rural and urban areas, and airports wherever predators are found to be causing damage to resources or posing threats to public health and safety. Areas may include federal, state, county, city, private, or other lands, where WS' assistance has been requested by a landowner or manager to reduce predator damage. The areas affected by the current program may also include property adjacent to identified sites where predation or threats to public health and safety could occur.

Scope of Analysis

USDA (1997a), this supplemental analysis evaluates WS PDM activities in North Dakota. The scope consists of the range of actions, alternatives, and impacts considered in USDA (1997a) and supplemental information (40 CFR §1508.25) to reduce damage and threats to protected resources. The scope of USDA (1997a) and supplement recognize that USDA-APHIS is tasked with protecting American agriculture and WS' mission goes beyond that to include property, public health and safety, and natural resources when requested.

Actions Analyzed

The EA and this supplement analyze the potential impacts of PDM activities conducted by North Dakota WS, when requested. WS uses a Decision Model (Slate et al. 1992) which involves evaluating each damage/threat situation, taking action, evaluating, and monitoring results of the action(s) (USDA 1997a,

1997b[4]). WS' personnel use the Decision Model to develop the most appropriate strategy to reduce damage and to determine potential environmental effects from damage management actions (Slate et al. 1992, USDA 1997a, 1997b).

The supplement analyzes actions conducted by North Dakota WS since the FONSIs were signed. The supplement evaluates WS' activities to ensure the latest FONSI is still appropriate and that activities conducted pursuant to the Decision do not warrant the preparation of an Environmental Impact Statement. The actions analyzed in the supplement do not replace, but are in addition to those activities described under the proposed action of USDA (1997a).

PROGRAM RESULTS and ANALYSIS - FY03 through FY10

Scope of Predator Damage

The need for action remains as stated in USDA (1997a, 2003, 2009), that the adverse effect of predation on livestock can be serious for individual livestock producers[5]. Livestock production in North Dakota is a sizeable industry, and predation on livestock represents a large financial loss; 74% of calf predation and most sheep predation was attributed to coyotes (NASS 2006, 2010). The most recent reports on cattle and sheep loss to predation document a $1.6 million loss to North Dakota's livestock industry (Table 1).

Table 1. Cattle and sheep losses to predators in North Dakota and the associated financial losses.

Livestock type	Adult	Calves/Lambs	Cost of damage
Cattle (NASS 2006)	100	1,700	$1,509,000
Sheep (NASS 2010)	500	1,400	$154,000
Total	600	3,100	$1,663,000

Table 2. Non-lethal methods utilized by North Dakota sheep producers to protect sheep (NASS 2005).

Fencing	Guard dog	Llama	Donkey	Shed lambing	Herding	Night penning	Fright tactics	Remove carrion
21%	31%	23%	7%	5%	1%	35%	3%	2%

Nationwide, farmers and ranchers spent $199 million on non-lethal control methods to prevent predation, with night penning being most popular, followed by the use of guard animals, and fencing (NASS 2006). North Dakota sheep producers implemented proactive, non-lethal methods which increase the validity for taking further, possibly lethal, action to alleviate damage from predators when predation losses continue to occur (Table 2).

OBJECTIVES

In USDA (1997a), ten objectives were established by WS for the North Dakota PDM program. Those same objectives remained in the USDA (2003, 2009) analysis. The objectives and statewide accomplishments toward meeting those objectives from FY03 through in FY10 are detailed below.

[4] Slate et al (1992) provides more detail on the processes used in WS' Decision Model. USDA (1997b) provides more detail and examples of how the model is used.

[5] Predator damage totaled $92.7 million in losses to ranchers nationwide.

***Objective A-1**: Respond to requests for assistance with the appropriate action as determined by North Dakota WS personnel, applying the ADC Decision Model*[6].

During the analysis period, WS conducted technical assistance (TA) or operational projects after receiving a request for assistance from the landowner/manager with predator conflicts. TA, which included the distribution of information to assist land/livestock owners with the reduction or prevention of further damage, totaled 2,128 projects for 3,983 people (Table 3). WS conducted operational projects to mitigate/resolve 5,309 occurrences of predator conflicts (Table 4).

Table 3. TA projects conducted FY03 – FY10 (MIS FY03-FY10).

Species	# of Projects	Average	# of Participants	Average
Badger	65	8	155	19
Coyote	1,031	129	2,305	288
Mink	16	2	54	7
Raccoon	476	60	650	81
Red Fox	60	8	122	15
Striped Skunk	480	60	697	87
Total	2,128	266	3,983	498

Table 4. Operational projects conducted FY03 - FY10 (MIS FY03-FY10).

Species	# of Projects	Average
Badger	81	10
Coyote	4,030	504
Mink	20	3
Raccoon	497	62
Red Fox	142	18
Skunk	539	67
Total	5,309	663

***Objective A-2:** Hold lamb losses due to predation to less than 3% per year for producers who have signed WS agreements.*

According to the National Agricultural Statistical Service (NASS), the statewide lamb crop ranged from 70,000 head (NASS 2011a) to 100,000 head (NASS 2004a) during the analysis period. Documented predation on lambs protected by WS from FY 03 through FY 10 never exceeded 0.9% (Figure 1), with an average of about 0.6%.

[6] The WS Decision Model is a cognitive process used by WS personnel to determine the best methods to address a given wildlife damage management problem (Figure 3-1) of the EA).

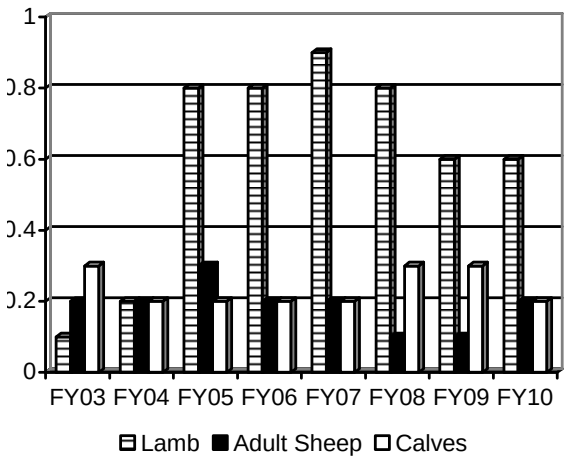
Objective A-3: *Hold adult sheep losses due to predation to less than 2% per year for producers who have signed WS agreements.*

From FY03 through FY10, the adult sheep inventory in North Dakota ranged from 61,000 (NASS 2011a) to 90,000 (NASS 2004a). Documented predation on adult sheep protected by WS during the analysis period never surpassed 0.3% (Figure 1), with an average of 0.2%.

Objective A-4: *Hold calf loss due to predation to less than 1% per year for producers who have signed WS agreements.*

The statewide calf crop for North Dakota ranged from 880,000 (NASS 2011b) to 1,000,000 (NASS 2004b) during the analysis period. Documented predation on calves protected by WS between FY03 and FY10 never surpassed 0.3% (Figure 1). The analysis period average was 0.2%.

Figure 1. Annual loss (%) of lambs, adult sheep, and calves; FY03 – FY10 (MIS FY03-FY10).



Objective A-5: *Provide requesting cooperators and cooperating Federal State, Tribal, and local agencies with information on non-lethal management techniques proven to be effective for reducing predation.*

Discussions of non-lethal management strategies were held with livestock producers during annual meetings with the North Dakota Stockmen's Association and the North Dakota Lamb and Wool Producers Association. During the analysis period, WS conducted 2,128 PDM TA projects (Table 3). All cooperators and cooperating agencies were provided information detailing lethal and non-lethal methods used to protect livestock from predators.

Objective A-6: *Maintain the lethal take of non-target animals by North Dakota WS personnel during damage management to less than 3% of the total animals taken.*

During the analysis period 21,157 target and non-target animals were killed during PDM activities (Table 5 and Table 6). Non-target take was 1.4%, which was below the threshold established in USDA 1997a.

Table 5. WS lethal take of target species, FY03 - FY10 (MIS FY03-FY10).

Species	FY03	FY04	FY05	FY06	FY07	FY08	FY09	FY10	8 Yr Total	8 Yr Avg
Coyote	2,688	2,334	2,352	2,502	1,899	2,231	2,615	2,531	19,152	2,394
Red Fox	91	92	103	62	52	59	32	47	538	67
Raccoon	209	208	71	74	50	25	23	24	684	86
Badger	15	18	8	28	14	9	5	10	107	13
Skunk	95	89	53	28	23	19	44	22	373	47
Mink	4	1	1	0	0	0	0	0	60	0.8
Total	3,102	2,742	2,588	2,694	2,038	2,343	2,719	2,634	20,860	2,608

Table 6. WS lethal take of non-target species, FY03-FY10 (MIS FY03-FY10).

Species	FY03	FY04	FY05	FY06	FY07	FY08	FY09	FY10	8 Yr Total	8 Yr Avg
Badger	4	2	4	5	2	5	11	11	44	6
Bobcat	0	0	0	0	0	0	0	2	2	< 1
Common Raven	0	2	0	1	0	1	2	0	6	< 1
Feral dog	0	1	0	4	2	2	2	1	12	2
Raccoon	7	8	1	3	7	4	19	5	54	7
Red fox	7	9	1	9	7	31	21	4	89	11
Striped skunk	2	1	4	4	1	3	5	5	25	3
Swift fox	0	0	0	0	0	0	0	1	1	< 1
Feral cat	1	0	1	0	1	0	0	0	3	< 1
Gray wolf	1	0	1	1	0	0	1	0	4	< 1
Jackrabbit	7	0	0	1	2	6	1	6	23	3
Porcupine	0	0	0	1	3	0	3	4	11	1
Mule Deer	0	0	0	0	0	0	0	1	1	< 1
White-tailed Deer	2	0	0	1	0	1	1	0	5	< 1
Woodchuck	1	0	0	0	0	0	0	0	1	< 1
Opossum	1	0	0	0	0	0	0	0	1	< 1
Pronghorn	0	0	0	0	0	0	0	1	1	< 1
Bald Eagle	1	0	1	0	0	0	0	0	2	< 1
Wild Turkey	1	0	0	0	0	0	0	1	2	< 1
Total	35	23	13	30	25	53	66	42	297	37

Objective A-7: *Continue to monitor the implementation of livestock producer non-lethal techniques.*

Nationwide, farmers and ranchers spent $199 million on non-lethal control to prevent predation, with fencing being most popular, followed by night penning and lamb sheds (NASS 2006). North Dakota WS files (unpubl data) show that 100% of North Dakota sheep and lamb producers that requested WS assistance, practice at least one non-lethal measure and 91% of the sheep and lamb producers use three or more non-lethal methods. In FY99, NASS (1999) reported that 83% of WS cooperating sheep and lamb producers in North Dakota practiced at least one non-lethal measure with expenditures of $124,040 to implement non-lethal methods. Producer implementing proactive, non-lethal methods increase the validity for taking further, possibly lethal, action to alleviate damage from predators when predation losses continue to occur.

Objective B-1: *Respond to requests from North Dakota Game & Fish, U.S. Fish & Wildlife Service and Tribes for protection of designated wildlife, dependent on funding and workforce.*

All requests during the 8-year analysis reporting period were addressed.

Objective B-2: *Involve the NDGF, USFWS or Tribes in wildlife damage management planning to consider specific wildlife to be protected and public health and safety when designating a wildlife damage*

management program.

The current North Dakota WS program involves the NDGFD, U.S. Fish and Wildlife Service (USFWS), USDA Forest Service (Forest Service), Bureau of Land Management (BLM) and Tribes, as appropriate, in the design of WS wildlife damage management programs and the implementation of minimization measures to preclude adverse impacts to target and non-target species and humans.

Objective C-1: *Respond to cooperator requests for public health and safety protection from predators using the ADC Decision Model (Slate et al. 1992).*

WS, the North Dakota Department of Health, and the North Dakota Department of Agriculture (NDDA) continued their cooperative efforts in response to reports of human health and safety/wildlife conflicts throughout the state. During the 8-year reporting period, WS responded to 408 incidents of public health and safety concerns from various predatory species.

MAJOR ISSUES ANALYZED IN DETAIL IN USDA (1997a)

The Multi Agency Team, consisting of representatives from the lead (WS) and cooperating agencies (BLM, Forest Service, NDGFD, NDDA, North Dakota State University Extension Service (NDSUES), USFWS) determined the issues to analyze in detail in the EA should be:

- Concerns for the North Dakota ADC[7] kill of predators to cause predator population declines, when added to other mortality.
- Concerns for the North Dakota ADC kill of non-target wildlife and T&E species incidental to North Dakota predator damage management.
- Concerns for the potential use of each predator damage management method.
- Concerns about the selectivity, relative cost, and effectiveness of each predator damage management method.
- Concerns about the effects of North Dakota ADC predator damage management on public health and safety.
- Concerns about the economic effects of predator damage management.

Concern for the North Dakota ADC kill of Predators to cause Predator Population declines, when added to other Mortality.

A primary issue addressed in USDA (1997a) was the impact of North Dakota WS predator removal on the viability of target and non-target wildlife populations. The species evaluated in USDA (1997a) were selected for analysis because they are taken by North Dakota WS personnel in response to livestock and wildlife predation, property damage, and public health and safety threats. The "*Magnitude*" analysis for USDA (1997a) followed the process described in USDA (1997b: Table 4-2). Magnitude is defined in USDA (1997b) as *". . . a measure of the number of animals killed in relation to their abundance."* Magnitude may be determined either quantitatively or qualitatively. Quantitative analysis is used whenever possible as it is more rigorous and is based on allowable harvest levels, population estimates, and harvest data. Qualitative analysis is based on population trends and harvest data or trends and modeling. Allowable harvest levels were determined from research studies cited in USDA (1997b: Table 4-2) and from other data.

Coyote predation continues to be the principle predator problem in the State and more coyotes were removed than any other species (Table 5). Many factors (including diseases, season of the year, geographic area, and the availability of suitable foods and habitats) contribute to the differing population

[7] On August 1, 1997, the Animal Damage Control (ADC) program was officially renamed "Wildlife Services" (WS).

densities (Storm and Tzilkowski 1982). NDGFD coyote population models determined that about 54% of the North Dakota coyote population could be removed annually and still maintain a viable and healthy population (Allen 1999). Allowable annual harvests of red fox have been estimated to be 50%-70% of the total population (Pils et al. 1981, USDA 1997b). Allowable annual harvest levels for raccoons were established at 49% of the total population (USDA 1997b), similar to the findings of Clark et al. (1989). In western Illinois, Sanderson (1987) estimated that 49-59% of the total raccoon population could be harvested without decreasing the population. Badger populations can sustain an annual harvest rate of 30-40% (Boddicker 1980).

Estimating wildlife densities is not precise and often dynamic, and professional judgment is required to account for unknowns and variables, such as the ability of habitats to support populations and recruitment. The NDGFD is the state agency responsible for managing and protecting furbearer populations within North Dakota. Regulations established by the NDGFD are designed to provide harvest opportunities and to reduce conflicts between wildlife and humans, while ensuring sustainable populations. Trend information on the population status of coyote, red fox, raccoon, badger, and skunk taken by regulated harvest and by WS activities indicate that those populations are generally stable throughout North Dakota, with minor fluctuations from year-to-year (Tucker 2011).

Concern for the North Dakota WS kill of Non-target Wildlife and T&E Species Incidental to North Dakota WS Predator Damage Management.

WS Policy (WS Directive 2.450) states, "Non-target animals captured would be released if it is determined that they are physically able to survive." From FY03 through FY10, North Dakota WS' non-target kill totaled 297 animals (Table 6). No non-target animals were taken by aerial gunning, calling, shooting, denning, or through the use of dogs. Trend information on the population status of non-target species taken by North Dakota WS indicates that those populations are generally stable throughout North Dakota, with minor fluctuations from year-to-year (S. Tucker, NDGFD Furbearer Biologist, pers comm., June 2011).

Threatened & Endangered (T&E) Species Concerns:

Bald Eagle - On February 26, 2003 a bald eagle was unintentionally killed when it activated an M-44 device that had been set to reduce coyote predation on livestock. This incident was investigated by the Law Enforcement Division of the USFWS and the U.S. Department of Justice (DOJ). The DOJ declined to prosecute the incident, but in an April 29, 2003 letter to WS, the DOJ recommended that WS and the USFWS consult to insure that policies and agreements were in place to address future possible take of a bald eagle and other species protected by the ESA. In May 2003, WS and USFWS initiated informal consultation pursuant to Section 7 of the ESA for all federally listed T&E species found in North Dakota that could potentially be affected by WS' PDM programs.

On January 6, 2004, WS requested initiation of formal Section 7 consultation concerning the possible effects of WS PDM activities on the T&E species found in North Dakota. The USFWS issued a Biological Opinion (BO) in May 2004 and concluded that WS' PDM activities would have no effect on the western fringed prairie orchid, pallid sturgeon, and whooping crane; and may affect, but not likely to adversely affect the least tern, piping plover, and black-footed ferret.

The USFWS concurred with WS' determination that its PDM activities may affect, likely to adversely affect the bald eagle. The USFWS also concluded that WS' PDM activities would not jeopardize the continued existence of the bald eagle. Further, the USFWS provided detailed reasonable and prudent measures WS should take to minimize the incidental take of bald eagles; an incidental take statement was also included for the bald eagle.

In FY05 a bald eagle was unintentionally killed when it activated an M-44 device which had been set to reduce coyote depredation on sheep. The take of the bald eagle in FY05 was less than the anticipated take established in the incidental take statement of the 2004 BO. However, in 2006 WS and the USFWS mutually agreed to amend the reasonable and prudent measures (to minimize unintentional take of bald eagles) identified in the 2004 BO. The amendments established more restrictive reasonable and prudent measures than those detailed in the 2004 BO.

In 2007 bald eagles were delisted from the ESA, however WS still complies with the reasonable and prudent measures established in the 2004 BO. There has been no unintentional take of bald eagles since the 2005 incident.

Gray Wolf - On April 1, 2003, the USFWS released their final rule for the reclassification of the gray wolf in the conterminous U.S. As a result of the final rule, the gray wolf was reclassified from "endangered" to "threatened" in two distinct population segments (DPS), the Western DPS (50 CFR 17.40(n)) and the Eastern DPS (50 CFR 17.40(o)). North Dakota was included in the Eastern DPS, therefore wolves within the state were reclassified as threatened. Section 4(d) of the ESA allows the USFWS to modify protections for threatened species to better address the unique conservation needs of the particular species. Mitigation of documented wolf predation on livestock was included in the provisions of Section 4(d), whereby employees of USFWS, state or tribal natural resource management agencies, or their agents could remove wolves responsible for livestock depredation.

WS responded to one verified gray wolf calf depredation in FY03. Pursuant to Section 4(d) of the ESA, WS notified the USFWS office in Bismarck, ND of the confirmed kill. The USFWS designated WS as "an agent of the USFWS" to carry out damage abatement efforts utilizing lethal damage management. WS initiated a review of the proposed action and determined that it was categorically excluded from further National Environmental Policy Act (NEPA) analysis and did not require the preparation of an environmental assessment or environmental impact statement. WS initiated a damage management action for a 10 day period but no wolves were taken and management efforts were terminated. No additional wolf depredations occurred following the termination of the initiated efforts.

On March 24, 2003 a gray wolf was unintentionally killed when it activated an M-44 device that had been set to reduce coyote predation on livestock. This incident was investigated by the Law Enforcement Division of the USFWS and DOJ. The DOJ declined to prosecute the incident, but in an April 29, 2003 letter to WS, the DOJ recommended that WS and the USFWS consult to insure that policies and agreements are in place to address the future possible take of a gray wolf and other species protected by the ESA.

As previously noted, in May 2003 WS and the USFWS initiated informal consultation pursuant to Section 7 of the ESA for all federally listed T&E species in North Dakota that could potentially be affected by WS' PDM program. On January 6, 2004, WS requested initiation of formal Section 7 consultation concerning the possible effects of WS PDM activities on all T&E species in North Dakota.

The USFWS issued a BO in May 2004 and concurred with WS' determination that its PDM activities may affect, likely to adversely affect the gray wolf. The USFWS also concluded that WS' PDM activities would not jeopardize the continued existence of the gray wolf. Further, the USFWS provided detailed reasonable and prudent measures WS should take to minimize the incidental take of gray wolves; an incidental take statement was also included for the gray wolf.

No gray wolves were taken by WS activities in FY04, FY07, and FY08. However, in FY05 a gray wolf was unintentionally killed in a neck snare which had been set to capture coyotes at a site which had a history of coyote predation on sheep. The USFWS investigated the incident and determined that WS had

complied with the reasonable and prudent measures identified in the 2004 BO and the take of one gray wolf in FY05 was less than the anticipated take established in the 2004 BO incidental take statement.

In FY06 a gray wolf was unintentionally killed after activating an M-44 device which had been set for coyotes at a site which had a history of coyote predation on sheep. The USFWS investigated the incident and determined that WS had complied with the reasonable and prudent measures identified in the 2004 BO and the take of one gray wolf in FY06 was less than the anticipated take established in the incidental take statement of the 2004 BO.

In February 2007 the USFWS removed gray wolves in the eastern two-thirds of North Dakota from the protection of the ESA[8]. Gray wolves in the western portion of North Dakota remained classified as federally endangered and protected by the ESA under the management authority of the USFWS.

In September 2008 a court decision vacated the USFWS delisting of wolves in North Dakota and provided that wolves be provided protection under the ESA as endangered.

In April 2009 the USFWS once again removed gray wolves in the eastern two-thirds of North Dakota from the protection of the ESA and they came under the regulatory authority of the NDGFD; wolves in the western portion of North Dakota remained classified as federally endangered and protected by the ESA. In May 2009 (FY09) one gray wolf was killed by a landowner at a site in eastern North Dakota where WS had set foothold traps in response to coyote predation on livestock. This event occurred in the area of the state where wolves were regulated by the NDGFD as a furbearer with a closed season. The NDGFD investigated the incident and did not initiate further action.

In June 2009, as a result of a court settlement agreement between the USFWS and several plaintiffs, wolves throughout all of North Dakota were again relisted as federally endangered under the protection of the ESA.

In April 2011, the USFWS announced a proposal to remove gray wolves in the Western Great Lakes area from the Federal List of Endangered and Threatened Wildlife because wolves have recovered in this area and no longer require the protection of the ESA. The proposal identifies the Western Great Lakes DPS of wolves, which includes a core area of Minnesota, Michigan, and Wisconsin, as well as parts of adjacent states that are within the range of wolves dispersing from the core recovery area.

WS continues to comply with the reasonable and prudent measures established in the 2004 BO.

Concerns for the Potential Use of Each Predator Damage Management Method.

All methods are used and would continue to be used as selectively and humanely as possible, in conformance with the WS Decision Model (Slate et al. 1992) and WS Program Directives. North Dakota WS personnel are trained in the use of each method and certified as pesticide applicators by the NDDA through the NDSUES's pesticide training and certification program. Some methods may be more or less effective or applicable depending on weather conditions, time of year, biological considerations, economic considerations, legal and administrative restrictions, or other factors. Because these factors may at times preclude use of certain methods, it is important to maintain the widest possible selection of damage management tools to most effectively resolve predator damage problems. North Dakota WS has not received any reports of adverse incidents of methods use from the public, nor have there been any reports of adverse human health and safety incidents.

[8] Wolves found east of Highway 83 and the Missouri River were placed under the regulatory authority of the NDGFD and classified as a furbearer with a closed season.

Concerns over the Selectivity, Relative Cost, and Effectiveness of Each Predator Damage Management Method.

Chapter 4 of USDA (1997a) included discussion about the relative effectiveness and selectivity of the various methods used by North Dakota WS and that discussion will not be repeated here. Under the current program, all methods are used as selectively and effectively as possible, in conformance with the WS Decision Model (Slate et al. 1992) and WS Program Directives. The selectivity of each method is based, in part, on the application of the method and the skill of the personnel, and the direction provided by WS Directives. Effectiveness of the various methods can vary widely depending on local circumstances at the time of application.

Several methods employed under the current program are typically 100% selective for target species. These methods include aerial shooting, ground shooting, denning and use of dogs. Other methods, such as foot-hold traps, neck snares, and the M-44 device as used by North Dakota WS are slightly less selective.

North Dakota WS uses foot-hold traps with offset jaws and pan-tension devices to reduce injuries to captured animals and to improve selectivity (WS Directive 2.450). The selectivity of snares is largely a function of how and where they are set. Breakaway snare locks are used to allow the release of larger animals such as deer or livestock which may be caught unintentionally. In addition, North Dakota WS personnel often try to reduce the need for setting traps or snares by first trying to remove problem animals by ground shooting or aerial shooting.

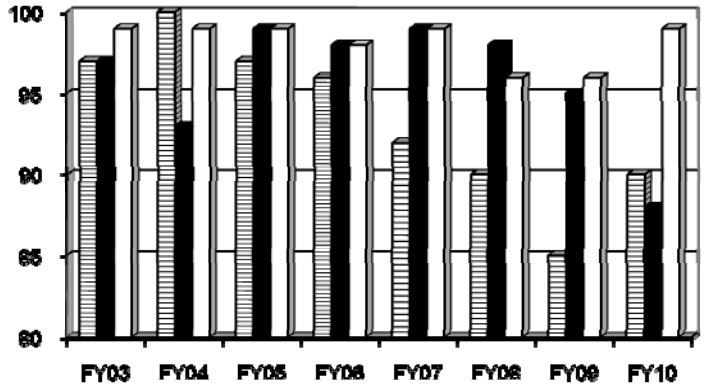
The selectivity of capture devices is defined as the total number of target species (captured/taken by a capture device) divided by the total of target and non-target species captured/taken by the devices. During the 8-year analysis period, the selectivity of foot-hold traps ranged from 85% to 100% (Figure 2). The selectivity of neck snares during the same time frame ranged from 88% to 99% and the selectivity of the M-44 device ranged from 96% to 99%. The averages over the analysis period were: foot-hold traps 93%, neck snare 96% and M-44 98%.

Other damage management methods used by North Dakota WS included decoy or trapline dogs which can be highly selective for removing target animals. Decoy and trapline dogs are relatively inexpensive to use in North Dakota, and they can be utilized in conjunction with aerial shooting, for finding dens, and for trailing target animals.

Denning is very selective because positive identification of the species is possible. Denning, and the act of finding the den, can be time consuming and therefore relatively more expensive compared to other methods.

Use of livestock guarding dogs by sheep producers has proven effective in preventing or reducing some predation losses (Gehring et al 2010), and use of guard dogs is generally perceived as a selective form of non-lethal damage management. However, guard dogs may also involve deaths of target and non-target animals and injuries to people (Timm and Schmidt 1989, Gehring et al 2010).

Figure 2. Selectivity (%) of foothold traps, snares, and M-44s; FY03-FY10.



Concerns over the effects of North Dakota WS Predator Damage Management on Public Health and Safety.

Effects on public health and safety include potential benefits caused by North Dakota WS fostering a safer environment and the potential negative effects that might result from the exposure of the public to PDM methods. The current program uses integrated methodologies to protect resources on public and private lands and the methods used for PDM in North Dakota pose low human safety risks (USDA 1997a, 1997b), and there have been no instances of any injuries to any member of the public associated with PDM in North Dakota. Sodium cyanide, the active ingredient in the M-44 device, poses possible risks, but they are mitigated through specific direction provided by WS Program Directives and by the respective pesticide label. Risks identified in the evaluation process for this chemical were primarily environmental risks addressed by the EPA rather than safety or health risks to the public.

Concerns over the Economic Effects of Predator Damage Management.

Economic impacts are monetary benefits or liabilities that the current program would have on livestock and wildlife losses, public health and safety, and property. Costs and benefits associated with implementing IWDM would be considered but may be a secondary concern in relation to overriding legal and environmental considerations and are not the primary basis for the decision(s) to be made. A review of the WS Program's Economic Impact Assessment may be found in USDA (1997b: Chapter 4) is incorporated by reference.

Benefits of the current program in North Dakota can be shown by examining predation rates to lambs, sheep, and calves (Figure 1). Those losses are well below stated objectives of the damage abatement program (see Objectives A-2 through A-4). However, other measures of economic efficacy are the level of predation prevented by WS PDM program and the cost:benefit ratios of the program.

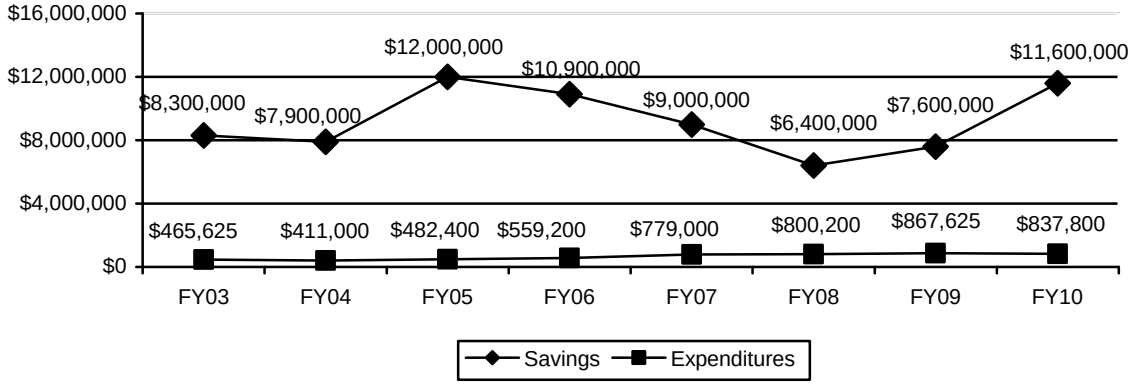
Bodenchuck et al. (2002) summarized the impacts of predator-induced losses in the absence of damage abatement programs: average annual losses of lambs equal 18%, adult sheep average 6% loss annually, and calve losses average 3% annually. Applying these values to the number of animals protected by North Dakota WS' PDM program provides an estimate of the potential loss of lambs, adult sheep, and calves to predation. Comparisons between potential loss and actual loss of these classes of livestock provide insight into the amount of predation prevented as a result of WS' activities. Applying market

values to the numbers of animals saved helps measure the economic benefits of the WS' program.

The North Dakota WS PDM program potentially prevented predator impacts to livestock on those properties where damage management action was taken during this analysis period. The savings not only benefited those livestock producers, but other segments of society as well. Recognizing the economic benefits of PDM extend beyond properties where WS provides assistance. Bodenchuck et al. (2002) applied a 3X multiplier effect to the direct savings which resulted from the prevention of livestock losses from predators. Using that same multiplier raises the economic benefits of the WS PDM program to segments of society not directly involved with livestock production in North Dakota. The gross total benefit (sum of direct and indirect benefits) of PDM in North Dakota varied from $6.4 million to $12 million during FY03 through FY10 (Figure 3).

The North Dakota WS program is cooperatively funded through a combination of federal and non-federal funding. Total funds during the 8-year reporting period ranged from $465,625 in FY03 to $867,625 in FY09 (Figure 3). The cost:benefit ratios of WS PDM program (defined as the ratio between one dollar of funds expended, to the amount of monetary losses saved) varied from 1:8 to 1:25 during the FY03 - FY10 reporting period (Figure 3). The North Dakota WS Program provides a positive economic benefit to livestock producers and property owners, in addition to nonmonetary benefits such as increased public health and safety, T&E species and other wildlife protection.

Figure 3. Potential savings versus cost of predator damage management in North Dakota, FY03 – FY10.



Cost: Benefit Ratio: FY03 (1:18); FY04 (1:19); FY05 (1:25); FY06 (1:19); FY07 (1:12); FY08 (1:8); FY09 (1:9); FY10 (1:14).

WS' Programmatic Environmental Impact Statement

WS developed a Final EIS[9] that addresses the need for wildlife damage management in the United States (USDA 1997b) and contains detailed discussions of potential impacts to the human environment from wildlife damage management methods used by WS. Pertinent information in USDA (1997b) has been incorporated by reference into USDA (1997a) and the supplemental information for the current program.

[9] Copies of WS' Programmatic FEIS are available from USDA/APHIS/WS-Operational Support Staff, 4700 River Road, Unit 87, Riverdale, MD 20737-1234.

X. Site Specificity

USDA (1997a) and this supplement analyze the potential impacts of PDM that could occur in North Dakota on lands under cooperative agreement or other comparable document, and in cooperation with the appropriate public land management agencies. It also addresses the impacts of damage management activities on areas where additional agreements may be signed in the future. Because the proposed action is to reduce damage and because the program's goals and directives are to provide services when requested, within the constraints of available funding and workforce, it is conceivable that additional damage management efforts could occur. Thus, USDA (1997a) anticipated this potential expansion and impacts of such efforts as part of the proposed alternative. Because livestock production and human activity occurs throughout North Dakota and predators are found in every county in North Dakota, it is conceivable that WS' activities could occur anywhere in the State.

USDA (1997a) and supplements emphasize major issues as they relate to specific areas whenever possible; however, many issues apply wherever predator damage, or potential predator damage occurs and management actions are taken. WS personnel use the WS Decision Model (Slate et al. 1992) as the *"on the ground"* site-specific procedure for each damage management action conducted by WS. The Decision Model is a thought process that guides WS though the analysis and development of the most appropriate individual strategy to reduce damages and detrimental environmental effects from damage management actions (USDA 1997a). The Decision Model (Slate et al. 1992) and WS Directive 2.105 describe the site-specific thought process used by WS.

Planning for the reduction of human/predator conflicts is conceptually similar to other agencies' actions whose missions are to stop or prevent adverse consequences from anticipated future events for which the actual sites and locations where they will occur are unknown but could be anywhere in a defined geographic area. Examples of such agencies and programs include fire and police departments, emergency clean-up organizations, insurance companies, etc. Although some of the sites where predator damage will occur can be predicted, all specific locations or times where such damage will occur in any given year cannot be predicted. USDA (1997a) and this supplement emphasize major issues as they relate to specific areas whenever possible, however, many issues apply wherever predator conflicts and resulting management occurs, and are treated as such. The analyses are intended to apply to any action that may occur *in any locale* and at *any time* within North Dakota. In this way, WS believes we meet the intent of NEPA with regard to site-specific analysis and that this is the only practical way for WS to comply with NEPA, be able to meet needs for assistance with predator damage management in a timely fashion and accomplish its mission. Decisions made using this thought process will be in accordance with minimization measures and Standard Operating Procedures described in USDA (1997a) established as part of any FONSI. This supplement adds to the analysis in USDA (1997a) and Decision and all information and analyses in USDA (1997a) remains valid unless otherwise noted.

Coordination with Federal and State Agencies

Work plans were established with and wildlife damage management methods were used consistent with BLM and Forest Service land use plans when and where it was determined necessary by WS personnel to resolve or prevent problems. M-44s and gas cartridges were used according to the label and use-restrictions, and pesticide use proposals approved by the land management agencies. Also, M-44s were removed during bird hunting seasons.

Summary of Public Involvement

Issues related to the proposed action were initially developed by an interdisciplinary team process involving WS, USFS, BLM, USFWS, NDDA, NDSUES, and NDGF. A Multi Agency Team of WS,

USFS, BLM, USFWS, NDGF, NDDA and NDSUES personnel refined these issues, prepared objectives and identified preliminary alternatives. Due to interest in the North Dakota WS Program, the multi agency team concurred that North Dakota Ws include an invitation for public involvement in the USDA (1997a) process. Notice of the proposed action and invitation for public involvement were placed in six newspapers with circulation throughout North Dakota. Public comments were documented from 26 letters or written comments. The responses represented a wide range of opinions, both supporting and opposing the proposal or parts of the proposal. All comments were analyzed to identify new issues, alternatives, or to redirect the objectives of the program.

As part of a public review and comment process, the Supplement is being made available through a NOA published for 3 consecutive days, in *The Bismarck Tribune*, the paper used for legal notices by WS in North Dakota (Fed. Reg. 72:13237-13238, March 21, 2007). The Supplement was also available at http://www.aphis.usda.gov/regulations/ws/ws_nepa_environmental_documents.shtml and http://www.regulations.gov. These notices stated that WS was providing an opportunity for public review and comment for 30-days and copies of USDA (1997a), Supplement may be obtained from the USDA-APHIS-WS. All responses are maintained in the administrative file located at the North Dakota ADC State Office, 1824 N 11th Street, Bismarck, North Dakota 58501-1913.

Compliance and Monitoring

The WS program in North Dakota reviews program activities to ensure that program activities are within the scope of analysis contained in USDA (1997a, 2003, 2009). If WS' activities identified during monitoring are outside the scope of the analyses in USDA (1997a, 2003, 2009) or if new issues are identified from available information, further analysis will occur and USDA (1997a, 2003, 2009) will be supplemented to the degree as identified by those processes pursuant to NEPA. WS' PDM has been conducted in a manner consistent with all applicable environmental regulations, including the ESA and NEPA. WS representatives will continue to consult with NDFGD and USFWS regarding the conduct of wildlife damage management. Substantial changes in the scope of work or changes in relevant guidance documents or environmental regulations may trigger the need for further analysis.

ISSUES SINCE COMPLETION OF USDA (1997a and USDA 2003)

WS PDM activities, including aerial gunning, are only conducted on those areas where the landowner or lessee has signed an "Agreement for Control" or where work plans have been discussed with appropriate state and federal land management agencies. Analysis of North Dakota WS aerial operations have been analyzed in USDA (2003, 2009) and that analysis and other WS' aerial operations analysis concluded that WS' aerial gunning is not causing any significant adverse impacts to wildlife, public land and users, or the environment (USDA 2005). From FY03 to FY10, North Dakota WS' aerial operations were conducted on less than 2% of the total North Dakota land base. Those aerial operations did not result in any fuel spills or fires and there were no reports of threats to public health or safety, therefore the 2003 analysis of those issues is still valid.

The use of aircraft increases the cost effectiveness of PDM, and in one study reduced the cost per coyote removed by about $700 (Wagner and Conover 1999). This reduction of cost was accompanied by a reduction in necessity for subsequent PDM (Wagner and Conover 1999), which further eliminates potential impacts, making aerial gunning the most efficient and cost effective tool available for certain situations.

The amount of time spent conducting aerial operations varies depending on the severity of losses experienced by the cooperators and on the weather. Low-level aerial operations are restricted to visual flight rules and are impractical in high winds or at times when predators are not easily visible. North

Dakota WS spent a total of 3,135 hours conducting aerial operations from FY03 – FY10, averaging 392 hours per year (Table 7). The aerial operations were conducted on less than 2% of the land area of North Dakota in any year. North Dakota WS' aerial operations are minor in terms of geographic scope because more than 98% of the land area in the State is not exposed to such activity.

Effects on Wildlife from WS Gunshot Noise

The time spent shooting at coyotes during aerial operations is an exceedingly small proportion of the total time spent flying. A typical "pass," in which shots are taken, requires only a few seconds and usually involves 2 to 3 shots with a 12 gauge shotgun. It is estimated that on average no more than 30-45 seconds of every hour spent flying are involved in shooting (L. Burraston, WS 2005 pers. comm.) which means that only 1-2% of the time spent aerial gunning is actually spent shooting at target animals and generating gunshot noises.

Table 7. Time and acres flown in North Dakota in FY 03 through FY 10 (MIS FY03-FY10).

Fiscal Year (FY)	Fixed wing Hours	Fixed wing acres*
03	332	643,653
04	211	315,123
05	534	687,658
06	459	627,893
07	329	339,523
08	425	526,921
09	469	641,250
10	376	523,429
Total	3,135	4,305,450
Average	392	538,181

* Represents total acreage on agreements flown. The actual acreage flown is less than the total, as terrain, vegetation and need do not justify flying each and every

Gunshot noise from WS aerial gunning operations probably has no discernable or at most only minor potential to adversely affect non-target wildlife because of the limited frequency of gunshot noise, duration of WS flights and the small proportion of geographic area involved in North Dakota (*i.e.*, less than 2%) which means only small proportions of non-target wildlife populations would hear noise from WS gunshots. Pater (1981) reported that muzzle blast is louder in the direction toward which the weapon is pointed by up to 14 decibels. Additionally, shooting from an aircraft is usually at an extreme downward angle. Thus, shooting downward toward the ground serves to lessen the noise in lateral directions. WS personnel on the ground observing aerial gunning report that the gunshot noise heard at a distance of 150 yards or more sounds like a subtle "pop" (L. Burraston, WS 2005 pers. comm.). This indicates shotgun noise from the aircraft is minimal and is not loud enough to cause disturbance to non-target wildlife.

Summary

North Dakota WS has reviewed the potential environmental effects and the scope of analysis contained in the EA and subsequent EA analyses (USDA 1997a, 2003, 2009). USDA (1997a, 2003, 2009), the FONSIs, and monitoring reports determined that activities conducted pursuant to USDA (1997a, 2003,

2009) are within the scope of analyses, enhanced public safety and no substantive changes to the program have occurred. The analysis in USDA (1997a), subsequent monitoring reports, and the 2003 and 2009 analyses did not identify any cumulative impacts nor are there any significant impacts to the quality of the human environment from the current PDM program conducted by North Dakota WS. The area (acres) that North Dakota WS conducts PDM continues to be a low proportion (less than 5%) of the total land area of the State. The effects to predator and non-target populations that North Dakota WS targets during PDM are low and do not have long-term adverse impact on any species, nor are there any adverse affects to human health and safety from WS actions (Tucker 2011). In addition, WS will continue to conduct PDM according to program procedures, protective measures discussed in USDA (1997a,), monitor activities, in compliance with relevant laws, regulations, policies, orders, and procedures, including the ESA, and Migratory Bird Treaty Act, and in coordination with the NDGFD.

Based on this supplement, the issues identified in USDA (1997a, 2003) are best addressed by continuing the current program. The current program has the lowest overall negative environmental consequences combined with the highest positive effects. The current program successfully addressed: (1) PDM using a combination of the most effective methods and does not adversely affect the environment, property, and/or non-target species, including T&E species; (2) it offers the greatest chance at maximizing effectiveness and benefits to resource owners and managers while minimizing cumulative impacts on the quality of the human environment; (3) it presents the greatest chance of maximizing net benefits while minimizing adverse impacts to public health and safety; and (4) it offers a balanced approach to the issues of humaneness and aesthetics when all facets of those issues are considered. However, the foremost considerations are that: 1) PDM will only be conducted by WS at the request of landowners/managers, 2) management actions are consistent with applicable laws, regulations, policies and orders and coordinated with the NDGFD, and 3) no adverse impacts to the environment were identified. The North Dakota WS program will continue to provide effective and practical TA and direct operational management that reduce damage.

Literature Cited:

Allen, S. H. 1999. Study No. E-I: Computer simulation of furbearer population dynamics. Project No. W-67-R-39, Report No. A-594, North Dakota Game and Fish Department, Bismarck, ND.

Boddicker, M. L. 1980. Trapping Rocky Mountain furbearers. Colorado Trapper's Assn., Littleton, CO.

Bodenchuk, M. J., J. R. Mason., and W. C. Pitt. 2002. Economics of predation management in relation to agriculture, wildlife, and human health and safety. (Pages 80-90) *in* L. Clark, editor. Human Conflicts with Wildlife: Economic Considerations.

Clark, W.R., J.J. Hasbrouck, J.M. Kienzler, and T.F. Glueck. 1989. Vital statistics and harvest of an Iowa raccoon population. J. Wildl. Manage. 53: 982-990.

Conover, M. 2002. Resolving human-wildlife conflicts: The science of wildlife damage management. CRC Press Company, Lewis Publishers, New York, New York, USA.

Gehring, T. M., K. C. VerCauteren, and J. Landry. 2010. Livestock protection dogs in the 21st century: Is an ancient tool relevant to modern conservation challenges? BioScience 60: 299-308.

MIS FY03-FY10. Unpublished management information system data for the North Dakota Wildlife Services program, FY03-FY10.

NASS (National Agricultural Statistics Service). 1999. 1999 Livestock wildlife damage survey results. USDA, NASS, Survey Management Division, Washington D.C. 20250.

NASS. 2004a. Sheep and Goats. NASS, North Dakota Field Office, Fargo, ND. Released January 30, 2004. 2 pages.

NASS. 2004b Cattle Inventory. NASS, North Dakota Field Office, Fargo, ND. Released January 30, 2004. 2 pages.

NASS. 2005. Sheep and Goats Death Loss. NASS, Agricultural Statistics Board, USDA, Washington D.C. Released May 6, 2005. 21 pages.

NASS. 2006. Cattle Death Loss. NASS, Agricultural Statistics Board, USDA, Washington D.C. Released May 5, 2006. 15 pages.

NASS. 2010. Sheep and Goats Death Loss. NASS, Agricultural Statistics Board, USDA, Washington D.C. Released May 27, 2010. 16 pages.

NASS. 2011a. Sheep and Goats. NASS, North Dakota Field Office, Fargo, ND. Released January 28, 2011. 2 pages.

NASS. 2011b. Cattle Inventory. NASS, North Dakota Field Office, Fargo, ND. Released January 28, 2011. 2 pages.

Pater, L. L. 1981. Gun blast far field peak overpressure contours (Technical Report NSWC TR 79-442): Naval Surface Weapons Center.

Pils, C. M., M. A. Martin, and E. L. Lange. 1981. Harvest, age structure, survivorship, and productivity of red foxes in Wisconsin, 1975-78. Wisconsin Dept. of Natural Resources Tech. Bull. 124.

Sanderson, G. C. 1987. Raccoon. (Pages 487-400) *in* M. Novak, J.A. Baker, M.E Obbard, and B. Malloch eds. Wild furbearer management and conservation in North America. Ontario Trappers Assoc., Nroth Bay, Canada.

Slate, D. A., R. Owens, G. Connolly, and G. Simmons. 1992. Decision making for wildlife damage management. Trans. North Am. Wildl. Nat. Res. Conf. 57: 51-62.

Storm, G. L., and M. W. Tzilkowski. 1982. Furbearer population dynamics: a local and regional management perspective. Proc. Midwest Fish Wildl. Conf. 43:69-90.

The Wildlife Society. 2010. TWS Position statement on wildlife damage management. The Wildlife Society, Bethesda, Md. 2 pp.

Timm, R. M., and R. H. Schmidt. 1989. Management problems encountered with livestock guarding dogs on the University of California, Hopland Field Station. Proc.Great Plains Wildl. Damage Control Workshop 9: 54-58.

Tucker, S. A. 2011. Study No. E-II: Furbearer harvest regulations study. Project No. W-67-R-50, Report No. C-450, North Dakota Game and Fish Department, Bismarck, ND.

USDA (U.S. Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services). 1997a. Wildlife damage management in North Dakota for the protection of livestock, public health and safety, property, and wildlife EA. USDA-APHIS-WS, North Dakota State Office, 2110 Miriam Circle, Bismarck, North Dakota 58501-2502.

USDA. 1997b (revised). Final Environmental Impact Statement. USDA, APHIS, ADC Operational Support Staff, 6505 Belcrest RD, Room 820 Federal Bldg, Hyattsville, MD 20782.

USDA. 2003. Wildlife damage management in North Dakota for the protection of livestock, public health and safety, property, and wildlife EA supplement. USDA-APHIS-WS, North Dakota State Office, 2110 Miriam Circle, Bismarck, North Dakota 58501-2502.

USDA. 2005. Predator damage management in Colorado EA. WS State Office, 12345 West Alameda Parkway, Suite 204, Lakewood, CO 80228.

USDA. 2009. 5-year environmental monitoring review for Wildlife damage management in North Dakota for the protection of livestock, public health and safety, property, and wildlife EA. USDA-APHIS-WS, North Dakota State Office, 2110 Miriam Circle, Bismarck, North Dakota 58501-2502.

Wagner, K. K. and M. R. Conover. 1999. Effect of preventive coyote hunting on sheep losses to coyote predation. J. Wildl. Manage. 63: 606-612.

Appendix A

North Dakota WS Predator Damage Management EA Quality Assurance Checklist[10]

Effects on Target Species Populations

- ✓ Management actions are consistent with applicable laws, regulations, policies and orders and coordinated with the NDGFD.
- ✓ Management actions were directed toward localized populations or groups and/or individual offending animals, depending on the species and magnitude of the problem.

Effects on Non-target Species Populations

- ✓ Non-target animals captured were released at the capture site unless the WS Specialist determined that they would not survive.
- ✓ Traps and snares were set at least 30 feet from exposed carcasses to avoid or minimize risk of capturing scavenging bird species.

Protecting Human Safety

- ✓ Conspicuous, bilingual warning signs alerting people to the presence of damage management devices were placed at major access points when devices were set in the field.
- ✓ No injuries or illnesses to members of the public occurred as a result of WS activities.

Use of Pesticides

- ✓ All pesticides used were registered with the Environmental Protection Agency (EPA) and NDDA and label directions were followed.
- ✓ WS employees followed label directions for pesticide use during the reporting period.
- ✓ No violations of pesticide laws or regulations were noted or documented during field inspections by program or project managers or by state or federal pesticide regulators.
- ✓ WS employees that used pesticides during the reporting period were trained and, for restricted use pesticides, certified to use such pesticides in accordance with EPA and NDDA approved programs and participate in continuing education programs to keep abreast of developments and to maintain their certifications.

Historic Preservation

- ✓ WS determined this program's actions are not the kind of actions with potential to affect historic resources.

Humaneness

[10] Checklist of Standard Operating Procedures to minimize or avoid adverse environmental effects.

- ✓ Chemical immobilization/euthanasia or other euthanasia procedures (*e.g*., gunshot to the brain) that minimize pain were used to kill captured target species slated for lethal removal and/or to kill captured non-target species deemed unable to survive if released.

- ✓ Pan tension devices to minimize the likelihood of capturing non-target species that are lighter in weight than the target species were used on foot-hold traps.

- ✓ Breakaway snare locks are used on all neck snares.

- ✓ Research continued to improve the selectivity and humaneness of management devices.

Endangered/Sensitive Species

- ✓ "Reasonable and Prudent Alternatives" (RPAs) or "Reasonable and Prudent Measures with Terms and Conditions" (RPMs) from the 1992 programmatic USFWS BO and the 2004 BO from the USFWS Bismarck, ND office were applicable to this action. WS will investigate project areas for wolf sign prior to setting foothold traps, neck snares, or M-44 devices to manage coyote predation. If wolf sign is detected and the verified loss of livestock is attributable to coyotes but not wolves, WS will manage the coyote predation with methods which require positive identification of the target animal (aerial gunning or shooting). The use of other damage management methods can resume provided no additional wolf sign is detected during the next 7 days.

- ✓ To the best of the knowledge of the project or program's manager, all of the RPAs and/or RPMs were met.

- ✓ Foothold traps and neck snares were not set within 1 mile of known bald eagle nest locations from March 15 through August 1.

- ✓ Foothold traps, neck snares, and the M-44 device were not set within 1 mile of known bald eagle winter roost locations from November 15 through March 30.

- ✓ For federal lands, sensitive species were addressed during the Work Planning process.

Native American Cultural Issues

- ✓ No activities were conducted on Native American tribal lands and actions would only be conducted on tribal lands at the request of the tribe.

Land Management Issues/Conflicts

- ✓ WS developed work plans in coordination with the BLM and/or U.S. Forest Service (USFS) officials before conducting activities on BLM and USFS lands.

- ✓ Work conducted on BLM or USFS lands was in accordance with the developed work plans referenced above.

- ✓ Vehicle access was limited to existing roads unless otherwise authorized by the land management agency.

- ✓ No conflicts with public land users occurred during the reporting period. (If conflicts did occur, further explanation should be included in the monitoring report).

- ✓ No work was conducted in any designated recreational areas or other special management areas.

Additional Measures to Minimize Impacts

- ✓ The WS Decision Model was used to identify the most appropriate wildlife damage management strategies and their impacts.