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SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT and MONITORING REPORT FOR PREDATOR DAMAGE MANAGEMENT CONDUCTED BY WILDLIFE SERVICES IN IDAHO
and
FINDING OF NO SIGNIFICANT IMPACT/DECISION

Introduction

The Animal and Plant Health Inspection Service (APHIS), Wildlife Services (WS) program, formerly known as the Animal Damage Control (ADC) program, prepared two separate Environmental Assessments (EAs) in 1996 which addressed the need to conduct predator damage management and the potential impacts of various alternatives for responding to predator damage problems in Idaho. The first of these two documents addressed predator damage management in southern Idaho and included all lands south of the southern boundaries of Adams, Valley, Custer, and Lemhi Counties (USDA 1996a). A Finding of No Significant Impact (FONSI) and Decision were issued July 22, 1996 for that document. The other EA addressed predator damage management in the remaining portion of the State (USDA 1996b), and a FONSI and Decision were issued for that document on November 4, 1996. The decision for both of those EAs was to continue conducting an integrated predator damage management program, using all legally available damage management methods as appropriate, plus the use of the Livestock Protection Collar (LPC) when it became registered in Idaho. A formal review and comparison of the analysis in the two 1996 EAs with more current monitoring information was undertaken in 1997 to determine whether the 1996 FONSIs and Decisions were still appropriate. An additional FONSI addressing both of the 1996 EAs was issued on October 2, 1997. Copies of all these documents are available from the Idaho WS State Office, USDA, APHIS, 9134 West Blackeagle Dr., Boise, ID 83709.

The purpose of this document is to: 1) review data relevant to Fiscal Year (FY) 98 predator damage management activities in Idaho, 2) provide rationale for authorizing use of the LPC at the U. S. Sheep Experiment Station at Dubois, ID, 3) document the potential need for predator damage management to protect sage grouse (*Centrocerus urophasianus*) and sharp-tailed grouse (*Tympanuchus phasianellus*), and, 4) determine if the FONSIs and Decisions made in conjunction with the 1996 EAs are still appropriate. This review makes use of the most currently available information, which in most cases is FY98 data.

Scope of Livestock Losses

According to data compiled by the Idaho Agricultural Statistics Service (IASS 1999), predation was the single largest cause of death loss for Idaho sheep in 1998, with 36% of the total death losses attributed to predators. A total of 3,500 adult sheep and 11,000 lambs, valued at $1.5 million, was reported killed by predators. Coyotes were responsible for the most damage, at 11,200 head of adult sheep and lambs. Predation by domestic dogs, black bears, mountain lions, red fox, and gray wolves accounted for most of the other predator losses. Based on reported sheep inventories and lamb crop, these losses represented a 4.6% predation loss of lambs, and a 1.5% loss of adult sheep Statewide. This was the loss level sustained *with an integrated damage control program in place.* Research results suggest that predation losses in the absence of a damage management program would be about 17% for lambs and 4.5% for adult sheep (USDA 1994).

In response to requests for assistance from livestock producers in FY98, WS personnel verified predation on 232 adult sheep, 613 lambs, 6 adult cattle, 139 calves, 31 goats, and 229 fowl Statewide. These losses represent only a fraction of the actual losses and serve more as an indicator of what predator damage exists rather than an indication of the magnitude of damage.

Environmental Impacts

A primary issue addressed in USDA (1996a, 1996b) was the impact of WS livestock protection efforts on the viability of target and non-target wildlife populations. Coyote predation continues to be the most serious predator problem in both analysis areas (Management Information System (MIS) 1998), and more coyotes were taken than any other species (Table 1). Based on the conservative coyote population estimates used in the EAs and the actual number of coyotes taken in FY98, WS removed an estimated 12.8% of the coyote population in the southern Idaho analysis area, and an estimated 2.7% of the population in the northern analysis area, or 8.4% of the Statewide coyote population (Table 1). When adding WS' FY98 total coyote take to the known 1997 Statewide harvest (1997 data are the most recent information available) from fur trappers and sport hunters, the cumulative coyote take is 13.1% (Table 1) of the total Statewide estimated population. But even if an additional unknown take were to double, it would still be far below the allowable harvest level of 70% (USDA 1994). This conclusion is consistent with the Government Accounting Office (GAO 1990) assessment regarding WS' impacts on coyote populations in the Western U. S. Data on WS coyote take per hour of aerial hunting also suggests that coyote populations were at least as high in 1998 as they were during preparation of the EAs and in 1997 (USDA 1997).

Table 1. Idaho WS Program and Cumulative Impact to Predators During FY98 (MIS 1998).

Species	Estimated Population[1]	WS Take	Other Known Take	WS Take (% of Pop.)	Cum. Take (% of Pop.)	Impact
Badger[2]	21,100	15	280[3]	0.07	1.4	Low
Black Bear[2]	20,000	10	1,515[4]	0.05	7.6	Low
Bobcat[2]	4,135	3	948[3]	0.07	23	Low
Coyote	49,000	4,136	2,932[3]	8.4	13.1	Low
Mountain Lion[2]	7,680	4	632[5]	0.05	8.3	Low
Raccoon[2]	[6]	6	999[3,7]			Low
Red Fox[2]	16,500	173	2,725[3,7]	1	17.6	Low
Striped Skunk[2]	24,600	16	681[3]	0.06	2.8	Low

[1]Based on analysis in USDA (1996a, 1996b).
[2]IDFG reports the population as stable or increasing (W. Melquist and J. Beecham, IDFG, pers. comm.).
[3]Animals reported to the IDFG as being taken or harvested during the State FY97 harvest season (IDFG 1998).
[4]Black bear checked-in by successful hunters during legal hunting seasons in the State FY97 hunting season (IDFG 1997a).
[5]Mountain lions checked-in by successful hunters during legal hunting seasons in the State FY97 hunting season (IDFG 1997b).
[6]No population estimate available.
[7]Animals reported as killed from the issuance of furbearer depredation kill permits in FY97 (IDFG 1998).

A total of 4,441 animals were taken during all predator damage management actions by Idaho WS during this period (MIS 1998). Of these, 29 were non-target animals killed in the southern Idaho analysis area, resulting in a target kill rate of 99.2%, and 7 were non-target animals killed in the northern Idaho analysis area, resulting in a 98.9% target kill rate. WS' Statewide target kill rate was 99.2% (which results in a non-target kill rate of 0.8%). All of these figures fall within the objectives set in the EAs. No non-target animals were killed by aerial hunting, calling, shooting, denning, or through the use of dogs in FY98. Of the three methods that did result in non-target take, M-44s were the most selective, followed by snares, and traps (Table 2). The methods used and the manner in which they were applied by Idaho WS are highly selective. None of the other target or non-target species taken by WS sustain as high a level of harvest as do coyotes, and the cumulative take of these species falls well within allowable harvest levels as analyzed in the EAs and USDA (1994).

Non-lethal Control Use by Cooperators

During FY97, WS field employees recorded information on non-lethal and lethal methods used by sheep producers that requested services from WS during that time period. Results showed that 91% of sheep producers were using at least one form of non-lethal control. Data from the National Agricultural Statistics Service (NASS 1999) reflects very similar results in that 92% of Idaho sheep producers were using at least one form of non-lethal control. Fencing, guarding animals, and shed lambing were cited as the 3 most commonly used methods. Connolly and Wagner (1998) reported that 84% of Idaho sheep producers having 1000 or more sheep were using guarding animals, which is twice the national average (42%) of sheep producers with over 1000 head who use guarding animals.

Table 2. Selectivity of WS Methods (MIS 1998).

Species	Target			Non-target		
	Trap	Snare	M-44	Trap	Snare	M-44
Badger	14			4		
Black Bear		8				
Bobcat	1	1		1		
Coyote	296	55	358			
Feral Dog	1	4		1		5
Jackrabbit					1	
Mountain Lion	2					
Porcupine				6	1	
Raccoon	2			5	3	2
Red Fox	44	11	68	2		
Striped Skunk	4			5		
Total	364	79	426	24	5	7
% Selectivity[1]	93.8	94	98.4			

[1]Proportion of total animals taken by this method that were target species.

Threatened/Endangered Species Activities

Idaho WS assisted the U.S. Fish and Wildlife Service (USFWS) and the Nez Perce Tribe (NPT) with their wolf management efforts by investigating 17 reported incidents of wolf predation on livestock during FY98. Of the 17 depredation investigations, 5 were confirmed by WS as wolf predation and damage management actions were initiated. These control actions resulted in 3 subadults and 1 juvenile wolf, from 2 separate packs, being captured. The subadult wolves were radio-collared and relocated by the NPT to the Selway-Bitteroot Wilderness area and released. The juvenile wolf was also radio-collared, but because of its age, was released on site as required by the *Final Rule* governing wolf reintroduction.

In addition to the above wolf depredation control actions, WS and the NPT entered into a cooperative agreement to facilitate capture of non-depredating wolves so additional animals could be radio-collared. Maximizing the number of radio-collared wolves enables NPT monitoring crews to keep better track of individual animals and packs and can help facilitate more efficient control actions in the event that livestock depredation does occur. Fourteen wolves were live-trapped in Idaho by WS employees during these efforts, all but one of which were radio-collared and released on site. The one animal was released on site without being radio-collared because it was a young pup too small to collar.

Rationale for Use of the LPC at the U.S. Sheep Experiment Station

Details regarding the proposed use and potential impacts from use of the LPC to protect sheep from coyote predation were discussed at length in USDA (1996a, 1996b). Although the Environmental Protection Agency labeling restrictions do not preclude use of the LPC on public lands, the two EAs prepared in 1996 inferred that LPCs would only be used on private lands in Idaho. The rationale for this thinking was that the LPC can only be used in fenced pastures, and in most cases this would involve private land. Subsequent to completion of the EAs, it was determined that there was in fact at least one situation where it may sometimes be desirable and appropriate to use the LPC on non-private lands. The University of Idaho, U.S. Sheep Experiment Station near Dubois, Idaho is a

research facility operated by the USDA Agricultural Research Service. The sheep operation at the Experiment Station includes some open rangeland grazing, which would not be appropriate for LPC use, but it also includes a number of fenced pastures. Livestock guarding dogs and fencing are used routinely at the Experiment Station to help protect sheep from predators, but there is a history of coyote predation on high-value research animals in spite of these measures. Public access to the fenced portions of the Experiment Station is controlled much as it would be on any other private lands in Idaho. Under similar circumstances at the University of California's Hopland Field Station, Timm and Hays (1998) successfully used the LPC as their primary means of coyote damage control to protect sheep on that 5,300 acre rangeland research facility. Their data suggested that selective removal of sheep-killing coyotes with the LPC was more effective at stopping losses than other forms of lethal control. In the event that LPCs were to be used at the Experiment Station, public access to any pastures containing collared sheep would be restricted and notification signs would be posted at gates and any other commonly used access points. The potential addition of this use for the LPC in Idaho would not be expected to appreciably change any of the issues or impacts discussed in USDA (1996a, 1996b).

Potential Need to Protect Sage Grouse and Sharp-tailed Grouse from Predation

In both EAs (USDA 1996a, USDA 1996b), the potential need for predator damage management to protect bird species of special concern was discussed. Since completion of the two EAs, the Idaho Department of Fish and Game (IDFG) has requested WS assistance in their efforts to assess the potential impact of predation on sage grouse and/or sharp-tailed grouse in southern Idaho. Although sharp-tailed grouse are common in southeastern Idaho, their populations in Idaho and much of the western U.S. are much lower than historic levels. Sage grouse populations in southern Idaho and across much of their historic range in the west are at all-time lows. Predation is one of the multiple factors that may be contributing to their decline. In a survey of U. S. public attitudes regarding predators and their management to enhance avian recruitment, Messmer et al. (1999) found that given information suggesting predators are among the threats to a declining bird population, the public generally supported using predator control for the protection of bird populations.

Artificial Nest Studies

Artificial nest studies have been conducted in a number of locations over the years to determine the potential impacts of predation on sage grouse nesting success. These studies have typically involved concealment of brown chicken eggs or pheasant eggs in artificial nests in sage grouse habitat, with subsequent monitoring of the nest sites to determine rates of predation.

Autenrieth (1981) conducted an artificial sage grouse nest study in Idaho in 1975 in what was considered good sage grouse habitat. Based on the level of nest predation he documented and on a review of data from studies conducted in other areas, Autenrieth (1981) concluded that one of the greatest constraints on sage grouse populations in Idaho was nest predation. Ravens were responsible for most of the nest predation during his 1975 study in Idaho, but there was evidence of predation by magpies and badgers as well.

Other researchers have likewise documented high levels of predation during artificial sage grouse nest studies. Klebenow et al. (1990) placed artificial nests out in 2 study areas in northwestern Nevada. In one of these areas the authors documented destruction of 84% of 200 nests within 3 days, and within 2 weeks, 100% of the nests had been destroyed. In another area, 84% of the artificial nests were destroyed within 10 days. Ravens were believed to be the primary nest predator. Ritchie et al. (1994) measured predation on 120 artificial sage grouse nests in northen Utah and found over 80% of depredated nests were destroyed by mammals, with badgers being the most frequent predator. DeLong et al. (1995) placed 330 artificial sage grouse nests out in sage grouse habitat in southeastern Oregon and found 71% of the nests destroyed by predators within 3 weeks.

In April of 1999, an artificial nest study was conducted in the Curlew Valley area of southeastern Idaho by personnel from the IDFG and WS. After 3 days, 64% of 50 nests had been destroyed, and 84% had been destroyed

within 1 week (unpublished data from IDFG). Intermittent rain during the monitoring period precluded identification of predator tracks at most nest sites, but tracks of 1 coyote, 1 red fox, 1 raven, and 1 probable striped skunk were identified.

Documented Predation on Actual Sage Grouse Nests

Studies have also been carried out where researchers were able to determine the fate of actual sage grouse nests. Batterson and Morse (1948) documented heavy predation on sage grouse nests in northeastern Oregon and concluded that the greatest single limiting factor for sage grouse populations was nest predation by ravens. Magpies, crows, coyotes, and badgers were also documented as nest predators, but of much less importance than ravens. The authors initiated a raven control program and subsequently documented a 51% nesting success rate in their treatment area versus a 6% nesting success rate in an area where no ravens were removed. They considered raven control an essential element of sage grouse management.

Nelson (1955) reported that over half of the sage grouse nests found during his study in southeastern Oregon had been destroyed by predators, with badgers being the most frequent predator, and lesser degrees of predation by birds and ground squirrels. Gill (1965) found that 50% of the sage grouse nest predation in Colorado was attributed to ground squirrels, and 44% of sage grouse nests were lost to badgers. Patterson (1952) reported 42% of the nest predation in a Wyoming study was caused by ground squirrels, 36% by badgers, and lesser amounts from coyotes and magpies. Connelly et al. (1991) noted that ravens and magpies were common predators of sage grouse nests in the Curlew Valley and Big Desert areas of southeastern Idaho during their study. Gregg et al. (1994) located 124 sage grouse nests over a 3-year period during their study in southeastern Oregon, and found that 85% of the nests were destroyed by predators.

Predation on Adult Sage Grouse

Although Autenrieth (1981) suggested that nest predation was likely the most important population constraint on sage grouse, predation on adult birds does occur and may be significant in some cases. Presnall and Wood (1953) reported tracking a coyote approximately 5 miles to its den in northen Colorado, and finding evidence along the way that the coyote had killed 3 adult sage grouse and destroyed a sage grouse nest. Examination of the stomach contents from an adult female coyote removed the next day showed parts of an adult sage hen, plus 6 newly-hatched sage hen chicks. The area around the den site was littered with sage hen bones and feathers. No other prey animal remains were found around the den, and it appeared that the pups had been raised largely upon sage grouse. Till (1982) documented sage grouse remains at 4 of the 30 coyote den sites examined during his study in south central Wyoming, but provided no indication of the relative abundance or distribution of sage grouse in his study area.

In northern Utah, researchers from Brigham Young University confirmed predation, primarily by red fox and coyote, as the cause of death for 13 of 21 radio-instrumented sage grouse in the first year in their study area (Bunnell and Flinders 1999). Two additional instrumented birds could not be found but were suspected to have been killed by predators, suggesting a 71% predation loss of instrumented birds. Additionally, 11 other sage grouse were found dead in their study area, and all but 1 of these birds were killed by mammalian predators. The other was killed by some kind of raptor. Additional predation on adult radio-instrumented birds occurring after preparation of the authors' report brought the total mortality of instrumented birds in the first year of their study to 82% (M. Bodenchuck, pers. comm.).

Predator Population Levels

Leopold (1933) was one of the first to suggest that the likelihood of predators having an impact on game species seems to increase as the ratio of predators to prey increases. Sage grouse numbers are definitely down from historic levels, and populations of some predators appear to be up from historic levels. The documented incidence of raven predation on sage grouse nests should be of particular concern considering the long-term trend for raven populations

in Idaho. Christmas Bird Count data (1959-1988) shows raven numbers in Idaho increasing about a 5% annually (Sauer et al. 1996). More recent trend data from the Breeding Bird Survey (1980-1996) likewise indicates that raven numbers in Idaho have been increasing about 5% annually (Sauer et al. 1997). Nest predation by crows has not been documented to as much of an extent as predation by ravens and magpies, but crows could also be potential nest predators. Graphs depicting annual indices of crow populations in Idaho clearly indicate that crow populations are steadily increasing as well (Sauer et al. 1996, Sauer et al. 1997).

Although coyotes have not been implicated to the extent that ravens have as predators on sage grouse nests, coyote populations today appear to be significantly higher than they were back in the 1950s-1960s when sage grouse were relatively abundant. USDA (1996a) provided coyote population trend data for southern Idaho based on the number of coyotes taken per hour of aerial hunting effort over a 40-year period. This data suggests coyote populations across southern Idaho during the most recent decades have been significantly higher than they were during the decades when toxicants were widely used to reduce coyote populations.

Red fox populations in Idaho apparently began increasing and expanding around 1960 (Fichter and Williams 1967) and their populations today appear to be relatively high. This is presumably reflected in the year-round open season for the taking of red fox in southern Idaho, as established by the Idaho Fish and Game Commission in 1994.

Habitat is frequently cited as the most critical factor associated with the current status of sage grouse populations, and an emphasis on maintaining and improving habitat seems justified. But to continue that emphasis without also considering the role of predation would seem unwise. In the 1960s and 70s, Idaho had large numbers of sage grouse and extensive livestock grazing (IDFG 1997c). One of the factors that has changed since that time is the increase in populations of potential sage grouse nest predators. There is a great deal of evidence that predation can in some circumstances be one of the most important limiting factors on sage grouse populations.

Proposed Management Action

Conducting additional artificial nest studies like the one conducted in April 1999 in Curlew Valley would serve several useful purposes. It would provide an indication of whether or not nest predation might be a problem in specific local areas, and if it were a problem, those species most responsible for the problem could be identified. If avian nest predation appeared to be a significant problem, it would probably be one of the easiest situations to deal with. The avicide DRC-1339 is registered for use in Idaho to control crows, ravens, and magpies. The product is injected into hard-boiled eggs, is highly effective, and poses no secondary poisoning hazards. By exposing the toxicant in egg baits, only those species that are consuming eggs are targeted. Ideally, multiple (at least 2-4) sage grouse nesting areas with high artificial nest predation would be treated. Then nesting success could be compared between treatment and control areas. Control for avian nest predation could be implemented 2-3 weeks prior to the onset of sage grouse nesting, and the reduction in consumption of treated egg baits would serve as an indicator of when to curtail the control effort. Because their populations are relatively high and stable to increasing, the number of ravens and/or magpies expected to be removed during any such control actions would only be expected to have a low magnitude of impact (USDA 1996a).

Compliance and Monitoring

Predator damage management activities have been and will continue to be conducted in a manner consistent with all applicable environmental regulations, including the Endangered Species Act and the National Environmental Policy Act. APHIS, WS representatives will continue to meet at least annually with cooperating local officials from the Bureau of Land Management, U. S. Forest Service, USFWS, and the IDFG regarding conduct of predator damage management activities. Substantial changes in the scope of work or changes in relevant guidance documents or environmental regulations may trigger the need for further analysis.

FINDING OF NO SIGNIFICANT IMPACT

Based on a review of information available since the completion of USDA (1996a, 1996b), there continue to be no indications that WS predator damage management is having a significant impact on the quality of the human environment. This determination is based on the following factors:

1. Predator damage management, as conducted by WS in the two identified analysis areas, is not regional or national in scope.

2. WS predator damage management activities pose minimal risk to public health and safety. No injuries to any member of the public are known to have resulted from these activities in either of the analysis areas.

3. There are no unique characteristics such as park lands, prime farm lands, wetlands, wild and scenic areas, or ecologically critical areas that would be significantly affected.

4. The effects on the quality of the human environment are not highly controversial. Although there is some opposition to predator damage management, the program is not highly controversial in terms of size, nature, or effect in either of the two analysis areas.

5. Based on the analysis documented in the EAs and the accompanying administrative files, the effects of the predator damage management program on the human environment would not be significant. The effects of these activities are not highly uncertain and do not involve unique or unknown risks.

6. These activities do not establish a precedent for any future action with significant effects.

7. No significant cumulative effects were identified through the previous EAs or through his review. The number of animals taken by WS, when added to the total known other take of all species, falls well within allowable harvest levels.

8. None of the activities in either analysis area would affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places, nor would they likely cause any loss or destruction of significant scientific, cultural, or historical resources.

9. An informal Section 7 consultation with the USFWS confirmed that the activities carried out under WS' predator damage management program would not likely adversely affect any T&E species.

10. All activities are carried out in compliance with all Federal, State, and local laws imposed for the protection of the environment.

DECISION

Based on the above monitoring information and supplementation of the EAs, it is my determination that continuation of WS predator damage management activities under the alternative selected in the July 22, 1996 and November 14, 1996 decisions is still appropriate. That alternative was to continue using all legally authorized methods, and also to begin using the LPC whenever appropriate. In addition, based on supplemental information discussed in this document, it now seems appropriate to expand upon several activities not specifically discussed or authorized under the 1996 EAs and decisions. Specifically, this decision authorizes use of the LPC on the U.S. Sheep Experiment Station, and predator damage management to protect sage grouse and/or sharp-tailed grouse. The analysis of impacts as discussed in the 1996 EAs would not be expected to differ appreciably if these additional activities are undertaken. For additional information or questions regarding this FONSI or Decision, please contact the Idaho WS State Office, USDA, APHIS, 9134 West Blackeagle Drive, Boise, ID 83709, telephone (208) 378-5077.

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