

GAO

Report to the Honorable  
Alan Cranston, U.S. Senate

August 1990

# WILDLIFE MANAGEMENT

## Effects of Animal Damage Control Program on Predators



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**Resources, Community, and  
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B-240460

August 9, 1990

The Honorable Alan Cranston  
United States Senate

Dear Senator Cranston:

This report discusses the effects of animal damage control (ADC) programs on several predator species. It is the second in a series of reports resulting from the broad review that you requested on federal wildlife management efforts. Our initial report discussed wildlife management by the Interior Department in the California Desert.<sup>1</sup> Later this year we will issue a more comprehensive report addressing the overall impact of Interior and Agriculture Department policies and practices on wildlife conditions on the public lands.

This report specifically discusses whether (1) a comprehensive federal policy exists for managing predator species, (2) individual state animal damage control programs are consistent with such a policy if it does exist, and (3) the policy and practices are threatening predator populations. Our review focused on certain predator species—bears, wolves, foxes, bobcats, mountain lions, and coyotes—in the 17 western states where they are most prevalent.

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**Results in Brief**

While the federal government has an interest in preserving wildlife, no comprehensive federal policy exists specifically for managing predator species. Historically, except for animals such as the gray wolf, which is a listed species under the Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1543), most matters pertaining to fish and wildlife, including predators, have been the province of the states. State wildlife management generally consists of managing to preserve wildlife populations while allowing hunting and trapping.

However, the federal government seeks to control predators in those areas where they are causing damage to livestock and agricultural interests. Under the Animal Damage Control Act of 1931, as amended (7 U.S.C. 426-426c), the Secretary of Agriculture is authorized and directed to control predators and the damage they cause, as well as to cooperate with states and others in carrying out the act. All of the ADC programs

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<sup>1</sup>California Desert: Planned Wildlife Protection and Enhancement Objectives Not Achieved (GAO/RCED-89-171, June 23, 1989).

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that we reviewed, each of which emphasized killing predators that have caused damage, were generally consistent with the act and ADC program guidance.

According to available information, the number of predators killed under ADC programs has not threatened statewide predator populations. While not dramatically affecting statewide predator numbers, ADC activities may have contributed to decreases in populations of certain predator species in localized areas with heavy livestock grazing.

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## Historical Perspective

Concern over predators and the damage they cause to livestock and agricultural interests dates back to the settlement of the American West. At that time, predators were generally viewed as nuisance animals—especially by ranchers concerned with protecting their livestock. Beginning in 1915, funds appropriated by the Congress were used to hunt, trap, and kill coyotes and other animals detrimental to agricultural and livestock interests on national forests and other public lands. Killing offending animals, even to the extent of exterminating entire populations, became an accepted approach to control predator damage.

In the approximately 6 decades since passage of the Animal Damage Control Act of 1931, the basic thrust of the law has not changed. The act still authorizes eradication, suppression, and campaigns for the destruction of predators. However, as currently administered, the ADC programs no longer emphasize eradication of statewide populations of predators. Instead, the programs emphasize controlling the damage caused by predators by selectively killing individual problem animals or all predators in areas grazed heavily by livestock.

The change in the ADC programs' emphasis has occurred largely as a result of an increased awareness by ADC officials and others that all wildlife, including predators, is a valued public resource. In addition, a thorough understanding of the interdependent relationship between predator and prey is generally recognized as essential to sound wildlife management.

Despite the shift in emphasis from eradication to control and the recognition that predators are an important public resource, controversy continues to surround the ADC programs. Concerns of conservationists and some state wildlife management officials focus on (1) the programs' emphasis on killing predators rather than using nonlethal control techniques and (2) the suffering that animals can endure as a result of some

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of the means used to kill them. For example, the use of traps, which if not checked frequently, can cause animals considerable suffering. Also, conservationists contend that predators have an equal right to exist on the public lands, and they question whether the federal government should be subsidizing livestock producers who should bear the risk for losses when using these lands.

In contrast to those who complain about ADC practices, livestock interests believe that it is unfair for the federal government to collect grazing fees from ranchers and not protect their stock from predators also occupying the public lands. Coyotes killed western sheep and lambs valued at an estimated \$18 million in 1989, and research indicates that localized predator controls can reduce predator damage.

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## Agency Comments

The Acting Assistant Secretary, Marketing and Inspection Services, on behalf of the Department of Agriculture, provided clarity points on information in our report. We considered these comments and made changes where appropriate. (See app. VI.)

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Appendix I to this report provides information on federal and state policies for managing predators. Appendix II discusses the consistency of ADC practices with legislation and guidance on the control of predators. Appendix III provides information on the extent to which animal damage control programs are threatening statewide predator populations. Appendix IV explains our review approach, and Appendix V contains detailed information on ADC predator control techniques.

To identify federal policies and practices for managing predators, we reviewed legislation and policies of federal wildlife and land management agencies. We also interviewed and collected documentation from officials of the Department of Agriculture's Animal and Plant Health Inspection Service, which manages the ADC programs; Interior's Bureau of Land Management and Fish and Wildlife Service; the Forest Service; and state wildlife and cooperative extension service agencies.

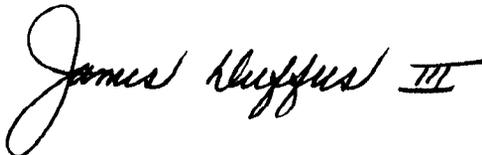
Although we collected information from 17 western states, we developed more detailed information on the ADC programs in 6 states: Arizona, Colorado, Utah, California, Texas, and Kansas. We selected these states because (1) they had a wide range of predator species and different topographical and climatic conditions and (2) they utilized different ADC predator control methods. We accompanied ADC field

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specialists to observe various predator control activities including the calling and shooting of predators, setting of snares, and placing of authorized poison devices. We conducted our work from March through December 1989.

As agreed with your office, unless you publicly announce its contents earlier, we plan no further distribution of this report until 30 days from the date of this letter. At that time, we will send copies to the Secretary of Agriculture; the Deputy Administrator, Animal Damage Control; and other interested parties. Please contact me on (202) 275-7756 if you have further questions. Major contributors to this report are listed in appendix VII.

Sincerely yours,

A handwritten signature in black ink that reads "James Duffus III". The signature is written in a cursive style with a large initial "J" and a distinct "III" at the end.

James Duffus III  
Director, Natural Resources  
Management Issues



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**Abbreviations**

ADC animal damage control  
GAO General Accounting Office

# No Comprehensive Federal Policy for Managing Predators Exists

Other than the protection afforded to predators listed as threatened or endangered under provisions of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1543), no federal policy exists specifically for managing predator species. Historically, managing fish and wildlife, including predators, has been the responsibility of the states. While the federal government does not have a comprehensive policy specifically for managing predators, the Animal Damage Control Act of 1931, as amended (7 U.S.C. 426-426c), authorizes and directs the Secretary of Agriculture to develop techniques for the control of injurious predators on public and private lands. Although the ADC programs are not wildlife management programs per se, they are the primary federal programs that affect nonthreatened or nonendangered predators.

## State Management of Wildlife Populations

The states have enacted the laws and administered most of the programs that have most directly affected the management and killing or trapping of predatory animals within their boundaries. States' wildlife management generally consists of managing to preserve wildlife populations while allowing hunting and trapping. States accomplish this goal primarily by regulating hunting and trapping seasons and limiting the number of animals killed. The level of protection afforded specific predators can vary significantly among the states due primarily to their estimated populations and how the states classify them.

For the purpose of discussing the various levels of protection afforded predators in the western states, we classified predators as protected, game, or unprotected. As the classification implies, protected predators are afforded maximum protection. For these predators, state wildlife regulations do not permit hunting or trapping at any time so as not to threaten their existence. Predators classified as game animals are afforded partial protection by state wildlife agencies who set regulated hunting and trapping seasons or limit the number of animals killed in order to sustain their populations. Unprotected predators are not afforded protection because state wildlife agencies have determined that they are present in such large numbers as to make them virtually incapable of being threatened.

In addition, some state legislatures do not authorize their state wildlife agencies to manage a category of predators called varmints. In these states, these predators can be killed at any time and in unlimited numbers. These are often those predators that are most often associated with the killing of livestock. The coyote is considered a varmint in Texas, Wyoming, New Mexico, Idaho, Utah, and Oregon. The mountain

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**Appendix I**  
**No Comprehensive Federal Policy for**  
**Managing Predators Exists**

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lion is considered a varmint in Texas. The gray wolf in Wyoming and the black bear and mountain lion in North Dakota are considered varmints. However, because few or none of these animals reside in these states, it is unlikely that predator control programs would be directed toward them. Also, federal protection under the Endangered Species Act supersedes state law and prohibits the killing of the gray wolf. The red fox is classified as a varmint in one state, Wyoming. Table I.1 illustrates the classification of different predators in the 17 western states included in our review.

**Appendix I  
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**Table I.1: Summary of Predator Status by State**

	Gray fox	Red fox	Kit fox	Swift fox	Coyote	Bobcat	Mountain lion	Black bear	Gray wolf <sup>a</sup>	Grizzly bear <sup>b</sup>
Arizona	G	G	G	G <sup>c</sup>	G	G	G	G	NP	NP
California	G	P	P	NP	U	G	P <sup>d</sup>	P <sup>e</sup>	NP	NP
Colorado	G	G	G	G	U	G	G	G	NP	NP
Idaho	NP	G	NP	NP	Y	G	G	G	P	P
Kansas	G	G	NP	G	U	G	NP	NP	NP	NP
Montana	NP	G	P <sup>c</sup>	P <sup>c</sup>	U	G	G	G	P	G <sup>i</sup>
Nebraska	U	U	NP	P	U	G	NP	NP	NP	NP
Nevada	G	P <sup>c</sup>	G	NP	U	G	G	P	NP	NP
New Mexico	G	G	G	G	Y	G	G	G	NP	NP
North Dakota	U	U	P <sup>c</sup>	P <sup>c</sup>	U	G	Y <sup>c</sup>	Y <sup>c</sup>	NP	NP
Oklahoma	G/P <sup>g</sup>	P	NP	P	U	G	P	P	NP	NP
Oregon	G	G	P	NP	Y	G	G	G	NP	NP
South Dakota	P	G/U <sup>h</sup>	P <sup>c</sup>	P	U	G	P	P <sup>c</sup>	NP	NP
Texas	U	U	U	U	Y	G	Y	P	NP	NP
Utah	G	G	G	G <sup>c</sup>	Y	G	G	G	NP	NP
Washington	NP	G	NP	NP	U	G	G	G	P	P
Wyoming	NP	Y	NP		Y	G	G	G	Y <sup>i</sup>	P

Notes:

NP - Not present in state or present only in small numbers.

P - Protected species, no hunting or trapping.

U - Unprotected species, unrestricted hunting and trapping.

G - Game Species, regulated hunting and trapping or limits on number of animals taken.

Y - Varmint: not managed by the state wildlife agency.

<sup>a</sup>Classified as endangered by the U.S. Fish and Wildlife Service.

<sup>b</sup>Classified as threatened by the U.S. Fish and Wildlife Service.

<sup>c</sup>Classified by state wildlife agency or legislature despite not being present in the state.

<sup>d</sup>Although the mountain lion is considered a game animal by the state wildlife agency, current hunting is forbidden by a court order pending completion of an environmental impact statement.

<sup>e</sup>Although the black bear is considered a game animal by the state wildlife agency, there is no 1989-1990 bear season.

<sup>i</sup>Limited hunting season in accordance with Interior regulations implementing the Endangered Species Act of 1973.

<sup>g</sup>Game animal in the eastern part of the state and protected in the western part of the state.

<sup>h</sup>Game animal in the eastern part of the state and unprotected in the western part of the state.

<sup>i</sup>Not addressed. Insignificant furbearer according to state wildlife agency.

<sup>j</sup>Protected by the Endangered Species Act of 1973, which supersedes state law.

As table I.1 shows, a predator's classification can vary significantly among the states. For example, the red fox is rare in Nevada and California, and it is a protected species. However, the red fox is more populous in Colorado, Utah, and Kansas and is considered a game animal; in North Dakota and western South Dakota, it is so prolific that it is unprotected. Similarly, because of its varying populations, the black bear is protected in Texas and Oklahoma but considered a game animal in Colorado and Utah.

Notwithstanding their classification under state wildlife management laws or regulations, most western states allow ranchers to kill predators that are threatening or damaging livestock without being bound by state hunting or trapping regulations. Some states require ranchers or their agents to report the kills to the appropriate state wildlife agency. For example, responding to mountain lion and black bear attacks on livestock, Arizona enacted a law that allows ranchers who have had livestock attacked or killed to protect them by killing offending or potentially offending animals. This state law has resulted in a heated debate over the killing of predators between parties that favor stricter control—such as environmentalists, sportsmen, and the state wildlife agency—and parties that believe they need to protect livestock from predators—such as ranchers, the Arizona Livestock Board, and ADC program officials.

States may also provide assistance to those experiencing predator problems through state cooperative extension services. This assistance may include disseminating information on predator control, teaching ranchers how to trap and snare nuisance predators, and killing predators that have caused damage. For example, the Kansas Cooperative Extension Service directly supervises most animal damage control activities in the state. It relies heavily on teaching ranchers to solve their own problems. Guard dogs, electric fencing, penning sheep at night, and proper disposal of sheep carcasses have proved to be effective in Kansas in reducing losses to predators.

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## **Federal Efforts to Manage Predators**

While fish and wildlife matters have generally been the province of the states, federal agencies have assumed a significant role in the management of some species. From a conservation standpoint, federal land management agencies have made efforts to increase the numbers of several endangered predators through breeding practices and by improving habitat. Through its administration of the Endangered Species Act, Interior's Fish and Wildlife Service also protects listed predator species from

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illegal killing, trapping, or harassment. The most concerted federal predator management efforts—exercised under authority of the Animal Damage Control Act of 1931—have focused on controlling the damage caused by predators to domestic livestock or agricultural interests.

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## **Federal Land Managing Agencies' Wildlife Management Roles and Responsibilities**

Interior's Fish and Wildlife Service is the principal federal agency charged with overall responsibility for conserving, protecting, and increasing fish and wildlife populations, including predators. For example, under authority of the Endangered Species Act of 1973, as amended, the Service formulates plans for the recovery of populations of species such as the gray wolf in northwestern Montana, central Idaho, and the Greater Yellowstone Area. This plan emphasizes, when possible, natural migration of gray wolves from populations in western Canada; otherwise reintroduction from elsewhere is attempted. Also, the Service identified three areas for recovery of grizzly bears—two locations principally in northwestern Montana and one in the Greater Yellowstone Area. In these areas, the Service emphasizes increasing existing populations primarily through reducing mortality and identifying critical habitat. The plans for both the gray wolf and the grizzly bear contain provisions for addressing situations where these predators are preying on livestock.

Interior's Bureau of Land Management and National Park Service and Agriculture's U.S. Forest Service generally concentrate on managing wildlife habitat, not wildlife species themselves. The National Park Service, however, directly manages wildlife to the extent that the available habitat in national parks can support only certain animal populations.

The Bureau of Land Management and the Forest Service manage public lands under their responsibility according to the principles of "multiple use and sustained-yield," in which wildlife is but one of several purposes to be served including recreation, timber production, livestock grazing, and mineral development. This requires striking a balance between competing and possibly conflicting objectives, such as using and developing resources and protecting and conserving resources. While wildlife needs are included among the values to be balanced, they have historically represented a relatively small part of the overall management concerns of these agencies. Our future report on Bureau of Land Management and Forest Service wildlife management efforts will more fully discuss these activities.

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## **ADC Program Policies and Practices**

The federal government controls predators and the damage they cause, primarily to livestock and agricultural interests, through the Animal Damage Control Act of 1931. Responsibility for administering the ADC programs resided in the Department of Agriculture until 1939 when it was transferred to Interior's Fish and Wildlife Service. It remained in Interior until 1985 when it was transferred back to Agriculture under the Animal and Plant Health Inspection Service. Under the Animal Damage Control Act of 1931, the Secretary of Agriculture is authorized and directed to

“... conduct such investigations, experiments, and tests as . . . necessary in order to determine, demonstrate, and promulgate the best methods of eradication, suppression, or bringing under control . . . mountain lions, wolves, coyotes, bobcats . . . and other animals injurious to agriculture, horticulture, forestry, [and] animal husbandry. . . .”

In implementing the ADC programs, Agriculture enters into cooperative agreements with federal land management agencies, state and county governments, livestock associations, Native American tribes, universities, and individual ranchers. These cooperative agreements are important because many ADC field activities are funded in part by parties to these agreements, and they define ADC operating procedures and specify that they must be consistent with state game management policies and federal requirements. For example, the cooperative agreement with the U.S. Forest Service in Utah prohibits animal damage control activities on lands with high recreational use. Because of laws unique to various state and local governments, and differing management philosophies of the decentralized federal land management agencies, the cooperative arrangements can vary considerably. For example, Colorado's and Wyoming's wildlife management agencies require that ADC program officials obtain case-by-case approval to destroy black bears and mountain lions that are killing livestock, but Idaho's wildlife management agency does not.

Direct federal funding for ADC activities in the 17 western states included in our review totaled about \$12.1 million in fiscal year 1989. This was augmented by \$11.9 million in state and private (cooperator) funds. Table I.2 lists fiscal year 1989 federal and cooperator funding for these 17 states.

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**Table I.2: Fiscal Year 1989 Source of ADC Funds in 17 Western States**

<b>State</b>	<b>Federal appropriations</b>	<b>Cooperator<sup>a</sup> funds</b>	<b>Total funds</b>
Arizona	\$371,674	\$240,439	\$612,113
California	1,181,532	2,085,566	3,267,098
Colorado	660,883	234,459	895,342
Idaho	803,624	280,108	1,083,732
Kansas	45,000	0	45,000
Montana	800,400	454,230	1,254,630
Nebraska	233,565	110,497	344,062
Nevada	609,198	505,662	1,114,860
New Mexico	983,615	641,135	1,624,750
North Dakota	596,081	364,414	960,495
Oklahoma	593,377	595,057	1,188,434
Oregon	812,114	697,547	1,509,661
South Dakota	364,660	532,749	897,409
Texas	1,969,808	3,583,805	5,553,613
Utah	824,404	732,839	1,557,243
Washington	401,656	257,557	659,213
Wyoming	821,034	537,886	1,358,920
<b>Total</b>	<b>\$12,072,625</b>	<b>\$11,853,950</b>	<b>\$23,926,575</b>

<sup>a</sup>Includes states, rancher associations, and individuals.

Although the ADC programs have continued to focus on killing predators, the thrust of the programs has changed over the years. Program emphasis in its early years was on conducting general eradication campaigns that might be directed at the entire statewide population of a particular species of predators. This operating philosophy contributed to decimating gray wolf populations in the continental United States. With changes in public attitudes, the program now emphasizes killing only problem animals. As much as possible, ADC agents are required to direct their efforts toward the individual offending animal or local populations of predators, such as those around heavily grazed areas, rather than attempting to eradicate entire statewide predator populations.

Despite the shift in emphasis from eradicating predator species to killing problem animals, public controversy continues to surround the ADC programs. Many environmental and wildlife protection groups and individuals disagree with ranchers who advocate killing predators as a means of controlling livestock loss. These groups and individuals want to put more emphasis on nonlethal preventive techniques, such as use of guard dogs and mesh wire fences.

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In addition, animal rights activists and some wildlife agency personnel are concerned with the pain and suffering that animals must endure because of the practices used to control and kill problem predators. For example, in Arizona, state wildlife agency officials told us that trapped black bears had to be killed because they became dehydrated after being left in the traps for several days. ADC agents in Arizona are required to check traps and snares only two to three times each week rather than daily as preferred by the state wildlife agency, according to these officials. ADC program personnel told us that states have different requirements regarding the frequency of trap checking and that ADC abides by the state's requirements. Other practices denounced by animal rights groups are the gassing of coyote pups in their dens and shooting of coyotes from aircraft.

In contrast to those who complain about ADC practices, advocates of control efforts cite losses to livestock, agricultural crops, and personal property. In this connection, on the basis of inventories of adult sheep and lambs provided by Agriculture and percentages of such livestock lost to predators furnished by Agriculture's Denver Wildlife Research Center, we estimate that coyotes killed western sheep and lambs valued at about \$18 million in 1989. According to available research, localized lethal controls have served their purpose in reducing such predator damage.

However, because ADC programs have placed heavy emphasis on protecting sheep from coyotes, environmentalists and some state wildlife agencies have charged that these programs constitute an inappropriate direct subsidy to the wool industry, and they have raised questions concerning whether the killing of animals is a proper role for an agency of the federal government. They also contend that (1) conflicting opinions and assertions exist regarding the effectiveness of ADC activities and loss estimates due to predation, (2) predators have an equal right to exist on the public lands, and (3) livestock losses are a risk that should be borne by producers who use public lands in an already heavily subsidized manner.

# ADC Practices Are Generally Consistent With Legislation and Guidance

The Animal Damage Control Act of 1931 and implementing guidance provide broad direction on the manner in which ADC programs in the states should operate. ADC programs in the states we visited appeared to be operating in a manner generally consistent with both by providing assistance in resolving conflicts between wildlife and man to alleviate damage and minimize economic losses as required by the law and ADC guidance. However, although the ADC policy manual states that non-lethal methods will be given first consideration when practical as a predator damage control technique, little evidence exists of state ADC program personnel employing such methods. Rather, in the six states we visited, killing offending animals was used predominantly to control predation on livestock. According to ADC personnel, selective killing of predators to control their damage is used most frequently because it is the fastest and most cost-effective way to solve livestock predation problems. They also believe that most of the practical, nonlethal methods such as predator-proof fencing, guard dogs, and night confinement are most appropriately used by the livestock owner rather than ADC personnel.

ADC programs operate on a request-for-services basis. After receiving a request for assistance, ADC guidance requires field specialists to verify that damage or loss has occurred, determine that the damage or loss was due to predators, choose and implement a control strategy, and record the action taken. Damage control strategies can be preventive to thwart animal damage before it occurs or corrective to address losses that have already occurred. Although some states' ADC programs provide that predators may be killed as a preventive measure, we found that the majority of ADC killing of predators is corrective in nature.

Although all states that we visited emphasized killing predators, the killing techniques varied among the states depending on the terrain, vegetation, and climate. For example, North Dakota's open flat terrain makes aerial hunting effective in killing coyotes. In contrast, in Texas, which has areas of dense vegetation, ADC field specialists commonly poison predators with the use of M-44 capsules. In Colorado, few leg-hold traps are used during winter months because of heavy snowfall, but traps are readily used in California and New Mexico to kill predators. Appendix V contains a description of these and other predator control techniques.

In those states where preventive control techniques are used, different restrictions on the use of the methods may exist. For example, in Colorado, preventive killing is allowed only in areas that experienced losses

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**Appendix II**  
**ADC Practices Are Generally Consistent With**  
**Legislation and Guidance**

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during the past year. In Utah, however, ADC kills coyotes in preventive situations if loss or damage is anticipated. For example, on national forest lands in Utah, ADC shoots coyotes from helicopters during winter months when the ground is snow-covered and the animals are more easily seen. This activity is undertaken to reduce local coyote populations before moving sheep onto the land the next summer regardless of whether livestock losses have occurred on the lands during the previous summer grazing season. Although ADC headquarters officials told us that such preventive control measures are used only in areas where there has been some historic coyote predation, which tends to reoccur in many areas, we found that this was not true for the majority of cases in Utah during the 1989 aerial shooting season. ADC reported no sheep killed by coyotes in 1988 on 60 percent of the Forest Service grazing allotments in Utah that were subject to aerial shooting from January through March 1989. Also, in Texas and New Mexico, ADC tries to kill all coyotes in and around specific livestock producing areas in order to prevent future losses.

Although nonlethal techniques are not used extensively, in the Forest Service's Mt. Naomi Wilderness Area in Utah, the ADC program began an experimental nonlethal control program in the summer of 1988. This program, an agreement between ADC and the Forest Service, requires that ranchers use guard dogs to protect their sheep from coyotes instead of ADC using aerial hunting. This 3-year program requires that increasing sheep loss thresholds be met before aerial gunning can be used. In the summers of 1988 and 1989, sheep losses did not exceed the established loss thresholds so aerial hunting was not allowed during the following winters.

# ADC Kills Are Not Threatening Statewide Predator Populations

According to officials at state wildlife and cooperative extension service agencies, the Department of Agriculture's Denver Wildlife Research Center, and our analyses, ADC killing of predators is not unduly threatening statewide predator populations. Estimates of predator populations by state fish and game department officials show that the number of predators killed by ADC is small compared with overall predator populations. Also, the number of predators killed by hunting and trapping, which are commonly monitored by state wildlife agencies to maintain predator populations, substantially exceeds the number of predators killed by ADC.

In addition, ADC kills of predators do not have significant effect on many predator populations because ADC operations are performed on only a small portion of most predators' habitats. While not severely affecting statewide predator numbers, predator populations in localized areas within states can be significantly reduced in the short term as a result of ADC killings.

## ADC Kills Are Small Compared With Estimated Predator Populations

Comparisons of ADC kills with estimated overall predator populations show that ADC generally kills a small percentage of predator species annually. Even ADC kills of coyotes, which have historically been the primary predator target of the ADC program and which in fiscal year 1988 totaled about 76,000, annually represent only an estimated 4 to 8 percent of the coyote population in the 17 western states. An annual 75-percent reduction over 50 years would have to occur to exterminate the population of coyotes, according to Denver Wildlife Research Center biologists.

For predators afforded some protection under state game laws, the numbers of ADC kills compared with population estimates show little impact. For example, ADC killed 921, or 1 percent, of the estimated 86,000 gray and red fox and 4, or less than 1 percent, of the estimated 2,800 bobcats in South Dakota in 1987. In 1988, ADC killed 28, or less than 3 percent, of the estimated 1,070 mountain lions in Utah.

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## **ADC Kills Are Small Compared With Legal Hunting and Trapping Kills**

The number of predators killed by ADC is also small when compared with the number of predators killed by hunters and trappers. State wildlife agencies, whose objective is to maintain predator populations while allowing hunting and trapping, consider the number of animals killed by ADC and sportsmen and estimates of the number killed by poachers before establishing hunting and trapping seasons and quotas. In Colorado, for example, in 1988, ADC killed 13 black bears, whereas legal hunters killed 600. Although it is very difficult to establish the number of illegally killed animals, the state estimated that poachers may have killed another 600 black bears. Property owners and livestock producers may have killed another 300 to 600 black bears under state law that allows them to kill predators that are threatening their livestock, according to state wildlife officials. Colorado's game-managing agency considered these numbers in establishing its 1989 black bear season. Table III.1 shows a comparison of the average annual number of animals killed by ADC between 1979 and 1988 with the estimated number killed by hunters and trappers in the 17 western states.

**Appendix III  
ADC Kills Are Not Threatening Statewide  
Predator Populations**

**Table III.1: Summary of Average Annual (1979-88) ADC and Hunting and Trapping Kills**

	Gray fox	Red fox	Kit fox	Swift fox	Coyote	Bobcat	Mountain lion	Black bear	Gray wolf	Grizzly bear
Arizona										
ADC	21	0	1	0	1,528	3	8	10	NP	NP
H&T	20,223 <sup>a</sup>	0	2,657 <sup>a</sup>	0	41,865 <sup>b</sup>	6,602 <sup>b</sup>	231	251	NP	NP
California										
ADC	130	18	0	NP	7,660	41	20	27	NP	NP
H&T	9,653 <sup>c</sup>	0	0	NP	6,435 <sup>c</sup>	8,637	0	1,179	NP	NP
Colorado										
ADC	2	12	0	0	2,510	4	5	11	NP	NP
H&T	1,301	2,644	2,787 <sup>d</sup>	e	35,833	2,684	125	669	NP	NP
Idaho										
ADC	NP	26	NP	NP	3,283	4	2	28	0	0
H&T	NP	2,030	NP	NP	7,163	976	202	NA	0	0
Kansas										
ADC	0	0	NP	0	1	0	NP	NP	NP	NP
H&T	133 <sup>f</sup>	884 <sup>f</sup>	NP	622 <sup>f</sup>	90,403	3,146	NP	NP	NP	NP
Montana										
ADC	NP	733	0	0	4,105	4	1	31	1	1
H&T	NP	7,918	0	0	10,760	1,305 <sup>g</sup>	134	1,257	0	11 <sup>h</sup>
Nebraska										
ADC	0	46	NP	0	1,261	0	NP	NP	NP	NP
H&T	50	2,180	NP	0	21,246	98	NP	NP	NP	NP
Nevada										
ADC	0	NP	5	NP	4,463	6	27	0	NP	NP
H&T	1,059	NP	1,216	NP	10,571	3,164	71	0	NP	NP
New Mexico										
ADC	134	2	86	35	4,537	77	9	0	NP	NP
H&T	6,454 <sup>i</sup>	492 <sup>i</sup>	2,467 <sup>d,i</sup>	e	20,344 <sup>i</sup>	3,218 <sup>i</sup>	90	320	NP	NP
North Dakota										
ADC	0	184	NP	NP	1,319	0	NP	NP	NP	NP
H&T	12	30,880	NP	NP	7,046	63	NP	NP	NP	NP
Oklahoma										
ADC	3	1	NP	0	2,863	8	0	0	NP	NP
H&T	1,394	0	NP	0	6,702	2,864	0	0	NP	NP
Oregon										
ADC	7	64	0	NP	5,867	28	7	65	NP	NP
H&T	332	626	0	NP	8,912	3,698	81	1,134	NP	NP
South Dakota										
ADC	0	696	NP	0	2,223	2	0	NP	NP	NP

(continued)

**Appendix III  
ADC Kills Are Not Threatening Statewide  
Predator Populations**

	<b>Gray fox</b>	<b>Red fox</b>	<b>Kit fox</b>	<b>Swift fox</b>	<b>Coyote</b>	<b>Bobcat</b>	<b>Mountain lion</b>	<b>Black bear</b>	<b>Gray wolf</b>	<b>Grizzly bear</b>
H&T	26	16,913	NP	0	8,754	80	0	NP	NP	NP
Texas										
ADC	608	384	2	7	15,277	497	33	0	NP	NP
H&T	41,206	6,752	900 <sup>i</sup>	310 <sup>i</sup>	61,946	17,887	NA	0	NP	NP
Utah										
ADC	2	54	15	NP	4,473	17	13	10	NP	NP
H&T	1,494 <sup>k</sup>	1,334 <sup>k</sup>	640 <sup>k</sup>	NP	5,604 <sup>k</sup>	1,931	200	35	NP	NP
Washington										
ADC	NP	3	NP	NP	951	2	1	24	0	0
H&T	NP	NA	NP	NP	NA	NA	NA	NA	NA	NA
Wyoming										
ADC	NP	538	NP	0	5,532	9	0	1	NP	0
H&T	NP	8,701	NP	109	8,030	2,686 <sup>l</sup>	52	193	NP	0

Notes:

The ADC average covers fiscal years 1980 through 1988.

Hunting and trapping averages cover the period from the 1979-1980 season through the 1987-1988 season. Numbers are estimates furnished by state wildlife agencies based on their surveys of license-holders and fur dealers and visual inspections of animal carcasses. Hunting and trapping kills for coyotes represent minimums for most states because of survey methods. Estimates based on fur sales may be low due to depressed fur prices, and estimates based on surveying license holders may fail to count coyotes killed without a license.

NP = Not present in state or present only in small numbers.

NA = Not available.

H&T = Hunting and trapping.

<sup>a</sup>Trapping average from 1980-1981 season through 1987-1988 season only.

<sup>b</sup>Includes data from 1985-1986 season through 1987-1988 season only.

<sup>c</sup>Average trapping harvest from 1985-1986 season through 1987-1988 season only.

<sup>d</sup>Average includes both kit and swift fox.

<sup>e</sup>See kit fox.

<sup>f</sup>Averages include data from 1982-1983 season through 1987-1988 season only.

<sup>g</sup>Data from 1985-1986 season only.

<sup>h</sup>In accordance with limited hunting season allowed by Interior regulations implementing the Endangered Species Act of 1973.

<sup>i</sup>Averages include 1979-1980 season through 1986-1987 season only.

<sup>j</sup>Data from 1982-1983 season only.

<sup>k</sup>Averages are from 1981-1982 season through 1987-1988 season only.

<sup>l</sup>Average includes data from 1979-1980 season through 1984-1985 season only.

---

## ADC Controls Predators on a Small Percentage of Their Habitats

ADC field specialists' concentration on a small portion of most predators' habitats also contributes to the low overall impact of ADC activities on predator populations. For example, ADC is active on less than 12 percent of the land area of Texas, and nearly the entire state is coyote habitat. In North Dakota, ADC operates on only about 4 percent of red fox habitat. In California, ADC conducts activities on less than 8 percent of gray fox habitat. Similarly, in Arizona, ADC operates on only about 5 percent of mountain lion and bobcat habitat.

In the case of one of the predators included in our review—the swift fox—ADC may be active on a significant portion of its habitat. The number of swift fox killed by ADC since 1980 does not appear to be large; however, no overall population estimates are available, making it difficult to determine whether this number of kills is significant. The Fish and Wildlife Service is considering listing the swift fox as a threatened or endangered species. Although most of the concern over the swift fox centers on the significant reduction in its habitat as a result of the transformation of native prairies to farmland, current prairie dog and coyote control practices, including the use of poisons, can further reduce swift fox populations.

---

## ADC Activities Can Significantly Affect Local Predator Populations

While ADC killing of predators does not unduly threaten statewide predator populations, ADC actions can significantly reduce predator populations in areas of heavy livestock grazing in the short term. For example, ADC officials intentionally try to kill all coyotes in some local livestock-producing areas in Texas and New Mexico. In Arizona, state wildlife management officials are concerned about the number of black bears killed by ADC field specialists in one county because they have noticed a significant decline in the bear population. Also, ADC killed 44 mountain lions in fiscal year 1989, a considerable increase over the annual average of 8 kills during fiscal years 1980 through 1988. (See table III.1.) State wildlife agencies are often concerned with balancing the interests of environmentalists, livestock producers, hunters and trappers, and others while making sure that state laws concerning wildlife are upheld.

Also, although ADC field specialists do not generally intentionally kill threatened or endangered predator species protected under the Endangered Species Act of 1973 or state wildlife agency regulations, some such predators may be killed by accident or necessity. Threatened or endangered predators may be killed accidentally when they get caught in a trap intended for another type of predator. Intentional kills of

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**Appendix III  
ADC Kills Are Not Threatening Statewide  
Predator Populations**

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threatened or endangered predators generally occur when a specific animal has been identified as causing extensive damage. However, the number of such predators killed is extremely small, according to wildlife management agency officials. For example, one gray wolf was killed by ADC during the 1979-88 time period.

# GAO Review Approach

To determine whether a comprehensive federal policy for predator management exists, we reviewed applicable legislation such as the Animal Damage Control Act of 1931 (7 U.S.C. 426-426c), the Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1543), and the National Environmental Policy Act of 1969 (42 U.S.C. 4321 et seq.). We interviewed officials and reviewed policies of the Department of the Interior's Fish and Wildlife Service and Bureau of Land Management and the Department of Agriculture's U.S. Forest Service and Animal and Plant Health Inspection Service. We also interviewed ADC state directors and district supervisors and reviewed their practices. In addition, we interviewed state wildlife agency personnel and cooperative extension service personnel about the relationship between their activities and ADC activities.

Because predator populations and ADC activities are concentrated in the 17 western states, we reviewed the annual reports of ADC activities in these states. We then selected six states for more detailed review: Arizona, Colorado, Utah, Texas, California, and Kansas. We selected these states because (1) they had a wide range of predator species and different topographical and climatic conditions and (2) they utilized different ADC predator control methods.

To ascertain the effects of ADC killing on predator populations, we interviewed wildlife biologists at the Department of Agriculture's Denver Wildlife Research Center; the cooperative extension services in Kansas, Colorado, Utah, Texas, and California; and state wildlife agencies in the 17 states. We also reviewed studies and statistics on wildlife biology, predator habitats, estimated predator populations, and predator hunting and trapping. Through analysis of such data, we (1) compared the number of ADC kills with predator population estimates, when available; (2) classified predators by type—protected, game animal, unprotected, or varmint—according to state wildlife management practices; (3) calculated the amount of predator habitat covered by ADC activities; and (4) compared the number of predators killed by ADC with the number killed by hunters and trappers.

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# Predator Control Techniques

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A variety of methods can be used to control predators. These methods, defined below, include killing or nonlethal techniques.

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## Aerial Hunting

Coyotes are often shot from fixed-wing aircraft or helicopters. This technique is common in areas with a history of predator damage or the potential for such damage.

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## Calling and Shooting

A device that imitates either a coyote's howl or a rabbit's cry of distress is used to lure coyotes to open land. As the coyotes come out into the open, they are shot.

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## M-44

A metal stake, an ejector, and a capsule containing a poisonous sodium cyanide mixture (called an M-44) is used to poison coyotes, foxes, and wild dogs. When an animal bites and pulls the device, which is baited with scent, the poison is ejected into the animal's mouth. Death follows within seconds.

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## Fencing

Barrier wire or electrical fences can be used in some areas to keep coyotes out of sheep pastures. Portable fencing can be effective in open-range situations.

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## Guard Dogs

Guard dog breeds, such as the Great Pyrenees, Akbash, and Komondor, have been selectively bred for use in protecting livestock, especially sheep, for hundreds of years in Europe and southwestern Asia. The dogs' large size is itself intimidating to predators, and they are trained to stay with sheep and bark at any predators that might approach.

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## Hunting Dogs

Dogs are sometimes used to lure coyotes into the open where the coyotes can be shot. Dogs are also used to track mountain lions and black bears.

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## Scare Devices

Various scare devices to frighten predators away from livestock can be used. These devices include electric lights, portable radios, sirens, and propane cannons. Scare devices are effective only for limited periods of time, however, because predators become used to the light or noise and they are no longer frightened away.

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## Snaring

Snares, which are flexible wire cables, are used to kill predators that crawl under or through fences to prey on domestic livestock. As the predator passes through or under the fence, a loop in the cable encircles its neck. A simple locking device holds the loop closed, so the predator strangles.

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## Toxic Collars

Sheep can be fit with collars that have a rubber bladder filled with a toxic solution. Because coyotes most commonly kill sheep by biting their throats, the collar is designed to rupture when bitten, thereby releasing the poison and killing the coyote.

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## Trapping

Steel leghold and padded-jaw traps baited with a scent attractive to the predator are used. Animals are then generally killed.

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## Denning

Denning involves tracking adult coyotes from livestock kills to their dens, shooting the adults, and throwing a fumigant cartridge into the den to destroy the pups.

# Comments From the Department of Agriculture

Note: GAO comments supplementing those in the report text appear at the end of this appendix.



DEPARTMENT OF AGRICULTURE  
OFFICE OF THE SECRETARY  
WASHINGTON, D. C. 20250

July 3, 1990

Mr. James Duffus III  
Director  
Natural Resources Management Issues  
Resources, Community, and  
Economic Development Division  
General Accounting Office  
Washington, DC 20548

Dear Mr. Duffus:

We reviewed the draft of the General Accounting Office report entitled Wildlife Management: Animal Damage Control Program Effects on Predators. The suggested revisions below include comments by the Animal Damage Control (ADC) entity of the Animal and Plant Health Inspection Service (APHIS) of the USDA. Most of our comments pertain to the clarification of the information provided in the report.

Page 17 - APPENDIX I

Paragraph 1, last sentence. "As much as possible, ADC agents are required to direct their efforts toward the individual offending animal or all predators around heavily grazed areas rather than attempting to eradicate entire Statewide predator populations." ADC never directs control efforts toward all predators. This would include eagles, mountain lions, bears, coyotes, foxes, skunks, raccoons, etc. However, ADC may direct efforts toward an individual animal or local population of predatory animals.

Paragraph 3, second sentence. "For example, in Arizona, State wildlife agency officials told us that black bears caught in steel-jawed traps had to be killed because they became dehydrated after being left in the traps for several days." Non-ADC trappers may have utilized steel-jawed traps in the instance(s) cited by the auditors. ADC policy prohibits the use of steel-jawed traps to capture bears. Only leg snares or neck snares are "set" by ADC to capture bears. Steel-jawed traps have not been utilized by ADC for trapping bears for several years. States have different requirements for frequency of trap checking. This frequency is determined by the State, and ADC abides by the State's decision.

Page 19 - APPENDIX II

Paragraph 1, third sentence. "However, although the ADC policy manual states that nonlethal methods will be given first consideration when practical as a predator damage control technique, little evidence exists of State ADC program personnel employing such methods." Most practical, nonlethal methods actually involve modification of livestock husbandry to include such practices as herding, shed lambing, night confinement, predator-proof fencing, guardian

Now on p. 14  
See comment 1

Now on p. 16.  
See comment 1.

Appendix VI  
Comments From the Department  
of Agriculture

Mr. James Duffus III

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animals, etc. These methods are most appropriately used by the livestock owner rather than ADC personnel, even though ADC routinely recommends nonlethal husbandry methods to producers to help avoid predation. In addition, once predators begin to attack livestock, an ADC Specialist may recommend nonlethal methods for the long term, but may immediately implement lethal control to stop losses.

See comment 1.

Paragraph 1, last sentence. "According to ADC personnel, killing predators to control their damage is used most frequently because killing is the fastest way to minimize losses." ADC recommends nonlethal husbandry methods to producers to help them avoid predation. Selective removal of individual depredatory animals, however, provides an immediate and cost-effective solution to livestock depredation problems.

Now on p. 17.

See comment 2.

Page 20 - APPENDIX II

Paragraph 2, fifth sentence. "This activity {preventive control} is undertaken to reduce local coyote populations before moving sheep onto the land the next summer regardless of whether livestock losses have occurred on the lands during the previous summer grazing season." Preventive control of coyotes is undertaken in areas of historic coyote predation in anticipation of livestock predation during the coming season. Livestock predation by coyotes tends to reoccur in many areas, and ADC personnel have learned to anticipate such losses and act to prevent them if possible.

Now on p. 18.

See comment 1.

Page 22 - APPENDIX III

Paragraph 2, last sentence. "While not severely affecting Statewide predator numbers, predator populations in localized areas within States can be significantly reduced as a result of ADC killings." Our own analysis indicates that this statement is true on a short-term basis only. It is not true on a long-term or permanent basis as implied. The populations are only temporarily reduced in localized areas. The wording in the report implies long-term or even permanent reduction of predator populations.

Now on p. 22.

See comment 1.

Pages 27 & 28 - APPENDIX III

Last sentence. "While ADC killing of predators does not unduly threaten Statewide predator populations, ADC actions can significantly reduce predator populations in areas of heavy livestock grazing." This sentence implies permanent reduction of populations, when it is actually only short-term reduction.

Now on p. 22.

See comment 1.

Page 28 - APPENDIX III

Paragraph 1, first full sentence. "For example, ADC officials intentionally try to kill all coyotes in some livestock-producing areas in Texas and New Mexico." These areas tend to be quite localized. We request that this sentence read ". . . in some local livestock-producing areas . . . ."

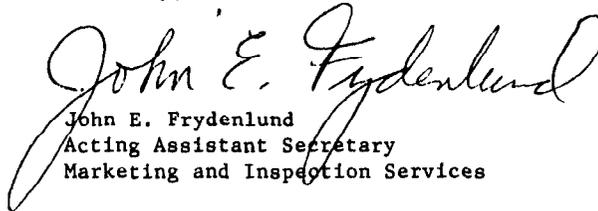
Appendix VI  
Comments From the Department  
of Agriculture

Mr. James Duffus III

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Thank you for the opportunity to review and comment on the draft of your report. We look forward to receiving the final version when it is issued by the General Accounting Office.

Sincerely,

  
John E. Frydenlund  
Acting Assistant Secretary  
Marketing and Inspection Services

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The following are GAO's supplemental comments on the Department of Agriculture's letter dated July 3, 1990.

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## GAO Comments

1. We revised the report where appropriate to reflect these comments.
2. We revised the report to reflect ADC's comment that preventive control of coyotes is undertaken in areas of historic coyote predation and such predation tends to reoccur in many areas. However, we found that this was not true for the majority of cases in Utah during the 1989 aerial shooting season. ADC reported no sheep killed by coyotes in 1988 on 60 percent of the Forest Service grazing allotments in Utah that were subject to aerial shooting from January through March 1989.

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# Major Contributors to This Report

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