

ENVIRONMENTAL ASSESSMENT
WILDLIFE DAMAGE MANAGEMENT
FOR THE PROTECTION OF LIVESTOCK, PROPERTY
AND HUMAN HEALTH AND SAFETY
IN THE CALIFORNIA ADC SACRAMENTO DISTRICT

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U.S. Department of Agriculture
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I. PURPOSE AND NEED FOR THE PROPOSED ACTION

The U.S. Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Animal Damage Control (ADC) program has received requests in the past, and is currently receiving requests, to conduct wildlife damage management in various counties in ADC's Sacramento District (District). The District is made up of the following 10 counties: Colusa, El Dorado, Lake, Marin, Napa, Placer, Sacramento, Solano, Sonoma and Yolo. Cooperative agreements (active and inactive) are in place on approximately 1,237,246 acres or in about 17% of the District's total acreage. During fiscal year (FY) 1995, ADC conducted predator damage management activities on 10.4% of the total acreage within these counties. The ADC Program typically does not conduct activities each year or throughout the year on properties under agreement.

The purpose of predator damage control activities is to reduce or alleviate damage to livestock, primarily sheep, cattle and poultry; threats to human health and safety; and damage to property. This environmental assessment (EA) examined potential impacts of the ADC program as it involves these resource conflicts with predatory animals (coyotes, bobcats, red fox, gray fox, black bear, mountain lion, and feral/free ranging dogs). The ADC program conducts wildlife damage management on localized tracts of private land on a temporary basis, and on Federal and state lands through work plans or cooperative agreements. None of the proposed activities would result in habitat modification. Normally, according to APHIS procedures implementing the National Environmental Policy Act (NEPA), individual predator damage control actions are categorically excluded (7 C.F.R. 372.5(c), 60 Fed. Reg. 6,000, 6,003 (1995)). This EA is prepared to evaluate and determine if there may be any potentially significant or cumulative impacts that may occur as a result of ADC activities.

ADC is the Federal agency authorized and directed to resolve conflicts from animals preying on livestock and wildlife, and for handling animal damage on property and for threats to human health and safety. ADC's authority comes from the Animal Damage Control Act of March 2, 1931, as amended (46 Stat. 1486; 7 U.S.C. 426-426c) and the Rural Development, Agriculture, and Related Agencies Appropriations Act of 1988. The analysis in this EA relies heavily on existing data contained in published documents, primarily the USDA-APHIS-ADC Environmental Impact Statement (ADC EIS) (USDA 1994) to which this environmental assessment (EA) is tiered, and the Final Environmental Document, Sections 265, 460-467, and 472-480, Title 14, California Code of Regulations Regarding: Furbearing and Nongame Mammal Hunting and Trapping (1996) prepared by the State of California, Resources Agency, Department of Fish and Game in compliance with the California Environmental Quality Act (CEQA).

The California Agricultural Commissioners Data (1995) reports that in the Sacramento District, total sheep and lamb production was valued at \$14,673,000 in 1994. Total cattle and calf production was valued at \$91,309,300 in the same year. Livestock lost to predation, according to the latest available USDA-APHIS-ADC Management Information System (MIS) data (1993) for the District totaled 5,597 animals (cattle, calves, sheep, lambs, goats, pigs, llamas, horses, poultry). Table 1 shows the numbers of each livestock species lost to predator species and the

value of the livestock lost. The value of reported livestock lost to predation in the District in 1993 was \$480,275. It can be expected that these figures would be similar for the years 1994, 1995 and 1996 (MIS 1993).

Confirmed losses are verified by an ADC specialist during an actual site visit. The ADC specialist not only confirms that the loss was caused by predators but also must be able to determine which predator species was responsible. Reported losses are those losses reported by the resource owner to the ADC program. Reported losses could be confirmed losses or unconfirmed losses or a combination of both. Some of the reported losses are predator kills that were made before the ADC specialist was contacted for assistance. Others are resource losses where the actual predator species could not be identified by the ADC specialist or the ADC specialist was not available to confirm the damage.

Table 1. Reported Livestock Losses to Predators in the ADC Sacramento District, 1993¹

Livestock Lost	Predation Sources							Total # Lost	Total Value (\$)
	Coyotes	Mountain Lion	Bear	Gray Fox	Bobcat	Dogs	Other ²		
Cattle	4	-	-	-	-	23	-	27	21725
Calves	122	27	-	-	-	47	-	196	89709
Sheep	984	82	12	-	12	181	-	271	92612
Lambs	3251	96	13	-	164	206	18	3748	247973
Goats	52	31	1	-	6	16	-	106	9150
Poultry	44	2	-	9	34	51	91	231	14551
Pigs	-	3	-	-	1	-	-	4	420
Horses	1	-	-	-	-	1	-	2	200
Other ³	-	-	-	-	1	9	2	12	3935
TOTAL	4458	241	26	9	218	534	111	5597	480275

From MIS 1993

¹Reported losses are determined from cooperator surveys and civil agreements.

²Other predator species include red fox, feral dogs, wild pigs, racoons, ravens, and golden eagles.

³Other livestock resources include emus, llamas, and other specialty or exotic livestock.

Connolly (1992) determined that only a fraction of the total predation attributable to coyotes is reported to or confirmed by ADC. He also stated that based on scientific studies and recent livestock loss surveys from the NASS, ADC only confirms about 19% of the total adult sheep and 23% of the lambs actually killed by predators. ADC Specialists do not attempt to locate every head of livestock reported by ranchers to be killed by predators, but rather to verify sufficient losses to determine that a problem exists that requires management action.

During 1995, ADC conducted control activities on Tahoe National Forest. Control work on this area was limited to coyote, bear and lion control. Bear and lion work is initiated after the CDFG issues a depredation permit and the BLM or USFS personnel are notified. Other predator species may be controlled as need arises such as bobcats. In addition, ADC may receive future requests to provide assistance in other National Forests or BLM Resource Areas. ADC does not propose to work on federal lands without reported, confirmed or reasonably anticipated losses based on historical data in the vicinity.

It is important to note that livestock loss numbers on the Tahoe National Forest are not representative of the actual damages that likely occur. ADC confirmed the loss of 3 cows and 2 lambs, however this was from a limited number of livestock permittees for a short period of time. An expanded program would be likely to show more damages since ADC would receive additional loss data from additional livestock permittees.

Statewide losses for sheep and lambs in 1994 included 5,750 head of sheep and 10,800 head of lambs lost to coyotes. Dogs took 925 head of sheep and 1,625 lambs. Also in 1994, 2,275 sheep and 1,850 lambs were lost to mountain lions, and 275 sheep and 325 lambs were lost to bears. Bobcats took 175 lambs, and other species (wild pigs, ravens etc.) accounted for the loss of 125 sheep and 175 lambs. The value of lambs and sheep lost to predators in 1994 was \$587,925 and \$794,750 respectively (NASS, 1995). In 1993 lambs were valued at \$61/head. In 1996 lambs prices increased substantially and would reflect a higher total value for similar losses.

Statewide losses for cattle and calves from predators in 1995 is reported as 1,500 head of cattle and 4,100 calves. Predators that caused these losses were coyotes, dogs, mountain lions, bobcats and others. Cattle lost to predators in 1995 were valued at \$1,235,000 and calves lost to predators were valued at \$1,025,000. (NASS, 1996).

Another important area of responsibility for the ADC Program is the protection of public health and safety. The program responds to health and safety requests in the areas of human/predator conflicts. These requests for assistance may come from cooperative agreements or a memorandum of understanding (MOU) with private land owners, county and city agencies, U.S. Fish and Wildlife Service (FWS), California Department of Health Services, or the California Department of Fish and Game (CDFG).

black bear destroying beehives, or breaking in and destroying the interior of a house, or coyotes causing damage to drip irrigation systems by biting holes in the pipe. In 1994 and 1995 ADC confirmed property damage valued at \$7,380 and \$17,064 respectively in the Sacramento District.

The scope of this document is to address ADC activities necessary for controlling losses of livestock, property and threats to human health and safety from predators. This document does not address nuisance urban wildlife or damage to crops caused by wildlife.

The relationship of this EA to other environmental documents is as follows:

ADC Programmatic EIS. ADC has issued a Final EIS and Record of Decision on the national ADC program (USDA 1994). This EA is tiered to the EIS.

BLM Recourse Management Plans (RMP)/ Management Framework Plans (MFP). The BLM currently uses RMP's and MFP's to guide management on lands they administer. Any future wildlife damage management efforts conducted by ADC would be in accordance with the decisions made from this EA and Work Plans prepared in conjunction with the BLM.

National Forest Land and Resource Management Plans (LRMPs). The National Forest Management ACT (NFMA) requires that each National Forest prepare a Land and Resource Management Plan (LRMP) for guiding long-range management and direction. All ADC activities are in compliance with the LRMP. Any future wildlife damage management efforts conducted by ADC would be in accordance with the decisions made from this EA and work Plans prepared in conjunction with the Forest Service.

National Forest EAs for Wildlife damage Management. Tahoe National Forest has an existing EA for wildlife damage management (USFS 1979). The Mendocino National Forest in the Sacramento District does not currently have an EA prepared, however needs may exist for wildlife damage management. Upon final decision, the Sacramento District ADC EA will supersede the Tahoe Forest EA.

II. ISSUES

The following predator control management issues (developed fully and assessed in the ADC EIS and/or assessed in the CEQA document and/or in this EA) were identified as relevant to this analysis:

1. Effects on target species populations
2. Effects on nontarget species populations, including threatened and endangered (T&E) species

3. Humaneness of control techniques
4. Effects on hunting and nonconsumptive use.
5. Use of toxicants - impacts on public safety and environment
6. Effectiveness of the ADC program
7. Cost effectiveness

Several issues were considered but rejected from detailed analysis from the alternatives since it was determined that the project would have little or no potential to impact these resources. They were:

- ◆ Air quality would not be significantly affected. The ADC EIS (USDA 1994) concluded that impacts on air quality from the methods used by the ADC program are considered negligible.
- ◆ Water quality would not be affected. This proposal does not include construction or discharge of pollutants into waterways and therefore would not require compliance with water quality related regulations or Executive Orders.
- ◆ Soils and vegetation would not be affected since this proposal would not involve any significant ground disturbance.
- ◆ This project would not have a significant impact on cultural resources. Correspondence between ADC and the California Department of Parks and Recreation, Office of Historic Preservation is included in Appendix 6.
- ◆ This project would not have a significant impact on Wilderness Areas (WA). ADC currently does not propose animal damage control work activities on any special management areas in the District. Animal damage control activities are not precluded in special management areas. If ADC were to receive a request to respond to a human health and safety incident, or to a livestock depredation incident, ADC would first consult with the appropriate land management agency to ensure conformance with all applicable regulations and land management plans, and to ensure that control actions would not conflict with land uses or values. Any control work that might be conducted would be extremely limited in scope

III. ALTERNATIVES

The ADC program alternatives must be programmatic. They must encompass the District needs for wildlife damage control. These needs differ requiring the ADC program to be diverse and dynamic. The program under any alternative should be adaptable to the varying situations and needs encountered. Table 2 and 3 compare the methods that would be used in each alternative. Reference these tables for all the alternatives addressed in this EA. Refer to Appendix 1 for detailed descriptions of each method.

Of the 13 alternative courses of action developed in the ADC EIS, the following are relevant to the District Program and were considered in this process:

A. Current Program and "No Action" Alternative

The "No Action" alternative is a procedural NEPA requirement (40 CFR 1502.14(d)), and is a viable and reasonable alternative that could be selected. It will serve as a baseline for comparison with the other alternatives. The No Action alternative is consistent with Council on Environmental Quality's definition (CEQ, 1981). No Action, in this case, is no change from the current program.

This alternative is the integrated wildlife damage management approach alternative and is analyzed and discussed in the ADC EIS (1994). It is composed of a variety of methods that are implemented based on the ADC Decision Model listed below.

ADC Decision Making Process

The ADC EIS describes the procedures used by ADC personnel to determine management strategies or methods applied to specific damage problems (USDA 1994 pp. 2-13, 2-20 to 31 and Appendix N).

As depicted in the Decision Model (Figure 1), consideration is given to the following factors before selecting or recommending control methods and techniques:

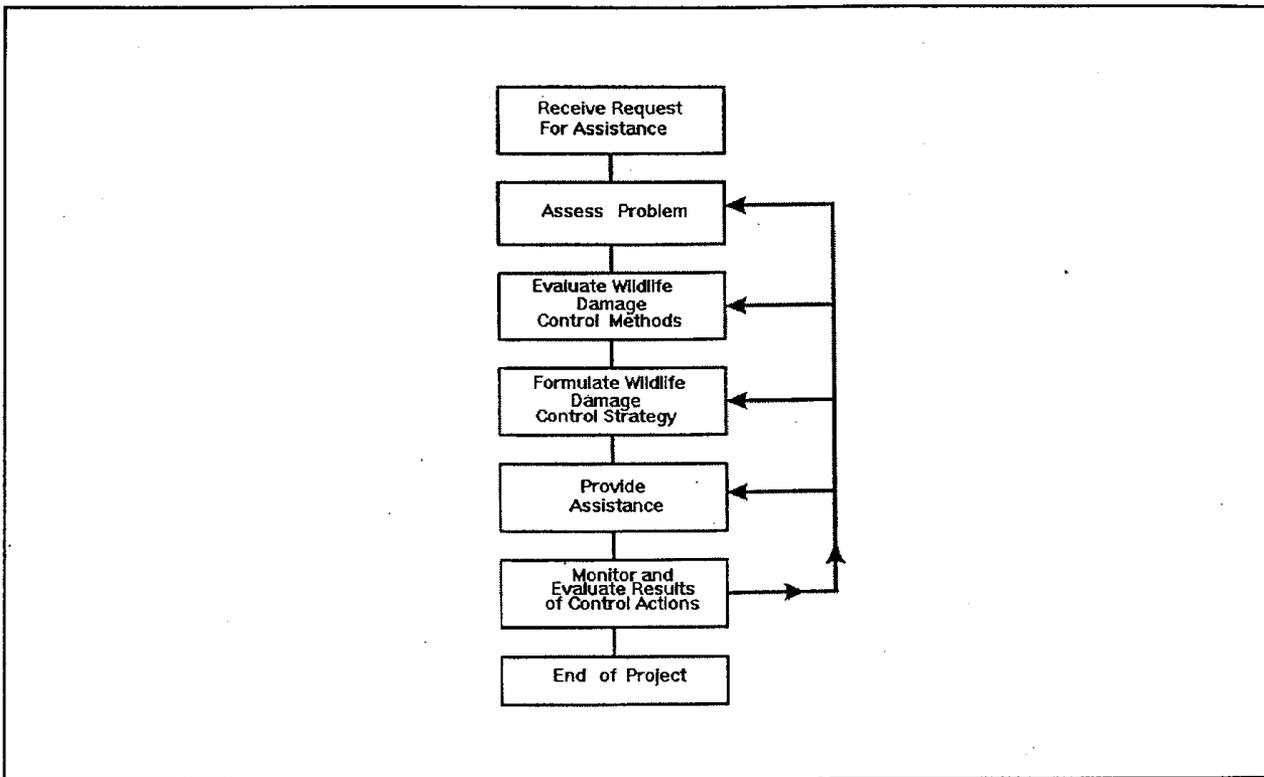
- Species responsible for damage
- Magnitude, geographic extent, frequency, and duration of the problem
- Status of target and nontarget species, including T&E species
- Local environmental conditions
- Potential biological, physical, economic, and social impacts
- Potential legal restrictions

- Costs of control options (the cost of control may sometimes be a secondary concern because of overriding environmental and legal considerations)

The ADC decision making process is a standardized procedure for evaluating and responding to damage complaints. ADC personnel frequently are contacted only after requesters have tried nonlethal techniques and found them to be inadequate for reducing damage to an acceptable level. ADC personnel evaluate the appropriateness of strategies, and methods are evaluated in the context of their availability (legal and administrative) and suitability based on biological, economic and social considerations. Following this evaluation, the methods deemed to be practical for the situation are formed into a management strategy. After the management strategy has been implemented, monitoring is conducted and evaluation continues to assess the effectiveness of the strategy. If the strategy is effective, the need for management is ended. The ADC EIS provides detailed examples of how the ADC Decision Model is implemented for coyote predation to sheep on public and private lands (USDA 1994).

On most ranches, predator damage may occur whenever vulnerable livestock are present, because no cost-effective method or combination of methods that permanently stops or prevents coyote predation are available. When damage continues intermittently over time, the ADC Specialist and rancher monitor and reevaluate the situation frequently. If one method or combination of methods fails to stop damage, a different strategy is implemented.

Figure 1
APHIS ADC Decision Model - Field Level



In terms of the ADC Decision Model, most damage management efforts consist of a continuous feedback loop between receiving the request and monitoring the results with the control strategy reevaluated and revised periodically.

Under the current program, ADC receives requests for assistance from and/or enters into Cooperative Agreements with private landowners, livestock managers, cooperating counties, the Bureau of Land Management (BLM), U.S. Forest Service (USFS), U.S. Fish and Wildlife Service Refuges, California Department of Food and Agriculture (CDFA), California Department of Health Services (CDHS), and the California Department of Fish and Game (CDFG).

ADC has a signed Memoranda of Understanding with the BLM, USFS, CDFG and CDHS to provide wildlife damage management service upon request. Usually requests for control work on BLM and USFS land come from the livestock permittees. Occasionally, the land management agency will request ADC assistance with problem bears destroying property or for public safety concerns dealing with bears and lions. All anticipated ADC activities on USFS and BLM lands would be outlined in ADC work plans for each Forest and Resource Area. Annual coordination

meetings are held between the ADC and personnel from the land management agencies to discuss accomplishments, issues of concern and any anticipated changes in proposed work plans.

Currently, ADC Sacramento District conducts control activities on the Clear Lake Resource Area⁵ and the Tahoe National Forest. Control work on the Folsom Resource Area has been limited to bear and lion damage control. Work is initiated after the CDFG issues a depredation permit and the USFS personnel are notified. However, in the future ADC may provide more assistance upon request on the Tahoe, Mendocino, and El Dorado National Forests

The methods used or proposed in the current program include technical assistance/direct control such as, animal husbandry, fencing, frightening devices, chemical repellents, harassment, leghold and cage traps, snares, shooting, calling/shooting, aerial hunting, M-44's, Livestock Protection Collar (LPC), gas cartridges, and hunting dogs. Refer to Appendix 1 for detailed descriptions of each method.

B. No Federal ADC Predator Damage Management Alternative

This alternative consists of no ADC program. Under this alternative, wildlife damage conflicts would be handled by private resource owners and managers, private contractors, and/or other government agencies. This alternative is discussed in detail in the ADC EIS.

C. Nonlethal Control Only Alternative

This alternative would allow ADC to provide technical information on nonlethal control such as guard dogs, frightening devices, chemical repellents, harassment, fencing, exclusion, animal husbandry, modification of human behavior, habitat modification (see Appendix 1). Information and training on lethal control methods would not be provided by ADC.

No lethal predator damage control activities by ADC would be authorized except when emergency control is necessary for public safety.

D. Compensation for Predator Damage Loss Alternative

The compensation alternative would require the establishment of a system to reimburse producers for predator losses. This alternative is analyzed and discussed in the ADC EIS.

E. Nonlethal Before Lethal Alternative

⁵ADC currently does only minimal work on the Clear Lake Resource Area. Occasionally ADC responds to depredation request on adjacent properties which can result in control work being done on these resource areas.

This alternative would require that: 1) permittees or landowners show evidence of sustained and ongoing use of nonlethal/husbandry techniques aimed at preventing or reducing predation prior to receiving the services of the ADC Program; 2) employees of the ADC Program use or recommend as a priority the use of appropriate nonlethal techniques in response to a confirmed damage situation; and 3) lethal techniques would only be used when the use of husbandry and/or nonlethal controls have failed to keep livestock losses below an acceptable level. This alternative is analyzed and discussed in the ADC EIS.

F. Expanded Program Alternative

An expanded alternative would be contingent upon increased program funding from cooperators and Federal sources, and would increase staffing substantially over the current level. This alternative is similar to Alternative A, but would increase damage control efforts of the current program District wide. Both lethal and nonlethal methods and corrective and preventative management strategies would be allowed, while adhering to applicable state and federal laws and regulations. Preventative control is used as a measure to reduce or eliminate damage before it occurs. Preventative control consist of a range of wildlife damage management techniques both nonlethal and lethal. Preventative damage control efforts would be increased especially in areas where losses to predators have historically occurred or an imminent threat of current losses would occur if livestock were present.

ADC would provide livestock owners with assistance and information concerning the use and effectiveness of nonlethal predator damage control methods and devices. ADC would employ nonlethal predator damage control methods whenever practical, and would recommend such control methods to livestock producers.

G. Summary of Alternatives

Table 2 contains a summary of the predator damage management methods which could be used under each of the alternatives.

Table 3 indicates which management methods would be allowed to be used on the various land classes throughout the District.

Table 2. Summary of the Predator Damage Management Methods							
Management Method	Alternative A* Current Program	Alternative B No Program ⁶	Alternative C Nonlethal	Alternative D Compensation	Alternative E Nonlethal/Ethical	Alternative F** Expanded Program	
Nonlethal	Yes	No	Yes	Yes	Yes	Yes	
Lethal	Yes	No	No	No	Yes	Yes	
M-44s	Yes	No	No	No	Yes	Yes	
Traps	Yes	No	No	No	Yes	Yes	
Neck Snares	Yes	No	No	No	Yes	Yes	
Foot Snares	Yes	No	No	No	Yes	Yes	
Denning	Yes	No	No	No	Yes	Yes	
Aerial Hunting	Yes	No	No	No	Yes	Yes	
Dogs	Yes	No	Yes	No	Yes	Yes	
Calling/ Shooting	Yes	No	No	No	Yes	Yes	
Preventative	Yes	No	No	No	No	Yes	
Livestock Collar	Yes	No	No	No	Yes	Yes	

* Alternatives A and F would both allow for the use of all management methods. The differences are in the geographic scope of the program.

⁶Except for M-44's and LPC, these methods could be used by private individuals or their agents.

Table 3. Possible Predator Damage Control Methods by Land Jurisdiction							
Management Method	Private	State	Bureau Land Management	BLM WSA's ⁷	Forest Service	Forest Service Wilderness	Other Federal Land
Nonlethal	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lethal	Yes	Yes	Yes	Yes	Yes	Yes	Yes
M-44s	Yes	No	Yes	Yes	Yes ⁸	No	No
Traps	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Neck Snares	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Foot Snares	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Denning	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Aerial Hunting	Yes	Yes ⁹	Yes	Yes	Yes	No	Yes
Dogs	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Calling/Shooting	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Preventative	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Livestock Collar	Yes	No	No	No	No	No	No

⁷Activities subject to BLM Interim Management Policy.

⁸Could be used after approval of Pesticide Use Proposal (PUP) by land managing agency. Currently and historically ADC has used no M-44's on public lands.

⁹If in compliance and approved by State Agency

IV. MITIGATION

Mitigation measures are any features of an action that serve to prevent, reduce, or compensate for impacts that otherwise might result from that action. The current ADC program, nationwide and in California, uses many such mitigation measures and these are discussed in detail in Chapter 5 of the ADC EIS (USDA 1994). The key mitigating measures incorporated into all alternatives except Alternative B and considered ADC Standard Operating Procedures (SOP) include:

A. Mitigation in Standard Operating Procedures (SOPs)

- ◆ Traps and snares are not set within 30 feet of exposed carcasses to prevent the capture of scavenging birds. The exception to this is for the capture of black bear because the weight of these target animals allows trap tension adjustments to exclude the capture of smaller nontarget animals.
- ◆ Leghold trap pan tension devices are used throughout the program to reduce capture of nontarget wildlife.
- ◆ Nontarget animals captured in leghold traps or foot snares are released at site of capture unless it is determined by the ADC Specialists that they will not survive.
- ◆ Conspicuous, bilingual warning signs alerting people to the presence of traps, snares, livestock protection collar and M-44's are placed at major access points when they are set in the field.
- ◆ Environmental Protection Agency (EPA) - approved label directions are followed for all pesticide use.
- ◆ All District ADC Specialists who use restricted chemicals and immobilization /euthanasia drugs are trained and certified by program personnel or other experts in the safe and effective use of these materials.
- ◆ The M-44 sodium cyanide devices are used following EPA label requirements (see ADC EIS Appendix Q for label and use restrictions).
- ◆ Research continues to improve the selectivity and humaneness of management devices.
- ◆ Padded traps are used in the Sierra Nevada red fox range within the District as per CDFG regulations and ADC policy.

- ◆ Breakaway snares are being developed and implemented into the program. Breakaway snares are snares designed to break open and release with tension exerted by larger nontarget animals such as deer, antelope and livestock.
- ◆ Traps are inspected daily throughout California per CDFG regulations and ADC policy.
- ◆ Chemical immobilization/euthanasia procedures that do not cause pain are used.
- ◆ All pesticides are registered with the Environmental Protection Agency (EPA) and California Environmental Protection Agency (Cal EPA). Label directions are followed by ADC employees. The ADC Decision Model is designed to identify effective wildlife damage management strategies and their impacts.
- ◆ ADC employees that use pesticides are trained to use each specific material and are certified for the use of pesticides under EPA and Cal EPA approved programs.
- ◆ ADC employees who use pesticides participate in continuing education programs to keep abreast of developments and to maintain their certifications.
- ◆ ADC consulted with the FWS regarding the nationwide program and has implemented all reasonable and prudent alternatives to protect T&E species. ADC has adopted all reasonable and prudent alternatives applicable to the program (see FWS BO 1992).
- ◆ ADC has conducted site specific informal consultation with the FWS for the District program (see Appendix 3).
- ◆ ADC has consulted with the California State Historic Preservation Office (May 20, 1996) and has determined that the program is not likely to affect historic properties or archeological sites (see Appendix 5).
- ◆ Currently, ADC does not work on tribal lands. If ADC receives requests for assistance on tribal lands, it would consult with the tribal leadership in order to identify and resolve any issues of concern to the tribes.

B. ADC Sacramento District Specific Mitigation Measures

- ◆ ADC Work Plans and maps are developed which delineate the areas where and when wildlife damage management occurs and the methods that are used on Federal lands.
- ◆ Management actions are directed toward localized populations or groups and/or individual offending animals, dependent on the species and magnitude of the problem.

- ◆ The use of traps and snares conform to current rules and regulations administered by CDFG.
- ◆ Decisions to relocate or kill problem bear and mountain lions are made by the CDFG.
- ◆ Historically, the ADC Sacramento District program has not used M-44's on public lands. If M-44's are proposed, ADC would consult with the land management to determine any potential conflicts with land use plans.
- ◆ No wildlife damage management is conducted within public safety zones (one-quarter mile or appropriate buffer zone around any residence, community, state or federal highway, or developed recreation site), except to protect human health and safety.

C. Additional Mitigation to avoid Cumulative Impacts

- ◆ District activities are directed towards resolving problems by taking action against individual problem animals, or local populations.
- ◆ ADC take is monitored by considering total animals removed and estimated population numbers of key species. These data are used to assess cumulative effects so as to maintain the magnitude of harvest below the level that would impact the viability of a population (see Section V.).

D. Activities in Wilderness, Wilderness Study Areas, and other Special Management Areas, (BLM and National Forests)

- ◆ ADC does not conduct animal damage control activities in National Parks except for protecting human health and safety or for research purposes as requested by the National Park Service (NPS) or CDFG.
- ◆ Wildlife damage management will be conducted only when and where a need exists.
- ◆ Vehicle access will be limited to existing roads.
- ◆ Wildlife damage management is conducted according to agreements specific in Memoranda of Understanding between cooperating agencies, and as specified in Land and Resource Management Plans.
- ◆ Wildlife damage management follows guidelines as specified in the ADC Work Plan, and developed in cooperation with the land management agency.
- ◆ Wildlife damage management is conducted only with the concurrence of the land management agency.

- ◆ Wildlife damage management follows guidelines as specified in the ADC Work Plans prepared in cooperation with the land management agency.
- ◆ Should any of BLM's existing Wilderness Study Areas (WSA) be officially designated as Wilderness Areas in the future, wildlife damage management would be performed in accordance with BLM Wilderness Management Policy (BLM 1981) and the enacting legislation.
- ◆ If it is necessary to work in areas outside the planned area the area manager or his/her representative will be contacted.
- ◆ In WSAs, ADC work is limited to actions allowed in BLM's Interim Management Policy for Lands Under Wilderness Review (H-8550-1, III. G. 5.) which states:

Animal damage control activities may be permitted as long as the activity is directed at a single offending animal, it will not diminish wilderness values of the WSA, and it will not jeopardize the continued presence of other animals of the same species or any other species specifically authorized by provisions of State law and upon the approval of the BLM State Director.

E. Coordination with other Agencies

- ◆ The ADC program in the District consults with the FWS, Federal land management agencies, and other appropriate agencies regarding program impacts. Frequent contact is made with the BLM and the USFS when ADC is conducting wildlife damage management on public lands administered by these agencies. The BLM and USFS are interested in the levels of livestock killed, injured and harassed by predators and the wildlife damage management methods used to stop or limit losses. The ADC program maintains close coordination with the CDFG and CDFA which have authority to manage wildlife species causing damage.
- ◆ Actions are consistent with ADC mitigation and guidance established from USFS and Resource Management Plans (LRMP) and Bureau of Land Management Resources Management Plans (RMP) and Interim Management Guidelines for WSA's.
- ◆ The ADC program in the Sacramento District is conducted under Cooperative Agreements and MOUs with Federal and state agencies. National MOUs with the BLM and USFS delineate expectations for wildlife damage management on public lands administered by these agencies. ADC work plans are developed with BLM offices and National Forests to detail the activity, target species, and mitigation measures to be implemented on allotments where wildlife damage management is needed.

V. ENVIRONMENTAL CONSEQUENCES

The environmental consequences of each alternative are discussed below with emphasis on the issues relevant to each.

A. The Current Program Alternative

The methods that would be used under the current program are the same as those that have been used in recent years in the District, but would also include the livestock protection collar (LPC, compound 1080, or sodium fluoroacetate). The methods include padded jaw leghold traps, aerial hunting, M-44's (sodium cyanide capsule), shooting, calling/shooting, neck snares, leghold traps, denning (gas cartridge). All methods used in the District are described in Appendix 1, and are fully assessed in the ADC EIS (Chapter 4, Environmental Consequences and Appendix P, Risk Assessment). Shooting and trapping methods are further assessed in the 1996 environmental document required by CEQA (CDFG 1996).

The LPC was approved for use May 4, 1990 by the U.S. Environmental Protection Agency (EPA) and is currently registered for use under an APHIS registration in California, Utah, Virginia, and West Virginia, and registered under individual State registrations in the following states: Texas, New Mexico, Wyoming, Montana and South Dakota. On February 27, 1996 the Cal EPA approved the LPC for use in California. The California ADC specialists using the LPC would first be trained and certified by USDA personnel, in a course approved by Cal-EPA. As with all pesticides, ADC would follow all label instructions. The LPC is fully assessed in the ADC EIS. Appendix 1 contains a description of the LPC. No significant impacts would result from the use of the LPC in the ADC program in Alternative A.

A. 1. Effects on Target Species

Coyote (*Canis latrans*) - Under the current program, the removal of depredating coyotes from the District would likely be similar to numbers taken in recent years. In 1994 and 1995, a total of 898 and 934 coyotes were removed, respectively. Most of the coyotes taken were from privately owned land. The resources protected in order of confirmed¹⁰ economic loss included livestock (lambs, calves, ewes and other livestock), and property (drip irrigation lines).

The coyote population numbers in the state are estimated to be between 227,818 and 1,139,092 after mortality (both from natural causes and by harvest). This estimate includes a potential ADC take of 9,512 coyotes in the state of California. This number includes an additional 30% to account for counties for which ADC currently does not provide assistance

¹⁰ Confirmed losses are those that are verified in the field by an ADC specialist to substantiate that assistance is needed. Confirmed losses are only a fraction of total loss. According to a 1989 survey of producers by National Agricultural Statistics, Survey less than 2 % of wildlife caused losses in the United States are reported to APHIS-ADC (USDA 1994).

(CDFG 1996). Both the ADC EIS and the CEQA document conclude that the impact of the ADC program is not expected to have a significant cumulative impact on the coyote population.

Table 4 shows coyote population dynamics in the District and ADC take compared to the total mortality in the District. More detailed coyote population information can be found in Appendix 2. Population densities vary throughout the District and are reflected in the high and low estimates. The low density (conservative) estimates were used in determining program impacts.

Red fox (*Vulpes vulpes*) - During 1994 and 1995, ADC removed a total of 13 red fox from the District. The numbers of red fox removed are typically this low and are negligible in terms of environmental impact. The red fox removed are not the Sierra Nevada red fox found above 4,000 feet in the Sierra Nevada range. The fox removed are the non-native red fox found in the Sacramento valley and Coastal region of the District (CDFG 1993).

Mountain Lion (*Felis concolor*) - The California Department of Fish and Game (CDFG) manages the mountain lion and issues depredation permits, as per CDFG Code section 4800 - 4809. ADC responds to requests from permit holders or CDFG, to evaluate and resolve lion conflicts, when necessary. ADC removed 13 and 8 lions, respectively in 1994 and 1995. ADC handles mountain lion removal (lethal/nonlethal) on a case-by-case basis, responding only to requests or depredation permits issued by the CDFG. This type of activity is categorically excluded under APHIS - ADC NEPA Implementing Procedures and will not be assessed further.

Black bear (*Ursus americanus*) - ADC receives occasional calls from individuals and CDFG to remove bears from preying on livestock (sheep, cattle, goats, and pigs), causing property damage (bee hives) and threatening human health and safety. ADC removed 1 and 13 black bears in 1994 and 1995, respectively. Like the mountain lion, the bear is managed and permitted for take by the CDFG, is categorically excluded under APHIS-ADC NEPA Implementing Procedures, and will not be assessed further.

Bobcat (*Felis rufus*) - During 1994 and 1995, ADC removed 16 and 15 bobcats, respectively. ADC occasionally responds to requests to resolve bobcat depredation on lambs, kid goats, poultry and pets. ADC program impacts on bobcat in the District and bobcat population numbers are shown below in Table 4. More detailed bobcat population information can be found in Appendix 2. ADC take of bobcat accounts for 0.20 % of the lowest total estimated population. This is not a significant impact.

Table 4. Predator Populations Data							
Species	Mortality	Alternative A Current Program	Alternative B No Program ¹⁾	Alternative C Nonlethal	Alternative D Compensation ²⁾	Alternative E Nonlethal/A.ethyl	Alternative F Expanded Program
Coyote	Population before mortality	31,165 (low) 155,737 (high)	31,165 (low) 155,737 (high)	31,165 (low) 155,737 (high)	31,165 (low) 155,737 (high)	31,165 (low) 155,737 (high)	31,165 (low) 155,737 (high)
	Sport hunting and trapping	4,892	4,892	4,892	4,892	4,892	4,892
	ADC take	916*	0	0	0	916	1,191
	Percent of ADC Take	2.9 (low) .59 (high)	0	0	0	2.9 (low) .59 (high)	3.8 (low) .76 (high)
Bobcat	Total Mortality	14,704 (low) 73,476 (high)	14,704 (low) 73,476 (high)	14,704 (low) 73,476 (high)	14,704 (low) 73,476 (high)	14,704 (low) 73,476 (high)	14,979 (low) 73,751 (high)
	Population before mortality	7,935 (low) 8,367 (high)	7,935 (low) 8,367 (high)	7,935 (low) 8,367 (high)	7,935 (low) 8,367 (high)	7,935 (low) 8,367 (high)	7,935 (low) 8,367 (high)
	Sport hunting and trapping	143	143	143	143	143	143
	ADC take	16*	0	0	0	16	21
Total Mortality	Percent of ADC Take	.20	0	0	0	0.20	0.26
	Total Mortality	2,558 (low)	2,558 (low)	2,558 (low)	2,558 (low)	2,558 (low)	2,563 (low)

¹⁾Except for M-44's and I.P.C., these methods could be used by private individuals or their agents.

		24,344 (low) 74,004 (high)					
Gray Fox	Population before mortality	74	74	74	74	74	74
	Sport hunting and trapping						
	ADC take	22*	0	0	22	29	
	Percent of ADC Take	0.090	0	0	0.090	.119	
	Total Mortality	12,490 (low)	12,490 (low)	12,490 (low)	12,490 (low)	12,497 (low)	

* Average for 1994 and 1995.
From (CDFG 1996) 1996 with adjustments for the Sacramento District

Gray fox (*Urocyon cinereoargenteus*) - ADC responds to requests to resolve conflicts with gray fox when the fox prey on small animals such as pets, rabbits, and poultry. ADC also removes foxes that are a potential human health and safety threat. Gray fox conflicts often occur in residential areas, especially in semi-urban areas. During 1994 and 1995, ADC took 27 and 25 gray fox, respectively. These numbers include all target and non-target gray foxes taken. Table 4 shows gray fox population data and ADC impacts on the population. ADC take accounts for approximately 0.11% of the lowest total estimated population. This is not a significant impact. More detailed gray fox population information can be found in Appendix 2.

Feral or Free Ranging Dogs - In 1994 and 1995 ADC took a total of 21 dogs in the District. Most often, ADC delivers offending dogs to the landowners who then attempt to locate the owners of the dogs (to recover losses), calls the local animal control office, or kills the dog. ADC does not have a significant impact on dogs.

Any reductions in targeted local wildlife as a result of the proposed action would have no major adverse impacts on the species involved or on the species regional populations. Cumulative impacts are expected to be low.

The staff hours and species taken on the different land jurisdictions (Table 5) are for FY 95. The staff hours and species taken under Alternative A will be similar to the data in Table 5.

Table 5 summarizes ADC program efforts and target animals removed on different land classes. Program effort is shown in staff months and percent staff months of total.

Table 5. Work Activities and Effects on Land Jurisdictions During FY 1995							
Land Class	Private	State	Bureau of Land Management	BLM WSA's	Forest Service	Forest Service Wilderness	Other Federal Land
Staff / Months	74.4	0	.01	0	0	0	0.6
%Staff months per land class	99.2	0	.0001	0	0	0	.7999
Acreage	826,939	0	3,200	0	22,000	0	1,390
Coyote taken	919	0	0	0	0	0	10
Bear taken	13	0	0	0	0	0	0
Mt. Lion taken	8	0	0	0	0	0	0
Bobcat taken	15	0	0	0	0	0	0
Gray Fox taken	25	0	0	0	0	0	0

* From MIS 1995

The summary in Table 5 shows that the vast majority of the program effort was aimed at livestock protection on private lands. Under the current program alternative ADC activities on Federal lands constituted .8 % of total staff months, and there were no staff months expended on state lands.

A. 2. Effects on Non-target Species Including Threatened and Endangered Species.

Federally listed species or critical habitat occurring in the project area are listed below:

BIRDS:

Aleutian Canada goose (*Branta canadensis leucopareia*)
American peregrine falcon (*Falco peregrinus anatum*)
bald eagle (*Haliaeetus leucocephalus*)
California brown pelican (*Pelecanus occidentalis californicus*)
California clapper rail (*Rallus longirostris obsoletus*)
northern spotted owl (*Strix occidentalis caurina*)
marbled murrelet (*Brachyramphus marmoratus*)
western snowy plover (*Charadrius alexandrinus nivosus*)

MAMMALS:

salt marsh harvest mouse (*Reithrodontomys raviventris*)
Steller sea-lion (*Eumetopias jubatus*)

REPTILES:

giant garter snake (*Thamnophis gigas*)

AMPHIBIANS:

California red-legged frog (*Rana aurora draytoni*)

FISH:

winter-run chinook salmon (*Oncorhynchus tshawytscha*)
delta smelt (*Hypomesus transpacificus*)
tidewater goby (*Eucyclogobius newberryi*)
Lahontan cutthroat trout (*Oncorhynchus clarki henshawi*)

INVERTEBRATES:

California freshwater shrimp (*Syncaris pacifica*)
Conservancy fairy shrimp (*Branchinecta conservatio*)
vernal pool fairy shrimp (*Branchinecta lynchi*)
vernal pool tadpole shrimp (*Lepidurus packardi*)
valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*)
mission blue butterfly (*Icaricia icarioides missionensis*)

INVERTEBRATES: (cont'd)

Myrtle's silverspot butterfly (*Speyeria zerene myrtleae*)
San Bruno elfin butterfly (*Incisalia mossii bayensis*)
Delta green ground beetle (*Elaphrus viridis*)

PLANTS:

Antioch Dunes evening-primrose (*Oenothera deltoides ssp. howellii*)
Baker's stickyseed (*Blennosperma bakeri*)
beach layia (*Layia carnosa*)
Burke's goldfields (*Lasthenia burkei*)
California sea blite (*Suaeda californica*)
Loch Lomond coyote-thistle (*Eryngium constancei*)
Marin dwarf-flax (*Hesperolinon congestum*)
palmate-bracted bird's-beak (*Cordylanthus palmatus*)
Pennell's bird's-beak (*Cordylanthus tenuis spp. capillaris*)
Pt. Reyes clover lupine (*Lupinus tidestromii var. tidestromii*)
salt marsh bird's-beak (*Cordylanthus maritimus spp. maritimus*)
Sebastopol meadowfoam (*Limnanthes vinculans*)
Solano grass (*Tuctoria mucronata*)
Sonoma spineflower (*Chorizanthe valida*)
Tiburon jewelflower (*Streptanthus niger*)
Tiburon mariposa lily (*Calochortus tiburonensis*)
Tiburon paintbrush (*Castilleja affinis spp. neglecta*)
Tidestrom's clover lupine (*Lupinus tidestromii var. tidestromii*)
Truckee barberry (*Berberis sonnei*)
white-rayed pentachaeta (*Pentachaeta bellidiflora*)

The FWS 1992 Biological Opinion (BO) on the national ADC program listed the following species as likely to be adversely affected by some aspect of the ADC Program (USDA 1994). However, the BO lists reasonable and prudent alternatives to preclude jeopardy to endangered species. The ADC program has adopted all reasonable and prudent alternatives identified in the BO. A detailed analysis of the potential effects to these species may be found in Appendix 3 and 4 in this document and in Appendix P in the ADC EIS (USDA 1994) :

Aleutian Canada goose (*Branta canadensis leucopareia*) - The Sacramento District ADC Program would not likely encounter the goose in its wintering areas, nor does it use the pesticides of concern to the Service (Avitrol, zinc phosphate, and above ground use of strychnine). Therefore, the Sacramento District ADC Program would not likely adversely affect the Aleutian Canada goose.

Bald eagle (*Haliaeetus leucocephalus*) - The Sacramento District ADC program does not use the pesticide of concern to the FWS (above ground use of strychnine). Bald eagles are generalized predators/scavengers primarily adapted to edges of aquatic habitats. Their primary foods are fish

(taken both alive and as carrion), waterfowl, mammalian carrion, and small birds and mammals. The risk of lead poisoning, caused by eagles ingesting lead in predator carcasses killed by shooting, was discussed with the FWS. ADC in California currently uses steel shot in all aerial hunting operations. Carcasses of predators killed with high-powered rifles normally do not retain the lead bullet. Based on an evaluation and discussion with the FWS, ADC has concluded that implementation of the proposed action is not likely to affect the bald eagle. The use of M-44's does not relate to the measures listed by the FWS in their July 1992 BO. Use restrictions for M-44's require that no M-44's be set within 30 feet of a draw station (large piece of meat or large carcass). Therefore the potential to adversely affect eagles by primary toxicity is minimized. There is no chance of secondary poisoning caused by eagles consuming carcasses of target animals since compounds with cyanide are toxic only upon liberation of the hydrogen cyanide gas, which occurs only at primary ingestion. Proposed actions also include the use of the LPC, which contains Compound 1080 (sodium fluoroacetate), but available research suggests that the levels of 1080 residues in coyotes killed by the LPC are so low that their tissues do not present a significant secondary hazard (Burns et al., 1991; Connolly, 1990).

American peregrine falcon (*Falco peregrinus anatum*) - The District program does not use the pesticide of concern to the Service (above ground use of strychnine). The peregrine falcon is a specialized predatory raptor that feeds almost exclusively on birds captured in flight. The use of DRC-1339 was not evaluated in the FWS'S July 1992 BO. DRC-1339 was fully evaluated in the ADC Programmatic EIS Appendix P. Primary toxicity is more toxic to birds than mammals which serves to increase specificity to target species. Toxicity to starlings, blackbirds, crows, and jays occurs from 1 to 10 ppm. Raptors and most mammals have toxicities ranging from 101 - 1,000 ppm. Due to the specialized predatory behavior of the falcon there is no potential for primary toxicity. Available research suggests little, if any, potential for secondary hazard because the compound is rapidly metabolized and excreted and is not accumulated (DeCino et al. 1996, Schafer 1991). Based on ADC'S evaluation and a review of the relevant section of the FWS 1992 BO, ADC has concluded that implementation of its proposed action would not likely adversely affect the peregrine falcon.

Proposed Action and "species not likely to be adversely affected list" for the Sacramento District

California clapper rail (*Rallus longirostris obsoletus*) - is locally common in coastal wetlands and brackish water around San Francisco, Monterey, and Morro bays. There is little opportunity for exposure to ADC program activities.

Western snowy plover (*Charadrius alexandrinus nivosus*) - The western snowy plover's habitat includes sandy marine and estuarine shorelines and found inland along the shore of alkali lakes. ADC Sacramento District control activities do not occur in these habitats therefore ADC would have no effect on the western snowy plover.

Salt marsh harvest mouse (*Reithrodontomys raviventris*) - The salt marsh harvest mouse is found only in saline emergent wetlands of San Francisco Bay and its tributaries. The ADC

program does not use or recommend the use of rodenticides within the home range of the salt marsh harvest mouse. If a need arises for the use of leghold traps within the range of the salt marsh harvest mouse the traps will incorporate a pan tension device to eliminate the capture of smaller non-target animals such as the salt marsh harvest mouse. There is no opportunity for exposure.

California state listed T&E species in the project area are listed below:

BIRDS:

Swainson's hawk (*Buteo swainsoni*)
bank swallow (*Riparia riparia*)
willow flycatcher (*Empidonax traillii*)
great gray owl (*Strix nebulosa*)
western yellow-billed cuckoo (*Coccyzus americanus occidentalis*)
greater sandhill crane (*Grus canadensis tabida*)
bald eagle (*Haliaeetus leucocephalus*) (also listed Federally)
American peregrine falcon (*Falco peregrinus anatum*) (also listed Federally)
California brown pelican (*Pelecanus occidentalis californicus*) (also listed Federally)
marbled murrelet (*Brachyramphus marmoratus*) (also listed Federally)
California black rail (*Lateralis jamaicensis*)
California clapper rail (*Rallus longirostris obsoletus*)

MAMMALS:

riparian brush rabbit (*Sylvilagus bachmani riparius*)
salt marsh harvest mouse (*Reithrodontomys raviventris*)
Sierra Nevada red fox (*Vulpes vulpes necator*)
wolverine (*Gulo gulo*)

REPTILES:

southern rubber boa (*Charina bottae umbratica*)
Alameda whipsnake (*Masticophis lateralis euryxanthus*)
giant garter snake (*Thamnophis couchi gigas*)

Proposed Action and "species not likely to be adversely affected list" for the Sacramento District

Sierra Nevada red fox (*Vulpes vulpes necator*) - The California ADC program uses only padded leghold traps within the range of the Sierra Nevada red fox. Leghold traps incorporate a pan tension device and center swivel with a shock spring to minimize any leg damage. No M-44 devices, neck snares or conibear land sets are used within this range. There has been no recorded take of Sierra Nevada red foxes by ADC field specialists during the last fifteen years. ADC control activities only occur on a small portion of the Sierra Nevada red fox range and are generally limited to summer months. Therefore, the ADC program in the Sacramento District is not likely to affect the Sierra Nevada red fox.

Wolverine (*Gulo gulo*) - The wolverine is a scarce resident of the North Coast mountains and Sierra Nevada. This species inhabits semi-open terrain at or above timberline. The California ADC program uses only padded leghold traps within the range of the wolverine. Leghold traps incorporate a pan tension device and center swivel with a shock spring to minimize any leg damage. No M-44 devices, neck snares or conibear land sets are used within this range. There is no recorded take of wolverine by ADC field specialists. ADC control activities only occur on a small portion of the wolverine's range and are generally limited to summer months. Therefore, the ADC program in the Sacramento District would not likely adversely effect the wolverine.

All species listed above have been fully evaluated on a site specific basis. ADC has consulted with the FWS, Ecological Services and the CDFG concerning the District program's potential to impact Federal and state listed threatened and endangered species. A full analysis is included in the correspondence between the agencies in Appendices 3 and 4. Both agencies have concurred with APHIS-ADC's determination that the program is not likely to adversely impact Federal or state listed species.

Other Non-Target Species

Non-target species taken in the Sacramento District have included mostly gray fox, raccoons, and striped skunks. In FY 1994, 27 non-target animals were taken in the Sacramento District. In FY 1995, 19 non-target animals were taken. Table 6 shows the numbers of non-target species taken during these two years.

Table 6. Non-Target Species Taken									
	Badger	Gray Fox	Jackrabbit	Muskrat	Opossum	Porcupine	Raccoon	Skunk	Total
1994	2	2	0	0	7	0	7	9	27
1995	0	3	5	0	1	0	6	4	19

From MIS 1994, 1995

None of these species were T&E species. These numbers are not significant in terms of impacts on populations. ADC methods are developed to be target specific, and ADC field specialists are trained to provide biologically sound, effective, and accountable solutions to wildlife problems. Non-target species in 1994 and 1995 represented about 2.3 % of the total ADC take in the District. This is not a significant impact.

A. 3. Humaneness

Humaneness is discussed and assessed in the ADC EIS (1994) and the CEQA document (CDFG 1996). The ADC program on a national level has evolved toward using more selective control techniques that reduce unnecessary pain and death. In addition to the National ADC program mitigation, the California ADC program complies with more stringent mitigation measures such as daily trap checks, as required by CDFG. National and California mitigation is listed in Section IV.

The issue of humaneness, as it relates to the killing or capturing of wildlife is an important but very complex concept that can be interpreted in a variety of ways. Humaneness is a person's perception of harm or pain inflicted on an animal, and people may perceive the humaneness of an action differently. Some individuals and groups are opposed to some management actions of ADC. ADC personnel are experienced and professional in their use of management methods so that they are as humane as possible. Professional predator control activities are said to be more humane than Nature because they result in less suffering. However people concerned with animal welfare are concerned with minimizing animal suffering as much as possible, or eliminating unnecessary suffering. The interpretation of what is unnecessary suffering is the point to debate (Schmidt, 1989).

ADC has improved the selectivity of management devices through research and development of pan tension devices, break-away snares, and chemical immobilization/euthanasia procedures that do not cause pain. Research continues to improve selectivity and humaneness of management devices (USDA, 1996).

A. 4. Impacts on Hunting and Non-consumptive Uses

ADC does not significantly impact hunting opportunities because there is no significant impact on game or non-game populations. ADC works mainly on private lands and coordinates with cooperators/landowners about where and when control methods are used, thereby avoiding conflicts with hunters. On Federal lands, ADC coordinates with the land management agency through work plans and removes control equipment before hunting seasons.

The nonconsumptive users (people who enjoy observing wildlife) of furbearing and nongame mammals have not been and are not expected to be significantly affected by damage control of furbearing and nongame mammals (CDFG 1996). ADC restricts its control activities in high use recreational areas. Also, ADC does not remove a significant number of any one species.

A. 5. Use of Toxicants - Impacts on Public Safety and Environment

Some ADC control methods may pose potential hazards to employees and the public if improperly used. However, the health risk to the public is low because ADC methods are used in areas where public access is limited, or where such use poses low risk due to ADC standard

operating procedures. Additionally, warning signs are posted to alert the public when such devices are present. The ADC EIS (Appendix P) provides a detailed risk assessment and documents the low levels of risks associated with methods used by ADC personnel. This assessment includes potential risks to nontarget animals, ADC employees, and the public (USDA 1994). Specimen labels for the LPC, gas cartridge and M-44 are included in Appendix 5.

Currently, ADC does not use M-44's on public lands in California. No hazardous wastes would be generated by this alternative.

A. 6. Program Effectiveness

The effectiveness of the program can be defined in terms of economic losses reduced, public health and safety incidences reduced, and property damage minimized. The effectiveness analysis includes costs of the program to the public, states, and other jurisdictions, and direct and indirect impacts, including costs of impacts on the environment. The current program alternative was compared with the other alternatives in the ADC EIS and was concluded to be the most effective of the alternatives considered (USDA, 1994). The ADC EIS did not analyze an expanded program alternative in detail. The current program could be less effective than an expanded program with additional preventive control.

A. 7. Cost Effectiveness

Council on Environmental Quality (CEQ) regulations (40 CFR 1502.23) do not require a formal, monetized cost-benefit analysis to comply with NEPA. Since a major intent of this EA is to assist agency planning and decision making, this EA will compare the relative costs of the alternatives being considered and the relative benefits to livestock operators and to the public.

It is not possible to accurately determine the number of livestock saved or human health and safety protected from predators by ADC since that number represents losses that never occurred. Using the best information available the ADC EIS concluded that benefits, in terms of avoided sheep and lamb losses plus price benefits to consumers, are 2.4 times the cost of providing ADC predator damage management services for sheep protection in the 16 western states (USDA 1994). A complete discussion of the economics of animal damage control can be found in the ADC EIS (1994).

An economic assessment of the California Cooperative Animal Damage Control program was completed for a 10-year period between 1980 and 1990. The results showed a cost to benefit ratio of 1:8 for direct producer benefits, and a cost to benefit ratio of 1:21 for the general public¹² (USDA 1991).

¹²Economists with the U.S. Department of Agriculture have published studies that indicate the CONSUMER IMPACTS are 2.62 times greater for the public or the consumer of agricultural commodities, than the costs of production and losses on profits received by the agricultural producer of these products.

Variables that would change the cost to benefit ratio of a predator damage management program include: local market values for livestock, age, class and type of livestock preyed upon, management practices, geographic and demographic differences, local laws and regulations and ADC polices, the skill and experience of the individual ADC specialist responding to the damage request, and others.

Cost effectiveness of human safety and wildlife protection cannot be easily determined since they are difficult, if not impossible, to quantify.

Connolly (1981) examined the issue of cost effectiveness of Federal predator control programs and concluded that public policy decisions have been made to steer the program away from being as cost effective as possible. This is because of the elimination of control methods believed to be effective but less environmentally preferable such as toxic baits. Thus, the increased costs of implementing the remaining available methods were to achieve other public benefits besides livestock protection and could be viewed as mitigation for the loss of effectiveness in reducing damage. The ADC EIS stated that "Cost effectiveness is not, nor should it be, the primary goal of the ADC program". Additional constraints, such as environmental protection, land management goals, and others, are considered whenever a request for assistance is received (USDA 1994). These constraints increase the cost of the program while not necessarily increasing its effectiveness, yet they are a vital part of the ADC program.

Regardless of the above constraints, the current program is estimated to be highly cost effective in California's Sacramento District.

B. No Federal ADC Program Alternative

This alternative does not comply with the ADC direction from Congress to provide wildlife damage assistance. However, this alternative was considered in detail in the ADC EIS and was found to have the potential to have significant impacts on target and non-target species, humaneness, public safety, and other resources. It can be assumed that without professional oversight, training, and experience, the environmental consequences of this alternative could be significant.

B. 1. Effects on Target Species Populations

ADC would have no impact on target species under this alternative. However, livestock and property losses would likely increase and cause untrained individuals or groups to use methods that may have a detrimental impact on target species.

B. 2. Effects on Non-target Species Populations, Including T&E Species

ADC would have no effect on nontarget or T&E species. Similar to the effect on target species, this alternative may lead to untrained individuals using unproven techniques and having an adverse impact on nontarget and T&E species.

Under the No Program Alternative, more nontarget animals would be affected (USDA, 1994).

B. 3. Humaneness of Control Techniques

Actions taken by individuals to control predator damage may be less humane than with a Federal program that is accountable to public input and upon which humane interest groups focus their opposition. Fewer people may be aware of actions taken by individuals that may be perceived as inhumane. Thus the perception of inhumane activities will be reduced, although actual occurrence of those activities may increase.

Under this alternative, ADC would have no program, therefore no direct effect on humaneness. However, individuals may conduct lethal controls on their own which could have the potential for increased agricultural losses and unnecessary pain and suffering to target and nontarget species.

B. 4. Effects on Hunting and Nonconsumptive Uses

ADC would not impact hunting and nonconsumptive uses with the No Federal Program Alternative. However, if individuals implement lethal control this could have significant adverse impacts on both the hunting and nonconsumptive user groups, depending on the extent of impacts on target and non-target animals.

B. 5. Use of Toxicants - Impacts on Public Safety and Environment

ADC would have no effect on public safety or the environment under this alternative. Significant negative effects on the environment and human safety may result from untrained and unlicensed individuals using toxicants.

B. 6. Effectiveness of the ADC Program

ADC would have no program, and therefore no effectiveness.

B. 7. Cost Effectiveness

Federal funds would not be expended for ADC services. Damage control costs could be large or small depending on the role of the public sector (USDA 1994). It was estimated that in a statewide "no program" option, monetary losses to producers would be expected to increase an average of four times the present level, based on current research (USDA 1991). Consumer

impacts and producer impacts could be expected to be significant. Therefore, the cost effectiveness under this alternative is estimated to be low (Table 7).

C. Nonlethal Control Only Alternative

The Nonlethal Control Only Alternative is a modification of the Current Program Alternative wherein no lethal technical assistance or direct control would be provided or used by ADC. Both technical assistance and direct control would be provided in the context of a modified integrated pest management approach that administratively constrains ADC personnel to use nonlethal strategies to resolve wildlife damage problems. ADC would only be authorized to conduct lethal control activities in cases of threats to human health and safety.

Under this alternative ADC would be limited to using nonlethal methods, whereas other agencies, organizations, or individuals would be free to carry out necessary lethal control work to resolve wildlife damage. Since nonlethal controls alone do not always prevent or reduce wildlife damage or threats to public health and safety to acceptable levels, other government agencies, private organizations, and individuals would likely assume responsibility for implementing lethal controls necessary to adequately deal with these problems.

C. 1. Effects on Target Species Populations

ADC would have no significant effect on target species under this alternative. However, actions taken by other individuals would possibly have the same impacts as the No ADC Program Alternative when the nonlethal control is not effective in resolving wildlife damage incidents.

C. 2. Effects on Nontarget Species Populations, Including T&E Species

Similarly to the effects on target species, this alternative would have the potential for significant adverse impacts from no action from ADC and from the actions of private individuals. Presumably, many service recipients would become frustrated with ADC's failure to resolve their wildlife damage, and would turn somewhere else for assistance. Significant variability in the level and scope of wildlife damage control activities could occur without a program, and this could have a significant effect on some local wildlife species including those listed as threatened or endangered.

C. 3. Humaneness of Control Techniques

Nonlethal control techniques are generally considered more humane by animal welfare groups. ADC service recipients would approve of nonlethal methods if effective and may conduct lethal controls on their own. This alternative would have the potential for increased agricultural losses and stress to target and non-target species (USDA 1994).

C. 4. Effects on Hunting and Nonconsumptive Uses

ADC would not impact hunting and nonconsumptive uses with the Nonlethal Alternative. However if individuals implement lethal control this could have adverse impacts on both the hunting and nonconsumptive user groups, depending on the effects on target and non-target species, and on the public safety.

C. 5. Use of Toxicants-Impacts on Public Safety and Environment

Most control methods with the potential for negative impacts on the physical environment or human health, such chemical toxicants, would not be used under this control program. The potential for ADC impacts on human health and safety would also be decreased since lethal controls would no longer be used by ADC employees. However, private individuals using unregistered toxicants or using toxicants incorrectly could have significant adverse impacts on public safety and the environment.

C. 6. Effectiveness of the ADC Program

With no lethal control by ADC, livestock and property losses would likely be higher than the current program and expanded program alternatives, because the full array of control techniques would not be available to resolve specific depredation incidences. Nonlethal control is not always effective as a sole alternative because: 1) it does not always resolve depredation problems; 2) it is often not cost effective; 3) it often results in producers needing to use lethal control methods which may sometimes have negative impacts on target and non-target species; and 4) it may cause producers to seek assistance from other agencies that may not have the expertise or authority to resolve depredation problems. This alternative would not be consistent with the ADC decision model (USDA 1994).

C. 7. Cost Effectiveness

Livestock losses would be greater than in the current program (USDA 1994). Federal costs to implement this alternative would be lower than the current program. The number of ADC personnel could be reduced to only those needed to provide technical assistance and make recommendations to landowners or permittees wishing to conduct their own control work. Monies would only be spent on nonlethal operational activities. Livestock owners would likely have to absorb the cost of hiring private control agents or conducting lethal control work themselves. Losses to predators would probably increase substantially, and some sheep operations would probably not be able to afford to stay in business.

D. Compensation for Predator Damage Loss Alternative

The compensation alternative would direct ADC program efforts and resources toward the verification of livestock and poultry losses from predators, and providing monetary

compensation to the producers. ADC services would not include any direct control nor would technical assistance or nonlethal methods be available. This option is not currently available to ADC because ADC is directed by law to protect American agriculture, and a compensation program has not been legally authorized or funded in state. The ADC EIS (USDA 1994) indicated that this alternative has many drawbacks.

D. 1. Effects on Target Species Populations

Under this alternative ADC would not be involved in the removal of target species. However, the use of various control methods by untrained individuals could have a significant adverse impact on target species.

D. 2. Effects on Nontarget Species Populations, Including T&E Species

Impacts on non-target species could be significant without ADC control. See explanations under V.B.2. and V.C.2, the No Program and Nonlethal Control Only Alternatives.

D. 3. Humaneness of Control Techniques

Humaneness would be similar to the No ADC Program Alternative because not all producers would rely on a compensation program, and contrary to the premise that this alternative would avoid killing wildlife, other groups and individuals would probably conduct wildlife damage control including lethal methods (USDA 1994).

D. 4. Effects on Hunting and Nonconsumptive Uses

The effects of this alternative would be the similar to the No ADC Program Alternative.

D. 5. Use of Toxicants - Impacts on Public Safety and Environment

The effects of this alternative would be similar to the No ADC Program Alternative.

D. 6. Effectiveness of the ADC Program

This alternative would be similar to the No ADC Program Alternative.

The ADC program under this alternative would be ineffective in reducing livestock losses. This alternative would only handle compensation directed at livestock losses and would not address human health and safety or property losses.

D. 7. Cost Effectiveness

The funding and authority for this alternative are not in place. Therefore, this is not a viable alternative. However the ADC EIS evaluated the compensation alternative in detail. This alternative would require increased expenditures to investigate and validate all losses, and to determine and administer appropriate compensation. Livestock operators would most likely not receive full market value for livestock lost and many losses may go unverified. Compensation would give little incentive to livestock owners to limit predation through improved animal husbandry practices and other management strategies (USDA 1996).

E. Nonlethal Before Lethal Control Alternative

This alternative could affect ADC's ability to quickly address wildlife threats and damage problems by limiting control actions to nonlethal control methods before lethal measures could be used. Continued or increased threats to livestock producers, property owners, and human safety would be likely to occur due to the restrictions placed on this management alternative.

E. 1. Effects on Target Species Populations

Any reductions in targeted wildlife by ADC as a result of this alternative would have no major adverse impacts to the species involved or to the species District populations. Most sheep and cattle producers already practice some form of nonlethal control. Impacts on target species populations would be similar to the current program.

E. 2. Effects on Nontarget Species Populations, Including T&E Species

Impacts on non-target species would be similar to the Current Program Alternative. Non-target species taken by ADC in 1994 and 1995 represented less than 2% of the total ADC take in the District.

E. 3. Humaneness of Control Techniques

Nonlethal control techniques are generally considered more humane by animal welfare groups. ADC service recipients would approve of nonlethal methods if effective. Individuals may conduct lethal controls on their own. The ADC program on a national level has evolved toward using more selective control techniques that reduce unnecessary pain and death. In California, the ADC program complies with more stringent mitigation measures such as daily trap checks, as required by the CDFG. The livestock industry would argue that domestic animals should be protected from predators because humans have bred the natural defense capabilities out of domestic animals and that humans have a moral obligation to protect these animals from predators (USDA 1994).

E. 4. Effects on Hunting and Nonconsumptive uses

ADC would not significantly impact hunting and nonconsumptive uses with the nonlethal or lethal alternatives. However, if individuals implement lethal control this could have significant adverse impacts on animals used by both hunting and nonconsumptive user groups.

E. 5. Use of Toxicants-Impacts on Public Safety and Environment

ADC would have no adverse effect on the public or the environment with nonlethal control. The effects of the use of toxicants are discussed in detail in the current program alternative section and the ADC EIS (USDA 1994).

E. 6. Effectiveness of the ADC Program

This alternative, at times would not allow ADC to respond to wildlife threats quickly or adequately. Additionally, this alternative is not supported by the ADC EIS and associated Record of Decision or ADC Directive 2.101, which addresses ADC's policy for applying Integrated Wildlife Damage Management.

Wildlife damage management efforts in the District would not cease under this alternative, but ADC's program expertise and techniques would not be fully available to respond to wildlife damage situations. Under this alternative, increased possibilities of wildlife damage and potential threats to human safety would be higher than the current program alternative.

The use on nonlethal methods first may delay effective wildlife damage management and the protection of livestock, property, human health and safety. The current program uses or recommends nonlethal methods in instances in which they are considered likely to be effective. Imposing nonlethal methods as a first option where they are unlikely to resolve a damage situation would be less effective. Under the integrated pest management approach, ADC always considers if nonlethal methods would be effective before lethal methods are considered. Nonlethal methods may also be used or recommended in conjunction with lethal methods that are used to resolve damage incidents.

E. 7. Cost Effectiveness

The cost effectiveness of using nonlethal methods in situations where they are not effective would be low. The cost effectiveness of the nonlethal before lethal methods alternative would be lower than the current program alternative, but higher than the nonlethal methods only alternative.

F. Expanded Program Alternative

F. 1. Effects on Target Species Populations

Under an expanded program, ADC would work on public lands (BLM and USFS) which are not currently covered in work plans or cooperative agreements, and could expand onto all other land classes as permitted by Federal and state laws and regulations. On public lands, the requests would come from grazing permittees primarily, with possible requests for ADC assistance to resolve human health and safety situations involving wildlife from the land managing agencies. If the expanded program involved an increase in funding and staffing, it is likely that more target animals would be removed.

The CEQA analysis of the ADC program included an additional 30% removal over current levels to account for areas not currently worked by ADC in its computation of ADC impacts on coyotes (CDFG 1996). This adjustment is conservative since low density estimates were used in determining program impacts in the CEQA document (CDFG 1996). Therefore, although more coyotes would be removed under this alternative, impacts would still not be significant on coyote numbers. The ADC EIS (USDA 1994) contains a more detailed discussion of maximum harvest levels allowed for coyotes before significant population impacts would occur.

An expanded program would not significantly impact other target species such as red fox, mountain lion, black bear, bobcat, gray fox, and feral dogs. The number of individual animals removed by ADC has been minimal. CDFG (1996) has determined that an increase of 30% would not be significant. ADC does not anticipate increasing its take of target animals over 30% under the expanded program alternative. The take of depredating bears and mountain lions would continue to be permitted by the CDFG and would not be expected to increase substantially.

F. 2. Effects on Nontarget Species Populations, Including Threatened and Endangered (T&E) Species

ADC impacts on non-target animals have been about 2% of its take of target animals (MIS 1994, MIS 1995). Under this alternative, it can be assumed that the non-target take would remain around 2% of total target take. Although the total numbers of non-target animals taken will increase there will not be a significant adverse effect on non-target species populations. ADC has had no adverse impacts on threatened or endangered species, and this would be expected to continue with an expanded program since all precautionary mitigation and standard practices would continue.

F. 3. Humaneness of Control Techniques

The humaneness of control techniques would not change under an expanded program. ADC would continue to use selective and humane techniques.

F. 4. Effects on Hunting and Nonconsumptive Uses

CDFG (1996) has determined that an additional 30% increase in ADC take would not significantly impact hunting and nonconsumptive uses. The discussion under Alternative A. 4 is applicable to this alternative.

F. 5. Use of Toxicants - Impacts on Public Safety and Environment

Impacts on public safety and the environment from toxicants under an expanded program could be higher than the Current Program Alternative due to an increased potential for exposure, but would still be expected to be low. Some ADC control methods may pose potential hazards to employees and the public if improperly used. However, the health risk to the public is low because ADC methods are used in areas where public access is limited, or where such use poses low risk due to ADC standard operating procedures. Additionally, warning signs are posted to alert the public when such devices are present. The ADC EIS (Appendix P) provides a detailed risk assessment and documents the low levels of risks associated with methods used by ADC personnel. This assessment includes potential risks to nontarget animals, ADC employees, and the public (USDA 1994). Specimen labels for the LPC, gas cartridge and M-44 are included in Appendix 5.

F. 6. Effectiveness of the ADC Program

An expanded program would be more effective in terms of losses prevented than any of the other alternatives considered. More effort could be put into preventative control which would prevent losses before they occurred. To some extent, local coyote populations and individuals that prey on sheep would be more effectively removed since some jurisdictional boundaries currently in place would no longer restrict ADC control work.

F. 7. Cost Effectiveness

Expanding the program would increase costs as livestock losses are reduced or prevented. The cost effectiveness of this alternative would be higher than the current program alternative.

The current program and the expanded program alternatives provide the lowest overall negative environmental consequences combined with the highest positive effects (program effectiveness and cost effectiveness), and are therefore the preferred alternatives.

Table 7. Comparison of Overall Effects on Species and Issues From the Alternatives¹³

Issues/ADC Impacts	Alternative A* Current Program	Alternative B No Program	Alternative C Nonlethal	Alternative D Compensation	Alternative E Nonlethal/Lethal	Alternative F* Expanded Program
Coyote	Low	Low	Low	Low	Low	Low
Black Bear	Low	Moderate	Moderate	Moderate	Low	Low
Mt. Lion	Low	Moderate	Moderate	Moderate	Low	Low
Bobcat	Low	Low	Low	Moderate	Low	Low
Gray Fox	Low	Low	Low	Low	Low	Low
Non-target Species	Low	Moderate	Moderate	Low	Low	Low
T/E Species	Low	Moderate	Moderate	Moderate	Low	Low
Humaneness	Low	Moderate	Moderate	Low	Low	Low
Hunting / Non-consumptive	Low	Moderate	Moderate	Low	Low	Low
Toxicants	Low	Moderate	Moderate	Low	Low	Low
Program Effectiveness	High	None	Low	Low	Moderate	High
Cost Effectiveness	High	Low	Low	Low	Moderate	High
WAS ¹⁴	Low	Moderate	Moderate	Low	Low	Low
Cumulative Impacts	Low	Moderate	Moderate	Low	Low	Low

* Alternatives A and F would both allow for the use of all management methods. The differences are in the geographic scope of the program.

¹³ Any action of control or removal would have a negative effect on that individual animal or issue. However, removing an individual predator could have a positive effect on it's prey species.

¹⁴ Wilderness Area (WA) - ADC does not anticipate working in any special management areas such as wilderness areas. However, if ADC receives a request to respond to a human health and safety or livestock depredation incident, ADC would first consult with the land management agency.

The following information was used as the guide (criteria) for the rating of impacts:

LEVEL OF IMPACT			
IMPACT	MAGNITUDE	DURATION	LIKELIHOOD
High (H)	Major	Long Term	Probable
Moderate (M)	Moderate	Intermediate or Long Term	Possible
Low (L)	Minor	Short Term	Possible

Long Term = 10 Years; Intermediate = 2-10 Years; Short term = 1 Year

VI. SUMMARY AND CONCLUSION

A summary of the environmental consequences of each program alternative relative to each issue is presented in Table 7.

The environmental impacts of implementing predator control activities correspond with those raised and discussed in detail in Chapter 4 of the ADC EIS and is further supplemented by reference to the CEQA document (CDFG 1996). Impacts associated with activities under consideration here are not expected to be "significant." Based on experience, impacts of predator control activities considered in this document are very limited in nature. The addition of those impacts to others associated with past, present, and reasonably foreseeable future actions (as described in the ADC EIS and the CEQA document), will not result in cumulatively significant environmental impacts. Monitoring the impacts of the program on populations of both target and non-target species will continue by tracking the number of individuals taken annually and determining the impact through the use of the existing population models. All predator control activities that may take place will comply with relevant laws, regulations, policies, orders, and procedures, including the Endangered Species Act.

This EA will remain valid until ADC and other appropriate agencies determine that new actions or new alternatives having substantially different environmental effects must be analyzed. Change in environmental policies, scope of project or other issues may trigger the need for additional NEPA compliance. This EA will be reviewed periodically for validity.

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APPENDIX 1 - APHIS-ADC WILDLIFE DAMAGE MANAGEMENT METHODS

Methods of Control

Description of Methods

The most effective approach to resolving wildlife damage problems is to integrate the use of several methods, either simultaneously or sequentially. Integrated Pest Management (IPM) is the integration and application of practical methods of prevention and control to reduce damage by wildlife while minimizing harmful effects of control measures on humans, other species, and the environment. IPM may incorporate Resource Management, Physical Exclusion, Wildlife Management, or any combination of these, depending on the characteristics of specific damage problems.

In selecting control techniques for specific damage situations, consideration is given to the responsible species and the magnitude, geographic extent, duration and frequency, and likelihood of wildlife damage. Consideration also must be given to the status of target and potential non-target species, local environmental conditions and impacts, social and legal aspects, and relative costs of control options. The cost of control may sometimes be a secondary concern because of the overriding environmental, legal, and animal welfare considerations. These factors are evaluated in formulating control strategies that incorporate the application of one or more techniques.

A variety of methods are used to accomplish objectives of the current Animal and Plant Health Inspection Service (APHIS) Animal Damage Control (ADC) program. Control strategies are based on applied IPM principles. APHIS ADC employs three general strategies for control of wildlife damage: Resource Management, Physical Exclusion, and Wildlife Management. Each of these approaches is a general strategy or recommendation for addressing wildlife damage situations. Within each approach there are available a number of specific methods or tactics. Selection of the appropriate approach and method is the result of the ADC decision making process outlined in the 1994 ADC EIS, Chapter 2. Mechanical methods generally are used and recommended in preference to chemical pesticides. No pesticide is used or recommended if it is likely to adversely affect fish, wildlife, food safety, or other components of the natural environment.

Various Federal, State, and local statutes and regulations as well as ADC Directives govern ADC use of control tools and substances. The following basic wildlife damage control methods and materials are used or recommended in the direct control and technical assistance efforts of the ADC program:

- Resource Management
 - Animal Husbandry
 - Crop Selection and Planting Schedules
 - Habitat Management
 - Modification of Human Behavior

- Physical Exclusion
 - Fencing

- Sheathing (hardware cloth, solid metal, chain link)
- Tree Protectors
- Entrance Barricades
- Netting, Porcupine Wire (Nixalite), Wire Grids, and Other Methods

- **Wildlife Management**

- Habitat Management
- Lure Crops/Alternate Foods
- Frightening Devices
- Chemical Repellents
- Capture Methods

The methods listed above all have limitations which are defined by the circumstances associated with individual wildlife damage problems. When ADC specialists receive a request for assistance, they consider a wide range of limitations as they apply the decision making process described in the 1994 ADC EIS, Chapter 2, to determine what method(s) to use to resolve a wildlife damage problem. Examples of limitations which must be considered and criteria to evaluate various methods are presented in the 1994 ADC EIS, Appendix N and in the following discussions.

Resource Management

Resource management includes a variety of practices that may be used by agriculture producers to reduce their exposure to potential wildlife depredation losses. Implementation of these practices is appropriate when the potential for depredation can be reduced without significantly increasing the cost of production or diminishing the resource owner's ability to achieve land management and production goals. Changes in resource management are recommended through the technical assistance extended to producers when the change appears to present a continuing means of averting losses.

Animal Husbandry

This general category includes modifications in the level of care and attention given to livestock, shifts in the timing of breeding and births, selection of less vulnerable livestock species to be produced, and the introduction of human custodians or guarding animals to protect livestock.

The level of care or attention given to livestock may range from daily to seasonal. Generally, as the frequency and intensity of livestock handling increase, so does the degree of protection. In operations where livestock are left unattended for extended periods, the risk of depredation is greatest. The risk of depredation can be reduced when operations permit nightly gathering so livestock are unavailable during the hours when predators are most active. Additionally, the risk of depredation is usually greatest with immature livestock. This risk diminishes as age and size increase and can be minimized by holding expectant females in pens or sheds to protect births and by holding newborn livestock in pens for the first 2 weeks. Shifts in breeding schedules can also reduce the risk of depredation by altering the timing of births to coincide with the greatest availability of natural prey to predators or to avoid seasonal concentrations of migrating predators such as golden eagles.

The use of human custodians and guarding animals can also provide significant protection in some instances. The presence of herders to accompany bands of sheep on open range may help ward off predators. Guard dogs have also proven successful in many sheep and goat operations.

Altering animal husbandry to reduce wildlife damage has many limitations. Nightly gathering may not be possible where livestock are in many fenced pastures and where grazing conditions require livestock to scatter. Hiring extra herders, building secure holding pens, and adjusting the timing of births is usually expensive. The timing of births may be related to weather or seasonal marketing of young livestock. The expense associated with a change in husbandry practice may exceed the savings.

The supply of proven guarding dogs is generally quite limited, requiring that most people purchase and rear a pup. Therefore, there is usually a 4-to-8 month period of time necessary to raise a guarding dog before it becomes an effective deterrent to predators. Since 25 to 30 percent of dogs are not successful, there is a reasonable chance that the first dog raised as a protector will not be useful. The effectiveness of guarding dogs may not be sufficient in areas where there is a high density of predators, where livestock widely scatter in order to forage, or where dog-to-livestock ratios are less than recommended. Guarding dogs often harass and kill non-target wildlife.

Crop Selection and Planting Schedules

The choice of crops and the time of planting have a direct bearing on the potential for depredation losses. Some crops are less prone to depredation than others. Crops planted for early or late harvest may have a high potential for wildlife depredation due to the lack of alternate food sources. The composition of native wildlife and their feeding preferences should be considered prior to final selection of crops for production. If migratory wildlife species are involved, it may be possible to regulate the time of planting to reduce or eliminate the availability of vulnerable crops. If altered planting schedules are not feasible, selection of damage-resistant varieties may be possible.

Other resource management approaches include removal of slash, and planting large seedlings immediately after logging to reduce hare and rabbit damage potential; planting or encouraging plant species preferred by deer to improve habitat and reduce the likelihood of browsing damage to commercially grown trees; decreasing cover and foods adjacent to sugar cane to suppress the carrying capacity for rats and other rodents; use of tree species or varieties that are generally resistant to damage by animals; and use of bird-damage resistant hybrids of corn and grain sorghum. In many situations suitable alternative crops might not be available in particular areas or climate zones.

Habitat Management

Change in the architectural design of a building or a public space can often help to avoid potential wildlife damage. For example, selecting species of trees and shrubs that are not attractive to wildlife can reduce the likelihood of potential wildlife damage to parks, public spaces, or residential areas. Similarly, incorporating devices into architectural design that exclude wildlife can significantly reduce potential problems. Grids or screens that prevent birds from entering are an example.

Architectural changes are often more feasible if considered during the design stage, rather than after a facility is built. A consideration of wildlife conflicts is frequently overlooked in the construction of new buildings and facilities. Modifying structures or public spaces to remove the potential for wildlife conflicts is often impractical because of economics or the presence of other nearby habitat features that attract wildlife.

Modification of Human Behavior

ADC may recommend alteration of human behavior to resolve potential conflicts between humans and wildlife. For example, ADC may recommend the elimination of feeding of wildlife that occurs in parks, forest, or residential areas. Many wildlife species adapt well to human settlements and activities, but their proximity to humans may result in damage to structures or threats to public health and safety. Eliminating wildlife feeding and handling can reduce potential problems, but many people who are not directly affected by problems caused by wildlife enjoy wild animals and engage in activities that encourage their presence. It is difficult to consistently enforce no-feeding regulations and to effectively educate all people concerning the potential liabilities of feeding wildlife.

Alter Aircraft Flight Patterns

With respect to airport safety, not all potential danger to human life and aircraft equipment can be dealt with by relocating bird or other wildlife populations. In such cases, ADC may recommend that aircraft flight patterns be altered to reduce potential problems. However, altering operations at airports to decrease the potential for wildlife hazards is not feasible unless an emergency condition exists. Otherwise, the expense of interrupted flights and the limitations of existing facilities make this practice prohibitive.

Physical Exclusion

Physical exclusion methods restrict the access of wildlife to resources. These methods, (including fences, sheathing, netting, porcupine wire, and wire grids) provide a means of appropriate and effective prevention of wildlife damage in many situations. Physical exclusion methods used or recommended by the ADC program are described in the following section.

Fencing

Fences are widely used to prevent damage to farm crops and forest plantations caused by rabbits, deer, and elk. Predator exclusion fences constructed of woven wire or multiple strands of electrified wire are also effective in some areas, but fencing does have limitations. Even an electrified fence is not predator proof and the expense exceeds the benefit in most cases. If large areas are fenced, the predators have to be removed from the enclosed area to make it useful. Some fences inadvertently trap, catch or affect the movement of non-target wildlife. It is not uncommon for coyotes to use fences to trap deer or antelope. Lastly, fencing is not practical or legal in some areas (e.g., restricting access to public land).

Sheathing

Sheathing consists of using hardware cloth, solid metal flashing, or other materials to protect trees from predators or to block entrances to gardens, fish ponds, dwellings, or other areas. Tree protectors are most often used as protection from bears, beavers, or porcupines. Entrance barricades of various kinds are used to exclude bobcats, coyotes, foxes, opossums, raccoons, skunks, or starlings from dwellings, storage areas, gardens, or other areas. Metal flashing may be used to prevent entry of small rodents to buildings. - Sheathing may be impractical where there are numerous plants to protect.

Netting, Porcupine Wire, Wire Grids, and Other Methods

Netting consists of placing plastic or wire nets around livestock pens, fish ponds, or agricultural areas. Currently, "Vexar" plastic mesh seedling protectors are widely used in reforestation to protect newly planted seedling trees against hares, rabbits, deer, elk, and pocket gophers. Wire and plastic netting are also used to exclude a variety of birds and mammals from many crops, roadways, nurseries, poultry operations, and other areas requiring exclusion of animals. Two types of physical barriers frequently used to protect fish

from foraging birds are (1) complete enclosure of ponds and raceways with screen or net and (2) partial exclusion using overhead wires, lines, net, or screen. Complete enclosures are costly but effectively exclude all problem birds. Partial enclosures, such as overhead lines, cost less but may not exclude all bird species. Selection of a barrier system depends on the bird species and expected duration of damage, size of facility, compatibility of the barrier with other operations (e.g., feeding, cleaning, harvesting, etc.), possible damage from severe weather, and effect on site aesthetics. Complete enclosure of ponds and raceways to exclude all fish-eating birds requires 1.5- to 2-inch mesh netting secured to frames or supported by overhead wires. Gates and other openings must also be covered. Some hatchery operators use mesh panels placed directly on raceways to effectively exclude birds. Small mesh netting or wire with less than 1-inch openings, secured to wood or pipe frames, prevents feeding through the panels. Because the panels may interfere with feeding, cleaning, or harvesting operations, they are most appropriate for seasonal or temporary protection.

Ponds or raceways can be protected with overhead wires or braided or monofilament lines suspended horizontally in one direction or in a crossing pattern. Spacing between wires or lines should be based on the species and habits of the birds causing damage.

Perimeter fencing or wire around ponds and raceways provides some protection from wading birds and is most effective for herons. For ponds, fencing at least 3 feet high should be erected in water 2 to 3 feet deep. Small mesh can be used to prevent fish from entering the shallow water. If fences are built in shallow water, birds can easily feed on the pond side of the fence. Raceway fences should be high enough to prevent feeding from the wall. Occasionally, blackbirds will cling to fencing or screening near the water and feed on small fish. A slippery surface created by draping plastic over the fence or screen can be used to eliminate this problem. Electric fences or wires have also been used with limited success. Some areas in need of protection are too large to be protected with netting or overhead wires. This type of exclusion can make routine work around ponds and hatcheries difficult or impossible.

Strips of sharp wire or metal spikes are placed on building ledges to exclude pigeons, sparrows, and other birds. However, many buildings and other structures have exposed surfaces too numerous or large to use wire or metal spikes to exclude birds.

Wildlife Management

Controlling wildlife damage through wildlife management is achieved through the use of a myriad of techniques. The objective of this approach is to alter the behavior of the target animal to eliminate or reduce the potential for loss or damage to property.

Habitat Management

Just as habitat management is an integral part of other wildlife management programs, it also plays an important role in wildlife damage control. The type, quality, and quantity of habitat are directly related to the wildlife that are produced. Therefore, habitat can be managed to not produce or attract certain wildlife species. Most habitat management in the ADC program revolves around airports and bird aircraft strike problems, blackbird and European starling winter roosts, and ground vegetation management to control field rodent populations in orchards and crops.

Habitat management around airports is aimed at eliminating bird nesting, roosting, loafing, or feeding sites. Generally, many bird problems on airport grounds can be minimized through management of vegetation (grass, shrubs, brush, and trees) and water from runway areas.

Habitat management also is often necessary to control damage caused by blackbirds and starlings that form large roosts during late fall and winter. Bird activity can be terminated at a roost site by removing all the trees or selectively thinning the stand. Roosts often will re-form at traditional sites, and substantial habitat alteration is the only way to permanently stop such activity.

Dense rodent populations pose a threat to various agricultural operations such as orchards. Maintaining grass cover at minimum heights is necessary in controlling rodent populations in orchards. Eliminating grass in reforestation areas also aids in reducing vole damage to trees.

Certain areas experience damage as a result of beaver dam construction on streams and rivers. Damage to roadways, railways, earthen dams, buildings, and crops results primarily from flooding, but crop and timber losses can also occur from beaver foraging activities. When used in conjunction with the removal of beaver, selective use of explosives to remove watercourse obstructions is a habitat modification method.

Several measures are available to alleviate pocket gopher damage to forest plantations. Leaving strips of uncut timber between logged areas and gopher-infested areas is recommended to reduce the potential of severe gopher damage problems in clear-cutting operations. Selective cutting and replanting, instead of clear-cutting, are recommended to reduce the potential for gopher damage in some areas. Common forest management practices such as weed and grass control can also reduce gopher populations and damage potential.

Limitations of habitat management as a method of controlling wildlife damage are determined by the characteristics of the species involved, the nature of the damage, economic feasibility, and other factors. Also, legal constraints may exist which preclude altering particular habitats.

Lure Crops/Alternate Foods

When depredation cannot be avoided by careful crop selection or modified planting schedules, lure crops can sometimes be used to mitigate the loss potential. Lure crops are planted or left for consumption by wildlife as an alternative food source. This approach provides relief for critical crops by sacrificing less important or specifically planted fields. For lure crops to be successful, frightening techniques may be necessary in fields where crops are to be protected; wildlife should not be disturbed in sacrificial fields.

Establishing lure crops is expensive, requires considerable time and planning to implement, and may attract other unwanted species to the area, causing additional wildlife damage problems. Also, there are potential legal consequences regarding hunting near lure crops, which must be considered before lure crops or alternate foods are used.

Frightening Devices

The success of frightening methods depends on animals' fear of, and subsequent aversion to offensive stimuli. Once animals become habituated to a stimulus, they often resume their damaging activities. Persistent effort is usually required to consistently apply frightening techniques and then vary them sufficiently to prolong their effectiveness. Over time, some animals learn to ignore commonly used scare tactics. In many cases animals frightened from one location become a problem at another. The effects of frightening devices on non-target wildlife need to be considered. For example, sensitive birds may be disturbed or frightened from nesting sites.

Electronic Distress Sounds

Distress and alarm calls of various animals have been used singly and in conjunction with other scaring devices to successfully scare or harass animals. Many of these sounds are available on records and tapes. Calls should be played back to the animals from either fixed or mobile equipment in the immediate or surrounding area of the problem. Animals react differently to distress calls; their use depends on the species and the problem. Calls may be played for short (few second) bursts, for longer periods, or even continually, depending on the severity of damage and relative effectiveness of different treatment or "playing" times. Some artificially created sounds also repel birds in the same manner as recorded "natural" distress calls.

Propane Exploders

Propane exploders operate on propane gas and are designed to produce loud explosions at controllable intervals. They are strategically located (elevated above the vegetation, if possible) in areas of high wildlife use to frighten wildlife from the problem site. Because animals are known to habituate to sounds, exploders must be moved frequently and used in conjunction with other scare devices. Exploders can be left in an area after dispersal is complete to discourage animals from returning.

Pyrotechnics

Double shotgun shells, known as shell crackers or scare cartridges, are 12-gauge shotgun shells containing a firecracker that is projected up to 75 yards in the air before exploding. They can be used to frighten birds or mammals but are most often used to prevent crop depredation by birds or to discourage birds from undesirable roost locations. The shells should be fired so they explode in front of, or underneath, flocks of birds attempting to enter crop fields or roosts. The purpose is to produce an explosion between the birds and their objective. Birds already in a crop field can be frightened from the field; however, it is extremely difficult to disperse birds that have already settled in a roost.

Noise bombs, whistle bombs, racket bombs, and rocket bombs are fired from 15 millimeter flare pistols. They are used similarly to shellcrackers but are projected for shorter distances. Noise bombs (also called bird bombs) are firecrackers that travel about 75 feet before exploding. Whistle bombs are similar to noise bombs, but whistle in flight and do not explode. They produce a noticeable response because of the trail of smoke and fire, as well as the whistling sound. Racket bombs make a screaming noise in flight and do not explode. Rocket bombs are similar to noise bombs but may travel up to 150 yards before exploding.

A variety of other pyrotechnic devices, including firecrackers, rockets, and Roman candles, are used for dispersing animals. Firecrackers can be inserted in slow-burning fuse ropes to control the timing of each explosion. The interval between explosions is determined by the rate at which the rope burns and the spacing between firecrackers.

Lights

A variety of lights, including strobe, barricade, and revolving units, are used with mixed results to frighten birds. Brilliant lights, similar to those used on aircraft, are most effective in frightening

night-feeding birds. These extremely bright-flashing lights have a blinding effect, causing confusion that reduces the bird's ability to catch fish.

Flashing amber barricade lights, like those used at construction sites, and revolving or moving lights may also frighten birds when these units are placed on raceway walls or fish pond banks. However, most birds rapidly become accustomed to such lights and their long-term effectiveness is questionable. In general, the type of light, the number of units, and their location are determined by the size of the area to be protected and by the power source available.

Water Spray Devices

Water sprays from rotating sprinklers placed at strategic locations in or around ponds or raceways will repel certain birds, particularly gulls. However, individual birds may become accustomed to the spray and feed among the sprinklers. Best results are obtained when high water pressure is used and the sprinklers are operated with an on-off cycle. The sudden startup noise also helps frighten the birds.

Harassment

Scaring and harassment techniques to frighten animals are probably the oldest methods of combating wildlife damage. A number of sophisticated techniques have been developed to scare or harass wildlife from an area. The use of noise-making devices is the most popular and commonly used; however, other methods, including aerial hazing and visual stimuli, are also used. Harassment using vehicles, people, falcons or dogs is used to frighten predators or birds from the immediate vicinity. Boats, planes, automobiles, and all-terrain vehicles are used as harassment methods. As with other wildlife damage control efforts, these techniques tend to be more effective when used collectively in a varied regime rather than individually. However, the continued success of these methods - frequently requires reinforcement by limited shooting (see Shooting).

Other Scaring Devices

Owl decoys, reflective Mylar tape, scarecrows, ribbons, plastic bags, suspended pie pans, and helium-filled balloons may be used as scaring devices. Their effectiveness is enhanced when they are used in conjunction with auditory scare devices. The Electronic Guard, a portable unit that houses a strobe light and siren has been developed by the Denver Wildlife Research Center and is produced by the Pocatello Supply Depot. In certain situations, this device has been used successfully to reduce coyote depredation on sheep. The device activates automatically at nightfall and is programmed to discharge periodically throughout the night. The technique has proven most successful when used at "bedding grounds" where sheep gather to sleep for the night.

Chemical Repellents

Chemical repellents are compounds that prevent consumption of food items or use of an area. They operate by producing an undesirable taste, odor, feel, or behavior pattern.

Effective and practical chemical repellents should be nonhazardous to wildlife; nontoxic to plants, seeds, and humans; resistant to weathering; easily applied; reasonably priced; and capable of

providing good repelling qualities. The reaction of different animals to a single chemical formulation varies, and for any species there may be variations in repellency between different habitat types.

Several paste repellents are used to repel birds around structures. These are grease-like materials that are either sprayed or applied with a caulking gun to window sills, ledges, or similar perches to discourage birds. They are most frequently used in urban areas to control pigeon and starling problems.

Development of chemical repellents is expensive and cost prohibitive in many situations. Chemical repellents are strictly regulated, and suitable repellents are not available for many wildlife species or wildlife damage situations.

Capture Methods

Leghold Traps

Leghold traps are used to capture animals such as the coyote and bobcat. These traps are the most versatile and widely used tool for capturing these species. The leghold trap can be set under a wide variety of conditions but can be difficult to keep in operation during rain, snow, or freezing weather. When placed without baits in the travel lanes of target animals, leghold traps are known as "trail sets." More frequently, traps are placed as "baited sets," meaning that they are used with a bait consisting of the animal's preferred food or some other lure, such as fetid meat, urine, or musk, to attract the animal. In some situations a "draw station," such as a carcass or large piece of meat, is used to attract target animals. In this approach, one to several traps are placed in the vicinity of the draw station. ADC program policy prohibits placement of traps closer than 30 feet to the draw station. This provides protection to scavenging birds.

Various tension devices can be used to prevent animals smaller than target animals from springing the trap. Effective trap placement also contributes to trap selectivity; however, livestock and non-target animals may still be captured. These traps usually permit the release of non-target animals.

Before leghold traps are employed, their limitations must be considered. Injury to target and non-target animals, including livestock, may occur. Weather and the skill of the user will often determine the success or failure of the leghold trap in preventing or stopping wildlife damage.

Cage Traps

A variety of cage traps are used in different wildlife damage control efforts. The most commonly known cage traps used in the current program are box traps. Box traps are usually rectangular, made from wood or heavy gauge mesh wire. These traps are used to capture animals alive and can often be used where many lethal or more dangerous tools would be too hazardous. Box traps are well suited for use in residential areas.

Cage traps usually work best when baited with foods attractive to the target animal. They are used to capture animals ranging in size from mice to deer, but are usually impractical in capturing most large animals. They are virtually ineffective for coyotes; however, large cage traps work well to capture bears and have shown promise for capturing mountain lions, provided the traps can be transported by vehicle to the control sites.

Cage traps made of flexible mesh wire are effective for capturing beaver in some situations. Resembling fully or partially open suitcases when set, these traps are best suited for use in fairly shallow water at the beavers' entrance and exit routes or in water travel lanes. The traps can be baited with an ear of corn or a fresh piece of aspen, cottonwood, willow, or other woody plant.

Large decoy traps, modeled after the Australian crow trap, are used to capture starlings, blackbirds, crows, and ravens. They are large screen enclosures with the access modified to suit the target species. A few live birds are maintained in the baited trap to attract birds of the same species and, as such, act as decoys. Non-target species are released unharmed.

There are some animals that avoid cage traps and others that become "trap happy" and purposely get captured to eat the bait, making the trap unavailable to catch other animals. Cage traps must be checked frequently to ensure that captured animals are not subjected to extreme environmental conditions. Some animals fight to escape from cage traps and become injured.

Snares

Snares made of wire or cable are among the oldest existing control tools. They can be used effectively to catch most species but are most frequently used to capture coyotes, beaver, and bears. They have limited application but are effective when used under proper conditions. They are much lighter and easier to use than leghold traps and are not generally affected by inclement weather.

Snares may be employed as either lethal or live-capture devices depending on how and where they are set. Snares set to capture an animal by the neck are usually lethal but stops can be applied to the cable to make the snare a live capture device. Snares positioned to capture the animal around the body can be useful live-capture devices. Also, most snares incorporate a breakaway feature to release non-target wildlife and livestock. These snares can be effectively used wherever a target animal moves through a restricted lane of travel (i.e., "crawls" under fences, trails through vegetation, or den entrances). When an animal moves forward into the loop formed by the cable, the noose tightens and the animal is held.

The foot or leg snare is a spring-powered nonlethal device, activated when an animal places its foot on the trigger. Foot snares are used effectively to capture black bears. In some situations using snares to capture wildlife is impractical due to the behavior or animal morphology of the animal, or the location of many wildlife conflicts. Snares must be set in locations where the likelihood of capturing non-target animals is minimized.

The catch-pole snare is used to capture or safely handle problem animals. This device consists of a hollow pipe with an internal cable or rope that forms an adjustable noose at one end. The free end of the cable or rope extends through a locking mechanism on the end opposite of the noose. By pulling on the free end of the cable or rope, the size of the noose is reduced sufficiently to hold an animal. Catch poles are used primarily to remove live animals from traps without danger to or from the captured animal.

Quick-Kill Traps

A number of specialized "quick-kill" traps are used in wildlife damage control work. They include Conibear, snap, gopher, and mole traps.

Conibear traps are used mostly in shallow water or underwater to capture muskrat, nutria, and beaver. The Conibear consists of a pair of rectangular wire frames that close like scissors when triggered, killing the captured animal with a quick body blow. Conibear traps have the added features of being lightweight and easily set.

Snap traps are common household rat or mouse traps usually placed in buildings. These traps are often used to collect and identify rodent species that cause damage so that species-specific control tools can be applied. If an infestation is minor, these traps may be used as the primary means of control. Glue boards (composed of shallow, flat containers of an extremely sticky substance) are also used as an alternative to snap traps.

Spring-powered harpoon traps are used to control damage caused by surface-tunneling moles. Soil is pressed down in an active tunnel and the trap is placed at that point. When the mole reopens the tunnel, it triggers the trap and is killed. Two variations of scissor-like traps are also used in burrows for both mole and pocket gopher population control.

Some quick-kill traps are potentially dangerous to people and cannot be used in populated areas. Quick-kill traps are available only for a limited number of species.

Denning

Denning is the practice of seeking out the dens of depredating coyotes or red fox and destroying the young, adults, or both to stop or prevent depredations on livestock. Denning is used in coyote damage control efforts primarily in the western States. The usefulness of denning as a damage control method is limited because coyote dens are difficult to locate in many parts of the country and den use is restricted to approximately 2 to 3 months during the spring.

Coyote depredations on livestock and poultry often increase in the spring and early summer because of the increased food requirements caused by the need to feed pups. The removal of pups will often stop depredations even though the adults are not taken. When the adults are taken it is customary to kill the pups to prevent their starvation. In this method, pups are removed from dens by excavation and then shot, or they are killed in the den with a registered fumigant. Denning is highly selective for the target species and family groups responsible for damage. Den hunting for adult coyotes and their young is often combined with calling and shooting. Denning can be labor intensive with no guarantee of finding the den of the target animal.

Shooting

Shooting is used selectively for target species but may be relatively expensive because of the staff hours sometimes required. Nevertheless, shooting is an essential control method. Removal of one or two problem woodpeckers, for example, can stop extensive woodpecker damage to residences or other buildings. Removal of beaver may be achieved by night shooting because beaver are primarily active at that time. Many airports have perimeter fences for security purposes that also confine resident deer populations. These deer frequently stray onto active runways and pose a significant threat to aircraft. Removal of these deer may be effectively achieved by shooting.

Lethal reinforcement through shooting is often necessary to ensure the continued success in bird scaring and harassment efforts (see the discussion on shooting under Modification of Human Behavior). This is especially important where birds are drawn by ripening crops, aquaculture and

mariculture facilities, sanitary landfills, and other locations where food is readily available. In situations where the feeding instinct is strong, most birds quickly adapt to scaring and harassment efforts unless the control program is periodically supplemented by shooting.

Shooting is frequently performed in conjunction with calling particular predators such as coyotes, bobcats, and fox. Trap-wise coyotes are often vulnerable to calling. Shooting is limited to locations where it is legal and safe to discharge firearms. Shooting may be ineffective for controlling damage by some species and may actually be detrimental to control efforts.

Aerial Shooting

Shooting from aircraft, or aerial hunting, is a commonly used coyote damage control method. Aerial hunting is species-selective and can be used for immediate control where livestock losses are severe if weather, terrain, and cover conditions are favorable. Aerial hunting can be effective in removing offending coyotes that have become "bait-shy" or are not susceptible to calling and shooting. Local depredation problems can often be quickly resolved by the use of aerial hunting.

Fixed-wing aircraft are useful for aerial hunting over flat and gently rolling terrain. Because of their maneuverability, helicopters have greater utility and are safer over , timbered areas, or broken land where animals are more difficult to spot. In broken timber or deciduous ground cover, aerial hunting is more effective in winter when snow cover improves visibility.

The ADC program aircraft-use policy helps ensure that aerial hunting is conducted in a safe and environmentally sound manner, in accordance with Federal and State laws. Pilots and aircraft must be certified under established ADC program procedures. Only properly trained ADC program employees are approved as gunners.

Hunting Dogs

Dogs are essential to successful hunting of mountain lion and bear. Dogs trained for coyote denning are also valuable in luring adult coyotes to be shot. Trained dogs are used primarily to locate, pursue, or decoy animals. Training and maintaining suitable dogs requires considerable skill, effort, and expense. There must be sufficient need for dogs to make the effort worthwhile.

Egg, Nest, and Hatchling Removal and Destruction

Nesting populations of cattle egrets and gulls, especially if located near airports, may pose a threat to public health and safety, as well as equipment. Pigeons and starlings can also cause extensive damage to public facilities. Egg and nest destruction is used mainly to control or limit the growth of a nesting population in a specific area through limiting reproduction of offspring or removal of nest to other locations. Egg and nest destruction is practiced by manual removal of the eggs or nest.

This method is practical only during a relatively short time interval and requires skill to properly identify the eggs and hatchlings of target species. Some species may persist in nesting and the laying of eggs, making this method ineffective.

Chemical immobilizing agents

Alpha-chloralose is an immobilizing agent used to capture and remove nuisance waterfowl and other birds (e.g., pigeons). It is typically used in recreational and residential areas, such as swimming pools, shoreline residential areas, golf courses, or resorts. Single bread or corn baits are fed directly to the target waterfowl, while corn baits are placed in feeding areas to capture pigeons. ADC personnel are present at the site of application during baiting to retrieve the immobilized birds. Unconsumed baits are removed from the site following each treatment.

Chemical Toxicants

Several toxic chemicals have been developed to control wildlife damage and are widely used because of their efficiency. Toxicants are generally not species specific, and their use may be hazardous unless used with care by knowledgeable personnel. The proper placement, size, type of bait, and time of year are keys to selectivity and successful control. Development of appropriate toxicants is expensive, and the path to a suitable end product is filled with legal and administrative hurdles. Few private companies are inclined to undertake such a venture. Most chemicals are aimed at a specific target species, and suitable chemicals are not available for most animals. Available delivery systems make the use of chemical toxicants unsuitable in many wildlife damage situations. This section describes the chemical toxicants used in the present ADC program.

Sodium cyanide is used in the M-44, a spring-activated ejector device developed specifically to kill coyotes and other canine predators. The M-44 device consists of a capsule holder wrapped with fur, cloth, or wool; a capsule containing 0.8 gram of powdered sodium cyanide; an ejector mechanism; and a 5- to 7-inch hollow stake. The hollow stake is driven into the ground, the ejector unit is cocked and placed in the stake, and the capsule holder containing the cyanide capsule is screwed onto the ejector unit. A fetid meat bait is spread on the capsule holder. An animal attracted by the bait will try to pick up or pull the baited capsule holder. When the M-44 is pulled, a spring-activated plunger propels sodium cyanide into the animal's mouth.

Compound 1080, or sodium fluoroacetate, has been widely used as a rodenticide since the mid-1940s. It was also used in predicide baits prior to 1972. Currently, the only registered use of this chemical is in controlling predators with the Livestock Protection Collar (LP Collar).

Fumigants or gases used to control burrowing wildlife are efficient but often expensive. In the ADC program, fumigants are only used in rodent burrows and in predator dens. The ADC program manufactures at the Pocatello Supply Depot, and uses den cartridges especially formulated for these purposes. The cartridges are placed in the active burrows of target animals, the fuse is lit, and the entrance is then tightly sealed with soil. The burning cartridge causes death by oxygen depletion and carbon monoxide poisoning.

Starlicide baits, containing DRC-1339, are commercially available to control starlings and blackbirds in cattle and hog feedlots and poultry yards. DRC-1339 is highly toxic to starlings and blackbirds, well accepted by these species, relatively nontoxic to mammals, and generally of low toxicity to most other birds. Poultry pellet baits are placed in feeding stations or scattered outside feed bunkers. After ingesting the baits, most of the birds die away from the roost site. This material is most effective in northern areas when snow covers most food supplies, causing starlings to congregate in feedlots. Starlicide is available to the public only in poultry pellets containing a low concentration of the chemical. Best results with this formulation are achieved when similar pellets are being used as livestock feed in the problem area.

DRC-1339 concentrate is used effectively in hard-boiled eggs to control raven damage under several State-specific registrations for the protection of livestock and certain endangered species. It is also registered for application on various materials, such as grain, meat baits, sandwich bread, and cull French fries to control pigeons, gulls, crows, ravens, blackbirds, and starlings. DRC-1339 concentrate is only available for use under ADC program supervision.

APPENDIX 2 -PREDATOR POPULATION MODELS

Predicted Coyote Population Information - Sacramento District	
Total Acres of Habitat, Sacramento District	7,156,000
Total Square Miles	11,181
Density (Individuals per square mile)	1.00 (low) 5.00 (high)
Sex Ratio	0.5
Female Breeding Success	0.65
Litter Size	5.50
Adult Mortality (estimate)	0.35
Juvenile Mortality	0.54
Total Adults	11,181 (low) 55,905 (high)
Breeding Females	5,590 (low) 27,925 (high)
Young at Den	19,984 (low) 99,832 (high)
Population Before Mortality	31,165 (low) 155,737 (high)
Juvenile Mortality	10,791 (low) 53,909 (high)
Adult Mortality	3,913 (low) 19,567 (high)
Animal Damage Control	916
Sport Hunting and Trapping	4,892
Total Mortality	14,704 (low) 73,476 (high)
Percentage of APHIS-ADC Take Of total mortality	6.2
Of population	2.9

From CEQA (1996) with revisions for the APHIS-ADC California Sacramento District from State of California, 1990.

Predicted Bobcat Population Information - Sacramento District	
Total Acres of Habitat, Sacramento District	5,382,000
Total Square Miles	8,409
Density (Individuals per square mile)	0.55 (low) 0.58 (high)
Sex Ratio	0.50
Female Breeding Success	0.53
Litter Size	2.70
Adult Mortality (estimate)	0.41
Juvenile Mortality	0.20
Total Adults	4,625 (low) 4,877 (high)
Breeding Females	2,313 (low) 2,439 (high)
Young at Den	3,310 (low) 3,490 (high)
Population Before Mortality	7,935 (low) 8,367 (high)
Juvenile Mortality	662 (low) 698 (high)
Adult Mortality	1,896 (low) 2,000 (high)
Animal Damage Control	16
Sport Hunting and Trapping	143
Total Mortality	2,558
Percentage of APHIS-ADC Take	
Of total mortality	0.63
Of population	0.20

From CEQA (1996) with revisions for the APHIS-ADC California Sacramento District

Predicted Gray Fox Population Information - Sacramento District	
Total Acres of Habitat, Sacramento District	5,777,580
Total Square Miles	9,027
Density (Individuals per square mile)	1.00 (low) 3.04 (high)
Sex Ratio	0.47
Female Breeding Success	0.95
Litter Size	3.80
Adult Mortality (estimate)	0.62
Juvenile Mortality	0.45
Total Adults	9,027 (low) 27,442 (high)
Breeding Females	4,243 (low) 12,898 (high)
Young at Den	15,317 (low) 46,562 (high)
Population Before Mortality	24,344 (low) 74,004 (high)
Juvenile Mortality	6,893 (low) 20,953 (high)
Adult Mortality	5,597 (low) 17,014 (high)
Animal Damage Control	26
Sport Hunting and Trapping	74
Total Mortality	12,490
Percentage of APHIS-ADC Take Of total mortality	0.21
Of population	0.11

From CEQA (1996) with revisions for the APHIS-ADC California Sacramento District from State of California, 1990.

APPENDIX 3 - U.S. FISH AND WILDLIFE SERVICE CORRESPONDENCE



United States
Department of
Agriculture

Animal and
Plant Health
Inspection
Service

Animal Damage
Control

Federal Building
Room W-2316
2800 Cottage Way
Sacramento, CA 95825

October 3, 1996

Mr. Joel Medlin
U.S. Fish and Wildlife Service
Ecological Services, Sacramento Field Office
2800 Cottage Way, Rm. E.1803
Sacramento, CA. 95825-1846

Dear Mr. Medlin;

The purpose of this letter is to request an informal consultation and concurrence of findings pursuant to Section 7 of the Endangered Species Act for those listed species found in the ADC California Sacramento District. We have reviewed the species list provided by your office on July 30, 1996 and have evaluated our proposed action in relation to potential impacts it may have on threatened and endangered (T&E) species occurring within our analysis area. The U.S. Fish and Wildlife Service's (FWS) July 28, 1992 Biological Opinion (BO) (Attachment A) reviewed and analyzed ADC programmatic activities. Those findings are pertinent to this review since ADC is currently adhering to all of the applicable "reasonable and prudent measures" stipulated to preclude jeopardy and minimize incidental take of listed species.

Please let us know if you concur with our assessment of the impacts of our proposed action on all of the listed species within this biological assessment project area.

Sincerely,

John E. Steuber
Assistant State Director
California State Office

Enclosures:

Biological Assessment - ADC California Biological Assessment



I. INTRODUCTION

The purpose of this document is to evaluate the effects of the of the Animal Damage Control (ADC) program in the California ADC Sacramento District on the habitat and continued existence of Threatened and Endangered (T&E) fish and wildlife species which may be in the project area or affected by activities occurring within the project area. The Biological Assessment (BA) is prepared in accordance with legal requirements set forth under section 7 of the Endangered Species Act [19 U.S.C. 1536 (c)].

The following list was provided by the Sacramento Field Office, Ecological Services of the U.S. Fish and Wildlife Service 30 July 1996. This Biological Assessment addresses the following species:

BIRDS:

Aleutian Canada goose (*Branta canadensis leucopareia*)
American peregrine falcon (*Falco peregrinus anatum*)
bald eagle (*Haliaeetus leucocephalus*)
California brown pelican (*Pelecanus occidentalis californicus*)
California clapper rail (*Rallus longirostris obsoletus*)
marbled murrelet (*Brachyramphus marmoratus*)
northern spotted owl (*Strix occidentalis caurina*)
western snowy plover (*Charadrius alexandrinus nivosus*)

MAMMALS:

salt marsh harvest mouse (*Reithrodontomys raviventris*)

REPTILES:

giant garter snake (*Thamnophis gigas*)

AMPHIBIANS:

California red-legged frog (*Rana aurora draytoni*)

FISH:

delta smelt (*Hypomesus transpacificus*)
tidewater goby (*Eucyclogobius newberryi*)
winter-run chinook salmon (*Oncorhynchus tshawytscha*)
Lahontan cutthroat trout (*Oncorhynchus clarki henshawi*)

INVERTEBRATES:

California freshwater shrimp (*Syncaris pacifica*)
Conservancy fairy shrimp (*Branchinecta conservatio*)
Delta green ground beetle (*Elaphrus viridis*)
mission blue butterfly (*Icaricia icariodes missionensis*)
Myrtle's silverspot butterfly (*Speyeria zerene myrtleae*)
San Bruno elfin butterfly (*Incisalia mossii bayensis*)
valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*)
vernal pool fairy shrimp (*Branchinecta lynchi*)
vernal pool tadpole shrimp (*Lepidurus packardi*)

PLANTS

Antioch Dunes evening-primrose (*Oenothera deltooides* ssp. *howellii*)
Baker's stickyseed (*Blennosperma bakeri*)
beach layia (*Layia carnosae*)
Burke's goldfields (*Lasthenia burkei*)
California sea blite (*Suaeda californica*)
Loch Lomond coyote-thistle (*Eryngium constancei*)
Marin dwarf-flax (*Hesperolinon congestum*)
palmate-bracted bird's-beak (*Cordylanthus palmatus*)
Pennell's bird's-beak (*Cordylanthus tenuis* spp. *capillaris*)
Pt. Reyes clover lupine (*Lupinus tidestromii* var. *tidestromii*)
salt marsh bird's-beak (*Cordylanthus maritimus* spp. *maritimus*)
Sebastopol meadowfoam (*Limnanthes vincularis*)
Solano grass (*Tuctoria mucronata*)
Sonoma spineflower (*Chorizanthe valida*)
Tiburon jewelflower (*Streptanthus niger*)
Tiburon mariposa lily (*Calochortus tiburonensis*)
Tiburon paintbrush (*Castilleja affinis* spp. *neglecta*)
Tidestrom's clover lupine (*Lupinus tidestromii* var. *tidestromii*)
Truckee barberry (*Berberis sonnei*)
white-rayed pentachaeta (*Pentachaeta bellidiflora*)

Critical habitat for the peregrine falcon, winter-run chinook salmon, delta smelt, delta green ground beetle.

Critical habitat for the northern spotted owl was designated by the U.S. Fish and Wildlife Service on 15 January 1992.

Critical habitat for the marbled murrelet was designated by the U.S. Fish and Wildlife Service on 15 May 1996.

II. CONSULTATION TO DATE

This Biological Assessment was written for the effects of the ADC program in the ADC Sacramento District. The first meeting was held 3 May 1996 between ADC representatives Mr. John Steuber and Mr. Jeff Jones and FWS representatives Mr. Ken Sanchez and Ms. Maria Boroja. In that meeting a general discussion was conducted on necessary requirements of section 7 consultations and biological assessments. On 7 June, 2 July, 12 July, and 24 July 1996 Mr. Steuber and Ms. Boroja met for additional consultations to discuss this Biological Assessment. Discussions included answers to FWS questions on the use of and technical information on lead shot, DRC-1339, M-44 Cyanide Capsules, Alpha-chloralose, and the Compound 1080 Livestock Protection Collar.

III. CURRENT MANAGEMENT DIRECTION

The primary statutory authority for the ADC program is the animal Damage Control Act of March 2, 1931, as amended (7 U.S.C. 426-426c; 46 Stat. 1468). ADC activities are conducted at

the request of and in cooperation with other Federal, State, and local agencies; private organizations; and individuals.

The final programmatic Environmental Impact Statement (EIS) for the ADC program was made available April 1994. In the programmatic EIS the Current Program Alternative, which uses an integrated pest management (IPM) approach to address wildlife damage problems, is the preferred alternative. The EIS documents the analysis of the ADC program for the protection of American agriculture, natural resources, and facilities and structures, and the safeguarding of public health and safety. The EIS follows the format recommended by the President's Council on Environmental Quality. The EIS addresses the entire ADC program, including its various functions, methods of operation, and locations throughout the Nation and it complies with the National Environmental Policy Act (NEPA) of 1969 which establishes policies, goals, and procedures to ensure that Federal agency decisions reflect an understanding of the environmental consequences of a proposed action and its alternatives.

The ADC program routinely consults with the FWS, Federal land management agencies, and the California Department of Fish and Game (CDFG) regarding program activities and impacts. USDA Forest Service and USDI Bureau of Land Management (BLM) are cooperating agencies in the final ADC EIS.

The ADC program has adopted the "reasonable and prudent alternatives" recommended in the FWS's 1992 BO to avoid potential adverse impacts to T&E species.

IV. PROPOSED ACTION

PROJECT AREA

The analysis area (California ADC Sacramento District) includes the following counties where ADC currently has cooperative agreements: Colusa, El Dorado, Lake, Marin, Napa, Placer, Sacramento, Solano, Sonoma, and Yolo Counties. During FY 1995, ADC conducted wildlife damage management activities on 10.4% of the total acreage within the counties listed above. The ADC program conducts wildlife damage management activities on localized tracts of private and public land on a temporary basis. None of the proposed activities will result in habitat modification. The proposal includes the use of methods and activities where the public would not be affected.

GENERAL DISCUSSION

ADC's proposed action is to continue using the full range of wildlife damage management methods currently authorized. The ADC program provides assistance to protect livestock, crops, and property from wildlife damage conflicts. Our control actions are targeted at offending coyotes, black bears, mountain lions, bobcats, red fox, gray fox, beavers, muskrats, raccoons, striped and spotted skunks, opossums, weasels, badgers, marmots, feral pigs, feral dogs, feral cats, ravens, black birds, crows and starlings. Our approach to wildlife conflict resolution is commonly referred to as integrated wildlife damage management. The ADC in the District incorporates several control methods and techniques. A detailed list and description of each control method can be found in Attachment B. The specific methods used in the District are listed below.

1. ADC would provide technical assistance to livestock, crop and property managers on cultural practice and aversive tactics. This would be:

- a) animal husbandry;
- b) use of physical barriers;
- c) habitat management and biological control;
- d) audio repellants (gas exploders and pyrotechnics) ; and
- e) visual repellants (effigies, scarecrows, and other scaring techniques).

Technical assistance is advice, recommendations, information, and materials provided by ADC employees for others to use in managing wildlife damage problems. ADC normally does not implement these methods but recommends them to producers and property owners or managers. However, devices such as the electronic guard (a strobe light-siren) or propane exploders are implemented by ADC to scare and harass predators away from areas needing protection.

2. ADC would use the following wildlife damage management techniques:

- a) nonlethal methods (leghold traps, cage traps, foot snares, dogs, Alpha-chloralose);
- b) lethal nonchemical methods (shooting, neck snares, conibear traps, aerial shooting); and
- c) lethal chemical methods (M-44 Sodium Cyanide devise, DRC-1339 avicide, Compound 1080 Livestock Protection Collar (LPC), gas cartridge, Sodium pentobarbital).

The Compound 1080 Livestock Protection Collar (LPC) was approved for use on May 4, 1990 by the U.S. Environmental Protection Agency. On February 27, 1996 the LPC was approved for use in California by the California Environmental Protection Agency (Cal EPA). The California ADC Specialists using the LPC would first be trained and certified by the National Wildlife Research Center, in a course approved by Cal EPA. The ADC programmatic Environmental Impact Statement (USDA 1994) fully assessed the impacts of the LPC and determined that no significant impacts would result from the use of the LPC in the ADC program.

The DRC-1339 label has been submitted to Cal EPA for approval. We are waiting for a response from Cal EPA on that submission.

For your reference, I have enclosed information from Appendix P of the ADC Final Programmatic EIS (Attachment B), which includes descriptions of all the methods listed above, along with a detailed risk assessment for each method.

V. EXISTING CONDITION

Currently within the ADC Sacramento District, ADC is conducting wildlife damage management activities in Colusa, El Dorado, Lake, Marin, Napa, Placer, Sacramento, Solano, Sonoma, and Yolo Counties. During FY 1995, ADC conducted wildlife damage management activities on 10.4% of the total acreage within the counties listed above. ADC does not anticipate any significant changes (either increase or decrease) in the amount of acreage where activities are conducted on in FY 1996. The ADC program conducts wildlife damage management activities on localized tracts of private and public land on a temporary basis and only when requested by

the land managers, land owners, or permittees. None of the current or proposed activities result in habitat modification.

VI. EFFECTS OF PROPOSED ACTION

The primary potential for impacts to any listed species would be associated with accidental injury or death of a nontarget listed species during efforts to control predation on livestock by predators and during efforts to reduce other damage caused by wildlife such as consumption and contamination of livestock feed, damage to drip irrigation, threats to human health and safety, and other damage.

Aleutian Canada goose (*Branta canadensis leucopareia*) - The District program would not likely encounter the goose in its wintering areas, nor does it use the pesticides of concern to the FWS (Avitrol, zinc phosphate, and above ground use of strychnine). The use of DRC-1339 was not addressed in the FWS's 1992 BO. Aleutian Canada geese are unlikely to occur in feedlots where bait is applied, however, in the unlikely event that the geese did occur in the area of a feedlot project the DRC-1339 label specifically prohibits use of the product where there is a danger of consumption by Endangered species. Prebaiting, done for 3-5 days prior to application of the bait, encourages feeding by target birds and gives the applicator the time to carefully observe the area and ensure there are no endangered species that could potentially consume the bait. All unconsumed bait material is disposed of in accordance with applicable state and federal laws.

American peregrine falcon (*Falco peregrinus anatum*) - The peregrine falcon is a specialized predatory raptor that feeds almost exclusively on birds captured in flight. The District program does not use the pesticide of concern to the FWS (above ground use of strychnine). The use of DRC-1339 was not evaluated in the FWS's July 1992 BO. DRC-1339 was fully evaluated in the ADC Programmatic EIS Appendix P (Attachment B). Primary toxicity is more toxic to birds than mammals which serves to increase specificity to target species. Toxicity to starlings, blackbirds, crows, and jays occurs from 1 to 10 ppm. Raptors and most mammals have toxicities ranging from 101 - 1,000 ppm. Due to the specialized predatory behavior of the falcon there is no potential for primary toxicity. Available research suggests little, if any, potential for secondary hazard because the compound is rapidly metabolized and excreted and is not accumulated (DeCino et al. 1996, Schafer 1991). The compound is completely metabolized in three to 24 hours, with the target species dying as soon as three hours after consuming the bait. Prebaiting is done 3-5 days before bait is applied to promote feeding by the target birds and to determine the presence of any nontarget species. The DRC-1339 label requires that the applicator dispose of unused, treated baits and carcasses of dead or dying birds that are found by burning or burial. ADC identifies roost areas of target birds prior to application of bait so that affected birds (carcasses) can be removed and disposed of properly. Potential contact with DRC-1339 by falcons (secondary toxicity) is further reduced by the very limited use of this product by ADC. In the past we have had very few requests for assistance with raven predation on livestock in the Sacramento District annually.

Bald eagle (*Haliaeetus leucocephalus*) - Bald eagles are generalized predators/scavengers primarily adapted to edges of aquatic habitats. Their primary foods are fish (taken both alive and as carrion), waterfowl, mammalian carrion, and small birds and mammals. The FWS's BO

stipulates two reasonable and prudent measures as necessary and appropriate to minimize incidental take of the bald eagle. Neither of these measures relates to ADC's use of the toxicant DRC-1339 because 1) EPA label restrictions for this product preclude any probable primary risk to bald eagles, and 2) available research data suggests little, if any, potential for secondary hazard because the compound is rapidly metabolized and excreted and is not accumulated (DeCino et al. 1966, Schafer 1991). Use restrictions on the label state that treated baits can not be applied in areas where there is a danger that T&E species will consume baits unless special precautions are taken to limit such exposures. Such precautions shall include constant observation of baited sites and use of hazing tactics to frighten away T&E species that otherwise might feed upon baits. The label also directs the applicator to dispose of unused, treated baits and carcasses of dead or dying birds that are found by burning or burial, as authorized by applicable laws. ADC personnel identify roost sites of target species prior to application of bait so that carcasses of affected target birds can be removed and disposed of properly after baiting.

The FWS's measures also do not relate to the use of lead shot. The risk of lead poisoning, caused by eagles ingesting lead in predator carcasses killed by ADC aerial hunting is not a concern in California since ADC in California currently uses steel shot in all aerial hunting operations.

The use of M-44's also do not relate to the measures listed by the FWS in their July 1992 BO. Use restrictions for M-44's require that no M-44's be set within 30 feet of a draw station (large piece of meat or large carcass). Therefore the potential to adversely affect eagles by primary toxicity is minimized. There is no chance of secondary poisoning caused by eagles consuming carcasses of target animals since compounds with cyanide are toxic only upon liberation of the hydrogen cyanide gas, which occurs only at primary ingestion.

The first reasonable and prudent measure stipulates that strychnine shall not be used within five miles of an active nest or roost site. This measure is not applicable in our assessment area because no use of strychnine would take place under the proposed action or any of the other alternatives being considered in our EA.

The second measure requires that when T&E species are present in the immediate vicinity of a proposed control program, daily searches be made for carcasses of target individuals. This measure further requires that carcasses of target animals taken with any chemical that may pose a secondary poisoning hazard must be immediately removed and disposed of in a manner that prevents scavenging by any nontarget species.

Although this measure may have been prescribed primarily to address secondary hazards posed by target animals taken with strychnine, the language does specifically refer to "any chemical that may pose a secondary hazard". ADC's proposed action includes the use of the LPC, which contains Compound 1080 (sodium fluoroacetate), but available research suggests that the levels of 1080 residues in coyotes killed by the LPC are so low that their tissues do not present a significant secondary hazard (Burns et al., 1991; Connolly, 1990). Use restrictions on the LPC require that all LP collared livestock must be checked at least once every seven days. If any LP collared animal is not accounted for in two consecutive checks, an intensive search for it must be made. In addition, if more than three LP collared animals are not accounted for during any one check, an intensive search for these animals is required.

The final applicable requirement is that ADC not place any leghold traps (except mountain lions) within 30 feet of any exposed bait. This is standard operating procedure for all ADC trapping activities. In California, leghold traps are not allowed for capturing mountain lions. In addition to this mitigation, our policy requires in those instances where an exposed carcass or bait might conceivably be dragged or moved by scavengers to within 30 feet of a leghold trap or snare (except when attempting to foot snare bears), the carcass must first be secured to prevent scavengers from moving it.

ADC policy specifically exempts use of leghold traps or foot snares for lions or bears from the 30 foot distance requirement because 1) we need to be able to set equipment close to the carcass to consistently and effectively capture the target animal (in California no leghold traps or foot snares can be set for lions and no leghold traps can be set for bears), and 2) we employ the use of pan tension devices with all leghold traps and foot snares set for coyotes, bears, or lions. These pan tension devices reduce or eliminate the likelihood that eagles or smaller nontarget species could set off the leghold trap or foot snare. The likelihood of an eagle being captured in a or foot snare set for bear is further mitigated by the fact that the exposed baits are usually covered in some kind of bait pen or are back in under a tree. This practice not only increases the likelihood of directing the bear into the snare, it reduces the likelihood of the bait being seen from above by an eagle or other nontarget bird. We are unaware of any instance in the entire ADC program where an eagle has ever been caught in ADC equipment set near a carcass to catch a bear or lion.

California brown pelican (*Pelecanus occidentalis californicus*)- Pelicans nest and feed in estuarine and marine habitats, so there is no opportunity for exposure.

Northern spotted owl (*Strix occidentalis caurina*)- The northern spotted owl is found in mature forests with dense, multi-layered canopies. The ADC program does not use or recommend the use of rodenticides within the habitat of the northern spotted owl. The proposed action will not destroy or modify any of the critical habitat of the northern spotted owl.

California clapper rail (*Rallus longirostris obsoletus*)- is locally common in coastal wetlands and brackish water around San Francisco, Monterey, and Morro bays. There is little opportunity for exposure to program activities.

Marbled murrelet (*Brachyramphus marmoratus*)- The marbled murrelet forages in shallow coastal waters where it spends the day. It comes inland to roost and nest in mature redwood and Douglas-fir forests. There is very little opportunity for exposure to program activities.

Western snowy plover (*Charadrius alexandrinus nivosus*)- The western snowy plover's habitat includes sandy marine and estuarine shorelines. Also found inland along the shore of alkali lakes.

Salt marsh harvest mouse (*Reithrodontomys raviventris*)- The salt marsh harvest mouse is found only in saline emergent wetlands of San Francisco Bay and its tributaries. The ADC program does not use or recommend the use of rodenticides within the home range of the salt marsh harvest mouse. If a need arises for the use of leghold traps within the range of the salt marsh harvest mouse the traps will incorporate a pan tension device to eliminate the capture of smaller non-target animals such as the salt marsh harvest mouse.

Giant garter snake (*Thamnophis gigas*)- The giant garter snake is found in the valley counties north of Sacramento.

California red-legged frog (*Rana aurora draytoni*)- The California red-legged frog inhabits quiet pools of streams, marshes, and occasionally ponds. It prefers shorelines with extensive vegetation.

The following list of T&E species of fish, plants and invertebrates were evaluated by the ADC program

FISH:

delta smelt (*Hypomesus transpacificus*)
tidewater goby (*Eucyclogobius newberryi*)
winter-run chinook salmon (*Oncorhynchus tshawytscha*)
Lahontan cutthroat trout (*Oncorhynchus clarki henshawi*)

INVERTEBRATES:

California freshwater shrimp (*Syncaris pacifica*)
Conservancy fairy shrimp (*Branchinecta conservatio*)
Delta green ground beetle (*Elaphrus viridis*)
mission blue butterfly (*Icaricia icariodes missionensis*)
Myrtle's silverspot butterfly (*Speyeria zerene myrtilae*)
San Bruno elfin butterfly (*Incisalia mossii bayensis*)
valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*)
vernal pool fairy shrimp (*Branchinecta lynchi*)
vernal pool tadpole shrimp (*Lepidurus packardi*)

PLANTS

Antioch Dunes evening-primrose (*Oenothera deltoides ssp. howellii*)
Baker's stickyseed (*Blennosperma bakeri*)
beach layia (*Layia carnosa*)
Burke's goldfields (*Lasthenia burkei*)
California sea blite (*Suaeda californica*)
Loch Lomond coyote-thistle (*Eryngium constancei*)
Marin dwarf-flax (*Hesperolinon congestum*)
palmate-bracted bird's-beak (*Cordylanthus palmatus*)
Pennell's bird's-beak (*Cordylanthus tenuis spp. capillaris*)
Pt. Reyes clover lupine (*Lupinus tidestromii var. tidestromii*)
salt marsh bird's-beak (*Cordylanthus maritimus spp. maritimus*)
Sebastopol meadowfoam (*Limnanthes vinculans*)
Solano grass (*Tuctoria mucronata*)
Sonoma soineflower (*Chorizanthe valida*)
Tiburon jewelflower (*Streptanthus niger*)
Tiburon mariposa lily (*Calochortus tiburonensis*)
Tiburon paintbrush (*Castilleja affinis spp. neglecta*)
Tidestrom's clover lupine (*Lupinus tidestromii var. tidestromii*)
Truckee barberry (*Berberis sonnei*)
white-rayed pentachaeta (*Pentachaeta bellidiflora*)

Critical habitat for the peregrine falcon, winter-run chinook salmon, delta smelt, delta green ground beetle.

Critical habitat for the northern spotted owl was designated by the U.S. Fish and Wildlife Service on 15 January 1992.

Critical habitat for the marbled murrelet was designated by the U.S. Fish and Wildlife Service on 15 May 1996.

VII. CONCLUSIONS

The following conclusions led to our final determination of the effects that implementation of the proposed ADC activity in the North District would have on threatened and Endangered species:

1. Leghold traps do not pose a threat to T&E species in the Sacramento District if they are used with pan tension devices and if set at least 30 feet from an exposed bait station.
2. Neck snares do not pose a threat to T&E species in this project area when properly set for target species and when set 30 feet or more from exposed bait.
3. Foot snares do not pose a threat to T&E species if they are used with pan tension devices and if bait is covered in some kind of bait pen or back in under a tree.
4. Dogs do not pose a threat to T&E species when properly trained to trail only target animals.
5. Alpha-chloralose does not pose a threat to T&E species as it is delivered specifically to the target animals and the target animals are removed from the field immediately.
6. Shooting does not pose a risk to T&E species when conducted by professional ADC Specialists.
7. Conibear traps do not pose a threat to T&E species in the Sacramento District.
8. Aerial hunting with steel shot does not pose a threat to T&E species.
9. M-44 Cyanide Capsules do not pose a threat to T&E species present in the Sacramento District when set at least 30 feet from a draw station.
10. DRC-1339 is not likely to adversely affect any T&E species in the Sacramento District because of its specificity to target pest birds and its low potential for secondary toxicity. The chance of adverse affects are further reduced by following the label directions. Prebaiting must be conducted to identify if any T&E species are in the area. All unconsumed bait material is disposed of in accordance with applicable state and federal laws. If any T&E species appears during baiting hazing tactics will be used to frighten them from the site. Carcasses of dead target birds are disposed of by burning or burial as authorized by applicable laws.
11. Compound 1080 Livestock Protection Collars are not likely to adversely affect T&E species

in the Sacramento District. Research has shown that levels of 1080 residues in affected target coyotes killed by the LPC are so low that their tissues do not present a significant secondary hazard. The hazard is further reduced by use restrictions requiring LP collared livestock to be checked at least once every seven days. Intensive searches must be conducted if collared animals are not accounted for during these weekly checks

12. Gas cartridges do not pose a threat to T&E species in the Sacramento District. They are used only at active coyote den sites.

13. Sodium pentobarbital does not pose a threat to T&E species as it is delivered directly to the target animal through injection and the carcass is disposed of properly.

VIII. DETERMINATION

Based on the analysis of the direct and indirect effects of implementing the proposed ADC activities in the Sacramento District, the size and scope of the proposed action, and on the FWS's July 28, 1992 BO on the ADC program the following determinations have been made in regard to T&E species listed in the project area.

It is my professional determination that implementing the proposed ADC activities in the Sacramento District are **not likely to adversely affect** the Aleutian Canada goose.

It is my professional determination that implementing the proposed ADC activities in the Sacramento District are **not likely to adversely affect** the American peregrine falcon.

It is my professional determination that implementing the proposed ADC activities in the Sacramento District are **not likely to adversely affect** the bald eagle.

It is my professional determination that implementing the proposed ADC activities in the Sacramento District will have **no effect** on the California brown pelican, the California clapper rail, or the western snowy plover.

It is my professional determination that implementing the proposed ADC activities in the Sacramento District will have **no effect** on the northern spotted owl or its designated Critical Habitat.

It is my professional determination that implementing the proposed ADC activities in the Sacramento District will have **no effect** on the marbled murrelet or its designated Critical Habitat.

It is my professional determination that implementing the proposed ADC activities in the Sacramento District will have **no effect** on the salt marsh harvest mouse.

It is my professional determination that implementing the proposed ADC activities in the Sacramento District will have **no effect** on the giant garter snake or the California red-legged frog.

It is my professional determination that the proposed ADC activities in the Sacramento District will have no effect on the following species:

delta smelt (*Hypomesus transpacificus*)
tidewater goby (*Eucyclogobius newberryi*)
winter-run chinook salmon (*Oncorhynchus tshawytscha*)
Lahontan cutthroat trout (*Oncorhynchus clarki henshawi*)
California freshwater shrimp (*Syncaris pacifica*)
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Tidestrom's clover lupine (*Lupinus tidestromii var. tidestromii*)
Truckee barberry (*Berberis sonnei*)
white-rayed pentachaeta (*Pentachaeta bellidiflora*)

Critical habitat for the peregrine falcon, winter-run chinook salmon, delta smelt, delta green ground beetle, northern spotted owl, and marbled murrelet.

IX. MANAGEMENT REQUIREMENTS

The FWS's July 1992 BO stipulates terms and conditions that ADC must comply with in order to implement the reasonable and prudent measures discussed earlier. The first of these terms and conditions requires that ADC contact local resource management authorities to determine bald eagle nest and roost locations. ADC maintains contact with local resources managers during the annual work planning process involving Forest Service, BLM, and CDFG. Biologists from the

CDFG typically provide information on eagle locations.

The terms and conditions also require that ADC notify the FWS with 5 days of finding any dead or injured bald eagle. ADC will continue to follow this guidance should any dead or injured bald eagle ever be found.

X. MANAGEMENT RECOMMENDATIONS

ADC will continue to implement all reasonable and prudent measures listed in the FWS's July 1992 BO.

ADC will also continue to follow all policies currently in place to mitigate any danger to T&E species

ADC will continue to consult with the FWS, Federal land management agencies, and CDFG on matters involving T&E species.

REFERENCES

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Connolly, G.E. 1990. The Livestock Protection Collar in *Predator Management in North Coastal California*. G.A. Giusti, R.M. Timm, and R.H. Schmidt (eds.) pp. 89-93.

DeCino, T.J., D.J. Cunningham, and E.W. Schafer. 1966. Toxicity of DRC-1339 to Starlings. *J. Wildl. Manage.* 30 (2) : 249-253.

Schafer, E.W. 1991. "Bird Control Chemicals - Nature, Modes of Action, and Toxicity," in *CRC Handbook of Pest Management in Agriculture* Vol. II, D. Pimental (ed.), pp. 599-610.



United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
Sacramento Field Office
3310 El Camino Avenue, Suite 130
Sacramento, California 95821

IN REPLY REFER TO:

1-1-97-I-98

October 31, 1996

Mr. Gary D. Simmons
State Director, California State Office
U.S. Department of Agriculture
Animal and Plant Health Inspection Service
2800 Cottage Way, Room W-2316
Sacramento, California 95825

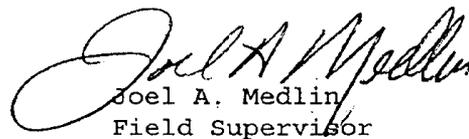
Subject: Informal Endangered Species Consultation on the Proposed Animal Damage Control Practices and Management for the Sacramento District including Placer, El Dorado, Sacramento, Yolo, Solano, Napa, Lake, Colusa, Sonoma, and Marin counties.

Dear Mr. Simmons:

This responds to your letter dated October 3, 1996, which was received in this office on October 11, 1996, requesting concurrence with the determination that the proposed action, the Animal Damage Control Practices and Management for the Sacramento District including Placer, El Dorado, Sacramento, Yolo, Solano, Napa, Lake, Colusa, Sonoma, and Marin counties, is not likely to adversely affect the threatened Aleutian Canada goose (*Branta canadensis leucopareia*) and bald eagle (*Haliaeetus leucocephalus*), or the endangered American peregrine falcon (*Falco peregrinus anatum*) or its critical habitat, or any federally listed threatened or endangered species. We have reviewed the Biological Assessment transmitted with your correspondence and concur with your determination. Therefore, unless new information reveals effects of the proposed action that may affect listed species in a manner or to an extent not considered, or a new species or critical habitat is designated that may be affected by the proposed action, no further action pursuant to the Endangered Species Act of 1973, as amended (Act), is necessary.

Please contact Ms. Maria Boroja of my staff at (916) 979-2749, if you have questions regarding this response.

Sincerely,


Joel A. Medlin
Field Supervisor

APPENDIX 4 - CALIFORNIA DEPARTMENT OF GAME AND FISH CORRESPONDENCE



United States
Department of
Agriculture

Animal and
Plant Health
Inspection
Service

Animal Damage
Control

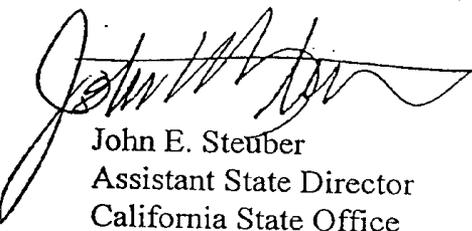
Federal Building
Room W-2316
2800 Cottage Way
Sacramento, CA 95825

October 11, 1996

Mr. John Carlson
California Department of Fish and Game
Wildlife Management Division
1416 Ninth Street
Room 1280
Sacramento, CA. 95814

Dear Mr. Carlson:

The purpose of this letter is to request concurrence with our findings for those State listed species found in the ADC California Sacramento District Office. We have reviewed the April 1996 list of Threatened and Endangered (T&E) species from the State of California and analyzed the potential impact that our program might have on each species. We have also reviewed the California Department of Fish and Game's (CDFG) 1996 Environmental Document titled "Furbearing and Nongame Mammal Hunting and Trapping" and evaluated possible impacts from ADC program activities on each T&E species listed.



John E. Steuber
Assistant State Director
California State Office

cc:
Terry Mansfield



I. INTRODUCTION

The purpose of this document is to evaluate the effects of the of the Animal Damage Control (ADC) program in the California ADC Sacramento District on the habitat and continued existence of T&E fish and wildlife species which may be in the project area or affected by activities occurring within the project area.

The following list was provided by the CDFG State Office 3 June 1996. This Biological Assessment addresses the following species:

BIRDS:

American peregrine falcon (*Falco peregrinus anatum*)
bald eagle (*Haliaeetus leucocephalus*)
California brown pelican (*Pelecanus occidentalis californicus*)
marbled murrelet (*Brachyramphus marmoratus*)
Swainson's hawk (*Buteo swainsoni*)
California black rail (*Laterallus jamaicensis coturniculus*)
California clapper rail (*Rallus longirostris levipes*)
greater sandhill crane (*Grus canadensis tabida*)
western yellow-billed cuckoo (*Coccyzus americanus occidentalis*)
willow flycatcher (*Empidonax traillii*)
bank swallow (*Riparia riparia*)

MAMMALS:

salt marsh harvest mouse (*Reithrodontomys raviventris*)
Sierra Nevada red fox (*Vulpes vulpes necator*)
northern sea lion (*Eumetopias jubatus*)
wolverine (*Gulo gulo*)

REPTILES:

southern rubber boa (*Charina bottae umbratica*)
Alameda whipsnake (*Masticophis lateralis euryxanthus*)
giant garter snake (*Thamnophis couchi gigas*)

II. CURRENT MANAGEMENT DIRECTION

The primary statutory authority for the ADC program is the Animal Damage Control Act of March 2, 1931, as amended (7 U.S.C. 426-426c; 46 Stat. 1468). ADC activities are conducted at the request of and in cooperation with other Federal, State, and local agencies; private organizations; and individuals.

The final programmatic Environmental Impact Statement (EIS) for the ADC Program was made available April 1994. In the programmatic EIS the Current Program Alternative, which uses an integrated pest management (IPM) approach to address wildlife damage problems, is the preferred alternative. The EIS documents the analysis of the ADC program for the protection of American agriculture, natural resources, and facilities and structures, and the safeguarding of public health and safety. The EIS follows the format recommended by the President's Council

on Environmental Quality. The EIS addresses the entire ADC program, including its various functions, methods of operation, and locations throughout the Nation and it complies with the National Environmental Policy Act (NEPA) of 1969 which establishes policies, goals, and procedures to ensure that Federal agency decisions reflect an understanding of the environmental consequences of a proposed action and its alternatives.

The ADC program routinely consults with FWS, Federal land management agencies, and the CDFG regarding program activities and impacts. USDA Forest Service and USDI Bureau of Land Management (BLM) are cooperating agencies in the final ADC EIS.

The ADC program has adopted the "reasonable and prudent alternatives" recommended in the FWS's 1992 Biological Opinion (BO), to avoid potential adverse impacts to Federal T&E species.

III. PROPOSED ACTION

PROJECT AREA

The analysis area (California ADC Sacramento District) includes the following counties where ADC currently has cooperative agreements: Colusa, El Dorado, Lake, Marin, Napa, Placer, Sacramento, Solano, Sonoma, and Yolo Counties. During FY 1995, ADC conducted wildlife damage management activities on 10.4% of the total acreage within the counties listed above. The ADC program conducts wildlife damage management activities on localized tracts of private and public land on a temporary basis. None of the proposed activities will result in habitat modification. The proposal includes the use of methods and activities where the public would not be affected.

GENERAL DISCUSSION

ADC's proposed action is to continue using the full range of wildlife damage management methods currently authorized. The ADC program provides assistance to protect livestock, crops, and property from wildlife damage conflicts. Our control actions are targeted at offending coyotes, black bears, mountain lions, bobcats, red fox, gray fox, beavers, muskrats, raccoons, striped and spotted skunks, opossums, weasels, badgers, marmots, feral pigs, feral dogs, feral cats, ravens, black birds, crows and starlings. Our approach to wildlife conflict resolution is commonly referred to as integrated wildlife damage management. The ADC in the District incorporates several control methods and techniques. A detailed list and description of each control method can be found in Attachment B. The specific methods used in the District are listed below.

1. ADC would provide technical assistance to livestock, crop and property managers on cultural practice and aversive tactics. This would be:
 - a) animal husbandry;
 - b) use of physical barriers;
 - c) habitat management and biological control;
 - d) audio repellants (gas exploders and pyrotechnics) ; and
 - e) visual repellants (effigies, scarecrows, and other scaring techniques).

Technical assistance is advice, recommendations, information, and materials provided by ADC employees for others to use in managing wildlife damage problems. ADC normally does not implement these methods but recommends them to producers and property owners or managers. However, devices such as the electronic guard (a strobe light-siren) or propane exploders are implemented by ADC to scare and harass predators away from areas needing protection.

2. ADC would use the following wildlife damage management techniques:

- a) nonlethal methods (leghold traps, cage traps, foot snares, dogs, Alpha-chloralose);
- b) lethal nonchemical methods (shooting, neck snares, conibear traps, aerial shooting); and
- c) lethal chemical methods (M-44 Sodium Cyanide devise, DRC-1339 avicide, Compound 1080 Livestock Protection Collar (LPC), gas cartridge, Sodium pentobarbital).

The Compound 1080 LPC was approved for use on May 4, 1990 by the U.S. EPA. On February 27, 1996 the LPC was approved for use in California by the Cal EPA. The California ADC Specialists using the LPC would first be trained and certified by USDA personnel in a course approved by Cal EPA. The ADC programmatic EIS (USDA 1994) fully assessed the impacts of the LPC and determined that no significant impacts would result from the use of the LPC in the ADC program.

The DRC-1339 label has been submitted to Cal EPA for approval. We are waiting for a response from Cal EPA on that submission.

For your reference, I have enclosed information from Appendix P of the ADC Final Programmatic EIS (Attachment B), which includes descriptions of all the methods listed above, along with a detailed risk assessment for each method.

IV. EXISTING CONDITION

Currently within the ADC Sacramento District, ADC is conducting wildlife damage management activities in Colusa, El Dorado, Lake, Marin, Napa, Placer, Sacramento, Solano, Sonoma, and Yolo Counties. During FY 1995, ADC conducted wildlife damage management activities on 10.4 % of the total acreage within the counties listed above. ADC does not anticipate any significant changes (either increase or decrease) in the amount of acreage where activities are conducted on in FY 1996. The ADC program conducts wildlife damage management activities on localized tracts of private and public land on a temporary basis and only when requested by the land managers, land owners, or permittees. None of the current or proposed activities result in habitat modification.

V. EFFECTS OF PROPOSED ACTION

The primary potential for impacts to any listed species would be associated with accidental injury or death of a nontarget listed species during efforts to control predation on livestock by predators and during efforts to reduce other damage caused by wildlife such as consumption and contamination of livestock feed, damage to drip irrigation, and threats to human safety.

American peregrine falcon (*Falco peregrinus anatum*) - The peregrine falcon is a specialized predatory raptor that feeds almost exclusively on birds captured in flight. The District program does not use the pesticide of concern to the FWS (above ground use of strychnine). The use of DRC-1339 was not evaluated in the FWS's July 1992 BO. DRC-1339 was fully evaluated in the ADC Programmatic EIS Appendix P (Attachment B). Primary toxicity is more toxic to birds than mammals which serves to increase specificity to target species. Toxicity to starlings, blackbirds, crows, and jays occurs from 1 to 10 ppm. Raptors and most mammals have toxicities ranging from 101 - 1,000 ppm. Due to the specialized predatory behavior of the falcon there is no potential for primary toxicity. Available research suggests little, if any, potential for secondary hazard because the compound is rapidly metabolized and excreted and is not accumulated (DeCino et al. 1996, Schafer 1991). The compound is completely metabolized in three to 24 hours, with the target species dying as soon as three hours after consuming the bait. Prebaiting is done 3-5 days before bait is applied to promote feeding by the target birds and to determine the presence of any nontarget species. The DRC-1339 label requires that the applicator dispose of unused, treated baits and carcasses of dead or dying birds that are found by burning or burial. ADC identifies roost areas of target birds prior to application of bait so that affected birds (carcasses) can be removed and disposed of properly. Potential contact with DRC-1339 by falcons (secondary toxicity) is further reduced by the very limited use of this product by ADC. In the past we have had 2-3 requests for assistance with raven predation on livestock in the Sacramento District annually.

Bald eagle (*Haliaeetus leucocephalus*) - Bald eagles are generalized predators/scavengers primarily adapted to edges of aquatic habitats. Their primary foods are fish (taken both alive and as carrion), waterfowl, mammalian carrion, and small birds and mammals. The FWS's BO stipulates two reasonable and prudent measures as necessary and appropriate to minimize incidental take of the bald eagle. Neither of these measures relates to ADC's use of the toxicant DRC-1339 because 1) EPA label restrictions for this product preclude any probable primary risk to bald eagles, and 2) available research data suggests little, if any, potential for secondary hazard because the compound is rapidly metabolized and excreted and is not accumulated (DeCino et al. 1966, Schafer 1991). Use restrictions on the label state that treated baits can not be applied in areas where there is a danger that T&E Species will consume baits unless special precautions are taken to limit such exposures. Such precautions shall include constant observation of baited sites and use of hazing tactics to frighten away T&E Species that otherwise might feed upon baits. The label also directs the applicator to dispose of unused, treated baits and carcasses of dead or dying birds that are found by burning or burial, as authorized by applicable laws. ADC personnel identify roost sites of target species prior to application of bait so that carcasses of affected target birds can be removed and disposed of properly after baiting.

The FWS's measures also do not relate to the use of lead shot. The risk of lead poisoning, caused by eagles ingesting lead in predator carcasses killed by ADC aerial hunting is not a concern in California since ADC in California currently uses steel shot in all aerial hunting operations.

The use of M-44's also do not relate to the measures listed by the FWS in their July 1992 BO. Use restrictions for M-44's require that no M-44's be set within 30 feet of a draw station (large piece of meat or large carcass). Therefore the potential to adversely affect eagles by primary toxicity is minimized. There is no chance of secondary poisoning caused by eagles consuming carcasses of target animals since compounds with cyanide are toxic only upon liberation of the

hydrogen cyanide gas, which occurs only at primary ingestion.

The first reasonable and prudent measure stipulates that strychnine shall not be used within five miles of an active nest or roost site. This measure is not applicable in our assessment area because no use of strychnine would take place under the proposed action or any of the other alternatives being considered in our EA.

The second measure requires that when T&E Species are present in the immediate vicinity of a proposed control program, daily searches be made for carcasses of target individuals. This measure further requires that carcasses of target animals taken with any chemical that may pose a secondary poisoning hazard must be immediately removed and disposed of in a manner that prevents scavenging by any nontarget species.

Although this measure may have been prescribed primarily to address secondary hazards posed by target animals taken with strychnine, the language does specifically refer to "any chemical that may pose a secondary hazard". ADC's proposed action includes the use of the LPC, which contains Compound 1080 (sodium fluoroacetate), but available research suggests that the levels of 1080 residues in coyotes killed by the LPC are so low that their tissues do not present a significant secondary hazard (Burns et al., 1991; Connolly, 1990). Use restrictions on the LPC require that all LP collared livestock must be checked at least once every seven days. If any LP collared animal is not accounted for in two consecutive checks, an intensive search for it must be made. In addition, if more than three LP collared animals are not accounted for during any one check, an intensive search for these animals is required.

The final applicable requirement is that ADC not place any leghold traps (except mountain lions) within 30 feet of any exposed bait. This is standard operating procedure for all ADC trapping activities. In California, leghold traps are not allowed for capturing mountain lions. In addition to this mitigation, our policy requires in those instances where an exposed carcass or bait might conceivably be dragged or moved by scavengers to within 30 feet of a leghold trap or snare (except when attempting to foot snare bears), the carcass must first be secured to prevent scavengers from moving it.

ADC policy specifically exempts use of leghold traps or foot snares for lions or bears from the 30 foot distance requirement because 1) we need to be able to set equipment close to the carcass to consistently and effectively capture the target animal (in California no leghold traps or foot snares can be set for lions and no leghold traps can be set for bears), and 2) we employ the use of pan tension devices with all leghold traps and foot snares set for coyotes, bears, or lions. These pan tension devices reduce or eliminate the likelihood that eagles or smaller nontarget species could set off the leghold trap or foot snare. The likelihood of an eagle being captured in a foot snare set for bear is further mitigated by the fact that the exposed baits are usually covered in some kind of bait pen or are back in under a tree. This practice not only increases the likelihood of directing the bear into the snare, it reduces the likelihood of the bait being seen from above by an eagle or other nontarget bird. We are unaware of any instance in the entire ADC program where an eagle has ever been caught in ADC equipment set near a carcass to catch a bear or lion.

California brown pelican (*Pelecanus occidentalis californicus*)- Pelicans nest and feed in estuarine and marine habitats, so there is no opportunity for exposure.

Marbled murrelet (*Brachyramphus marmoratus*)- The marbled murrelet forages in shallow coastal waters where it spends the day. It comes inland to roost and nest in mature redwood and Douglas-fir forests. There is very little opportunity for exposure to program activities.

Swainson's hawk (*Buteo swainsoni*) - The Swainson's hawks seasonal range is the Central Valley and northeast corner of California. This hawk is an uncommon breeding resident and migrant throughout its California range. The Swainson's hawk mainly feeds on small mammals, arthropods, amphibians, reptiles, and birds. ADC requires pan tension devices on leghold traps and leghold traps must be placed a minimum of 30 feet from bait that can be seen by a soaring bird. This is to prevent capture of non-target birds like Swainson's hawks.

California black rail (*Laterallus jamaicensis coturniculus*) - The California black rail is a yearlong resident of saline, brackish, and fresh emergent wetlands. There is little opportunity for exposure to program activities.

California clapper rail (*Rallus longirostris levipes*) - The California clapper rail prefers emergent wetlands and forages in higher marsh vegetation, along vegetation and mudflat interface, and along tidal creeks. There is little opportunity for exposure to program activities.

Greater sandhill crane (*Grus canadensis tabida*) - The greater sandhill crane nests in northeastern California and winters in the Central Valley. Sandhill cranes feed in wet meadows, shallow lacustrine and fresh emergent habitats. The ADC program conducts very limited trapping activities in these aquatic areas. Conibear traps would be utilized for beavers and placed in deep water sets.

Western yellow-billed cuckoo (*Coccyzus americanus occidentalis*) - The western yellow-billed cuckoo is an uncommon to rare summer resident of valley foothill and desert riparian habitats in scattered locations in California. There would be no opportunity for adverse exposure to program activities.

Willow flycatcher (*Empidonax traillii*) - A rare to locally uncommon, summer resident in wet meadow and montane riparian habitats in California. There would be no opportunity for adverse exposure to program activities.

Bank swallow (*Riparia riparia*) - A migrant found primarily in riparian and other lowland habitats in California west of the deserts. There would be no opportunity for adverse exposure to program activities.

Salt marsh harvest mouse (*Reithrodontomys raviventris*) - The salt marsh harvest mouse is found only in saline emergent wetlands of San Francisco Bay and its tributaries. ADC does very limited work in these areas. There would be little opportunity for adverse exposure to program activities.

Sierra Nevada red fox (*Vulpes vulpes necator*) - The Sierra Nevada red fox is found in the Cascades, in Siskiyou County, and from Lassen County south to Tulare County. The California ADC program uses only padded leghold traps within the range of the Sierra Nevada red fox. Leghold traps incorporate a pan tension device to reduce the capture of smaller nontarget animals such as the red fox and also incorporate a center swivel with a shock spring to minimize any leg

damage. No M-44 devices, neck snares or conibear trap land sets are used within this range. There has been no recorded take of a Sierra Nevada red fox by ADC field specialists during the last fifteen years. ADC control activities occur on only a small portion of the Sierra Nevada red fox range and are generally limited to the summer months.

Wolverine (*Gulo gulo*) - The wolverine is a scarce resident of the North Coast mountains and Sierra Nevada. This species inhabits semi-open terrain at or above timberline in the Cascade and Sierra Nevada mountains in California. The California ADC program uses only padded leghold traps within the range of the wolverine. Leghold traps incorporate a pan tension device and center swivel with a shock spring to minimize any leg damage. No M-44 devices. Neck snares or conibear traps land sets are used within this range. There is no recorded take of wolverines by ADC field specialists. ADC control activities only occur on a small portion of the wolverine's range and are generally limited to summer months.

Northern sea lion (*Eumetopias jubatus*) - The northern sea lion feeds in nearshore waters and spends its time on the coast on land in rocky areas easily accessible to water. There would be no opportunity for exposure to program activities.

The following list of T&E species of reptiles were evaluated by the ADC program. There is no opportunity for exposure to program activities .

Southern rubber boa (*Charina bottae umbratica*)
Alameda whipsnake (*Masticophis lateralis euryxanthus*)
giant garter snake (*Thamnophis couchi gigas*)

VI. CONCLUSIONS

The following conclusions led to our final determination of the effects that implementation of the proposed ADC activity in the Sacramento District would have on T&E species:

1. Leghold traps do not pose a threat to T&E species in the ADC California Sacramento District if they are used with pan tension devices and if set at least 30 feet from an exposed bait station. In the wolverine and Sierra Nevada red fox ranges only padded leghold traps are used.
2. Neck snares will not be utilized in the wolverine and Sierra Nevada red fox ranges. In other areas neck snares do not pose a threat to T&E species in this project area when properly set for target species and when set 30 feet or more from exposed bait.
3. Foot snares do not pose a threat to T&E species if they are used with pan tension devices and if bait is covered in some kind of bait pen or back in under a tree.
4. Dogs do not pose a threat to T&E species when properly trained to trail only target animals.
5. Alpha-chloralose does not pose a threat to T&E species as it is delivered specifically to the target animals and the target animals are removed from the field immediately.

6. Shooting does not pose a risk to T&E species when conducted by professional ADC Specialists.
7. Conibear traps do not pose a threat to T&E species in the Sacramento District when set underwater.
8. Aerial hunting with steel shot does not pose a threat to T&E species.
9. M-44 devices are not utilized in the wolverine and sierra Nevada red fox range. In other areas M-44 Cyanide Capsules do not pose a threat to T&E species present in the Sacramento District when set at least 30 feet from a draw station.
10. DRC-1339 is not likely to adversely affect any T&E species in the Sacramento District because of its specificity to target pest birds and its low potential for secondary toxicity. The chance of adverse affects are further reduced by following the label directions. Prebaiting must be conducted to identify if any T&E species are in the area. All unconsumed bait material is disposed of in accordance with applicable state and federal laws. If any T&E species appears during baiting hazing tactics will be used to frighten them from the site. Carcasses of dead and/or dying target birds are disposed of by burning or burial as authorized by applicable laws.
11. Compound 1080 Livestock Protection Collars are not likely to adversely affect T&E species in the Sacramento District. Research has shown that levels of 1080 residues in affected target coyotes killed by the LPC are so low that their tissues do not present a significant secondary hazard. The hazard is further reduced by use restrictions requiring LP collared livestock to be checked at least once every seven days. Intensive searches must be conducted if collared animals are not accounted for during these weekly checks
12. Gas cartridges do not pose a threat to T&E species in the Sacramento District. They are used only at active coyote den sites.
13. Sodium pentobarbital does not pose a threat to T&E species as it is delivered directly to the target animal through injection and the carcass is disposed of properly.

VII. DETERMINATION

Based on the analysis of the direct and indirect effects of implementing the proposed ADC activities in the Sacramento District, the size and scope of the proposed action, and on the FWS's July 28, 1992 BO on the ADC program the following determinations have been made in regard to T&E Species listed in the project area.

It is my professional determination that implementing the proposed ADC activities in the Sacramento District are **not likely to adversely affect** the American peregrine falcon.

It is my professional determination that implementing the proposed ADC activities in the Sacramento District are **not likely to adversely affect** the bald eagle.

It is my professional determination that implementing the proposed ADC activities in the Sacramento District will have **no effect** on the California brown pelican, the marbled murrelet, the Swainson's hawk, the California black rail, the California clapper rail, the greater sandhill crane, the western yellow-billed cuckoo, the willow flycatcher, and the bank swallow.

It is my professional opinion that implementing the proposed ADC activities in the Sacramento District will have **no effect** on the salt marsh harvest mouse.

It is my professional opinion that implementing the proposed ADC activities in the Sacramento District are **not likely to adversely affect** the wolverine.

It is my professional opinion that implementing the proposed ADC activities in the Sacramento District are **not likely to adversely affect** the Sierra Nevada red fox.

It is my professional determination that implementing the proposed ADC activities in the Sacramento District will have **no effect** on the southern rubber boa, the Alameda whipsnake, and the giant garter snake.

VIII. MANAGEMENT REQUIREMENTS

The FWS's July 1992 BO stipulates terms and conditions that ADC must comply with in order to implement the reasonable and prudent measures discussed earlier. The first of these terms and conditions requires that ADC contact local resource management authorities to determine bald eagle nest and roost locations. ADC maintains contact with local resources managers during the annual work planning process involving Forest Service, BLM, and CDFG. Biologists from the CDFG typically provide information on eagle locations.

The terms and conditions also require that ADC notify the FWS with 5 days of finding any dead or injured bald eagle. ADC will continue to follow this guidance should any dead or injured bald eagle ever be found.

IX. MANAGEMENT RECOMMENDATIONS

ADC will continue to implement all reasonable and prudent measures listed in the FWS's July 1992 BO.

ADC will also continue to follow all policies currently in place to mitigate any danger to T&E species

ADC will continue to consult with the FWS, Federal land management agencies, and the CDFG on matters involving T&E species.

REFERENCES

Burns, R.J., H.P. Tietjen, and G.E. Connolly. 1991. Secondary hazard of Livestock Protection Collars to skunks and eagles. *J. Wildl. Manage.* 55 (4) : 701-704

Connolly, G.E. 1990. The Livestock Protection Collar in *Predator Management in North Coastal California*. G.A. Giusti, R.M. Timm, and R.H. Schmidt (eds.) pp. 89-93.

DeCino, T.J., D.J. Cunningham, and E.W. Schafer. 1966. Toxicity of DRC-1339 to Starlings. *J. Wildl. Manage.* 30 (2) : 249-253.

Schafer, E.W. 1991. "Bird Control Chemicals - Nature, Modes of Action, and Toxicity," in *CRC Handbook of Pest Management in Agriculture* Vol. II, D. Pimental (ed.), pp. 599-610.

DEPARTMENT OF FISH AND GAME

1416 NINTH STREET

P.O. BOX 944209

SACRAMENTO, CA 94244-2090

(916) 653-7203



December 20, 1996

Mr. John E. Steuber, Assistant State Director
United States Department of Agriculture
APHIS/ADC
California State Office
Federal Building, Room W-2316
2800 Cottage Way
Sacramento, California 95825

Dear Mr. Steuber:

This letter is in response to your October 11, 1996 request for concurrence regarding your findings of potential impacts of the Animal Damage Control (ADC) program on State-listed species in the ADC Sacramento District. We concur with your assessment of potential impacts and suggested mitigation for the 18 species that you considered in your analysis.

Thank you for the opportunity to review your findings. If your program changes, we would appreciate the opportunity to review the potential impacts with you.

If you have any questions, feel free to contact Mr. John Carlson, Jr., Supervisor of the Bird and Mammal Conservation Program, by writing to the letterhead address or by telephone at (916) 654-3828.

Sincerely,

A handwritten signature in black ink, appearing to read "Terry M. Mansfield".

Terry M. Mansfield, Chief
Wildlife Management Division

cc: Mr. John Carlson, Jr.
Department of Fish and Game
Sacramento, California

APPENDIX 5 - CALIFORNIA DEPARTMENT OF PARKS AND RECREATION
CORRESPONDENCE

ENQL 7

FILE COPY



United States
Department of
Agriculture

Animal and
Plant Health
Inspection
Service

Animal Damage
Control

Federal Building
Room W-2316
2800 Cottage Way
Sacramento, CA 95825

May 7, 1996

Steven D. Grantham
State Archeologist
Department of Parks and Recreation
Office of Historic Preservation
1416 9th Street
Sacramento, CA 94296-0001

Dear Mr. Grantham:

As you discussed with John Steuber, our Assistant State Director, on May 6, 1996, we are sending this letter to request your concurrence with our determination that the U.S. Department of Agriculture, Animal and Plant Health Inspection Service, Animal Damage Control (APHIS-ADC) in California has no effect on cultural resources. This request is made pursuant to Section 106 of the National Historic Preservation Act. My determination is made based on the nature of our program, and the interdisciplinary consultation we undergo as part our National Environmental Policy Act compliance process.

The objective of our program is to respond to requests from government and private entities to resolve wildlife damage conflicts with agriculture, human health and safety, property, and livestock. The methods we use in carrying out our program, include a variety of techniques for lethal and non-lethal control of offending animals. We are not involved in construction activities, and we do not alter any structures. Ground disturbing activities associated with our program are limited to laying leghold traps and placing M-44 (sodium cyanide) ejector devices. Traps are typically laid in a hole dug to four-inches-deep by 12-inches-long by 8-inches-wide. Traps are usually set in agricultural areas or near fence lines (previously disturbed areas). M-44 devices are 1 inch diameter cylinders, normally 5-7 inches long, inserted into similar areas. In most counties trap use is limited to less than 50 sets per year.

Pertinent mitigation measures to avoid any potential impacts on cultural resources would include limiting vehicular travel to established roads and trails on previously undisturbed areas, consultation with federal and cultural resource specialists on federally managed lands, consultation with tribes where we work on or near Indian lands, and avoidance of ground disturbing activities on previously undisturbed areas.

Thank you for your consideration.

Sincerely,

Gary Simmons
State Director
California State Office





OFFICE OF HISTORIC PRESERVATION
DEPARTMENT OF PARKS AND RECREATION
P.O. BOX 942896
SACRAMENTO 94296-0001
(916) 653-6624
FAX: (916) 653-9824

May 20, 1996

Reply to: APhi960509A

Gary Simmons, Director
California State Office
Animal and Plant Health Inspection Service
Federal Building, Room W-2316
2800 Cottage Way
SACRAMENTO CA 95825

Subject: Animal and Plant Health Inspection Service Consultation

Dear Mr. Simmons:

I have received recent correspondence describing the Animal and Plant Health Inspection Service's program. Thank you for consulting me.

It is evident that the bulk of the agencies project work is of the type and nature that should not affect historic properties. This is not to say that there could be instances where the agency should consider any specific undertaking's potential to affect historic properties. In cases that the agency has identified the presence of such properties, the legal course of action will be to comply with Section 106 of the National Historic Preservation Act (NHPA) and follow the requirements and recommendations of 36 CFR 800.

Thank you for affording me the opportunity to offer opinion on the agencies Section 106 responsibilities. Should the agency identify the need to consult under applicable law and regulations I look forward to working with it in those instances. If you have further questions or need additional information, please contact staff archaeologist Steven Grantham at (916) 653-8920.

Sincerely,

A handwritten signature in black ink, appearing to read "Cheryl E. Widell".

Ms. Cheryl E. Widell
State Historic Preservation Officer

APPENDIX 6 - TOXICANT LABELS

PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS AND DOMESTIC ANIMALS

DANGER

Sodium Cyanide may be fatal if swallowed or inhaled. Use only with adequate ventilation and do not breathe the gas or dust. When handling, setting out or checking M-44 cyanide capsules, always have at least six pearls of Amyl-Nitrite readily available in case sodium cyanide is swallowed or inhaled.

While handling sodium cyanide capsules, protect hands with gloves and shield eyes to prevent eye burns and skin irritation. Wash thoroughly before eating or smoking.

Do not use in areas frequented by humans or domestic dogs.

ENVIRONMENTAL HAZARDS

This pesticide is TOXIC TO WILDLIFE. Keep out of lakes, ponds or streams. Do not contaminate water by cleaning of equipment or disposal of waste. The M-44 ejector device cannot be used in areas inhabited by endangered canids and felids.

CHEMICAL HAZARDS

Contact with acid liberates poisonous and flammable cyanide gas.

50 capsules - Net Weight 48.5 grams
9/84

RESTRICTED USE PESTICIDE

DUE TO HIGH ACUTE TOXICITY AND THE NEED FOR HIGHLY SPECIALIZED APPLICATOR TRAINING

For retail sale to and use only by Certified Applicators or persons under their direct supervision and only for those uses covered by the Certified Applicators certification. For use exclusively by USDA-APHIS Animal Damage Control personnel or persons under their direct supervision.

M-44 CYANIDE CAPSULES

★ ★ CALIFORNIA USE ONLY ★ ★

For use in the M-44 ejector device to control coyotes (Canis latrans); suspected of preying on livestock or poultry; or, Federally designated threatened or endangered species; or, that are vectors of a communicable disease.

ACTIVE INGREDIENT:

Sodium Cyanide	91.06%
INERT INGREDIENTS:	8.94%
TOTAL	100.00%

**KEEP OUT OF REACH OF CHILDREN
DANGER — POISON**



STATEMENT OF PRACTICAL TREATMENT OF SWALLOWED: CALL A PHYSICIAN OR POISON CONTROL CENTER IMMEDIATELY!

IF SWALLOWED OR INHALED - Prompt treatment is of the utmost importance. Carry patient to fresh air, have him lie down. Patient should breathe the contents of an Amyl-Nitrite pearl 15-30 seconds each minute if necessary, until five pearls have been used. Use artificial respiration if breathing has stopped. Remove contaminated clothing, but keep the patient warm.

CALL A PHYSICIAN IMMEDIATELY.

IF ON SKIN - Immediately flush with plenty of water.

IF IN EYES - Immediately flush with plenty of water and call a physician.

See Left side panel for ADDITIONAL PRECAUTIONARY STATEMENTS.

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

For use in specific situations to reduce coyotes: suspected of preying on livestock or poultry; or, Federally designated threatened or endangered species; or, that are vectors of a communicable disease. For use on pastures, range land and forest land only. Do not place in areas where food crops are planted.

IMPORTANT - Before handling or placing M-44 cyanide capsules or M-44 ejector devices, consult the Use Restriction Bulletin for specific information on endangered species, warning signs and antidotal measures.

WARNING SIGNS - Bilingual (Spanish/English) warning signs must be posted in the general area and at the application site.

STORAGE AND DISPOSAL

STORAGE - Store M-44 cyanide capsules under lock and key in a dry place away from food, domestic animals and acids. Do not contaminate feed or food stuffs.

DISPOSAL - Dispose of defective and used M-44 capsules by burial in a safe location: in the field or at a proper landfill site. Incineration may be used instead of burial for disposal. Place capsules in an incinerator or refuse hole and attend the burn until the contaminated material is completely consumed. If burned, stay out of smoke.

**US DEPARTMENT OF AGRICULTURE
ANIMAL AND PLANT HEALTH**

INSPECTION SERVICE

Hyattsville, MD 20782

EPA Reg. No. 56228-15

EPA Est. No. 56228-ID-1

**PRECAUTIONARY STATEMENTS
HAZARDS TO HUMANS AND
DOMESTIC ANIMALS**

DANGER

Fatal if swallowed; poisonous if swallowed or absorbed through skin. Wear waterproof gloves when handling collars. Wash hands after handling collars or animals that have been contaminated with 1080 solution. Do not use contaminated animals for food or feed.

ENVIRONMENTAL HAZARDS

This pesticide is very highly toxic to wildlife. Birds and mammals feeding on carcasses of contaminated livestock may be killed. Keep out of any body of water. Apply this product only as specified on this label.

**ENDANGERED SPECIES
CONSIDERATIONS**

NOTICE: It is a Federal offense to use any pesticide in a manner that results in the death of a member of an endangered species. The use of 1080 in the Livestock Protection Collar has been determined to pose a hazard to several endangered species. See technical bulletin (use restriction No. 15) for specific areas where the 1080 collar cannot be used or approval must be obtained from the U.S. Fish and Wildlife Service prior to use.

NOTE TO PHYSICIAN

WARNING SYMPTOMS: 1080 poisoning results from the transformation of fluoroacetate into fluocitrate within cell mitochondria. Poisoning is characterized by a symptom-free latent period of 1/2 to 2 hours or longer between ingestion and onset of symptoms (nausea, vomiting, diarrhea, and hyperactive behavior leading to convulsions, coma, and cyanosis). Ventricular fibrillation is commonly noted and is the primary cause of death. Early symptoms include alteration of heart sounds and premature, weak contractions.

TREATMENT: No effective antidote is known but symptomatic treatment may be effective. Establish respiration; create artificial airway if necessary. Check adequacy of tidal volume. Initiate emesis. If patient is comatose, convulsing, or has lost the gag reflex, endotracheal intubation should precede gastric lavage with large bore tube. Administer activated charcoal and magnesium sulfate. Treat seizures with IV diazepam. Monitor cardiac function closely. Treatment with glyceryl monoacetate (monoacetin) may be effective; however, it is experimental and unproven in humans. **CONSULT NEAREST POISON CONTROL CENTER FOR CURRENT INFORMATION.** Symptoms of non-lethal intoxication will usually subside within 12-24 hours.

RESTRICTED USE PESTICIDE

Collars shall be sold or transferred only by registrants or their agents and only to certified Livestock Protection Collar applicators. Collars may be used only by specifically certified Livestock Protection Collar applicators or by persons under their direct supervision.

**SODIUM FLUOROACETATE
(COMPOUND 1080)
LIVESTOCK PROTECTION COLLAR**

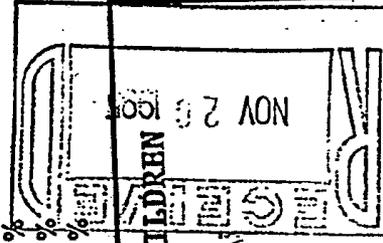
For use on sheep or goats to kill depredating coyotes

ACTIVE INGREDIENT:

Sodium fluoroacetate 1.00%

INERT INGREDIENTS: 99.00%

TOTAL 100.00%



KEEP OUT OF REACH OF CHILDREN

DANGEROUS POISON



STATEMENT OF PRACTICAL TREATMENT
IF SWALLOWED: CALL A PHYSICIAN OR POISON CONTROL CENTER IMMEDIATELY

IF SWALLOWED: Induce vomiting at once with an emetic such as syrup of ipecac; use as directed. If emetic is not available, drink 1-2 glasses of water and induce vomiting by touching back of throat with finger. Do not induce vomiting or give anything by mouth to an unconscious person. **PROMPT TREATMENT IS MANDATORY. GET MEDICAL ATTENTION IMMEDIATELY.**

IF ON SKIN - Wash the exposed area twice with soap and water.
IF IN EYES - Wash eyes with plenty of water for at least 15 minutes.
IF ON CLOTHING - Remove contaminated clothing and wash before re-use. Dispose of all contaminated leather, including shoes, boots, and gloves; according to the pesticide Disposal Section. See disposal instruction on side panel.

SEE LEFT SIDE PANEL FOR ADDITIONAL PRECAUTIONARY STATEMENTS

MANUFACTURED BY: UNITED STATES DEPARTMENT OF AGRICULTURE
ANIMAL AND PLANT HEALTH INSPECTION SERVICE
Rivendale, MD 20737-1237

U.S. PAT. 3,842,806
EPA Est. No. 56228-ID-1
EPA Reg. No. 56228-22
30.4 grams (1.1 oz.) per collar

NET CONTENTS:

NOTICE

Seller makes no warranty, expressed or implied, concerning the use of this product other than that indicated on the label. Buyer assumes all risk of use and/or handling of this material when such use and/or handling is contrary to label instructions.

STORAGE AND DISPOSAL

Do not contaminate water, food or feed by storage or disposal.

STORAGE: Store Livestock Protection Collars only in original container, in a dry, locked place away from food, feed, domestic animals and corrosive chemicals. Do not store in any structure occupied by humans.

When snow or frozen ground make on site disposal impractical, up to one cubic foot of wastes may be stored in a leakproof container, in a dry locked place for up to 90 days.

PESTICIDE DISPOSAL: Pesticide wastes are acutely hazardous. Improper disposal of such materials is a violation of Federal Law.

Dispose of collars and other wastes contaminated by 1080 (carcasses, wool, hair, vegetation, soil, leather clothing, and water) under three feet of soil, at a safe location, preferably on property owned and managed by the applicator and at least one half mile from human habitations and water supplies.

Incineration may be used instead of burial for disposal in the field (preferably on property owned or managed by the applicator) at least 1/2 mile from human habitation and water supplies. Place collars and wastes (listed above) in an incinerator or refuse hole, saturate with diesel fuel, and ignite. Attend the burn until the contaminated material is completely consumed.

Alternatively, contact your state pesticide or Environmental Control Agency or the Hazardous Waste representative at the nearest EPA Regional Office for guidance in disposing of wastes at approved hazardous waste disposal facilities.

CONTAINER DISPOSAL:

Metal Containers: Triple rinse contaminated and uncontaminated containers with water. Then puncture and dispose of contaminated containers and rinse as above.

Plastic Containers: Triple rinse with water. Then puncture and dispose of container and rinse as above.

COLLAR DISPOSAL: Dispose of punctured or unserviceable collars as above, except that not more than 10 collars may be buried in any one hole. If buried in trench, groups of 10 collars must be at least 10 feet apart.

SEE BACK PANEL AND TECHNICAL BULLETIN FOR DIRECTIONS FOR USE

LARGE GAS CARTRIDGE

For control of coyotes (*Canis latrans*), red foxes (*Vulpes vulpes fulva*), and striped skunks (*Mephitis mephitis*) in dens only.

NOT FOR SALE TO PERSONS UNDER 16 YEARS OLD

ACTIVE INGREDIENTS:

- Sodium Nitrate 53.0%
- Charcoal 28.0%
- INERT INGREDIENTS...19.0%
- TOTAL 100.00%

KEEP OUT OF REACH OF CHILDREN
WARNING

STATEMENT OF PRACTICAL TREATMENT
CALL A PHYSICIAN OR POISON CONTROL CENTER IMMEDIATELY!

If inhaled and person has poisoning symptoms (headache, nausea, dizziness, weakness), transfer victim to fresh air. Have victim lie down and keep warm. If respiration is adequate, recovery will be rapid. If breathing has stopped, use artificial respiration. If available, pure oxygen should be given.

SEE LEFT SIDE PANEL FOR ADDITIONAL PRECAUTIONARY STATEMENTS

UNITED STATES DEPARTMENT OF AGRICULTURE
ANIMAL AND PLANT HEALTH INSPECTION SERVICE
Hyattsville, MD 20782
EPA Est. No. 56228-ID-1
EPA Reg. Nol 56228-21

Net Weight 8.5 ounces (240 grams)

PRECAUTIONARY STATEMENTS HAZARDS TO HUMANS AND DOMESTIC ANIMALS

WARNING

After ignition, cartridge produces the toxic gas, carbon monoxide. Fumes may be harmful if inhaled.

ENVIRONMENTAL HAZARDS

This product is highly toxic to wildlife. Check all burrows for signs of nontarget species. If present, do not treat burrows.

CHEMICAL HAZARDS

Once ignited by the fuse, this cartridge will burn vigorously until completely spent and is capable of causing severe burns to exposed skin and clothes, and of igniting dry grass, leaves and other combustible materials.

ENDANGERED SPECIES CONSIDERATIONS

NOTICE: It is a Federal offense to use any pesticide in a manner that results in the death of a member of an endangered species. Unless authorized by the U.S. Fish and Wildlife Service, DO NOT use in areas where the following Endangered Species may have dens: red wolf, gray wolf, and San Joaquin kit fox.

DIRECTIONS FOR USE

It is a violation of Federal Law to use this product in a manner inconsistent with its labeling.

USE RESTRICTIONS

For control of coyotes (*Canis latrans*), red foxes (*Vulpes vulpes fulva*), and striped skunks (*Mephitis mephitis*) in dens only on rangelands, crop and non-crop areas. Do not use near flammable material or inside Buildings. USE ONLY IN DENS IN ACTIVE USE BY THE TARGET SPECIES.

SEE RIGHT PANEL FOR ADDITIONAL DIRECTIONS FOR USE

STORAGE AND DISPOSAL

Do not contaminate water, food or feed by storage or disposal.
STORAGE: Store in cool, dry place away from fire, heat and direct sunlight.
PESTICIDE DISPOSAL: To dispose of unused cartridges, soak in water, crush and bury at least 6" deep in loose soil.
CONTAINER DISPOSAL: Place in trash collection.

DIRECTIONS FOR USE (Continued)

DEN SELECTION

COYOTES First select a den in active use by coyotes for treatment. Coyote dens are normally found in steep embankments or draws and may be concealed in brush. These dens can easily be distinguished from nontarget animal dens (such as badger and fox) by the large size of the den and coyote sign around its entrance. Coyote dens range in size from 9 to 12 inches in width and 12 to 18 inches in height. Typical coyote sign around the entrance includes tracks of the adults before the pups are active outside the den. After the pups become active, their tracks will also be present as well as their scat and the vegetation around the den will be laid flat due to the pups' activity. Active dens may be identified by these signs being fresh and the pups may sometimes be heard upon approaching the entrance. DO NOT use unless the den is occupied by coyotes.

RED FOXES Determine the den location of particular foxes which are preying on livestock or causing other damage. Such predation occurs during rearing of kits. Fox tracks and drag marks of prey lead to the den site usually located in mixed farmlands and woodlots, the brushy fringe of forests, or along marshes or tilled fields. The dens will be marked by remains of prey in addition to tracks and observations. Active dens may be identified by these signs being fresh and the kits may sometimes be heard upon approaching the entrance.

SEE BACK PANEL FOR ADDITIONAL DIRECTIONS FOR USE

LARGE GAS CARTRIDGE
EPA REGISTRATION NO. 56228-21

Contains Sodium Nitrate (53.0%), Charcoal (19.0%),
Inert Ingredients (19.0%)

Select den in active use by coyotes, red foxes, or skunks. Make sure cartridge will enter freely. Obtain material to plug entrance. Plug other entrances, if present. With 1/8" nail, puncture cap at end of the cartridge at points marked. Insert fuse into one of the center holes. Insure there is a minimum of 3 inches of exposed fuse. Hold cartridge away from face and body, then light fuse. Place cartridge, fuse-end first, into burrow as far as possible. Plug burrow immediately. (If burrow is steep, contents of cartridge may flow out of lighted end. If so, place cartridge as deep as possible with fuse-end up, light, then close burrow.)

MINIMUM FUSE BURN TIME IS 5 SECONDS

Read complete Directions for Use on carton label.

LARGE GAS CARTRIDGE
EPA REGISTRATION NO. 56228-21

Contains Sodium Nitrate (53.0%), Charcoal (28.0%),
Inert Ingredients (19.0%)

Select den in active use by coyotes, red foxes, or skunks. Make sure cartridge will enter freely. Obtain material to plug entrance. Plug other entrances, if present. With 1/8" nail, puncture cap at end of the cartridge at points marked. Insert fuse into one of the center holes. Insure there is a minimum of 3 inches of exposed fuse. Hold cartridge away from face and body, then light fuse. Place cartridge, fuse-end first, into burrow as far as possible. Plug burrow immediately. (If burrow is steep, contents of cartridge may flow out of lighted end. If so, place cartridge as deep as possible with fuse-end up, light, then close burrow.)

MINIMUM FUSE BURN TIME IS 5 SECONDS

Read complete Directions for Use on carton label.

LARGE GAS CARTRIDGE

EPA Reg. No. 56228-21

ENDANGERED SPECIES CONSIDERATIONS

Use of this product is subject to limitations set forth below for the purpose of protecting endangered species.

Black-footed ferret. To limit risks to the black-footed ferret (*Mustela nigripes*) and to avoid destruction of its prey base, do not use this product within 4.3 miles (7 kilometers) of any prairie dog town unless the colony is an isolated black-tailed prairie dog town less than 80 acres in size or an isolated white-tailed or Gunnison prairie dog town less than 200 acres in size, or unless the town has been appropriately surveyed, using methods acceptable to the U.S. Fish and Wildlife Service, and found not to contain black-footed ferrets and found by the FWS not to be a suitable site for ferret reintroductions.

Use of this product within the occupied habitats of the organisms listed below is limited to qualified individuals who have been trained to distinguish dens and burrows of target species from those of nontarget species. Such individuals may be wildlife biologists, certified applicators, representatives of California State or Federal agencies, or agents of county agricultural offices or university extension offices. These limitations apply to uses in occupied habitats of

Fresno kangaroo rat (*Dipodomys nitratoides exilis*) in Fresno and Merced Counties, California;

Giant kangaroo rat (*D. ingens*) in Merced, Fresno, Kings, Tulare, Kern, San Luis Obispo, and Santa Barbara Counties, California;

Stephen's kangaroo rat (*D. stephensi*) in Riverside, San Diego, and San Bernardino Counties, California;

Tipton kangaroo rat (*D. n. nitratoides*) in Kings, Tulare, Kern, and Fresno Counties, California;

Point Arena mountain beaver (*Aplodontia rufa nigra*) in Mendocino County, California;

San Joaquin kit fox (*Vulpes macrotis mutica*), as determined by the U.S. Fish and Wildlife Service (FWS) in Alameda, Contra Costa, Fresno, Kern, Kings, Merced, Monterey, San Benito, San Joaquin, San Luis Obispo, Santa Barbara, Santa Clara, Stanislaus, or Tulare Counties, California;

Desert tortoise (*Gopherus agassizii*) in Arizona, southern California, southern Nevada, and southern Utah.

Do not use this product within the occupied habitats of the following endangered animals:

Hualapi Mexican vole (*M. Mexicanus hualapaiensis*) in Mohave County, Arizona;

Morro Bay kangaroo rat (*D. heermanni morroensis*) in San Luis Obispo County, California;

Utah prairie dog (*Cynomys parvidens*) in Garfield, Iron, Kane, Piute, Sevier, and Wayne Counties, Utah;

Coachella Valley fringe-toed lizard (*Uma inornata*) in the Coachella Valley area of southern California;

Island night lizard (*Xantusia riversiana*) on Santa Barbara, San Clemente, and San Nicolas Islands, California.

Blunt-nosed leopard lizard. Do not use this product within the occupied habitat of the blunt-nosed leopard lizard (*Gambelia silius*) in Fresno, Kern, Kings, Merced, Monterey, San Benito, San Luis Obispo, Santa Barbara, Santa Clara, and Stanislaus Counties, California, from October 1 to April 15, unless a specific blunt-nosed leopard lizard protection program for this period is approved by the U.S. Fish and Wildlife Service and fully implemented. Use of this product in occupied habitat of this species from April 15 through September 30 is limited to

daylight hours when air temperatures are 77-95°F (20-30°C).

San Francisco garter snake. Do not use this product within the occupied habitat of the San Francisco garter snake (*Thamnophis sirtalis tetrataenia*) in San Mateo, San Francisco, Santa Clara, and Santa Cruz Counties, California, from November 1 to March 30, unless a specific San Francisco garter snake protection program for this period is approved by the U.S. Fish and Wildlife Service and fully implemented. Use of this product in occupied habitat of this species under such approved programs or from April 1 through October 31 is limited to qualified individuals who have been trained to distinguish dens and burrows of target species from those of nontarget species. Such individuals may be wildlife biologists, certified applicators, representatives of California State or Federal agencies, or agents of county agricultural offices or university extension offices.

Eastern indigo snake. Do not use this product within habitat types and locales known to support the eastern indigo snake (*Drymarchon corais couperi*) throughout Florida and the coastal plain of Georgia.

Gopher tortoise. Do not use this product in or adjacent to known gopher tortoise (*Gopherus polyphemus*) occupied habitat west of the Mobile and Tombigbee Rivers in Alabama."

SKUNKS Track individual skunks creating health or safety hazards or depredating endangered or threatened species. Treat a den which the target skunk has entered based on tracking evidence. Do not treat dens under inhabited structures or buildings where toxic gases could reach humans, pets, or domestic animals including livestock.

APPLICATION DIRECTIONS

Make sure cartridge will pass easily into opening. Close any openings to den other than the one to be treated. Obtain material to plug entrance. Then, with a nail at least 1/8" in diameter, puncture cap at end of cartridge at points marked. Insert fuse in one of the center holes. Insure that there is a minimum of 3 inches of exposed fuse. Hold cartridge away from face and body, then light.

NOTE: The minimum burn time for these fuses is 5 seconds.

Place cartridge, fuse-end first, as far into the burrow as possible. Close entrance to burrow immediately. (If burrow is steep, contents of cartridge may flow out of lighted end. If so, place cartridge as deep in burrow as possible with fuse-end up, light, and close burrow.)