



United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ventura Fish and Wildlife Office
2493 Portola Road, Suite B
Ventura, California 93003

January 3, 2000

Dear Interested Party:

The U.S. Fish and Wildlife Service (Service) requested the U.S. Department of Agriculture's Division of Wildlife Services prepare a draft Environmental Assessment (EA) for the management of mountain lions to help protect the Sierra Nevada bighorn sheep. A draft EA was completed and made available for public comment on October 11, 1999.

The Service revised and finalized the EA and reached a Finding of No Significant Impact (FONSI). Copies of the final EA, agency response to comments, and FONSI are enclosed.

If you have any questions regarding this issue, please contact Carl Benz, Santa Barbara County/Great Basin Division Chief, at the Ventura Fish and Wildlife Office, 805/644-1766.

Sincerely,

Diane K. Noda
Field Supervisor

Decision and Finding of No Significant Impact **FISH AND WILDLIFE SERVICE**

Predator Damage Management to Protect the Federally Endangered ~~Sierra Nevada~~ Bighorn Sheep, California

RECEIVED
VENTURA, CA

1. Introduction

The United States Department of Interior, Fish and Wildlife Service (Service), in cooperation with California, Department of Fish and Game (CDFG), the United States Department of Agriculture, Forest Service (USFS), the United States Department of Interior, National Park Service (NPS) and United States Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services (APHIS-WS) has completed an Environmental Assessment (EA) (November 1999) that analyzed potential impacts of a proposed program and alternatives to manage predators to protect the federally endangered Sierra Nevada bighorn sheep (*Ovis canadensis californiana*). Based on a review of the EA, the Service has decided to select the Proposed Action and to issue a Finding of No Significant Impact (FONSI).

The purpose of the selected action is to effectively protect the Sierra Nevada bighorn sheep (bighorn sheep) from predation by mountain lions (*Puma concolor*), coyotes (*Canis latrans*) and bobcats (*Lynx rufus*), and from displacement from important winter range, due to the presence of these predators. Due to the precariously low numbers of bighorn sheep, action is needed immediately. The direct and indirect effects of predation by mountain lions is considered a critical factor limiting bighorn sheep population recovery.

The EA evaluated ways by which predator damage management can be carried out to protect the bighorn sheep from predation on and around its current range. The current and historic range is the western and eastern crest and the eastern escarpment of the Sierra Nevada Mountains, primarily on the Inyo National Forest, in Mono and Inyo counties. Historic range also included the Humboldt-Toiyabe, Stanislaus, Sierra, and Sequoia National forests, as well as Sequoia, Kings Canyon, and Yosemite National Parks where bighorn sheep still occur during the summer. Predator damage management will be focused on mountain lions, coyotes and bobcats due to actual threats from these species.

2. Background

The Service listed the Sierra Nevada distinct population segment of California bighorn sheep as Endangered pursuant to the Endangered Species Act of 1973, as amended (Act), by emergency rule on April 20, 1999. The Sierra Nevada bighorn sheep is known from five distinct subpopulations, totaling about 100 animals. All 5 subpopulations are very small and are imminently threatened by mountain lion predation and the transmission of disease from domestic sheep. Every individual Sierra Nevada bighorn sheep is now considered a significant portion of the overall population (USFWS, 1999).

Finding of No Significant Impact
Predator Damage Management to Protect the Federally Endangered Sierra Nevada Bighorn Sheep, California

An emergency rule provides Federal protection pursuant to the Act for a period of 240 days, the Sierra Nevada bighorn sheep emergency rule period terminates December 16, 1999. A proposed rule to list the Sierra Nevada bighorn sheep as endangered was published concurrently with the emergency rule. Federal agencies are charged with using their authorities to conserve federally listed endangered and threatened species and their habitats (Section 7(a)(1) of the Act). Besides the Federal listing, the California Department of Fish and Game (CDFG) reclassified the Sierra Nevada bighorn sheep from threatened to endangered on March 4, 1999 under the California Endangered Species Act.

Sierra Nevada bighorn sheep numbers have declined from about 310 individuals in 1985-86 to 100 individuals currently. Predation from mountain lions and associated abandonment of winter habitat are thought to be major factors contributing to this decline (Service 1999a, Service 1999b). Predation in the late 1980's increased throughout the Sierra Nevada bighorn sheep's range, and continued into the 1990's (Wehausen 1996). At least seventy accounts of mountain lion predation on bighorn sheep have been recorded (J. Wehausen pers. comm. 1999). Furthermore, mountain lions are thought to affect Sierra Nevada bighorn sheep indirectly when the sheep abandon lower elevation winter range apparently to avoid predation (Service 1999b). Wehausen (1996) cites habitat abandonment as having the potential to lead to extirpation of some bighorn sheep populations. Bighorn sheep have shown much greater susceptibility to catastrophic winter losses when avoiding winter ranges (Wehausen 1996).

Mountain lions and bighorn sheep are both native to the Sierra Nevada and have presumably coexisted as predator and prey for many years. However, the smaller, fragmented populations of bighorn sheep that exist today cannot sustain present levels of predation.

Other predators that are known to have killed the Sierra Nevada bighorn sheep include the coyote and bobcat (Jones 1950; Cowan and Geist 1971). The most abundant of these occurring in bighorn sheep range is the coyote (SNBSIAG 1997). Coyotes and bobcats are primarily a threat to bighorn lambs. Bobcats also threaten Sierra Nevada bighorn sheep survival. Although few predation incidents by coyotes and bobcats have been documented, the loss of even one remaining Sierra Nevada bighorn sheep could have a substantially detrimental impact on the population. This is why predator damage management must include identifying and controlling coyotes and bobcats which are identified as a threat to bighorn sheep along with management of mountain lions. As the Sierra Nevada bighorn sheep subpopulations increase in size, predator control will be lessened and eventually eliminated allowing a natural predator/prey dynamics to resume.

In 1990, Proposition 117 passed into State law, designating the mountain lion a specially protected mammal. This law restricted the CDFG's ability to "take" mountain lions only to

cases involving threats to public safety and damage to livestock and pets. Since this time, lion predation has continued to be a significant limiting factor for the Sierra Nevada bighorn sheep (Service, 1999a). In order to provide the state increased authority to control mountain lions, Assembly Bill 560 was signed into law on September 17, 1999. This amendment authorized the State to remove mountain lions that threaten the listed Sierra Nevada bighorn sheep.

3. Issues

The following issues were identified during the interagency and public scoping and review processes: impacts on predator populations; the effectiveness of the program in meeting established objectives; the potential impacts on species not targeted in predator damage management; impacts on threatened and endangered species, including the Sierra Nevada bighorn sheep; the humaneness of the various strategies; and the potential impacts of the program on special management areas such as Wilderness and Wilderness Study Areas. These issues were determined to be important and were used to drive the environmental analysis and compare the impacts of the alternatives.

4. Decision and Rationale

The alternative courses of action (Alternatives) were developed with input from the cooperating agencies and the public, and were analyzed in the EA against the issues noted above in item 3. A summary of the impacts and the reasons for selecting or not selecting the alternatives is discussed.

Alternative 1: Proposed Action

The Proposed Action is a predator damage management program that is designed to selectively remove problem mountain lions, coyotes and bobcats that threaten bighorn sheep. It is a goal of the Service, Wildlife Services, and CDFG, and the other cooperating agencies, to minimize lethal control of mountain lions. This alternative was selected because it incorporates the most effective techniques for preventing and minimizing losses of endangered bighorn sheep to predators. Alternative 1 will provide the cooperating agencies with the best chance of meeting the immediate objectives to protect the Sierra Nevada bighorn sheep from predation, with a short term goal of no further losses due to predation, and preventing bighorn sheep displacement from critical wintering range due to the presence of predators. At the same time, the predator damage management program will not have a significant effect on any predator population or any of the other environmental criteria assessed in the EA. The impact on the lion, coyote

and bobcat populations in California would be negligible to low. This alternative would trap and/or shoot predators that are found to be a threat to bighorn sheep. However, measures have been incorporated into the program to minimize animal suffering. The most likely impact of this alternative on Wilderness Areas is the decrease in the ability of the wilderness users to view predators. However, this may be offset by enhancing the ability of the wilderness users to view bighorn sheep.

Alternative 2: No Action Alternative

The “No Action” Alternative is a procedural NEPA requirement (40 CFR 1502.14(d)). Alternative 2 would result in no action taken by the Federal agencies to protect the Sierra Nevada bighorn sheep from predation or displacement by predators. This alternative would be more humane for predators and would have no impact on Wilderness Areas. However, it was not selected because it does not meet the objectives of the proposal and conversely, would likely result in the loss of at least some of the subpopulations and, possibly, the ability to restore viable subpopulations of bighorn sheep.

Alternative 3: Nonlethal Control of Mountain Lions with Lethal Control of Coyotes and Bobcats

Alternative 3 was developed to address the concerns for the welfare of individual mountain lions, since lions are a specially protected species in California. This alternative would use nonlethal control (relocation or harassment) to prevent losses from lions, with lethal control of coyotes and bobcats. This alternative was not selected because relocating lions is not considered desirable from a management standpoint because all suitable habitat for mountain lions is occupied and it is also not considered humane since relocated individuals are likely to endure stress, displacement, wounding or death, or in some cases, they may return to their home ranges. Harassment is considered experimental and would not be expected to be effective enough to meet the objectives of the proposal. The benefit to the bighorn sheep would be less than the proposed alternative that used lethal control of lions. The perception of humaneness would vary. Some people feel that any form of nonlethal control would be more desirable than lethal control. There would be no significant impact on wilderness or Wilderness Study Areas, or non target species.

Alternative 4 - Nonlethal Control of Mountain Lions, Coyotes and Bobcats

This alternative was designed to assess the impacts that a nonlethal option would have for

all predators, regardless of legal status. This alternative would have the same impacts on mountain lions as Alternative 3. Nonlethal control of bobcats is possible if suitable habitat can be found where bobcat densities are not high. Relocating coyotes is not desirable from a management standpoint because coyotes are abundant throughout California and they create considerable damages to livestock and other resources. Relocating coyotes and bobcats is also not considered humane since relocated individuals are likely to endure stress, displacement, wounding or death, or in some cases as with coyotes and mountain lions, they may return to their home ranges. No significant impacts would result from this alternative, because of the limited numbers of animals that would be removed. The perception of humaneness would vary. Some people feel that any form of nonlethal control would be more desirable than lethal control even with the risks discussed above. Impacts on Wilderness Areas are similar to the Alternative 1, the proposed action. This alternative was not selected because relocating lions and coyotes is not feasible or appropriate from a management perspective, the alternative would be less effective in meeting the objectives of the proposal, and because this alternative would increase costs for holding, possible veterinary exam, relocating, and tracking relocated individuals.

5. Public Involvement

The cooperating agencies developed a letter describing the need for action, and the preliminary alternatives and issues, and inviting public participation. The invitation for involvement was sent to groups and individuals who had expressed an interest in the program, or who were thought to be interested. At the same time, legal notices announcing the intent to prepare an EA and inviting public participation were posed in the Fresno Bee (August 4, 1999) and the Inyo Register (August 5, 1999). All responses to the invitation for public involvement were considered in the development of the October 11, 1999 Draft EA.

The draft EA and request for comments were sent to everyone who provided a response to the invitation for public involvement or expressed an interest in the EA. Legal notices of availability of the draft EA and request for comments were posted in the Fresno Bee and the Inyo Register (October 14, 1999).

All public comments were reviewed carefully by the cooperating agencies and modifications were made to the October 11, 1999 Draft EA. However, the comments and changes did not provide new information to change the alternatives considered or the result of the analysis. The November 1999 Final EA will be made available to the interested public.

This FONSI with Agency response to comments and information on the availability of the EA will be mailed to all people who have provided written input during any phase of the EA or who have otherwise expressed interest in this EA. In addition, a notice of a Finding of No Significant Impact will be published in the newspapers identified above.

FINDING OF NO SIGNIFICANT IMPACT

A careful review of the EA indicates that there will not be a significant impact on the quality of the human environment as a result of this proposal. This determination is based on consideration of the following factors:

1. The proposed activities will occur in isolated and localized areas within or adjacent to occupied Sierra Nevada bighorn sheep range, and only where a threat from predators is determined by experienced wildlife professionals. The proposed activities are not national or regional in scope.
2. The proposed activities will not significantly affect public health and safety. The methods used to control mountain lions, coyotes and bobcats are highly target specific and are not likely to affect public health and safety.
3. The proposed activities will not significantly impact unique characteristics of the geographic area such as historical or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecological critical areas. The proposed activities will impact the relative abundance of predators in the action area. However, the impact was determined to be insignificant to the statewide population for each predator.
4. The effects on the quality of the human environment of the proposed activities are not highly controversial. Although some people are opposed to some aspects of predator damage management, the methods and impacts are not controversial among experts.
5. The possible effects of the proposed activities on the quality of the human environment are not highly uncertain and do not involve unique or unknown risks.
6. The proposed activities do not establish a precedent for actions with future significant effects or represent a decision in principle about a future

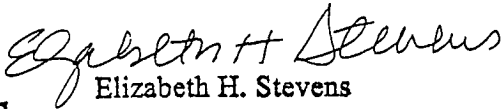
consideration.

7. There are no significant cumulative effects identified by this assessment. All predator removal will be coordinated with CDFG and will stay within management objectives set for each species. The impacts on mountain lion, bobcat, and coyote populations, when combined with other sources of mortality have low to negligible impact on these predator's populations.
8. The proposed activities will not affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places nor will it cause a loss or destruction of significant scientific, cultural, or historical resources. Predator damage management, in general, does not have the potential to significantly affect historic properties.
9. The proposed activities will fully comply with the Endangered Species Act of 1973, as amended. The proposed activities would not affect non target federally or state listed threatened and endangered species. The proposed action will be likely to benefit the Sierra Nevada bighorn sheep by reducing additional losses due to predators which will allow the population of bighorn sheep to increase.
10. The proposed activities will result in the irretrievable loss of some individual predators. However, this loss was determined to be insignificant to each species statewide population. In addition, a minor amount of fossil fuels will be consumed for routine operations.
11. The proposed activities will not threaten a violation of Federal, State, or local law or requirements imposed for the protection of the environment. Federal agencies, and the state of California are authorized under Federal and California law to remove mountain lions that threaten the continued existence of the Sierra Nevada bighorn sheep.

The Service has determined that the proposed action does not constitute a major Federal action significantly affecting the quality of the human environment within the meaning of section

Finding of No Significant Impact
Predator Damage Management to Protect the Federally Endangered Sierra Nevada Bighorn Sheep, California

102(2)(c) of the National Environmental Policy Act of 1969. Therefore, an environmental impact statement will not be prepared.


Elizabeth H. Stevens

Acting

Manager, California/Nevada Operations Office

DEC 1 1999

Date

REFERENCES

- Cowan, I.M. and V. Geist. 1971. The North American wild sheep. Pp. 58-83 In R. Water, ed. North American Big Game. 1971 ed. Boone and Crockett Club, Pittsburgh. 403 pp.
- Jones, F.L. 1950. A survey of the Sierra Nevada bighorn. Sierra Club Bulletin 35(6):29-76.
- U.S. Fish and Wildlife Service. 1999a. The Service proposes emergency protection for Sierra Nevada bighorn sheep. New Release. 3 pp.
- U.S. Fish and Wildlife Service. 1999b. Endangered and threatened wildlife and plants; emergency rule to list the Sierra Nevada distinct population segment of California bighorn sheep as endangered. In. Fed. Register. V64(75):19300-19309.
- Wehausen, J.D. 1996. Effects of mountain lion predation on bighorn sheep in the Sierra Nevada and Granite Mountains of California. Wildlife Society Bulletin 24:471-479.

Finding of No Significant Impact
Predator Damage Management to Protect the Federally Endangered Sierra Nevada Bighorn Sheep, California

For additional information concerning this decision, please contact:

Carl Benz
U.S. Fish and Wildlife Service
2493 Portola Road, Suite. B
Ventura, California 93003

Telephone (805) 644-1766
Fax (805) 644-3958

Summary of Public Comments and Responses

1. Further define the criteria that would be followed to identify a mountain lion that would be targeted and killed. Include examples for why field level flexibility is necessary.

Pages 2-1 to 2-4 in the Environmental Assessment (EA) defines the criteria that would be applied. The criteria are necessary guidelines that must be weighed against variables that effect the potential that a mountain lion would be a threat to Sierra Nevada bighorn sheep (bighorn sheep). The U.S. Fish and Wildlife Service (Service) does not believe the criteria can be further defined because there are countless scenarios that could occur. The following examples are provided to show how each potential threat is unique and cannot be predetermined due to the variable nature of the natural environment.

Example 1. This is an actual example, based on current conditions. Deer located in bighorn sheep wintering ranges have migrated out of the area due to recent storms and weather changes. The bighorn sheep are moving down into the wintering range. A mountain lion has been traveling through the area on and off throughout the summer and fall. The mountain lion was not considered a threat when the sheep were not present. There is no alternative prey in the area. Therefore, this mountain lion could be targeted for removal.

Conversely, if a mountain lion were moving toward bighorn sheep range but would be moving through a large deer herd first, the mountain lion would not be considered an immediate threat. Barring other variables, it would be monitored but not removed under this situation.

Example 2. A mountain lion is found to be within one night's travel of bighorn sheep. It should be monitored, since the mountain lion could travel overnight to kill a sheep. The distance that it would be considered a threat would differ between males and females, a lone female, or a female with young kittens. The distance would also vary depending upon the terrain.

Example 3. Bighorn sheep are getting ready to move up to higher elevations to spring habitat and are not expected to be in the area where a female mountain lion with young kittens has been spotted. A female mountain lion within two miles or less, with small kittens, will be less likely to travel farther than this distance to feed her kittens. If there are deer in the vicinity, or she has a fresh kill, this female would not be considered a threat to the sheep. Weather conditions could affect this example further. If a warm spring resulted in earlier vegetative growth, the sheep would be likely to move up to higher ground sooner, as the lower elevation is less desirable in terms of forage nutrition compared to higher grounds. Sheep would move up faster and there would be no need to control mountain lions in wintering range anymore for the remainder of the year.

This example can be revised to where this is a male mountain lion and the spring has been cold. Barring other variables, this mountain lion could be considered to be a threat.

2. The program must collect and use information gathered on mountain lion behavior and population dynamics.

The Service has collected and used all available information to design the proposed action. However, as the proposed action is implemented, and we learn more about the behavior and population dynamics of the individual mountain lions in the project area, this information will be used in the ongoing development of the predator management program. Page 2-1 states that the program will focus on understanding the location, distribution, and activities of mountain lions in order to identify individual problem mountain lions, and selectively remove as few mountain lions as possible.

3. Mountain lions that may pose a threat to bighorn sheep should be radio collared and monitored.

The Service agrees; this is part of the proposed action as discussed in the EA (Page 2-2).

4. Coyotes and bobcats should also be monitored so that removal is based on sound and informed methodology.

Coyotes and bobcats will be monitored in the field to determine if they threaten bighorn sheep. As described in the Environmental Assessment, the removal of coyotes and bobcats will be based on the following sound and informed methodology: single bobcats or coyotes will not be considered a threat to bighorn sheep unless they are near bighorn sheep lambing ranges, or near ewes with lambs; any bobcat or coyote found to have killed an adult bighorn sheep or lamb would be targeted; and coyotes or bobcats, which are found in current bighorn sheep wintering ranges and causing bighorn sheep to avoid such areas, will be targeted.

5. The EA should explain the relative significance of factors that attribute to mountain lion predation rates on bighorn sheep, and it should explain how this information will be used to develop criteria to determine when mountain lion control may no longer be necessary.

The relative significance of factors that can contribute to mountain lion predation will be studied as information is gained. For example, deer management may affect mountain lion predation rates. The presence of deer can provide a decoy for bighorns, on the other hand, increased abundance of deer can increase the numbers of mountain lions that can occupy an area. This kind of information will be explored in more detail. The criteria will be adaptive and modified based on new information. The relative significance of each factor that effects the potential for mountain lion predation rates will not be static, but will need to be weighed with the other factors, all of which are dynamic. The response to comment number 1 provides examples to illustrate this point.

This information will be used by the bighorn sheep recovery team in the development of the conservation plan¹ led by California Department of Fish and Game (CDFG). However, the immediate need to protect bighorn sheep from predation is independent of the recovery team's effort to look at larger issues and identify the characteristics of a bighorn sheep population that would be able to once again withstand natural predation.

6. Exactly how will interagency efforts be coordinated.

The Service and CDFG are the lead agencies responsible for the recovery of the bighorn sheep. Both agencies regularly collect and coordinate information and disseminate that information to other agencies, organizations, and the interested public.

In the past, the Sierra Nevada Bighorn Sheep Interagency Group (SNBSIAG) served as a group of experts to help coordinate efforts to protect and recover the bighorn sheep. Coordination ranged from informal sharing of information among members to regularly scheduled meetings of members with other interested scientists, and other agency representatives. However, the coordination role this group played in the past will now be served by the CDFG led recovery team that will be meeting regularly to develop, implement and coordinate the bighorn sheep conservation plan. This effort will be supported by a full-time biologist hired by CDFG to coordinate conservation efforts for the bighorn sheep.

Information related specifically to predator damage management will be coordinated between the wildlife specialists or agents in the field, and the following agencies: the Service, CDFG, US Forest Service and National Park Service. The CDFG bighorn sheep coordinator will be the central point of contact. In the event a mountain lion is taken or identified as potential to be taken, US Department of Agriculture, Animal and Plant Health Inspection Service - Wildlife Services (APHIS-WS) will contact the CDFG bighorn sheep coordinator, who will then contact all other agencies, including the Service. There will be situations when a mountain lion was determined to be such an immediate threat to bighorn sheep by the wildlife specialists or agents in the field that it was killed without prior notice to the Service or other cooperating agencies. However, if a mountain lion is exhibiting only potentially threatening behavior, the Service, along with other cooperating agencies, will be notified prior to killing the mountain lion.

In addition, periodically the above agencies and APHIS-WS will review the program's progress, impacts, and report results to CDFG's bighorn sheep recovery team. The recovery team will respond with comments and recommendations for APHIS-WS to implement in the field.

¹ The state conservation plan is equivalent to a federal recovery plan. Should the Sierra Nevada bighorn sheep become federally listed, the conservation plan will become the recovery plan.

7. The “No Action” alternative includes action by CDFG. Include a no control, no action alternative to show what would happen to the bighorn sheep.

The No Action Alternative is a required component of the analysis, as defined by National Environmental Policy Act (NEPA) regulations, and therefore was included in the EA. Only federal actions are subject to NEPA, and therefore, the no action alternative can only be “no federal action”. NEPA also requires that cumulative impacts be considered in the analysis. A reasonably foreseeable future action under the “no federal action” alternative is that the state would take action to protect bighorn sheep. Therefore, action by the state must be considered under the assessment of cumulative impacts.

The EA discusses the likely continued decline of bighorn sheep if no action is taken. The status quo is likely to result in the extinction of the remaining native populations (EA pages 4-25 to 4-26).

8. Explain why low density estimates for mountain lions were used in the EA. What if the mountain lion density is higher? How might this and changing population characteristics affect the bighorn?

Low density population estimates were compared with the potential number of mountain lions that could be removed to protect bighorn sheep. The estimate of the number of mountain lions that could be removed was based on field observations, not on the low density population estimates. Therefore, the impact estimate is conservative, or a worst case scenario. This is not a requirement of NEPA, but was examined to show the most negative impacts that could happen to the mountain lion population from the proposal. If the mountain lion density is higher, actual impacts on the population will be lower than the impacts described in the EA. Natural or human induced changes in the local mountain lion population will not significantly effect the bighorn sheep because the focus on preventing damage to bighorns is to identify and remove only mountain lions that will be likely to prey on bighorn sheep. Again, not all mountain lions will be targeted.

9. Time is of the essence for the bighorn sheep. A dead ram was documented as of November 10 with clear indication it was killed by a mountain lion. Complete the EA as quickly as possible.

The agencies acknowledge the urgency of the need for action. The decision will be implemented effective immediately upon the Service’s finding of no significant impact (FONSI).

10. Several comments stated that it is not acceptable to recover bighorn sheep so that trophy hunters can hunt them.

There is no proposal to recover bighorn sheep for hunting. Further more, the bighorn sheep is a fully protected animal of the state. The proposed action is necessary to comply with the Federal Endangered Species Act (ESA) to prevent the further decline of the species. It is the ultimate goal of the ESA to recover bighorn sheep so that they are self-sustaining members of the Sierra Nevada mountain range ecosystem.

11. Several comments stated opposition with the wholesale slaughter of mountain lions and requested non-lethal methods of removal be used, such as relocation.

All of the cooperating agencies agree that only those mountain lions that present a reasonably justifiable threat to the bighorn sheep should be removed. Mountain lion distribution and behavior will continue to be studied carefully in the field to determine if any may be likely to kill bighorn sheep, or deter bighorn sheep from critical wintering range. As few mountain lions as possible will be selectively removed in order to prevent further losses to bighorn sheep (EA page 2-1). From field information gathered to date, it is most likely that “up to three to five mountain lions would be removed in the upcoming year” (EA page 4-6).

The EA evaluated the merits of a non lethal methods alternative for mountain lions that included relocation. Because California’s mountain lion population covers the entire range of all suitable mountain lion habitat, and unoccupied habitat is not known to exist, mountain lion relocation could create considerable problems for the transplanted mountain lion. In addition relocation may not be permanent, and relocation may create new predation problems in the relocation area. The EA discusses this in more detail (EA pages 4-27 to 4-30 discussing the impacts on mountain lions, the effectiveness, and humaneness of the alternative).

12. The bighorn sheep and mountain lion interactions discussed in chapters 1 and 2 are speculative.

The comment was not specific to a particular discussion for a set of data. The discussions in the EA referenced the data and opinions of scientists specializing in the subject matter.

13. Concerned with an effort to link the passage of Proposition 117 to Sierra Nevada bighorn sheep declines.

Although the intent of Proposition 117 was not to prejudice the protection of mountain lions over endangered sheep species, Proposition 117 did limit the State’s authority to recover the bighorn sheep.

Neither the Service's emergency rule listing the bighorn sheep nor the EA proclaim that bighorn sheep declines are due to the passage of Proposition 117. The EA does contend that the passage of Proposition 117 has made it impossible for the state of California to manage mountain lions so that predation on bighorn sheep would be minimized. Mountain lion activity has shown an increasing trend over the last 26 years, (the last two years of depredation activities show a decline). Overall, mountain lion activity remains at historically high levels (S. Torres pers. comm. 1999). Currently, bighorn sheep have been declining. All of these factors have created the current situation where we cannot afford to lose even one bighorn sheep to a mountain lion.

14. The EA does not provide data and fails to demonstrate that mountain lion populations have, in fact, increased since the passage of Proposition 117 in and around bighorn sheep habitat, and fails to show that bighorn sheep kills have increased.

The EA contends that the passage of Proposition 117 has made it impossible for the State of California to manage mountain lion predation on bighorn sheep, regardless of the population size of mountain lions. Mountain lion activity has shown an increasing trend over the last 26 years (the last two years of depredation activities show a decline) and fluctuations in the mountain lion population does not diminish the urgent need for action to protect bighorn sheep from predation. There is no need to show that kills have increased when the loss of even one more endangered bighorn sheep could have dire consequences.

Data in Dr. John Wehausen's 1996 paper clearly shows an increase in predation of bighorn sheep in the 1980s (Wehausen 1996). Currently, kills of bighorn sheep have not increased in the last few years due to bighorn sheep abandoning their winter range to avoid mountain lions.

In addition, if it is found mountain lion activity drops in the project area, fewer mountain lions, or even no mountain lions may need to be removed.

15. Some discussion of disease and "other threats" effecting bighorn sheep is necessary in order to judge the need for predator control. The Draft EA fails to evaluate the adverse impact of disease on the bighorn sheep.

The EA does address the disease transmission issue between domestic sheep and bighorn sheep. However, it does not go into detail on the disease itself. We have updated the EA to include more information on this subject. This is a very serious issue and one of the significant reasons the bighorn sheep was emergency listed as endangered by the Service. Just as we cannot afford to lose one bighorn sheep to predation, we cannot afford to lose one bighorn sheep to disease transmitted from domestic sheep. We have been working with those agencies responsible for issuing domestic sheep grazing permits to ensure such a loss does not occur. Each domestic sheep grazing and trailing permit in the vicinity of bighorn sheep is being reviewed by the Service to assess the risk of disease transmission and to ensure no reasonable possibility of contact between domestic sheep and bighorn sheep occurs. Some allotments have been closed

since the emergency listing and some are being greatly modified to ensure this protection. However, the need to protect bighorn sheep from predation is independent of the need to protect bighorn sheep from risk of disease transmission. Regardless of the actions taken to protect bighorn sheep from disease, bighorn sheep will remain threatened by predation. Each issue is critical to the survival of the species, however, this EA is focused specifically on those actions the Service is taking to prevent losses due to predators.

16. The status of mountain lion prey species should be addressed, e.g., white-tailed deer numbers. A comprehensive management program should include efforts to boost deer numbers. The public should be provided an opportunity to comment on this aspect.

Mule deer are the primary prey species for mountain lions in the region (white-tailed deer are neither indigenous nor do they occupy this protected area). The recovery team will be taking these and all factors that could affect bighorn sheep survival into consideration. The purpose of this EA is to provide an immediate solution to the problem of predation on Sierra Nevada bighorn sheep while other recovery efforts are being developed. The comment proposes a simplified solution to a complex problem. More consideration must be given to the interaction of deer and mountain lions, prior to actively managing deer populations as boosting deer numbers could result in more mountain lions. These factors are being considered carefully.

17. Exercise equal consideration of bobcats and coyotes in the final decision.

Bobcats and coyotes were given additional consideration through other NEPA and California Environmental Quality Act documents and public review, as stated in the EA. Bobcats and coyotes will also be considered by the recovery team as potential threats to bighorn sheep.

Bobcats and coyotes do not pose an equal threat to bighorn sheep. Mountain lions will take bighorn sheep in all life stages, whereas, bobcats and coyotes are primarily a threat to lambs. In addition, few predation incidents by coyotes and bobcats have been documented in the Eastern Sierra Nevada mountain ranges.

18. The EA is invalid and contains no data to support its conclusions.

The Service and cooperating agencies disagree that the EA is invalid and contains no data to support its conclusions. The EA is the appropriate document to use in order to assess whether anticipated environmental impacts are significant. The EA has presented substantial scientific analysis to support its conclusions including various studies on mountain lions, bighorn sheep, coyotes, mule deer; information, data and studies from various agencies; and review by scientific experts and agency representatives.

19. Killing 13 mountain lions annually in California is a major federal action under NEPA and requires that an environmental impact statement be prepared.

The EA analyzes the impact of taking 13 mountain lions annually from a conservative and low density estimated population size. The EA discussion on killing 13 mountain lions is presented as an unlikely event. It is more likely that up to 3 to 5 mountain lions may be killed a year, based on current field observations, as stated in the EA. In this worst case scenario, (taking the high numbers of mountain lions out of the low estimate of the population), the potential impact is temporary, limited in scope, consistent with relevant laws, and would have a negligible biological impact on the mountain lion population. This is not significant, according to the definition provided by NEPA, and therefore does not trigger the need to prepare an environmental impact statement. The Finding of No Significant Impact enumerates the reasons that the proposed action does not require the preparation of an environmental impact statement, as defined by the Council of Environmental Quality.

The commenter provided no credible scientific explanation for the conclusion that impacts to mountain lions are significant. The analysis in the EA represented an objective, and well reasoned biologically based examination of potential impacts to mountain lions. The analysis is based on state collected data and analyzed against two different published reports by experts which concludes that the few mountain lions which might need to be killed would result in only minor or negligible impacts to regional populations of this highly adaptive and fecund species.

20. The EA overstates the impact of and remedy for mountain lion predation on bighorn sheep. There is no evidence that removing 13 mountain lions will result in no loss of bighorn sheep.

There is no guarantee that all losses can be prevented. However, the proposed action would be the most effective of the alternatives considered in achieving the objectives to minimize losses from predators.

21. Prior to Proposition 117, CDFG had the authority to kill mountain lions and the (Mount Baxter) population still declined. What other factors could cause bighorn sheep to abandon winter range? (Human interaction, other predators, destruction of habitat, etc.). For a 12-year period CDFG never recommended removal of up to 13 mountain lions, why do we need removal of 13 now?

At the time, the Mount Baxter population was relatively stable. Predation was not of urgent concern prior to 1990. The Mount Baxter population did not decline until the 1990s, and this is believed to be due to predation, not other factors. Regarding the removal of 13 mountain lions, the Service is not recommending the removal of 13 mountain lions per year. We have evaluated various alternatives, and in the preferred alternative identified that under a worst case scenario,

13 mountain lions may have to be removed in a year. This scenario is not expected to occur over multiple years.

22. Does APHIS have authority to kill mountain lions anywhere in the winter range or East and West side of Sierra Nevada until the Sierra Nevada bighorn sheep are recovered?

In coordination with CDFG and others, mountain lions that are determined to be a threat may be killed in the winter range on the east and west sides of the Sierra Nevada, as discussed in the EA. See response to comment number one which discusses examples of when a mountain lion may or may not be considered a threat in winter range. The conservation plan will develop further criteria for determining when the bighorn sheep population can withstand certain levels of natural predation.

23. Studies show that removing mountain lions will have no effect on the survival of bighorn sheep and will not reduce depredation. A New Mexico study showed that removing 40 mountain lions had no effect on bighorn survival.

Previous CDFG experience with the reintroduction of sheep in Lee Vining Canyon demonstrated that selective mountain lion removal can stimulate population recovery. Ross (1997) demonstrated that some individual mountain lions do select bighorn sheep more than others. This suggests that identifying and removing those individuals could be beneficial.

The New Mexico study does not apply well to the situation in the Sierra Nevada. The New Mexico study removed mountain lions randomly, not selectively. The study was not designed to identify mountain lions that might kill bighorn sheep, but rather the focus was on removing mountain lions in such a way as to mimic a hunting program. The question posed in the study was, would hunting be an effective management tool.

24. Trauma of bighorn sheep from collaring makes them more susceptible to other predators and fearful of humans.

Presently, only four bighorn sheep are collared and no additional bighorn sheep will be collared as a result of implementing the preferred alternative in the Environmental Assessment.

25. The EA's population estimate of mountain lions is a wild guess. There have been no population studies statewide or on the east slope of the Sierras.

The EA references the data sources used for population estimates. The best available information used was provided by the CDFG, and low density conservative estimates were used in the range of available estimates. This project would add to existing information on mountain lion population.

26. A temporary increase in mountain lion density will increase opportunities for bighorn predation and further discourage the bighorn sheep from occupying winter range.

The density may be less of a factor than the threat of certain individual mountain lions. However, new mountain lions may or may not be a threat to bighorns, and as discussed in this appendix and the EA, only mountain lions determined to be a threat to bighorn would be removed. This is discussed in the EA. Mountain lions would most likely be removed during the winter, to minimize recruitment into winter range.

27. There is no margin for error if removing 13 mountain lions annually will have a moderate impact but removing 14 mountain lions will have a high impact. The EA failed to mention that there is a downward trend to the mountain lion population. Cumulative impacts on mountain lions are meaningless because they are statewide.

According to conservative estimates, removing 14 mountain lions could result in a localized high impact, according to one study, as presented in the EA (page 4-6 to 4-7). A more commonly accepted allowable harvest level for mountain lions is much higher (30 percent) than the more conservative study used in the EA that used an 11 percent threshold. Other studies would indicate that this is not a high magnitude impact on the local population. In the unlikely event of a high localized impact (according to the worst case scenario presented in the EA), there would still be a low magnitude impact on the mountain lion population, regionally and statewide.

CDFG data on known predation on deer and bighorn sheep, depredation on livestock, and threats to public safety all suggest that the mountain lion population has increased dramatically over the last 26 years. Recent declines in depredation suggest that mountain lion activities have declined, yet these levels still remain at historically high levels. Mountain lion populations can be expected to fluctuate.

28. There are no baseline data for the affected region or statewide for the public or any decision-maker to use in evaluating the cumulative consequences of the proposed action on the mountain lion population.

The Service disagrees. Data are presented in table 2 of the EA which presents the statewide mountain lion depredation permits issued and mountain lions killed each year over a 26-year period. In 1998, for example, 109 mountain lions were killed statewide under depredation permits. Only one of those mountain lions was taken from Inyo and Mono counties (CDFG, unpublished data). Examination of the cumulative impact on the mountain lion population in these two counties shows negligible impacts. The mountain lion population has increased under the existing regime of mortality factors. The proposal would add a low number to the cumulative mortality, looking at local, regional, or statewide impacts.

29. The EA fails to describe the feasibility of the proposed action or how the program will be implemented. The public has no way of evaluating the feasibility of the proposed action.

The proposed action will be implemented as discussed in the EA. The cooperating agencies have the capability in the form of staff, support, and expertise to carry out the proposed actions. The “feasibility” of the proposed action has been addressed in the EA where the document addresses the effectiveness of the various alternatives.

30. The EA lacks specificity in how the program will be monitored.

Monitoring bighorn sheep and predators will be ongoing at various levels. Field biologists, and APHIS-WS wildlife specialist routinely collect information on the abundance, distribution, and behavior of bighorn sheep and predators observed as well as any sign of these animals. This information will be shared among the cooperating agencies and other scientists, and will be used to make management decisions. The APHIS-WS wildlife specialists in the field will spend the vast majority of their time monitoring mountain lions that are identified in relation to the bighorn sheep. At the administrative level, APHIS-WS monitors its activities through its management information system. This information is provided to its cooperating agencies, including CDFG for monitoring and planning purposes.

The program will be monitored on a regular basis to ensure its effectiveness. Substantial changes that could change the analysis or decision could trigger the need for additional analysis and public involvement.

31. No description of “hounding” or the success rate of hounds in finding a “targeted” mountain lion.

A mountain lion tracker becomes familiar with individual mountain lions in the area by their individual signs. Hounds are trained to locate mountain lion scent, and to follow the track. Hound handlers monitor the dogs’ trailing by checking mountain lion tracks (that are unique to each individual) and other signs. Hounds are the most selective method for finding individual mountain lions. Because of the distribution of mountain lions, the intent of monitoring the mountain lion population is to locate and distinguish between individual mountain lions that may or may not be a threat to bighorn sheep.

The Service disagrees. A mountain lion will not be taken until after the Service, CDFG, and the APHIS-WS wildlife specialists have discussed the situation. However, the wildlife specialists will be authorized to remove a mountain lion if in their professional judgement, a bighorn sheep is immediately at risk from a specific mountain lion and to delay would possibly result in losing that animal.

32. An immense amount of discretion is left to the agency whose mission is to kill predators.

No agency has a mission to kill predators. Discretion for field level decisions is left to the agencies who have the responsibility and authority to manage endangered species recovery, predator populations, predator damage management, and land use management. All of the cooperating agencies are concerned that only the minimum number of predators necessary be removed to protect the bighorn sheep from further decline. See response to comment number 6, for further information as to the process.

33. Genetic testing should be used to identify actual target mountain lions and minimize take.

When feasible, genetic testing may be used to compliment other methods. This is currently being considered and may be presented to the scientific bighorn sheep recovery team assembled by the CDFG.

34. There is no discussion of funding the proposed action.

Funding is not an environmental impact issue in this analysis.

35. The EA relies on questionable depredation information and a legally invalidated CDFG Environmental Impact Report (EIR) to support the proposed action's effectiveness. The Service makes claims referencing a CDFG draft EA that removing mountain lions was done to protect bighorn sheep, and fails to state that the document was invalidated by the California Court of Appeals.

The 1988 CDFG EIR was only one document among many other different more recent sources of information listed in the references section of the EA to help assess impacts of the various alternative actions on mountain lions.

36. The EA claims that removing two to three mountain lions per year for domestic sheep predation indirectly benefitted the Lee Vining group of bighorn sheep. This information supports an argument that existing efforts at managing mountain lions are sufficient to protect bighorn sheep.

The Service disagrees. The existing effort referred to was to control damage to livestock. Removing those mountain lions may have benefitted the Lee Vining group by removing mountain lions that may have prevented bighorn sheep from occupying that winter range. However, we can not rely on protecting all bighorn sheep through the livestock depredation permit program. In addition, mountain lions that are preying upon livestock may or may not be a threat to bighorn sheep.

37. The EA ignores studies of the transient component of the cougar population.

The project proposes selective removal of mountain lions that are determined to threaten bighorn sheep. Transient animals will be identified to the best of the agencies' abilities. If they are a threat, they will be removed. The population structure of mountain lions will be studied in the field and results will be monitored by the recovery team.

38. The claimed removal of up to three mountain lions annually is not reflected in Table 1 of the EA. In 1998, only one mountain lion was killed in Mono County under a depredation permit.

No mountain lions have been removed to protect Sierra Nevada bighorn sheep since the species has been emergency listed as endangered. Table 1 is a historical record of mountain lions killed for depredation (livestock and property). The EA must examine the potential number of mountain lions that may have to be removed to protect all 5 of the bighorn sheep subpopulations. It is inappropriate to compare the number of animals removed under a depredation permit with the number that may have to be removed to protect bighorn sheep.

39. The EA is merely justification for a decision already made.

The EA was developed and modified in accordance with agency NEPA procedures, and in response to agency and public input processes. No decision was made prior to the development of the EA.

40. The proposed action does not adequately protect the bighorn sheep. If a mountain lion kills a sheep first, by the time a team is mobilized, more sheep could be lost and the result could be devastating.

The Service believes that the proposed action is adequate; however, the programs effectiveness will be monitored. The Service does expect a bighorn sheep may be killed before a wildlife specialist is able to identify the high risk situation. Mountain lion trackers will be mobilized and in the field full time. They will be in communication with each other and CDFG with radio and cellular phones. Collared mountain lions will be monitored carefully.

41. Mountain lions should be eliminated from the area.

Mountain lions that do not threaten bighorn sheep should not be killed because they may be replaced by a mountain lion that targets bighorn sheep as prey.

42. Presence of alternative prey and the time of year should not be considered in determining whether to remove a mountain lion.

The Service disagrees. All of these factors will be considered in the proposed action and in the conservation plan because they can affect the potential for a kill.

43. Predator control must include all predators.

All known predators were included in the analysis. Coyotes and bobcats were considered a lesser threat, but still included because of known kills by these species. Bobcats, coyotes and mountain lions will be monitored to determine if they pose a threat to Sierra Nevada bighorn sheep.

44. The Service will violate the Endangered Species Act by choosing an alternative that protects mountain lions over bighorn sheep.

The purpose of the EA is to evaluate alternatives for protecting bighorn sheep from predators. The Service has selected the alternative that best meets the objective of the proposal, complies with all applicable laws, and results in no significant impact on the environment.

The Service and other federal agencies are required by the Endangered Species Act to use their authorities to protect and conserve listed species. The preferred alternative provides such protection to the bighorn sheep. Studies have documented that not all mountain lions in the vicinity of bighorn sheep prey upon bighorn sheep. Thus, we expect mountain lions and other predators will be selective and as a result, we should be selective in dispatching or removing such animals. It is not our intent to remove all predators, in the vicinity of bighorn sheep. Such a broad sweeping approach will not provide more protection to the bighorn sheep and will result in disruption of other dynamics in the ecosystem.

45. The impact of trained dogs would be more likely to drive the sheep up the mountain. What is the impact of an army of Federal agents?

Only trained dogs would be used by the trackers. Trained dogs do not chase sheep and there are no expected impacts on the bighorn sheep from dogs. Initially, there will be only one or two mountain lion trackers (wildlife specialist) in the field with the dogs. Additional wildlife specialists may be necessary to ensure all of the subpopulations of bighorn sheep have adequate protection.

46. Look for long term solutions to saving the sheep. The mountain lions are not the problem.

One of the most immediate threats to bighorn sheep is predation by mountain lions. This is one of the significant reasons why the species was emergency listed as endangered. Between 1976 and 1988, 49 sheep were documented to be killed by mountain lions (Wehausen 1996).

However, we recognize that predation by mountain lions was probably a natural occurrence and, given a healthy distribution and abundance of bighorn sheep, was part of the balance of nature. Thus, we need to immediately protect bighorn sheep from mountain lion predation while we address other threats to bighorn sheep until the predator/prey balance can be restored.

Long term solutions to recover bighorn sheep will be identified by the bighorn sheep recovery team led by the CDFG and by the coordinated efforts of various agencies and organizations to resolve the threat of disease transmission by domestic sheep.

47. Start immediately to remove mountain lions now. Dogs are the most effective method.

We agree that dogs are effective and specific in tracking individually identified mountain lions in rough country. The selected alternative can be implemented immediately. Only mountain lions that are identified as a threat to Sierra Nevada bighorn sheep will be removed.

48. The Service fails to meet their mandate to protect sheep if another sheep is killed while the agencies determine whether or not a mountain lion is “persisting in the area”.

The Service will work with the USDA, APHIS-WS, and CDFG to actively protect bighorn sheep from predation by mountain lions and other predators by selectively removing predators that pose a threat to bighorn sheep. It is not our intent to remove all predators, in the vicinity of bighorn sheep. Such a broad sweeping approach will not provide more protection to the bighorn sheep and will result in disruption of other dynamics in the ecosystem. However, as effective as the proposed approach has been designed, perfection can not be guaranteed. There may be an instance where a mountain lion takes a bighorn sheep with full implementation of the proposed action. We have designed a program that reduces this risk to the maximum extent practicable, but the dynamics of living creatures in an ever-changing environment, can not be predicted with 100 percent accuracy.

49. What resources are needed in terms of personnel and support, and how would the reliability of the action be assessed?

Personnel and support resources will be in place to effectively accomplish the selected action. USDA, APHIS-WS is dedicating two full-time expert trackers to identify, locate, monitor, study, track, and/or capture and dispatch or collar and release the target predators. This initial level of effort is believed adequate to fully implement the proposed action. The effectiveness of the actions taken will be assessed by APHIS-WS, the Service, National Park Service, and U.S. Forest Service regularly. Reports will be submitted to the bighorn sheep recovery team. The recovery team may be asked to respond with comments and recommendations.

50. Relocating mountain lions creates another problem in the new location. Human and mountain lion populations are both increasing and human/mountain lion contacts are increasing.

The Service agrees. The EA discusses the potential impacts of relocating mountain lions.

51. Alternative 1 is the best, but does not ensure that bighorn sheep will be protected in a timely and efficient manner.

The Service disagrees that the program, as identified in the preferred alternative, would not be timely and efficient. Based on preliminary studies, few mountain lions have been identified as potential threats. The wildlife specialists will be in the field full time monitoring mountain lion activity; they are familiar with the terrain, and will be able to take immediate action, if necessary, to dispatch a mountain lion.

52. The only way to protect the bighorn sheep is to remove all mountain lions, coyotes, and bobcats that are found in proximity to both the winter and summer ranges.

The Service disagrees. All cooperating agencies agree that the intent should be to remove only those predators that pose a threat to bighorn sheep. See response to comment number 1.

53. Harassment will not achieve the stated goals and objectives and should not be an option.

The Service agrees. Harassment was considered, but not selected, because it is considered experimental.

54. Relocating predators is unacceptable because habitat is saturated, predators may return, relocation creates or transfers problems, and the cost vs benefit is too great.

The Service agrees. The EA and FONSI discuss the potential impacts of relocation.

55. The Draft EA fails to disclose information about the status of the bighorn habitat within the project area.

Habitat throughout the historic range of bighorn sheep remains essentially intact; the habitat is neither fragmented nor degraded. Lack of habitat has never been a limiting factor in bighorn sheep recovery (EA Appendix B). However, the Inyo National Forest has and will continue to improve bighorn winter habitat by using prescribed burning as a tool to reduce hiding cover for mountain lions (EA page 1-9).

56. The Draft EA does not provide a proper or legally sufficient description of the affected environment and the legal mandates which pertain to those different land management jurisdictions.

A description of the affected environment is found in Chapter 1 of the EA (pages 6-7) and in the Federal Register Notice Final Rule to Emergency List the Sierra Nevada bighorn sheep as Endangered (EA Appendix B). The affected area comprises only current bighorn sheep range, i.e. lands that are occupied by bighorn at some time of the year. A geographic information system based map is provided in the document (EA Figure 1).

As stated in the EA (pages 12-14), the intent is to limit the proposed action in a manner consistent with the Wilderness Act and the regulations and policies implementing the Wilderness Act on National Forest System lands. These regulations, as stated in the Forest Service Manual (FSM), allow for predator control in Wilderness Areas on National Forest System lands where it is necessary to protect federally listed threatened or endangered species (FSM 2323.33c).

National Park Service (NPS) regulations, and the statutes that govern them, permit lethal removal as one tool for managing wildlife in furtherance of park objectives, whether those objectives are concerning desired resource condition or protection of life and property. The disclosure and discussion of the governing statutes and regulations of the NPS is not within the scope of this Environmental Assessment. By definition, any actions contemplated on NPS lands are compelled to remain within the scope of law and regulation, and all the alternatives do so. No new policy is contemplated here, so the National Environmental Policy Act is not invoked with respect to actions on NPS lands.

57. The Draft EA provides virtually no population-specific information about the individual bighorn populations. Until and unless agencies provide population-specific information they will be in violation of NEPA.

Detailed discussions of the individual bighorn subpopulations (herds) are contained in Appendix B. It is the professional judgement of the biologists representing the affected state and federal agencies, based on available information, that all populations remain potentially reproductive and viable, and that mountain lion predation critically jeopardizes that viability.

58. The EA lacks a midrange alternative.

The alternatives were developed through agency meetings and public involvement, according to agency NEPA procedures. The alternatives were revised based on information received from the public. The comment proposes a "mid range" alternative that uses harassment first, and if that is not effective, lethal control could be used. If harassment were determined to be effective, the components of that alternative could be combined with lethal control, even though they were analyzed as two "separate" alternatives. The final decision is to select the alternative that will best meet the objectives of the proposal.

59. The EA fails to discuss the impacts of lethal control methods on individual animals.

The EA provides information on the impacts of lethal control methods on individual animals and incorporated by reference a detailed discussion in the CDFG document which conclusions were discussed in the EA. The EA discusses humaneness under all of the alternatives, and discusses the various perspectives on it. Measures to mitigate these effects to make the action as humane as practicable are incorporated into the proposed action, including using euthanasia.

60. Better explain how the Service and cooperating agencies will determine the program's success, that is, identify the stage at which the agencies will stop controlling mountain lions and other predators because the bighorn are at a healthy enough population level to withstand natural predation.

The predator damage management program for protection of bighorn sheep will likely continue until all 5 subpopulations of bighorn sheep are composed of a biologically sound age and sex ratio and are large enough to sustain growth with natural predation occurring. In order not to prejudice the outcome of the bighorn sheep recovery team's recommendations for determination of recovery, more specific guidelines to indicate when the predator damage management program will cease can not be provided at this time. But, it will be the responsibility of the Recovery Team to define recovery for bighorn sheep in quantifiable terms and provide specific indicators for when predator damage management can cease.

REFERENCES

- Ross, P. I., Jalkotzy, M. G., Festa-Bianchet, M., 1997. Cougar predation on bighorn sheep in southwestern Alberta during winter. *Can. J. Zool.*; 75(5):771-775.
- Wehausen, J.D. 1996. Effects of mountain lion predation on bighorn sheep in the "Sierra Nevada and Granite Mountains of California. *Wildlife Society Bulletin* 24:471-479.

Final Environmental Assessment

**Predator Damage Management
To Protect the Federally Endangered
Sierra Nevada Bighorn Sheep**

California

Lead Agency: U.S. Department of Interior
Fish and Wildlife Service
Region 1

Cooperating Agencies: State of California
The Resources Agency
Department of Fish and Game

U.S. Department of Agriculture
National Forest Service
Pacific Southwest Region

U.S. Department of Interior
National Park Service
Yosemite, Kings Canyon, and Sequoia National Parks

**Prepared by
Cooperating Agency:** U.S. Department of Agriculture
Animal and Plant Health Inspection Service
Wildlife Services

November 1999

Final Environmental Assessment

**Predator Damage Management
To Protect the Federally Endangered
Sierra Nevada Bighorn Sheep**

California

Lead Agency:

U.S. Department of Interior
Fish and Wildlife Service
Region 1

Cooperating Agencies:

State of California
The Resources Agency
Department of Fish and Game

U.S. Department of Agriculture
National Forest Service
Pacific Southwest Region

U.S. Department of Interior
National Park Service
Yosemite, Kings Canyon, and Sequoia National Parks

Prepared by

Cooperating Agency:

U.S. Department of Agriculture
Animal and Plant Health Inspection Service
Wildlife Services

November 1999

List of Acronyms and Abbreviations Used for this Document

| | |
|---------|--|
| APHIS | Animal and Plant Health Inspection Service (USDA agency) |
| AVMA | American Veterinary Medical Association |
| BLM | Bureau of Land Management |
| CDFG | California Department of Fish and Game |
| CEQ | President's Council on Environmental Quality |
| CEQA | California Environmental Quality Act |
| CFR | Code of Federal Regulations |
| DM | Department of the Interior's Departmental Manual |
| EA | Environmental Assessment |
| km | kilometer |
| MOU | Memorandum of Understanding |
| NPS | National Park Service |
| NEPA | National Environmental Policy Act |
| ODFW | Oregon Department of Fish and Wildlife |
| Service | United States Fish and Wildlife Service (USDI agency) |
| T&E | Threatened and Endangered |
| USDA | United States Department of Agriculture |
| USDI | United States Department of the Interior |
| USFS | United States Forest Service (USDA agency) |
| WS | Wildlife Services (USDA-APHIS program) |

TABLE OF CONTENTS

List of Acronyms

| | |
|--|------|
| Chapter 1: Purpose and Need for Action | 1-1 |
| 1.0 Introduction | 1-1 |
| 1.1 Purpose | 1-1 |
| 1.2 Need for Action | 1-2 |
| 1.3 Background | 1-5 |
| 1.4 Location | 1-6 |
| 1.5 Sierra Nevada Bighorn Sheep Conservation Efforts | 1-8 |
| 1.6 Objectives and Scope | 1-10 |
| 1.7 Summary of Public Involvement Efforts | 1-11 |
| 1.8 Relationship of this EA to other Environmental Documents | 1-11 |
| 1.9 Authority and Compliance | 1-13 |
| Chapter 2: Description of the Alternatives | |
| 2.1 Alternative 1 - Predator Damage Management (Proposed Action Alternative) | 2-1 |
| 2.2 No Action Alternative | 2-4 |
| 2.3 Non Lethal Control of Mountain Lions with Lethal Control of Coyotes and Bobcats | 2-4 |
| 2.4 Non Lethal Control of Mountain Lions, Coyotes and Bobcats | 2-5 |
| Chapter 3: Issues Important to the Analysis of Impacts | |
| 3.1 Issues Driving the Analysis | 3-1 |
| 3.2 Issues Not Analyzed in Detail with Rationale | 3-1 |
| 3.3 Evaluation Methodology | 3-2 |
| Chapter 4: Environmental Consequence | |
| 4.1 Alternative 1 - Proposed Action Alternative | 4-1 |
| 4.2 Alternative 2 - No Action Alternative | 4-24 |
| 4.3 Alternative 3 - Nonlethal Control of Mountain Lions | 4-28 |
| 4.4 Alternative 4 - Nonlethal Control of Mountain Lions, Coyotes and Bobcats .. | 4-31 |
| 4.5 Summary Conclusions | 4-33 |
| References and Consultations | |
| APPENDIX A - Frequently Asked Questions About the Emergency and Proposed Listing of the Sierra Nevada Bighorn Sheep | |
| APPENDIX B - Federal Register Emergency Final Rule to List the Sierra Nevada Bighorn Sheep as Endangered | |
| APPENDIX C - Text of Assembly Bill 560, Oller Bill - Amending Section 4801 of the California Fish and Game Code | |

CHAPTER 1: PURPOSE AND NEED FOR ACTION

1.0 Introduction

The U.S. Fish and Wildlife Service (Service) published an emergency rule on April 20, 1999, listing the Sierra Nevada distinct population segment of California bighorn sheep (*Ovis canadensis californiana*) as endangered, under the Endangered Species Act of 1973, as amended (Act). The Sierra Nevada bighorn sheep (bighorn sheep) is known from 5 distinct subpopulations (herds) along the eastern escarpment of the Sierra Nevada totaling about 100 animals. All 5 subpopulations are very small and are imminently threatened by mountain lion (*Puma concolor*) predation and disease from domestic sheep. Every individual bighorn sheep is now considered a significant portion of the overall population. A complete discussion of the criteria for listing the bighorn sheep is contained in the federal Register notice implementing the emergency rule (Appendix A - Emergency Rule).

The emergency rule provided federal protection pursuant to the Act for a period of 240 days, (until December 16, 1999). A proposed rule to list the Sierra Nevada bighorn sheep as endangered was published concurrently with the emergency rule. Federal agencies are charged with using their authorities for the conservation of federally listed endangered and threatened species and their habitats (Section 7(a)(1) of the Act). Besides the federal listing, the California Department of Fish and Game (CDFG) has listed the Sierra Nevada bighorn sheep as endangered under the California Endangered Species Act (March 4, 1999).

1.1 Purpose

The purpose of this project is to protect the federally endangered Sierra Nevada bighorn sheep from direct predation by mountain lions, coyotes (*Canis latrans*) and bobcats (*Lynx rufus*), and from displacement from important winter range, believed to be due to the presence of predators. The precariously low numbers of bighorn sheep require immediate action. The direct and indirect effects of predation by mountain lions are considered a critical factor limiting bighorn sheep population recovery.

This Environmental Assessment (EA) evaluates methods by which predator damage management can be carried out to protect the bighorn sheep from predation on and around its current range. The current and historical range covers the western and eastern crests and the eastern escarpment of the Sierra Nevada Mountains, primarily on the Inyo National Forest, located in Mono and Inyo counties. Historical range also included the Humboldt-Toiyabe, Stanislaus, Sierra, and Sequoia National Forests as well as Sequoia, Kings Canyon, and Yosemite National Parks - where bighorn sheep still occur during the summer. Predator damage management will be focused on mountain lions, coyotes, and bobcats, given the actual and potential threats to bighorn sheep from these species.

The purpose of this EA is to assess the environmental impacts of conducting a comprehensive predator damage management program to protect bighorn sheep, where predators critically threaten the remaining populations.

1.2 Need for Action

The primary threats to bighorn sheep are believed to be direct and indirect effects of predation from mountain lions, risk of disease from domestic sheep, and environmental catastrophes. Bighorn sheep are more vulnerable to environmental effects when they avoid their winter range [Interagency Group (SNBSIAG) 1977]. Disease risks and environmental catastrophes are discussed briefly for the reader's understanding of the fate of the bighorn sheep, but are outside the scope of this assessment. Disease prevention is being handled separately by the land management agencies which permit domestic sheep use on their lands (Inyo National Forest, Humboldt-Toiyabe National Forest, Bureau of Land Management, and Los Angeles Department of Water and Power). As explained below, it is necessary to address the impacts of predation on bighorn sheep regardless of what efforts are taken to address disease transmission and other threats to the bighorn sheep. Reduction of the threat posed by predators will be beneficial to bighorn sheep apart from other conservation-related efforts.

1.2.1 Mountain lion predation

Increased mountain lion predation on bighorn sheep from the late 1980s and early 1990s has become a limiting factor for the continued survival of the bighorn sheep (The Service 1999b) (Wehausen 1996). The decline of bighorn sheep is attributed to mountain lions which impact bighorn sheep in two ways: direct predation and indirect effect of bighorn sheep avoiding use of their wintering range. Table 1 shows the declining numbers of bighorn sheep from 1978 to 1998. At least 70 accounts of mountain lion predation on bighorn sheep have been recorded (J. Wehausen pers. comm. 1999). From 1976 to 1988, 49 sheep were found killed by mountain lions on the winter range used by the Mount Baxter population (Wehausen 1996).

Second, mountain lions are thought to affect bighorn sheep indirectly by forcing the sheep to abandon lower elevation winter range to avoid predation (The Service 1999b). The Mount Baxter population abandoned its winter range in 1978, most likely due to the presence of mountain lions (Wehausen 1996). When groups of bighorn sheep avoid moving into lower elevation wintering range, they are adversely affected by the harsh conditions and poor forage available at the higher elevations; they emerge from winter in poorer condition

and less recruitment is seen in the population. Wehausen (1996) cites habitat abandonment as having the potential to lead to extirpation of some bighorn sheep populations. Bighorn sheep have shown much greater susceptibility to catastrophic losses when avoiding winter range (Wehausen 1996).

| Year | No. of populations | Total sheep |
|------|--------------------|-------------|
| 1978 | 2 | 250 |
| 1985 | 4 | 310 |
| 1995 | 5 | 100 |
| 1996 | 5 | 110 |
| 1997 | 5 | 130 |
| 1998 | 5 | 100 |

Torres et al. (1996) suggest that an increasing mountain lion population correlates with an increase in the predation trend. Mountain lion depredation problems with bighorn sheep, livestock, and other resources in Inyo and Mono counties has increased up until 1996 (Wehausen 1996). Mountain lions killed at least 49 members of the Mount Baxter herd of bighorn sheep between 1976 and 1988 within their winter range. Mountain lion activity is blamed for the abandonment of the Mount Baxter herd's wintering range. Forced use of high elevation areas had a detrimental effect on the Mount Baxter subpopulation because of poor nutrition in late winter and spring, exposure to cold and deep snows, and avalanches in heavy winters. The herd at Mount Baxter lambbed later in the year and had poor lamb survival which led to low recruitment that did not balance adult mortality. This has led to a major population decline, with the population currently at about 15 percent of its peak level (SNBSIAG 1997).

In a conservation strategy for bighorn sheep, the Sierra Nevada Bighorn Sheep Interagency Advisory Group reports that mountain lion predation problems in Inyo and Mono counties increased sharply during the 1980s (SNBSIAG 1997). The increase in direct predation trend apparently correlates with an increase in the mountain lion population. Additional detailed records of mountain lion deaths supports evidence of the increase. Mountain lions drowning in the Los Angeles Aqueduct in the southern Owens Valley were never recorded between 1934 and 1988, despite many years of detailed records (J. Wehausen, pers. comm.). From 1989 and 1993, 12 mountain lions were recorded as having

drowned in the aqueduct. This increase may have resulted from passage of Proposition 117 in 1990 after which, mountain lions were no longer controlled to prevent predation on bighorn sheep (SNBSIAG 1997).

Mountain lions and bighorn sheep are both native to the Sierra Nevada mountain range and have presumably coexisted as predator and prey for many years. However, the smaller sized, fragmented populations of bighorn sheep that exist today cannot sustain present levels of predation. If bighorn sheep can be recovered to larger and more widely distributed populations, continued predator control may no longer be necessary and a predator/prey system will be more equally balanced.

A more detailed discussion of the history and effects of mountain lion predation on the bighorn sheep subpopulations can be found in the Final Rule for the Emergency Rule Listing of the Sierra Nevada Bighorn Sheep (Appendix B).

1.2.2 Predation by other predators - coyotes and bobcats

Other predators that are known to effect the bighorn sheep include the coyote and bobcat (Jones 1950; Cowan and Geist 1971). The most abundant of these occurring in bighorn sheep range is the coyote (SNBSIAG 1997). Coyotes and bobcats are primarily a threat to bighorn sheep lambs.

Coyote predation incidents have been observed, and others are believed by some experts to have occurred in Lee Vining Canyon (K. Chang, pers. comm. 1999). On March 3, 1993, a lamb was killed by a group of coyotes, its ewe was not seen again after that date. On March 28, 1995, a large ram was believed to have been killed by a group of coyotes within Lee Vining Canyon winter range. Lone coyotes will stalk or harass large rams, but a single coyote may not be capable of killing large bighorn sheep (K. Chang, pers. comm. 1999). On January 16, 1997, a yearling ewe was killed by a coyote along highway 120 in Lee Vining Canyon. Since the predation incident in 1997, an estimated 24 coyotes have been removed from Lee Vining Canyon (K. Chang, pers. comm. 1999).

Bobcats also threaten bighorn sheep survival. Bobcats have been observed on 2 occasions, one in the Old Dad Mountains in San Bernardino California and another in the Marble Mountains of California killing Nelson bighorn sheep lambs (S. Torres and J. Wehausen pers. comm. 1999). A confirmed bighorn sheep lamb kill by a bobcat was recorded in the winter of 1995 by California Department of Transportation employees in Lee Vining Canyon (J. Wehausen, pers. comm. 1999). Bobcats have also been observed stalking bighorn sheep,

causing them to move away from the winter range (K. Chang, pers. comm. 1999).

Although few predation incidents by coyotes and bobcats have been documented, the loss of even one remaining bighorn sheep can have a substantially detrimental impact on the overall population. That is why predator damage management must include identifying and controlling coyotes and bobcats where they are identified as a threat to bighorn sheep.

1.3 Background

By 1900, about half of the bighorn sheep population was lost, most likely because of introduction of diseases by domestic livestock in the late 1800s, and illegal hunting (SNBSIAG 1997, The Service 1999b). Diseases such as scabies¹ and pneumonia contracted from domestic sheep caused significant declines. People hunted bighorn sheep for food, they were also killed by sheepmen who considered them competitors with domestic sheep for forage. In the late 1800s, California passed legislation providing protection to bighorn sheep (Jones 1950, Wehausen 1979).

The Sierra Nevada bighorn sheep was listed by California in 1971 as “rare”; in 1984, the designation was changed to “threatened” under the California Endangered Species Act. The bighorn sheep status was upgraded to “endangered” in 1999. (A list of frequently asked questions and answers about the emergency and proposed listing of the Sierra Nevada bighorn sheep can be found in Appendix B). Since 1971, the CDFG has implemented a number of conservation efforts including field studies, reestablishing three additional sub-populations, creating the Sierra Nevada Bighorn Sheep Interagency Advisory Group (including representatives from federal, state and local resource management agencies), and removing three mountain lions that were preying upon bighorn sheep.

From 1907 to 1963, the state provided a bounty on mountain lions that likely kept the population reduced to such a level that bighorn sheep predation was rare and did not threaten the population. Between 1963 and 1968, mountain lions were managed as a non-game and non-protected mammal, and take was not regulated. Between 1969 and 1972, mountain lions were classified as game animals with regulated hunting. A moratorium on mountain lion hunting began in 1972 and mountain lion numbers increased steadily

¹ Sierra Nevada bighorn sheep probably contracted scabies from domestic sheep. Cattle also carry scabies and were present in the Sierra Nevada prior to the 1860s (The Service 1999b).

through the early 1990s (S. Torres and T. Mansfield pers. comm. 1999). In 1986, the species was again classified as a game animal, but no hunting was authorized.

Bighorn sheep numbers have declined from about 310 individuals in 1985-86 to 100 individuals currently. Predation from mountain lions and associated abandonment of winter habitat are thought to be major factors contributing to this decline (The Service 1999a, The Service 1999b).

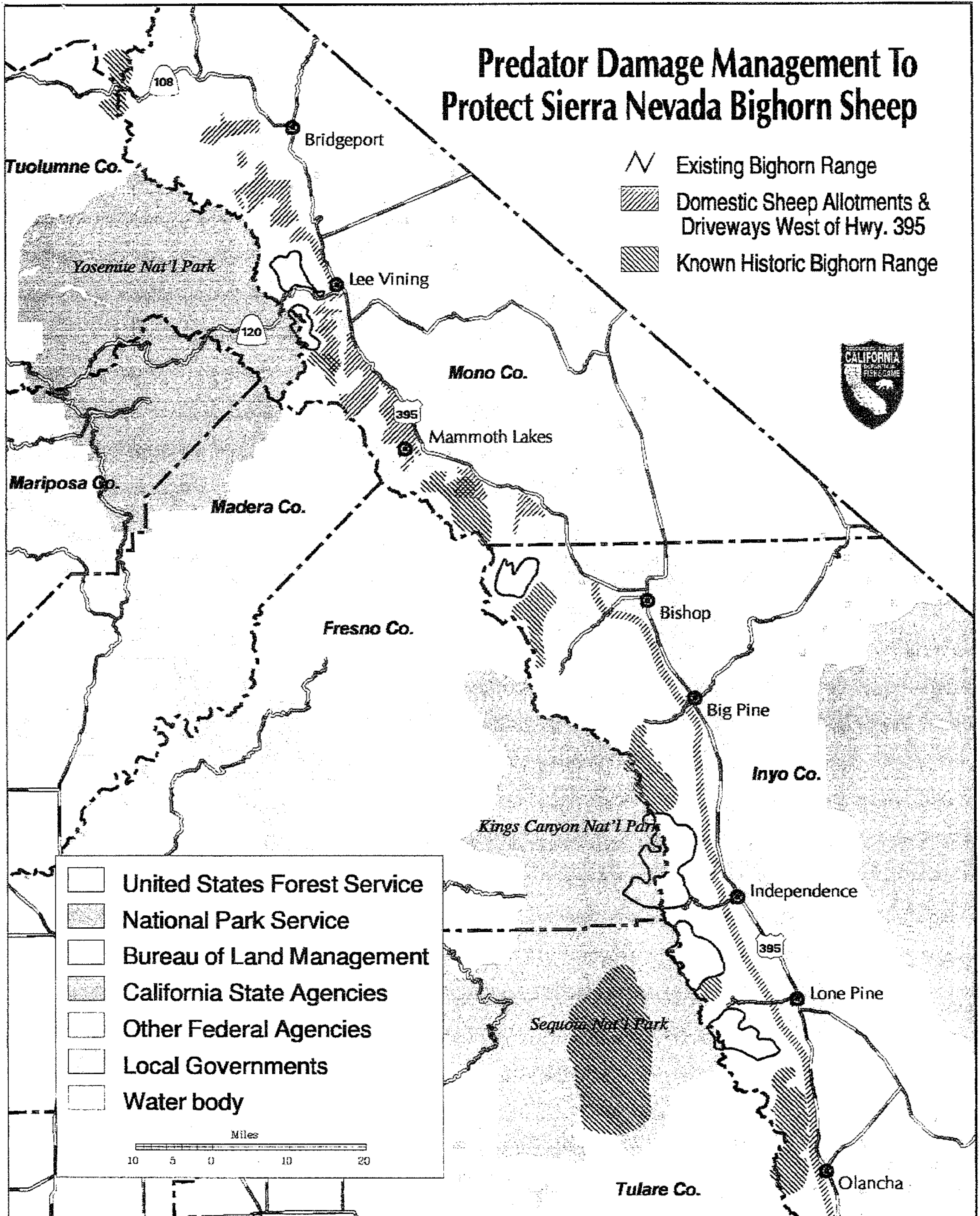
In 1990, Proposition 117 was passed which designated the mountain lion a specially protected mammal. This law limited the taking or removal of mountain lions only to cases involving threats to people, pets or livestock. Since the passage Proposition 117, mountain lion predation has continued to be a significant limiting factor for the bighorn sheep (The Service, 1999a). A bill recently passed by the State legislature (AB 560) allows the removal of any mountain lion that is perceived to be an imminent threat to any threatened, endangered candidate or fully protected sheep species (a copy of the bill can be found in Appendix C).

1.4 Location

The proposed project would be carried out to protect the bighorn sheep from predation on and around its current range. The current range, which occurs within the historical range, covers the western and eastern crest and the eastern escarpment of the Sierra Nevada Mountains, primarily on the Inyo National Forest, located in Mono and Inyo counties, California. The historical range also included the Humboldt-Toiyabe, Stanislaus, Sierra, and Sequoia National Forests as well as Sequoia, Kings Canyon, and Yosemite National Parks - where bighorn sheep still occur during the summer. The potential project locations could encompass sites within this larger area of about 346 square kilometers (approximately, 215 square miles) (Jones 1950, Wehausen 1979, 1980, The Service 1999b). Elevation throughout the historic range from 1463 meters (4800 feet) to over 4300 meters (14,000 feet). During the summer months, bighorn sheep use open rough, rocky, and sparsely vegetated slopes and canyons (SNBSIAG 1997). Suitable winter range occurs at lower elevations at the very base of the eastern escarpment, characterized as sagebrush steppe habitat at the lower elevations.

Currently, 5 subpopulations of bighorn sheep exist: Lee Vining Canyon, Wheeler Crest, Mount Baxter, Mount Williamson, and Mount Langley in Mono and Inyo counties. Three of the 5 subpopulations were reestablished through translocation of sheep obtained from the Mount Baxter group. Figure 1 shows the proposed project locations, associated land jurisdiction, and major features.

Figure 1



1.5 Sierra Nevada Bighorn Sheep Conservation Efforts

1.5.1 Management of Bighorn Sheep Disease Threats from Domestic Sheep Grazing

In addition to the proposal to manage predation, other bighorn sheep conservation efforts include management of bighorn sheep disease threats from domestic sheep grazing. Native bighorn sheep cannot tolerate strains of respiratory bacteria, such as Pasteurella species, carried normally by domestic sheep. Close contact with domestic animals results in transmission of disease and subsequent deaths of the exposed animals (Foreyt and Jessup 1982). Bighorn sheep can also develop pneumonia independent of contact with domestic sheep.

Disease is believed to have been the major contributing factor responsible for the precipitous decline of bighorn sheep starting in the late 1800s (Foreyt and Jessup 1982). Cattle were first introduced into the Sierra Nevada in the 1860s, but were replaced with domestic sheep that could graze more extensively over the rugged terrain. Large numbers of domestic sheep were grazed seasonally in the Sierra Nevada prior to the turn of the century, and the domestic sheep would use the same range as the bighorn sheep, occasionally coming into direct contact with them. Both domestic sheep and cattle can act as disease reservoirs.

However, today domestic sheep grazing continues in the Sierra Nevada, but under much greater restrictions. Domestic sheep do not graze in the same range as the bighorn sheep. Domestic sheep grazing operations are permitted or leased within geographically constrained allotments, some of which are adjacent to bighorn sheep habitat. However, there has not been a documented die-off of bighorn sheep attributed to disease since intensive monitoring of bighorn sheep began in the 1970s.

The following agencies administer domestic sheep grazing operations in proximity to occupied bighorn sheep habitat: The Inyo National Forest, Los Angeles Department of Water and Power, Bureau of Land Management, and the Humboldt-Toiyabe National Forest. The Service has defined the area of concern as all domestic sheep grazing allotments/leases west of Highway 395, between Virginia Creek to the north and Olancho Creek to the south. It is believed the highway serves as an adequate barrier due to its distance from occupied bighorn sheep habitat, the maintained fence along the highway, and the difficulty for domestic sheep to cross traffic.

The Service has formally consulted with the Inyo National Forest on their grazing operations for the 1999 grazing season and is in informal consultation with all agencies for the 2000 grazing season. All agencies are working cooperatively throughout the consultation process to identify high risk areas and address unacceptable risks, so that domestic sheep grazing does not threaten the existence of bighorn sheep. The objective in the management of these allotments is for there to be no reasonable possibility of contact between domestic sheep and bighorn sheep. Just as we cannot afford to loose one bighorn sheep to predation, we also cannot accept loss of one bighorn sheep due to disease transmission from domestic livestock.

1.5.2 Habitat Improvement

The Inyo National Forest has also consulted with the Service on a habitat enhancement project for bighorn sheep to improve winter habitat by reducing the cover by which mountain lions and other predators can hide behind and ambush bighorn sheep. The Forest Service will use downing of trees and prescribed fire to open up areas of low and mid-elevation winter and transition range for bighorn sheep. No ignition will occur within 100 feet of water courses and spring areas to minimize impacts to water quality and riparian wildlife habitat and to reduce potential for accelerated erosion. The areas planned for future enhancement include approximately 100 acres on the north ridge of Carroll Creek, 40 acres on a south-facing slope of the Bairs Creek, and 60 acres on a south-facing slope of Diaz Creek.

1.5.3 Conservation Plan for the Sierra Nevada Bighorn Sheep

The Service has designated the CDFG as lead agency in developing a Sierra Nevada Bighorn Sheep Conservation Plan. The plan will outline measures that should be implemented for the restoration of the bighorn sheep population, but it will also identify the bighorn sheep population characteristics that would be able to once again withstand natural predation. The conservation plan will consider all historic, current, and future conservation needs. This conservation plan is being developed in accordance with the Service's recovery plan guidelines, so that in the event the bighorn sheep is formally listed as endangered, the conservation plan may be adopted as the Service's approved recovery plan. The proposal in this EA is independent of the forthcoming conservation plan, except that information from the plan will be used to help determine the length of time that predator damage management would be necessary.

1.6 Objectives and Scope

The objectives of this proposal are twofold:

- 1) protect the bighorn sheep from predation, with a short term goal of no further losses due to predation. Predator species that have been identified as a threat are mountain lions, coyotes, and bobcats; and
- 2) protect the bighorn sheep from being displaced from its critical wintering range due to the presence of mountain lions, coyotes, and bobcats.

The selected action must answer the following question: How can the Service and its cooperating agencies best respond to the need for action and meet the objectives to protect the bighorn sheep from further decline by predation and/or displacement from wintering habitat from mountain lions, coyotes, and bobcats, while other measures to protect and recover the population are being developed or implemented?

The decision will include a determination of whether or not the proposal would be likely to have a significant impact on the human environment.

CDFG goals for managing mountain lions (Torres et al. 1996) are:

- 1) maintain healthy populations;
- 2) minimize threats to people, property, and wildlife;
- 3) protect important habitats;
- 4) recognize ecological role and value;
- 5) monitor populations and conduct research; and
- 6) improve public awareness.

The predator management plan will be designed and implemented in a manner consistent with these goals.

This EA will remain valid until the Service, in consultation with its cooperating agencies, determines that the need for action, or issues driving this EA change substantially. The need for action to protect the bighorn sheep from predators would change as the bighorn sheep population recovers. The pending conservation plan will determine the population levels and characteristics of bighorn sheep at which predator control would no longer be necessary (See Section 1.5 - Sierra Nevada Bighorn Sheep Conservation Efforts, Conservation Plan).

1.7 Summary of Public Involvement Efforts

Public participation in the National Environmental Policy Act (NEPA) process for this EA was conducted consistent with the Service's NEPA procedures. Issues related to the proposed action were identified during interagency meetings and through a public outreach process. The public outreach included an information gathering phase wherein 56 interested groups or individuals were contacted (representing conservation groups, technical experts, and government offices). Legal notices were posted in local newspapers covering the proposed project area. Notices inviting public participation in the development of the EA were published in the Fresno Bee (August 4, 1999) and Inyo Register (August 5, 1999). Letters describing the proposal and preliminary issues and alternatives were sent to the public via FedEx® or US Postal Service (when a street address could not be identified for FedEx®) on July 30, 1999. A two week comment period was provided for initial public input. Four letters were received from groups interested in providing input for the development of this EA. The letters received were considered in this analysis and substantive and relevant information was incorporated into this document. A legal notice was submitted for publication in the Fresno Bee (October 14, 1999) and in the Inyo Register (October 14, 1999), soliciting comments on this environmental assessment during the public comment period. All comments that were received by the due date were considered in reaching a final decision.

1.8 Relationship of this Environmental Assessment to other Environmental Documents

Department of Interior, The Service Emergency Rule (1999). 50 Code of Federal Regulations (CFR) Part 17. Federal Register/Vol. 64, No. 75, pp 19300 - 19309. The emergency rule was published in the Federal Register on April 20, 1999 listing the Sierra Nevada bighorn sheep as endangered, under the Act. The complete emergency rule is contained in Appendix A.

Department of Interior, The Service Proposed Rule (1999). 50 CFR Part 17. Federal Register/Vol. 64, No. 75, pp 19333 - 19334. The proposed rule to make permanent the provisions of the emergency rule listing the Sierra Nevada bighorn sheep as an endangered species under the Act.

CDFG Draft Environmental Document Regarding Furbearing and Non-game Mammal Hunting and Trapping (1999). Provides analysis of cumulative impacts from "taking" bobcats and coyotes as proposed in this EA. CDFG policy is to provide for the harvesting of wildlife resources (which includes take from predation) where such use is consistent with maintaining healthy wildlife populations. CDFG complies with the California Environmental Quality Act (CEQA), which is similar to the National

Environmental Policy Act (NEPA). CDFG provides for a public comment period on its draft CEQA documents.

Animal and Plant Health Inspection Service (APHIS)-Wildlife Services EA for Wildlife Damage Management. The California Central District office of APHIS-WS prepared an EA for its ongoing predator damage management program to protect livestock, property, and human health and safety in east central California (including counties containing Sierra Nevada bighorn sheep) (USDA 1997). General discussions about impacts on predator species populations, APHIS-WS responsibilities, guidance, decision-making procedures, and restrictions for various management tools in the United States Department of Agriculture (USDA) (1997) EA do apply to this EA, and therefore is incorporated by reference. The USDA (1997) EA included within its scope of activities the potential to work on predator damage management on the Inyo National Forest. Local and cumulative impacts are assessed for coyotes and bobcats taken to reduce predation. The USDA (1997) EA contains the full biological assessments and consultation and concurrence letters (both 1997) regarding any concerns with federal and state listed threatened and endangered species with the Service (under section 7 of the Endangered Species Act of 1973, as amended) and CDFG, respectively.

ADC Programmatic EIS. WS (formerly called Animal Damage Control (ADC)) has issued a Final Environmental Impact Statement on the national APHIS-WS program (USDA 1995). Pertinent and current information available in the EIS has been incorporated by reference into this EA.

National Forest Land and Resource Management Plans (LRMPs). The National Forest Management Act requires that each National Forest prepare a Land and Resource Management Plan (LRMP) for guiding long range management and direction. The decision made from this document will be consistent with the LRMPs for the Inyo, Sierra, Sequoia, Stanislaus, and Humboldt-Toiyabe National Forests.

BLM Resource Management Plan (RMP). The BLM currently uses RMPs to guide management on lands it administers. RMPs generally replace older land use plans known as management framework plans. Any decision made as a result of this EA process will be consistent with guidance in the Bishop District RMP.

A Conservation Strategy for Sierra Nevada Bighorn Sheep. This strategy was prepared by the Sierra Nevada Bighorn Sheep Interagency Advisory Group (1997). The group includes representatives from federal, state, and local resource management agencies whose jurisdictions include bighorn sheep or their habitat in the Sierra Nevada mountain range. The group includes the U.S. Forest Service (USFS), Service, CDFG, NPS, the University of California, and the Sierra Nevada Bighorn Sheep Foundation.

The conservation strategy outlines actions recommended to conserve the bighorn sheep, which includes appropriate predator control.

1.9 Authority and Compliance

The Service cooperates with land and wildlife management agencies to resolve wildlife management problems in compliance with applicable federal, state and local laws.

Based on agency relationships, missions, and legislative mandates, the Service is the “lead agency” and “decision maker” for this EA, and therefore responsible for the EA’s scope and content. As cooperating agencies, the USFS, CDFG, NPS and APHIS-WS have provided input on this EA and will provide advice and recommendations to the Service on when, where, and how predator damage management could be conducted.

1.9.1 Authority of Federal and State Agencies in Wildlife Damage Management and Endangered Species Protection

US Fish and Wildlife Service. The Service is charged with implementation and enforcement of the Endangered Species Act of 1973, as amended (Act). The Service cooperates with the USFS, NPS, CDFG and APHIS-WS by recommending measures to avoid or minimize take of threatened and endangered species. The term “take” is defined by the Act (section 3(19)) to mean “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.” The terms “harass” and “harm” have been further defined by Service regulations at 50 CFR section 17.3, as follows: 1) harass means an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering; 2) harm means an act which actually kills or injures wildlife. Such acts may include significant habitat modification or degradation when it actually kills or injures wildlife by significantly impairing essential behavioral patterns including breeding, feeding or sheltering.

The Service is also charged with developing recovery plans for listed species.

APHIS-Wildlife Services. APHIS-WS is subject to the Act which requires federal agencies to use their authorities to conserve threatened and endangered species. The primary statutory authorities for the WS program are the Animal Damage Control Act of 1931, and the Rural Development, Agriculture, and Related Agencies Appropriations Act of 1988 which authorize and direct APHIS-WS to manage damage caused by wildlife, in cooperation with other agencies.

California Department of Fish and Game. CDFG is mandated to manage wildlife throughout the state, including state listed endangered and threatened species. Under Memoranda of Understanding (MOU), CDFG cooperates with APHIS-WS on wildlife damage management issues, and with BLM, USFS, and the Service on habitat and species enhancement. A MOU between CDFG and the Service, pursuant to section 6 of the Act, identified how CDFG and the Service will coordinate an endangered species issue.

National Park Service (NPS). Under the National Park Service Organic Act, the NPS has jurisdiction over lands and wildlife in Yosemite, Sequoia, and Kings Canyon National Parks. The NPS is subject to the Act which requires federal agencies to use their authorities to conserve threatened and endangered species. In the proposed project, the NPS agrees to cooperate with the pursuit and removal of bighorn sheep predators from park lands if such control is selected as the chosen alternative.

U.S. Forest Service. The USFS is subject to the Act which requires federal agencies to use their authorities to conserve threatened and endangered species. Under the Animal Damage Control Act of 1932, as amended, (7 U.S.C. 426-426c), the USFS and APHIS-WS, along with the states, cooperate to manage animal damage on National Forest System lands. Under the framework of a MOU between the USFS and APHIS-WS, APHIS-WS is designated as the lead agency concerning animal damage management activities involving predators on National Forest System lands. This includes a responsibility to maintain technical expertise in the science of animal damage management, control tools and techniques, conducting management programs, and complying with the National Environmental Policy Act (NEPA) for activities related to predator control.

The USFS is responsible for the management of land and resources under its jurisdiction and for conducting non-predator control operations on National Forest System lands, including NEPA compliance on these activities. The MOU directs the USFS to coordinate with APHIS-WS in the development and annual review of animal damage management work plans governing APHIS-WS's activities on National Forest System lands and to cooperate in APHIS-WS's NEPA processes.

Bureau of Land Management. The BLM is subject to the Act which requires federal agencies to use their authorities to conserve threatened and endangered species. Under the Animal Damage Control Act of 1932, as amended, (7 U.S.C. 426-426c), BLM and APHIS-WS, along with the states, cooperate to manage animal damage on Bureau of Land Management lands. Similar to the USFS, BLM and APHIS-WS have entered into a MOU which identifies the roles and responsibilities of each agency in animal damage management operations and

coordination, and NEPA compliance. The BLM is responsible for the management of land and resources under its jurisdiction and for conducting non-predator control operations on its' lands, including NEPA compliance on these activities. The MOU directs BLM to coordinate with APHIS-WS in the development and annual review of animal damage management work plans governing APHIS-WS' activities on BLM lands and to cooperate in APHIS-WS NEPA processes.

1.9.2 Compliance with Federal Laws

The following federal laws are relevant to the actions considered in this EA.

National Environmental Policy Act (NEPA). This Environmental Assessment (EA) has been prepared in compliance with NEPA (42 USC Section 4231, et seq.); the President's Council on Environmental Quality (CEQ) Regulations, 40 Code of Federal Regulations (CFR) Section 1500 - 1508; and Department of the Interior's Departmental Manual for NEPA compliance, Fish and Wildlife Service (516 DM 6). Recovery plans do not require NEPA compliance. However, individual actions by any federal agency implementing conservation or recovery actions identified in a conservation or recovery plan may be subject to NEPA.

Endangered Species Act (ESA). It is federal policy, under the ESA, that federal agencies shall seek to conserve threatened and endangered species and shall utilize their authorities in furtherance of the purposes of the Act (Sec. 2(c)).

The Service has completed an intra-service ESA Section 7 biological evaluation on the effects of predator damage management on Sierra Nevada bighorn sheep and other federally listed species in the area. Related compliance is discussed under Chapter 4, Environmental Consequences.

Migratory Bird Treaty Act. The Migratory Bird Treaty Act provides the Service regulatory authority to protect species of birds that migrate outside the United States. All cooperating agencies coordinate with the Service on migratory bird issues. Migratory birds would not be affected by this proposal except in an unlikely event of non-target capture or lead poisoning from scavenging on predators shot with lead containing ammunition. Any impact on a migratory bird would be reported the Service, Migratory Bird Management Office. See Chapter 4, Impacts on non-target species.

National Park Service Organic Act. This statute governs the administration of units of the National Park System, including Yosemite, Sequoia and Kings

Canyon National Parks. The Organic Act requires the NPS to manage parks to conserve scenery and natural and cultural resources and to provide for the enjoyment of these resources by this and future generations.

Animal Damage Control Act and the Rural Development, Agriculture, and Related Agencies Appropriations Act. The Act authorize and direct APHIS-WS to manage damage caused by wildlife, in cooperation with other agencies.

1.9.3 California State laws

California Endangered Species Act. The California Fish and Game Commission reclassified the Sierra Nevada bighorn sheep from threatened to endangered under the California Endangered Species Act (March 5, 1999). Thus requiring, all state agencies, boards, and commissions to seek to conserve Sierra Nevada bighorn sheep and to utilize their authority in furtherance of the purposes of Chapter 1.5 of the Act. In addition, no person shall import into California, export out of California, or take, possess, purchase, or sell within California, Sierra Nevada bighorn sheep, or any part thereof.

Proposition 117 of 1990. This proposition designated the mountain lion as a specially protected mammal under the laws of California (California Fish and Game Code Section 4800). The Department of Fish and Game may grant authority to take mountain lions under limited circumstances relating to property damage (livestock or domestic pet predation), or public safety. A new provision enacted on September 17, 1999 amended the Fish and Game Code to authorize CDFG (and/or other appropriate local agency with public safety responsibility) to take any mountain lions perceived to be an imminent threat to the survival of any threatened, candidate, or fully protected sheep species.

Proposition 4 of 1998. A California State law enacted in November 1998 limits or prohibits the use of leghold traps except in limited situations involving human safety (California Fish and Game Code §3003.1 (c)). The U.S. District Court in San Francisco has determined that Proposition 4 “. . . does not apply to the use of padded leg-hold traps . . . by a federal employee (or a federally authorized agent) for the purpose of conserving an endangered . . . species under the Endangered Species Act, 16 U.S.C. § 1531-1544.” (An Order Granting Preliminary Declaratory Relief, Docket No. C-89-4610-CAL, National Audubon Society, et al., v Gray Davis, Governor of California, et al., dated February 3, 1999.)

California Environmental Quality Act (CEQA, Public Resources Code sections 21000 et seq.). CEQA is California’s state agencies’ environmental evaluation and decision making procedural regulation. CDFG now has the legal authority to remove mountain lions for the protection of the endangered bighorn

sheep population. This activity would be implemented in compliance with CEQA.

CDFG completes the Environmental Document Regarding Furbearing and Nongame Mammal Hunting and Trapping each year in compliance with CEQA (CDFG 1999a). CDFG (1999a) analyzes coyote and bobcat take, including depredation take by APHIS-WS. The environmental document is incorporated by reference.

CHAPTER 2: DESCRIPTION OF ALTERNATIVES

2.1 Alternative 1 - Predator Damage Management (Proposed Action Alternative)

The proposed action would implement a predator damage management program whereby the Service would request that APHIS-WS, in consultation with CDFG, USFS and NPS, take immediate action to protect the endangered bighorn sheep from both direct and indirect impacts from predators.

Predator damage management is based on interagency relationships, which requires close coordination and cooperation because of overlapping authorities and legal mandates. The CDFG's goals for mountain lion management include minimal removal of problem mountain lions. The program will selectively remove as few mountain lions as possible by focusing on understanding the location, distribution and activities of mountain lions in relation to bighorn sheep, in order to identify individual problem mountain lions. Control would be directed toward individual problem mountain lions and bobcats (if necessary), and groups of and/or individual problem coyotes. The proposed action would employ expert trackers that use sign, sighting, and specialized methods to locate, track, study, capture and dispatch or release the target predators.

The proposed action has several components:

- Mountain lions that have killed bighorn sheep would be trailed from the kill site and dispatched by shooting. Trained scent hounds would probably need to be used to track mountain lions because of the rough terrain. Alternative methods that could be used to take mountain lions are foot or leg snares or cage traps, with euthanasia.
- Any mature mountain lion persisting within the vicinity of bighorn sheep would be trailed and dispatched by shooting or as described above.
- Any mountain lion perceived to be a threat would be killed. Factors that determine a threat might include proximity to bighorn sheep, availability of alternative prey, time of year, or overall behavior and movement of the mountain lion. The "perception" of a threat is difficult to predict because it will depend upon numerous factors, many of which are dynamic, as are listed on the following pages. Determinations would be made based on the professional judgement of APHIS-WS and CDFG. All activities that result in the removal of mountain lions would be done in consultation with the Service.
- Prior to, and during, winter months, wildlife specialists or agents would determine, on a case-by-case basis, whether a mountain lion would be likely to deter bighorn sheep from moving into lower elevation wintering habitat, or from

remaining in that range during critical winter months. If the agencies agree that the mountain lion is a likely threat to bighorn sheep, the mountain lion would be trailed with hounds and it would be dispatched by shooting, or other methods as discussed above.

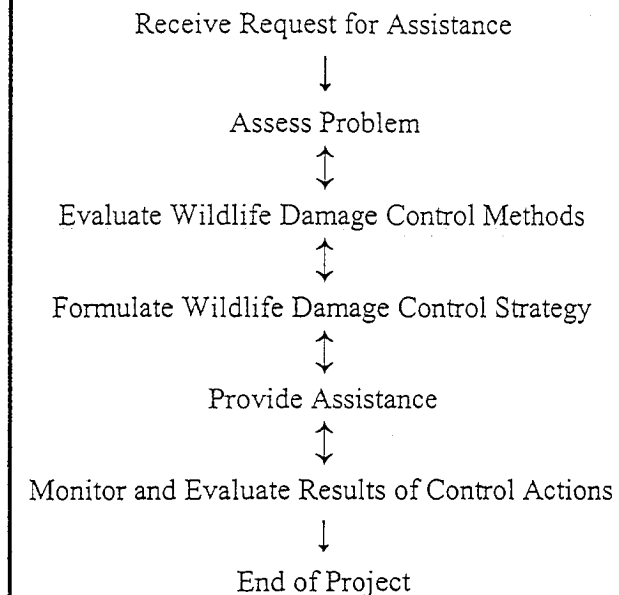
- Mountain lions that do not pose an immediate threat may be radio collared, and their movement patterns studied to determine if that mountain lion is frequenting bighorn sheep wintering range.
- Coyotes and/or bobcats would be taken if the wildlife specialist in the field determines, on a case-by-case basis, that the coyote(s) and/or bobcat(s) are either a direct or indirect threat to bighorn sheep. Direct threats would be actual or likely predation. An indirect threat would be if the predator is located or behaving in such a way that it precludes or would preclude bighorn sheep from moving into or remaining in wintering range during the critical winter months. Methods that could be used to take coyotes or bobcats could include leghold or neck snaring, padded (soft catch) leghold traps, or shooting. Captured bobcats or coyotes would be killed by shooting.
- Conspicuous, bilingual warning signs alerting people to the presence of traps and snares are placed at major access points when they are set in the field.
- The Service, APHIS-WS and CDFG would monitor the program by assessing impacts from removing mountain lions on the overall mountain lion population and on the bighorn sheep population. The cooperating agencies would periodically review program progress and impacts, and report results to CDFG's Sierra Nevada bighorn sheep recovery team. The recovery team would respond with comments and recommendations. Mountain lion removal would cease after the bighorn sheep population reaches a more stable level in its population, as determined by the Sierra Nevada Bighorn Sheep Conservation Plan.

APHIS-WS would be the federal agency that conducts predator damage management, after consultation with the cooperating agencies as identified above. APHIS-WS would use its formalized Decision Model (USDA 1995) (Figure 2) in the field, after applying the criteria listed above, to determine the most appropriate implementation strategy to resolve predator damage. This proposal would implement safe and practical methods for the prevention and control of damage caused by predators, based on local problem analysis, environmental and social factors, and the informed judgement of trained personnel. In selecting management techniques for specific damage situations, consideration is given to:

- magnitude of threat or predation;

- geographic extent of threat;
- life cycle of the bighorn sheep, time of year, and vulnerability to each predator;
- other land uses (such as proximity to recreation areas or wilderness);
- feasibility of implementation of the various allowed techniques;
- predator movement patterns and life cycle of the predator;
- status of target and non-target species (such as protected or endangered);
- local environmental conditions such as terrain, vegetation, and weather;
- potential legal restrictions such as availability of tools or management methods;
- humaneness of the available options; and
- costs of control options (the cost of control in this proposal may be a secondary concern because of overriding environmental and legal considerations).

Figure 2. APHIS-WS Decision Model



The APHIS-WS decision making process is a standardized procedure for evaluating and responding to damage complaints (USDA 1995). APHIS-WS 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 form the basis of a management strategy. After the management strategy has been implemented, monitoring is conducted and evaluation continues to assess the effectiveness of the strategy. If the strategy is effective, the need for management is ended in that particular case, records are kept, and reported to the appropriate wildlife management agencies.

An effective program requires that site specific consideration of the many variables be given to allow the wildlife specialist to select and implement the most appropriate

technique to resolve each unique damage situation. Flexibility in the management approach is important because of the high variability found in the natural environment.

2.2 Alternative 2 - No Action Alternative

This alternative would not change the status quo. No action, in this case, means no Federal Action, as is consistent with the Council on Environmental Quality's definition and requirement for a "no action" alternative. The no action alternative serves as a baseline from which to compare the action alternatives. Under the no action alternative, the lead and federal cooperating agencies would not take any action to prevent mountain lion predation on bighorn sheep. State government officials and their contracted agents could take actions with regards to all predators and private individuals could only take actions toward coyotes and/or bobcats. The federal agencies would not initiate actions to protect the bighorn sheep from predation or displacement by predators.

2.3 Alternative 3 - Non Lethal Control of Mountain Lions with Lethal Control of Coyotes and Bobcats

Alternate 3 was developed to address concerns for the welfare of individual mountain lions, since mountain lions are a specially protected species in California. Under this alternative, mountain lions determined to be a threat, either directly or indirectly, according to the criteria established under the Proposed Action Alternative, would be controlled through 1 of 2 non-lethal methods. Under this alternative, mountain lions would not be killed.

After determining that a mountain lion is a threat to bighorn sheep, one option would be to capture, tranquilize and relocate the target mountain lion to a suitable location away from the project area. This option would be used if the wildlife specialist determined that the mountain lion was an imminent threat to bighorn sheep, and must be removed immediately. This would require identification of a suitable new location, upon CDFG approval, and the cooperation of the recipient land management agency.

Another nonlethal option is to "harass" the mountain lion away from the site and bighorn sheep, by trailing with trained scent hounds until bayed or treed, shot with a tranquilizer, radio collared, and released unharmed. Harassment is thought by some mountain lion specialists to teach some mountain lions to avoid the location where they were harassed because of the unpleasant experience associated with it (J. Brent, pers. comm. 1999, Hebert 1996).

Mountain lions may also be live trapped using cage traps or captured with foot snares for collaring and relocation. Cage traps are placed in areas of suspected target animal use and baited with an appropriate attractant. The cage traps are then set and monitored daily. Cage traps may be used for mountain lions and bobcats.

Under this alternative, bobcats and coyotes would be lethally removed as discussed under Alternative 1. The site specific decision making process and the criteria for removing mountain lions would be similar to Alternative 1, except that mountain lions would be captured and removed live or harassed and released in all cases.

2.4 Alternative 4 - Nonlethal Control of Mountain lions, Coyotes and Bobcats

Alternative 3 discusses nonlethal control of mountain lions because the mountain lion is a specially protected mammal in the state of California. Because some people may consider that nonlethal wildlife damage management is preferable for all species, regardless of legal status, a nonlethal option to manage damage by all target predators of bighorn sheep was developed. Just as Alternative 3 was developed to address concerns for the welfare of individual mountain lions, Alternative 4 was developed to consider the welfare of all of the predators. With respect to mountain lions, this alternative would be identical to Alternative 3.

Under Alternative 4, coyotes and bobcats that are determined to be a threat to bighorn sheep, according to the criteria established under the proposed action alternative, would be captured and relocated to a suitable location. All methods except shooting and neck snares, as described under the proposed action alternative, would be used to capture coyotes and bobcats. Captured animals would be radio collared to track their movement and released in a suitable new location. Potential sites suitable for relocation would be identified by CDFG in coordination with the recipient land management agency and approved by CDFG.

Nonlethal methods that are often used effectively to control predator damage to domestic livestock were considered in this alternative. Methods such as fencing, animal husbandry, guard dogs, and electronic guards were rejected because they would not be practical in bighorn sheep habitat due to the remote and rugged habitat, and the wild nature of bighorn sheep.

CHAPTER 3 - ISSUES IMPORTANT TO THE ANALYSIS OF IMPACTS

3.1 Issues Driving the Analysis

The Service and its cooperating agencies have determined that the following issues should be considered in the decision making process for this EA to help compare the impacts of the various alternative management strategies:

- **Impacts on predator populations** - mountain lions, bobcats and coyotes. What would be the impacts of a predator damage management program on predator species populations? What would be the cumulative direct and indirect impacts of the proposal?
- **Effectiveness** - What is the relative effectiveness of the alternative strategies in protecting the bighorn sheep from predation? Do they meet the objectives of the proposal?
- **Impacts on non-target species** - Would there be potential impacts on other species not targeted in predator damage management?
- **Impacts on threatened and endangered species** - What would be the adverse or beneficial impacts on federally protected species?
- **Humaneness** - How humane are the various alternative strategies? Since humaneness can be subject to perspective, how is humaneness perceived by different interests?
- **Special management areas** - How might the alternative actions affect the values of designated Wilderness and Wilderness Study Areas?

3.2 Issues Not Analyzed in Detail with Rationale

- **Impacts on biodiversity** - No wildlife damage management would be conducted to eradicate native or indigenous wildlife populations. As the agent implementing the Service's predator damage management program, APHIS-WS program impacts on biodiversity are not significant nationwide, statewide, or within the Inyo National Forest (USDA 1995). The number of individual animals taken is a small number of the total population as analyzed in Chapter 4.
- **Impacts on minority and low income persons or populations (Environmental Justice and Executive Order 12898)** - Executive Order 12898 requires federal agencies to make Environmental Justice part of their mission, and to identify and address disproportionately high and adverse human health and environmental

effects of federal programs, policies and activities on minority and low-income persons or populations. All Service activities are evaluated for their impact on the human environment and compliance with Executive Order 12898 to ensure Environmental Justice. Because there are no minority or low-income populations within the proposed project area, it is not anticipated that the proposed action would result in any adverse or disproportionate environmental impacts to minority and low-income persons or populations.

- **Analysis of impacts on bighorn sheep from domestic sheep** - During the initial public involvement, one comment suggested that the federal agencies were segmenting recovery actions and that all recovery actions must be subjected to NEPA analysis. Recovery plans developed under the provisions of the Act essentially consist of actions which could or should be taken to recover the species but do not direct any particular entity to carry out those actions. Because recovery plans do not direct federal agencies to conduct species activities, they do not represent proposals for action and thus do not require compliance with NEPA. However, should a federal agency elect to conduct a recovery action, that proposal for action would be subject to NEPA compliance. For example, the USFS is proposing to take management action to reduce the threat of disease by minimizing the likelihood of interactions between domestic sheep and bighorn sheep and assessing the effects of that proposal under NEPA. As a separate proposal, the Service is seeking to eliminate or reduce bighorn sheep predation which is being assessed in the EA, and other conservation actions will be assessed in the cumulative effects analysis of this EA.
- **Other resources** - The actions discussed in this EA do not involve any ground disturbance or construction. Therefore, the following resource values are not expected to be significantly affected by any of the alternatives analyzed: soils, geology, minerals, water quality/quantity, flood plains, wetlands, visual resources, air quality, prime and unique farmlands, aquatic resources, and vegetation, or cultural resources. There are no significant irreversible or irretrievable commitments of resources. These resources will not be analyzed further.

3.3 Evaluation Methodology

Each issue will be evaluated under each alternative and the direct, indirect and cumulative impacts will be disclosed. NEPA describes the elements that determine whether or not an impact is "significant". Significance is dependent upon the context and intensity of the impact. The following factors were used to evaluate the significance of the impacts in this EA that relate to context and intensity (adapted from USDA (1995) for this proposal):

- **magnitude of the impact** (size, number, or relative amount of impact) (intensity)
 - The "magnitude" analysis for this EA follows the process described in USDA (1995). Magnitude is defined in USDA (1995) as ". . . a measure of the number of

animals killed in relation to their abundance." Quantitative analysis is used wherever possible as it is more rigorous and is based on allowable harvest² levels and the best available population estimates. Qualitative analysis is based on population trends and modeling. Magnitude may be determined either quantitatively or qualitatively;

- **duration and frequency of the impact** (temporary, seasonal impact, year round or ongoing) (intensity);
- **likelihood of the impact** (intensity);
- **geographic extent** (limited to the immediate project area, the Sierra Nevada mountain range or the State of California or beyond) (context); and
- **the legal status** of a species that may be removed, or **conformance with regulations and policies** that protect the resource in question (context).

The target species were selected because they are proven bighorn sheep predators that could be removed or deterred to help protect bighorn sheep from further decline due to predation. The analysis in Chapter 4 uses the lowest density estimates for target predator species populations (where high and low population density estimates are provided in the text) to arrive at the most conservative impact estimate.

The eastern slopes of the Sierra Nevada mountain range are used as the preliminary analysis area because the proposed project is located primarily in the eastern Sierra Nevada habitat. The eastern Sierra offers a conservative view of the potential impacts because it has low density population estimates compared with the western Sierra Nevada habitat. However, the western Sierra Nevada habitat is adjacent to the proposed project area and in reality, mountain lions, coyotes and bobcats from the western Sierra are likely to be affected by the proposal, and they could be recruited into the project area as replacements. In addition, mountain lions, coyotes and bobcats from the eastern Sierra could be tracked into the western Sierra and taken. The analysis therefore begins with the eastern Sierra as the immediate impact area, and then includes the western Sierra Nevada habitat zone if any notable impact is detected on the lowest density estimate. If no notable impact is detected in the eastern Sierra Nevada habitat, the impact analysis would not warrant further investigation.

² The use of "allowable harvest" levels in managing wildlife populations provides for long-term maintenance of animal populations and therefore is appropriate in establishing criteria for determining magnitude (USDA 1995).

CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

Chapter 4 provides information needed for making informed decisions on the predator damage management objectives identified in Chapter 1. This chapter uses the issues identified in Chapter 3 as the evaluation criteria. Each of the issues will be analyzed for its environmental consequences under each alternative.

Cumulative impacts are discussed in relationship to each of the key species analyzed in this EA. Indirect impacts are discussed throughout the environmental consequences section where applicable.

4.1 Alternative 1 - Proposed Action Alternative - Predator Damage Management

4.1.1 Impact of predator damage management on the target species populations

4.1.1.1 Impacts on mountain lions

Mountain lion population information

Mountain lions inhabit many habitat types from desert to alpine environments, indicating a wide range of adaptability. They are closely associated with deer and elk because of their dependence upon these species for food.

Female mountain lions typically breed for the first time between 22 and 29 months of age (Ashman et al. 1983), but initial breeding may be delayed (Hornocker 1970). Mountain lions breed and give birth year round but most births occur during late spring and summer following a 90-day gestation period (Ashman et al. 1983, Seidemsticker et al. 1973, Robinette et al. 1961). One to six offspring per litter is possible, with an average of two to three young per litter.

Mountain lion density is related closely to prey availability and the social tolerance for other mountain lions. Prey availability is directly related to prey habitat quality that directly influences mountain lion nutritional health, and reproductive and mortality rates. Studies indicate that as available prey increases, so do mountain lion populations. As mountain lion population density increases, mortality rates from intra-specific fighting and cannibalism also increase, and/or mountain lions disperse into unoccupied or less densely occupied habitat. The relationship of the mountain lion to its prey and to other mountain lions is why their densities do not reach levels observed in a number of other wildlife species (ODFW 1993).

Mountain lion densities in other states, based on a variety of population estimating techniques, range from a low of about 1 per 100 square miles to a high of 24 per 100 square miles (Johnson and Strickland 1992). An average density estimate for the western states was 7.5 per 100 square miles (Johnson and Strickland 1992).

Mountain lion densities in California

Statewide, the mountain lion population density generally range from 3 to 10 adults per 100 square miles. On the east slope of the Sierra Nevada, the mountain lion density is estimated to be 3 to 6 per 100 square miles. On the west slope of the Sierra Nevada, mountain lion density range from 5 to 10 per 100 square miles (Mansfield and Weaver 1989). The proposed project area is entirely composed of suitable habitat for mountain lions, and all suitable habitat in California is occupied (Mansfield and Weaver 1989). Since most of the bighorn sheep habitat occurs on the east slope of the Sierra Nevada, and to be conservative, we used the lowest estimated mountain lion density to determine that the mountain lion population in the immediate 215 square mile proposed project area is approximately 6 adult mountain lions. The high estimate for the project area would then be 13 mountain lions. Low density mountain lion population estimates for the eastern and western slopes of the Sierra Nevada are 126 and 810 mountain lions respectively. High density estimates for the eastern and western slopes of the Sierra Nevada mountain range were 252 and 1620 mountain lions, respectively (Mansfield and Weaver 1989).

A trend of increasing mountain lion depredation incidents correlates with the changes in the estimated mountain lion population (V. Bleich, unpublished data). Mountain lion hunting has not been in effect in California since 1972. Since that time, CDFG has recorded a substantial increase in human-mountain lion conflicts through the 1970s and 1980s (Mansfield and Weaver 1989, Torres et al. 1996). Chapter 10 of the Fish and Game Code of California declares the mountain lion a specially protected mammal. CDFG, or its agent, is authorized to remove or take any mountain lion that is a threat to public health or safety or that has damaged or destroyed livestock or pets. CDFG must confirm requests for "take" permits that would allow the killing of an offending mountain lion in the case of property or livestock damage. Table 1 shows the numbers of depredation permits issued and the numbers of mountain lions killed in Inyo and Mono counties between 1972 and 1998. The data in Table 1 show an increasing number of confirmed predation incidents in those counties during these years. Mountain lion problems in Inyo and Mono

counties have increased, triggering the issuance of permits and increased take of offending mountain lions (S. Torres pers. comm. 1999).

Mountain lion activity peaked in the late 1980s through the mid 1990s. This correlates with mountain lion predation of, and declines in, bighorn sheep (SNBSIAG 1997, S. Torres, pers. comm. 1999). Since 1995, mountain lion predation activity has declined statewide and in the region, as shown by the depredation data. The exact reason is not known but during the mid 1990s the mountain lion population may have surpassed its carrying capacity after the release in the 1960s from bounty and other hunting. CDFG believes that indicators such as statewide predation trends (shown in Table 2) and local reports in the project area, help corroborate the observed patterns of increased mountain lion activity and may be helpful for predicting the potential for mountain lion problems on bighorn sheep (S. Torres, pers. comm. 1999).

Although mountain lion kills of bighorn sheep are well documented, direct kills of sheep are not always a good indicator of mountain lion activity because kills are difficult to find in the rough, steep terrain. CDFG believes that other trends and indicators such as the statewide trend, and local predation reports in the project area, may help predict the potential for mountain lion problems on bighorn sheep (S. Torres, pers. comm. 1999).

Mountain lion population impact analysis

Mountain lion populations can sustain relatively moderate to heavy losses of adults and still maintain viable populations. Robinette et al. (1977) reported an annual mortality of 32 percent in Utah, while Ashman et al. (1983) noted a sustained annual mortality of at least 30 percent in Nevada. Ashman et al. (1983) believed that under "moderate to heavy exploitation (30 percent-50 percent)" mountain lion populations within their study area had the recruitment (reproduction and immigration) capability to rapidly replace annual losses. The allowable annual harvest level for mountain lion cited by the USDA (1995) is 30 percent of the population. Logan et al. (1996 and 1997) concluded from a study in New Mexico that about 11 percent of the adult mountain lion population was a sustainable harvest level for mountain lion populations that are at carrying capacity, and that are not hunted or controlled. Logan's study was based on a relatively isolated population in the San Andres Mountains. An important distinction to be made is that the mountain lion population in the proposed project area is not isolated.

| Table 1. Depredation Permits Issued and Mountain Lions Killed in Inyo and Mono Counties | | | | |
|---|----------------------------|---------------------------|----------------------------|---------------------------|
| Year | Inyo County | | Mono County | |
| | Depredation Permits Issued | Lions Killed Under Permit | Depredation Permits Issued | Lions Killed Under Permit |
| 1972-1980 | 0 | 0 | 4 (1975, 1978 & 1979) | 1 (1978) |
| 1981 | 0 | 0 | 1 | 0 |
| 1982 | 0 | 0 | 4 | 0 |
| 1983 | 1 | 1 | 2 | 0 |
| 1984 | 1 | 0 | 0 | 0 |
| 1985 | 0 | 0 | 2 | 0 |
| 1986 | 2 | 1 | 12 | 2 |
| 1987 | 0 | 0 | 9 | 3 |
| 1988 | 4 | 2 | 7 | 1 |
| 1989 | 3 | 2 | 11 | 5 |
| 1990 | 3 | 0 | 7 | 4 |
| 1991 | 7 | 0 | 5 | 0 |
| 1992 | 4 | 3 | 4 | 1 |
| 1993 | 2 | 2 | 4 | 2 |
| 1994 | 7 | 1 | 2 | 0 |
| 1995 | 11 | 2 | 5 | 2 |
| 1996 | 0 | 0 | 6 | 2 |
| 1997 | 0 | 0 | 5 | 2 |
| 1998 | 1 | 0 | 3 | 1 |
| TOTAL | 46 | 14 | 93 | 26 |

(From S. Torres, CDFG, unpublished data)

| Year | 1972 | 1973 | 1974 | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 |
|-------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| No. | 4 | 21 | 21 | 15 | 29 | 39 | 32 | 51 | 41 | 41 | 66 | 63 | 94 | 135 |
| Lions | 1 | 4 | 2 | 2 | 6 | 7 | 8 | 21 | 12 | 12 | 18 | 27 | 37 | 59 |
| Year | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 |
| No. | 131 | 112 | 145 | 182 | 193 | 201 | 195 | 190 | 328 | 331 | 281 | 252 | 237 | N/A |
| Lions | 46 | 50 | 61 | 77 | 71 | 73 | 81 | 71 | 121 | 117 | 103 | 89 | 109 | N/A |

(From S. Torres, CDFG, unpublished data)

An important distinction to be made is that the mountain lion population in the proposed project area is not isolated, but because of suitable habitat, is contiguous throughout much of the state. Therefore, the analysis of impact on the mountain lion population could be made at or near the statewide level.

Mountain lions have large home range that often extend over different land jurisdictions. Therefore, removing a mountain lion from the Inyo National Forest, for example, could remove an animal that also ranges on adjacent property, such as a National Park or other land.

The cooperating agencies propose to remove all mountain lions that are determined to be a threat to the bighorn sheep, as defined by the criteria established in Chapter 2. It is likely that only a few mountain lions would be removed, but the exact number is not known at this time, nor could it be predicted annually with any certainty (for the reasons discussed under Section 2.1). Therefore, this analysis will focus on 2 scenarios; on the most likely impact of removing up to 3 to 5 mountain lions, and on the more unlikely scenario of removing 13 or more mountain lions. It is important to stress that only a mountain lion that is determined to be a threat to the bighorn sheep would be removed.

Impact of removing up to five mountain lions per year

Based upon field observations to date, it is most likely that up to 3 mountain lions would be removed in the upcoming year, and an upper limit would be to remove 5 mountain lions from the proposed project area (J. Wehausen pers. comm. 1999). The impact on the mountain lion population would then be a reduction of less than 1 percent to up to 4 percent of the low density, conservative population estimate in the eastern Sierra Nevada mountain range. Biologically, this is not a significant impact; it would not produce a measurable response in the mountain lion population. The mountain lion population is resilient, and there is an abundance of mountain lions regionally and statewide. The impact on the population would be very low and well under allowable harvest levels and the figures are well within the parameters for a determination of "low magnitude" of impact as determined by USDA (1995).

Impact of removing 13 mountain lions or more per year

An estimated upper limit of about 13 mountain lions could potentially be removed per year from bighorn sheep habitat (G. Simmons pers. comm. 1999). The higher figure is based on the potential that a particular mountain lion could have juveniles hunting with it, or a replacement mountain lion emerges and creates another threat within a short period of time. These are factors that cannot be predicted with certainty. If 13 mountain lions were removed each year from the low density estimate of 126 mountain lions in the eastern Sierra, 10 percent of the mountain lions in the eastern Sierra Nevada habitat area would be removed (assuming no recruitment of mountain lions).

If we look only at the eastern Sierra and apply the Logan et al. (1996 and 1997) study to measure the impact of taking 13 mountain lions, the impact magnitude on the population would be "moderate". Logan established that a "high" magnitude would exceed the 11 percent allowable harvest level, and he concluded that it could cause a decline in the abundance of mountain lions in his study area (Logan 1997). Taking 14 mountain lions would reach the 11 percent level in the eastern Sierra Nevada "study" area. However, it should be noted that the study area of Logan et al. is significantly different than the area under study in this EA.

If 13 mountain lions were removed from the eastern and western Sierra Nevada habitats, the immediate impact in that area would be a loss of 13 individual mountain lions from an estimated total of 936 mountain lions (low density estimates of 810 mountain lions in the western Sierra Nevada

habitat and 126 in the eastern Sierra Nevada habitat (Mansfield and Weaver 1989)). This equates to removing 1.4 percent of the mountain lions from the eastern and western Sierras. This is a low magnitude impact. When we look at the population in the state, impacts are negligible.

Because the proposed project area is bounded by the western Sierra Nevada, the habitat is adjoined, and because mountain lions have large home range, we can reasonably expand the analysis area to include the population in the western Sierra Nevada. Mountain lions that range from the western Sierra Nevada habitat could be removed from the project area, as could mountain lions that range from the eastern Sierra Nevada. Similarly, mountain lions from both sides could be recruited into the proposed project area to replace mountain lions that are removed to protect bighorn sheep. Although the immediate localized impacts could be high (all mountain lions could potentially be removed from the 215 square mile project area), impacts on the surrounding areas, the eastern and western Sierra Nevada habitats, would be low, because of high mountain lion numbers, recruitment and replacement, and resiliency of the population. Impacts would also be temporary; young or transient mountain lions would be recruited as replacements, and mountain lions would be removed for a limited number of years. In addition, the impact of taking 13 or more mountain lions is a worst case scenario, and the likelihood of this impact is low. Finally, the proposed action would be within management objectives as defined by CDFG to maintain a healthy mountain lion population. For all of these reasons, the proposal would not have a significant impact on the viability of the mountain lion population in eastern and western Sierra Nevada, or in California.

Therefore, because the intensity of the impact is low and temporary, and because the context is limited in scope and consistent with relevant laws, the biological impact on the mountain lion population is not considered to be significant.

Monitoring plans would routinely assess the impact of the program on the mountain lion population. In addition, the proposal emphasizes monitoring mountain lions around the project area. This will give agency experts more information on the status and trends of the mountain lion population in the eastern and western Sierra Nevada. The information would be used to continue to assess the impacts of the proposed project. The CDFG fully expects that the proposed action alternative would be conducted within the bounds of its management objectives.

Cumulative impacts on the mountain lion population

Other sources of mortality of mountain lions would not add significantly to the cumulative impacts because the regional mountain lion population has increased under the existing regime of mortality factors. Mountain lion survival is functionally related to the status of their prey base (S. Torres, pers. comm. 1999).

In comparison to the total number of mountain lions that have been killed each year statewide because of predation on livestock and pets, this proposal could add the following to that mortality: in our worst case scenario, the proposed action could add about 12 percent to the total average number of mountain lions that have been killed statewide under depredation permits in the last 4 years (1995-1998, see Table 2)³. It is more likely that the proposed program would add between 1 and 5 percent to the average number of mountain lions killed in the last 4 years, based on field observations (J. Wehausen, pers. comm. 1999). In fact, some of the mountain lions removed to protect bighorn sheep may have been removed under depredation permits.

When all other known sources of mountain lion mortality are added to the number of mountain lions that may be killed to protect the bighorn sheep, figures still remain low. The impact on the mountain lion population in California is too small to detect a measurable response. Biologically, there would not be a significant impact on the viability of the mountain lion population in the eastern Sierra Nevada, the eastern and western Sierra Nevada, or in California. The proposed project would be well within CDFG goals for managing mountain lions as discussed in this chapter.

Indirect impacts on mountain lions

The average age of mountain lions in a population is reduced when individuals are removed by hunting because those that are killed tend to be compensated for by recruitment of young mountain lions and the immigration of transient mountain lions (CDFG 1988). In comparison, the age class structure of California mountain lions might be expected to be weighted toward the older animals. This is not a surprise since mountain lions have not been hunted since 1972. Under existing law, mountain

³ Between 1995 and 1998, a total of 418 mountain lions were killed (104 per year average for 4 years) pursuant to a total of 1101 depredation permits issued (275 per year average during that time), for mountain lions that had depredated on livestock or property.

lions are only taken in cases of property damage (livestock and pets), and threats to public safety. A younger mountain lion population suggests a high reproductive rate, high turnover rate, and immigration of young transient animals. An older population suggests a lower reproductive rate, slow turnover, and infrequent immigration of young transients (CDFG 1988). Removing mountain lions from the proposed project area may result in a slight shift to younger animals and an increased survival and recruitment of young mountain lions.

Another indirect impact that could result from removing a mountain lion, the dominant predator, from its range is a possible ingress of other predators such as coyotes or bobcats. The proposed program alternative would remove the additional smaller bighorn sheep predators if they are determined to be a threat to sheep. Refer to the following sections 4.1.1.2 and 4.1.1.3 for a more detailed discussion of the impacts on bobcats and coyotes.

A potential indirect impact of removing mountain lions may be a limited decrease in the aesthetic value of a wilderness experience for some people. However, the potential for viewing mountain lions in a park, forest, or wilderness area would not change significantly by removing a limited number of mountain lions because mountain lions are generally solitary and secretive. Wildlife field biologists and mountain lion specialists rarely see mountain lions unless they are tracked or captured (see section 4.1.6. Impacts on Wilderness and Wilderness Study Areas).

The significance of removing a limited number of mountain lions is also considered in context of the legal status of mountain lions in California, and the legal status of bighorn sheep. Mountain lions are afforded special protection in the state of California as a result of the passage of Proposition 117. The legislative history of this provision indicates that this initiative was designed to stop sport hunting of mountain lions. There is no indication in the legislative history that Proposition 117 was intended to preclude endangered species protection efforts. Indeed, on September 17, 1999, CDFG was provided legal authority to remove mountain lions that threaten endangered bighorn sheep (AB 560). Sierra Nevada bighorn sheep are afforded protection under both the State and Federal Endangered Species Acts. Because the bighorn sheep are protected under the Federal Endangered Species Act, and the federal cooperating agencies are authorized under the Federal Endangered Species Act and other federal laws to remove mountain lions to protect the bighorn sheep from further decline, and because CDFG has similar authority under state law, the proposed action complies with applicable laws and does not conflict with the intent of Proposition 117.

4.1.1.2 Impacts on coyotes

Coyotes would be taken if the wildlife specialist in the field determines, on a case-by-case basis, that the coyote(s) are a threat to bighorn sheep. A threat would be found if there was an actual predation account, or a likelihood of potential predation. In the first case, any coyote that has killed a bighorn sheep or lamb would be targeted. Coyotes near bighorn sheep lambing range or near ewes with lambs would also be removed. Single coyotes are not considered to be a direct threat to rams. Bighorn sheep may also avoid wintering range due to the presence of coyotes. If coyotes were in these areas prior to or during winter months, they would be targeted. Methods that could be used to take coyotes could include snaring, padded (soft catch) leghold traps, or shooting.

Coyotes are the most abundant predator in the bighorn sheep range (Bleich 1999). The coyote is an abundant, permanent resident throughout the state. It occurs in almost all habitats and successional stages. Coyote densities range from 1 to 5 per square mile throughout their range in California (CDFG 1999a). Within the historic and current bighorn sheep range, there may be between 215 and 1,075 coyotes. Statewide there are between 154,742 and 773,708 adult coyotes (CDFG 1999a).

The allowable harvest rate for coyotes is 70 percent (Connolly and Longhurst 1975). CDFG analyzes coyote mortality from all sources annually, in its environmental document entitled Furbearing and Non-Game Mammal Hunting and Trapping (CDFG 1999a) (incorporated by reference). Included in its analysis is the APHIS-WS programs depredation take from an unrelated livestock and property protection program (USDA 1997). CDFG adds a margin of 33 percent onto the APHIS-WS coyote take to account for potential increases that may be necessary. When added to trapping, hunting, and other known mortality, CDFG concluded that the annual harvest of coyotes is far below the estimated number of young animals produced each year, and therefore is not expected to have a significant impact on the coyote population in California (CDFG 1999a).

The proposed action would likely remove up to 50 coyotes per year from bighorn sheep range, or 25 percent of the coyotes from the immediate project area, when the estimate is made using the conservative, low density population estimate of 215 coyotes in the project area. In a less likely scenario, the proposed action could result in the removal of up to 100 coyotes or more. Although extremely unlikely, the example of removing all of the coyotes from within the immediate proposed project area is used

to show the low impact of that level of take. Removing all of the coyotes from the immediate project area would fall well within the 30 percent margin created by USDA (1997) and the 33 percent margin created by CDFG (1999a). Both assessments concluded no significant impact on the coyote population.

Cumulative impacts on the coyote population

Coyote take was also assessed in the APHIS-WS Environmental Assessment entitled Wildlife Damage Management for the protection of livestock, property and human health and safety (USDA 1997). The analysis area included coyotes taken in Mono and Inyo counties. The analysis did not include predator damage management for the protection of endangered species, since no such work was proposed at that time. However, the species targeted, the issues, and the methods in this proposal fall within the scope and content of the APHIS-WS EA and therefore, is incorporated by reference.

The APHIS-WS EA on wildlife damage management provided a margin of 30 percent for additional work that could occur where APHIS-WS did not provide service at the time of analysis. The total coyote take was 2.3 percent of the conservatively estimated (low density) coyote population in the APHIS-WS District. Estimates used a low density population model to err on the conservative side. According to the analysis contained in CDFG (1999a), USDA (1997) and USDA (1995) this would add a negligible increase in the total annual coyote mortality from all sources and is not a significant impact.

Annual coyote take to protect the bighorn sheep would be recorded and monitored annually by APHIS-WS and CDFG, and reported to CDFG and the Service. The proposed action would not have a significant cumulative impact on coyotes because impacts would be localized and temporary, coyotes are abundant throughout California and the cumulative mortality is well below allowable harvest levels as concluded in CDFG (1999a) and USDA (1997).

4.1.1.3 Impacts on bobcats

Bobcats would be taken if the wildlife specialist in the field determines, on a case-by-case basis, that a bobcat poses a threat to bighorn sheep. Bobcats can be a threat to bighorn sheep during lambing, and when lambs are young. Methods that could be used to take bobcats include snaring, padded (soft catch) leghold traps, trailing hounds, and shooting.

The bobcat is a common to uncommon, permanent resident throughout most of California, found in nearly all habitat types and successional stages. Bobcat densities are estimated at 0.55 to 0.58 animals per square mile (CDFG 1999a). The allowable harvest rate for bobcats is 20 percent (CDFG 1999a, USDA 1995). Within the immediate project area, the historical and current bighorn sheep range, there may be between 118 and 125 bobcats. Few bobcats are expected to be taken in this proposal. Assuming APHIS-WS takes up to 5 to 10 bobcats per year, negligible impacts on its population are expected. In this scenario, up to 8 percent of the bobcats could be removed from the immediate project area. This is not significant because the impact is localized and is well below the allowable harvest level for bobcats. The regional and statewide impacts would be negligible. CDFG (1999) estimates that there are between 70,207 and 74,037 adult bobcats in California. The proposed project would remove so few bobcats compared with the total adult population in the state that it may not be measurable.

Cumulative impacts on the bobcat population

CDFG calculated total annual harvest for bobcats and has determined that total mortality, including depredation take by APHIS-WS for the protection of livestock and property, would not be expected to have a significant adverse impact on the bobcat population in California (CDFG 1999a). The analysis included an additional 33 percent of actual APHIS-WS take to account for unexpected take. CDFG (1999a) is incorporated by reference.

APHIS-WS determined that the impacts of its program on its Central District (which includes Inyo and Mono counties) would not have a significant impact on bobcats. The cumulative annual mortality of bobcats in California between 1996 -1997, from hunting, trapping, and APHIS-WS was a total of 1,537 animals, or about 2 percent of the adult population in the District, well below the 20 percent allowed (CDFG 1999a). Like coyotes, bobcats were not included in the USDA (1997) analysis of predator damage management for purposes of protecting endangered species. However, the issues identified in this EA are similar to those issues identified in the Central District EA⁴ and therefore the analysis is

⁴ Issues that drove the analysis in the APHIS-WS Central District EA (USDA 1997) were 1) effects on target species (including coyotes and bobcats), 2) effects on non-target species, including T&E species, humaneness, effects on hunting and nonconsumptive uses, impacts on public safety and environment, effectiveness (in reducing depredation), and

incorporated by reference. The CDFG (1999a) and USDA (1997) analysis of the cumulative impacts on bobcats included margins for unexpected take. Expected potential bobcat take from the proposed action falls well within the limits of the established margins.

Annual bobcat take to protect the bighorn sheep would be monitored by both CDFG and APHIS-WS and is not expected to be a significant impact on the population either locally, regionally, or statewide, when added to other sources of mortality.

4.1.2 Effectiveness

The effectiveness of predator damage management is dependent upon the careful and skilled use of the appropriate combination of proven tools. The management methods proposed are padded leg-hold traps, snares, shooting (for coyotes and bobcats), and cage traps, trailing, or snaring and collaring or shooting (for mountain lions).

Traps and snares are a proven effective method for capturing coyotes and bobcats. Traps and snares would be checked daily and the captured target animal would be shot. Traps and snares would be placed either in the target animal's travel lane or are baited with the target animal's preferred food or some other lure such as fetid meat, urine, or musk to attract the animal. Effective trap and snare placement contributes to the selectivity of capturing the targeted animal. Non target animals would be further avoided with tension devices on traps and snares, and breakaway devices and locks for snares. The smaller non-target animals can be avoided, and larger animals can usually be released unharmed. Shooting is an effective and selective method when personnel are on site (see section 4.1.3).

Coyotes avoid cage traps, and therefore they would not be used. Cage traps may be used for mountain lions, but may not be large enough for all cats, and may not be practical for capturing mountain lions because of transportation limitations in the project area. Cage traps may be used if a particular target site is readily accessible from a road. Cage traps are most effective for mountain lions when the mountain lion's freshly killed prey is used in the trap. Traps would be checked daily.

Dogs are often essential to the successful capture of mountain lions. Trained dogs would be used to locate and pursue the target mountain lion. Training and maintaining suitable dogs requires considerable skill. Mountain lion tracking

cost effectiveness.

specialists with their own hounds would be employed that have years of specialized experience, and who have a first hand knowledge of the project area. This is the most effective “tool” that is available to manage mountain lion damage in rugged remote terrain, such as the proposed project area.

Removing mountain lions to protect the bighorn sheep has been demonstrated to be beneficial to the sheep. Two examples are described under section 4.1.4 Impacts on threatened and endangered species.

A conclusion drawn from a CDFG analysis on mountain lion sport harvest in the state of California⁵ (CDFG 1988) discussed the effects that mountain lion hunting would have on other wildlife species. This example may be used to further demonstrate the potential effectiveness of removing mountain lions to protect bighorn sheep. CDFG (1988) noted that removing mountain lions has the potential to increase the survival of some deer and bighorn sheep populations, and that it would assist somewhat with management objectives for the threatened bighorn sheep. Sport harvest, not part of the proposed action in this EA, would have removed mountain lions randomly from various designated locations. Because the proposed action in this EA would take mountain lions only from bighorn sheep range that have either preyed on bighorn sheep or are likely to prey on bighorn sheep or otherwise adversely affect bighorn sheep, it is reasonable to assume that this action would be likely to have a greater effect on reducing predation and displacement of bighorn sheep from winter habitat, while minimizing the number of mountain lions removed.

The effectiveness of the proposed action would be dependent upon numerous factors such as the skill of the specialists, and cooperation of the affected agencies and project personnel. Some factors that may influence effectiveness cannot be predicted, such as weather, predator movement patterns, and exact bighorn sheep movement patterns. Overall, the effectiveness of the proposed action alternative would be rated as the high when compared to the other alternatives, because

⁵ Mountain lion sport harvest was not allowed under the regulations from 1972 to 1986. Statutory changes resulted in the mountain lion being designated a game mammal. Accordingly, CDFG prepared an environmental document, as required under the California Environmental Quality Act, to regulate mountain lion take. The recommendations for regulated mountain lion hunts, (190 tags statewide), were challenged in court during 1987 and 1988. A ballot initiative to designate the mountain lion as a “specially protected mammal” was passed into law in 1990. No hunts occurred as a result of the environmental document.

methods that are known to be effective would be used by skilled technicians, with the cooperation of various agency experts.

4.1.3 Impacts on non-target species

A comprehensive review of the APHIS-WS predator damage management program in its Central District in California can be used as a comparison for determining the likelihood and potential extent of capturing and killing non-target species as a result of the activities designed to protect the bighorn sheep. The APHIS-WS Central District encompasses an area that includes Mono and Inyo counties, but also a number of other counties. Although larger in scope than the proposed project, with more management methods, targeted species, and numbers of individual predators targeted, the comprehensive APHIS-WS program took only 4 non-target animals each year for 3 years during the analysis period (USDA 1997). None of the species were threatened or endangered species. Under the proposed program, some non-target species may be captured and released unharmed. Non-target species lethally removed by the APHIS-WS program during the USDA (1997) analysis period, included red foxes, gray foxes, opossums, raccoons, 1 bobcat, and 1 skunk. Non-target species that could potentially be caught and killed or released unharmed are expected to be the same. It is likely that very few non-target animals would be killed from this proposal.

When soft catch traps or snares are used to capture coyotes and bobcats, they are equipped with a pan tension device that excludes animals of lighter weight than the targeted animals. Shooting is highly target specific and does not pose a risk to threatened or endangered species or other non-target animals when conducted by professional wildlife specialists trained in firearm use and trained to identify target and non-target species.

Dogs used to track mountain lions do not pose a threat to threatened or endangered species or other non-target species because they are trained to trail only the target animal.

Based on the experience of the APHIS-WS program around the proposed project area and throughout the state, the proposed action would not be likely to result in the death of more than 1 to 3 individual non-target animals each year. All non-target species captured by the APHIS-WS program are recorded and reported to the appropriate management agency. The proposed action would not have a significant impact on non-target species.

4.1.4 Impacts on threatened and endangered species

The following federally listed threatened and endangered species may be affected by the proposed action:

| | |
|---|-------------|
| bald eagle (<i>Haliaeetus leucocephalus</i>) | Threatened |
| California condor (<i>Gymnogyps californianus</i>) | Endangered* |
| Sierra Nevada bighorn sheep (<i>Ovis canadensis californiana</i>) | Endangered |

* Critical habitat has been designated for the California condor. However, the proposed action area is not within the critical habitat areas designated.

Endangered Species Act Compliance

The Service has completed an intra-service ESA Section 7 biological evaluation on the effects of predator damage management on the above listed species found in the project area. The intra-Service consultation found the bald eagle, California condor, and Sierra Nevada bighorn sheep may be affected by the proposed action, but are not likely to be adversely affected. However, to further reduce the potential for lead poisoning of bald eagles and California condors, APHIS-WS will either use ammunition with non-lead projectiles and/or will pack out all predators (mountain lions, bobcats, and coyotes) where practicable or dispose of the carcass in deep narrow canyons which are inaccessible to bald eagles and California condors.

The Service also determined the following species are outside of the proposed project area and will not be affected at any level of significance by the proposed action: Lahontan cutthroat trout, Owen's tui chub, and Paiute cutthroat trout.

APHIS-WS is the cooperating agency that would implement any field level predator damage management resulting from this EA. Therefore, prior Endangered Species Act consultations between APHIS-WS and the Service for other projects within the same geographic area as this proposal are pertinent to this analysis. Prior consultations encompassed all of the proposed methods, target species, and threatened and endangered species that are involved in this proposal.

A 1992 biological opinion issued by the Service on the national APHIS-WS program indicated various reasonable and prudent alternatives to preclude jeopardy to endangered and threatened species. APHIS-WS has adopted all reasonable and prudent alternatives and measures, and terms and conditions that apply.

In a February 27, 1997 letter to APHIS-WS, the Service's Sacramento Fish and Wildlife Office indicated that an APHIS-WS ongoing livestock and property protection program would not likely adversely affect any federally listed threatened or endangered species. The consultation encompassed all target species and threatened and endangered species within the proposed bighorn sheep protection project location. APHIS-WS has maintained ongoing contact with the Service to ensure that its program would not be likely to adversely affect any threatened or endangered species and to comply with the Endangered Species Act.

Specific analysis of impacts on listed species

Bald Eagle - Bald eagles are generalized predators/scavengers primarily adapted to the edges of aquatic habitats. Their primary foods are fish, waterfowl, mammalian carrion, and small birds and mammals. There have been two nesting pairs of bald eagles in close proximity to the project area and the 1986 Pacific Bald Eagle Recovery Plan identifies 10 to 20 wintering bald eagles throughout the entire Owen's Valley area. However no areas were targeted for recovery.

The proposed project may affect bald eagles in the form of lead ingestion by scavenging on mountain lions, coyotes, and/or bobcats shot with lead ammunition by APHIS-WS trackers. The likelihood of a bald eagle being in the area to scavenge on one of the above predators is low, but their main source of food in the winter is scavenging on carcasses. APHIS-WS will minimize the potential for lead ingestion by either using ammunition with non-lead projectiles, and/or packing out all predators where practicable, or disposing of the carcass in deep narrow canyons which are inaccessible to bald eagles.

Based on an evaluation and discussion with the Service, both agencies agreed that implementation of the APHIS-WS program is not likely to adversely affect the bald eagle.

California condor - The California condor is strictly a scavenger, eating carrion such as cattle, sheep, deer, and ground squirrel carcasses. It is only a resident of the western Sierra Nevada mountain range, primarily in Fresno and Tulare Counties. However, a few California condors have been identified within the project area (south of Big Pine and north of Bishop, California).

The proposed project may affect California condors in the form of lead ingestion by scavenging on mountain lions, coyotes, and/or bobcats shot with lead ammunition by APHIS-WS trackers. However, the likelihood of a California condor being in the area to have the opportunity to scavenge on one of the above predators is extremely low. APHIS-WS will minimize the potential for lead ingestion by either using ammunition with non-lead projectiles, and/or packing

out all predators where practicable, or disposing of the carcass in deep narrow canyons which are inaccessible to California condors.

California bighorn sheep - The purpose of the proposed action is to benefit Sierra Nevada bighorn sheep by precluding predation by mountain lions, coyotes and bobcats. The benefit to bighorn sheep from removing mountain lions in particular has been demonstrated in Lee Vining Canyon where a restoration program reestablished a bighorn sheep subpopulation, but the success of the program was threatened by mountain lion predation. The removal of 1 mountain lion in 3 consecutive years reversed the trend (Chow 1991).

However, it is necessary to address the possibility of a Sierra Nevada bighorn sheep being caught in a trap or snare set for a predator. The possibility of such an event is extremely low for the following reasons: 1) traps and snares are infrequently used; 2) bighorn sheep will not be attracted to the traps or snares because they are baited with meat based products or urine; and 3) bighorn sheep do not frequent densely vegetated areas where the traps and snares are located.

In a January 16, 1997 letter to APHIS-WS, CDFG concurred with APHIS that the APHIS predator damage management program would have no adverse effect on the California bighorn sheep. Any impacts would likely be beneficial by removing predators of the sheep and helping bighorn sheep populations maintain their current levels or increase over the near future.

In addition, CDFG concurred with the APHIS-WS assessment that the project would have either no effect or no adverse effect on any state listed species. APHIS-WS continues to consult with CDFG regarding its ongoing predator damage management program to ensure that the program would not jeopardize any species of concern to the state.

For the reasons described above, the proposed action would not have a significant adverse effect on federally or state listed threatened or endangered species.

4.1.5 Humaneness

The issue of humaneness, as it relates to the killing or capturing of wildlife, is an important and 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 (USDA 1995). Some individuals and groups may be opposed to some of the management techniques proposed. Most animal welfare organizations do not oppose the concept of wildlife damage control, but they support more restrictions on those control methods perceived by them as inhumane, and support greater use of

nonlethal controls (Schmidt 1989). Behavior modification (harassment) of mountain lions could be construed by some as being stressful.

CDFG (1999a) discussed issues related to humaneness and animal welfare in its Environmental Document Regarding Furbearing and Nongame Mammal Hunting and Trapping. The document discussed welfare of individual animals, including the effects of various methods of "take" on pain and suffering, effects of an animal's death, the effects of wounding, and chase-related effects. The detailed discussion in CDFG (1999a) is incorporated by reference. The document concludes that wounding would be the greatest adverse effect that CDFG's proposed statewide hunting and trapping program for coyotes and bobcats could have on the individual animal. The EA did not include mountain lions, but these discussions apply as well to mountain lions.

The proposed action contains measures to minimize animal suffering as much as possible, and to eliminate unnecessary suffering. APHIS-WS employs highly specialized, well trained and experienced specialists to conduct predator damage management, and has improved the selectivity of management devices through research and development of pan tension devices, break-away snares, and chemical immobilization/euthanasia procedures that minimize or do not cause pain. Therefore, the magnitude of the impact is considered minor because wounding would be minimized, and selectivity would be maximized. Research continues to improve selectivity and humaneness of management devices (USDA 1995).

The skillful use of specific management methods designed to minimize pain and suffering, and used when necessary to protect the endangered bighorn sheep, is considered to be the most humane approach by the cooperating agencies. APHIS-WS uses AVMA recommendations for humane animal treatment. AVMA euthanasia methods were developed principally for companion animals, and not for free-ranging wildlife. The AVMA (1993) considers in some circumstances, gunshot to the head or neck to be the only practical and acceptable method of euthanasia. They recommend it be performed by highly skilled personnel using a firearm appropriate for the situation (AVMA 1993). This will be the predominant method of removal of predators. However, predators that are targeted to be killed and are captured live or predators that are captured and found to be wounded to the degree they can not survive would be removed by euthanizing drugs following methods recommended by the American Veterinary Medical Association (AVMA).

4.1.6 Impact on Wilderness and Wilderness Study Areas

Wilderness Areas within the range of the current populations of bighorn sheep are: John Muir, Ansel Adams, Golden Trout, and Hoover Wilderness Areas.

Figure 3 shows the locations of the Wilderness and Wilderness Study Areas that are within or adjacent to current and historical bighorn sheep habitat.

USFS Wilderness and BLM Wilderness Study Area - Legislation and Policy

The Wilderness Act (Public Law 88-577(16 USC Sections 1131-1136)) established a national preservation system to protect areas “where the earth and its community of life are untrammelled by man”. Wilderness areas are devoted to the public for recreational, scenic, scientific, educational, conservation, and historical use. The policy for predator damage management in Wilderness areas is discussed in the MOU between USFS and APHIS-WS.

The BLM's Interim Management Policy for Lands Under Wilderness Review, H-8550-1 of 1995, or as revised (IMP), and the MOU between BLM and APHIS-WS clearly outline the restrictions and coordination requirements for predator damage management in Wilderness Study Areas. The BLM's IMP currently 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 in the area . . . “

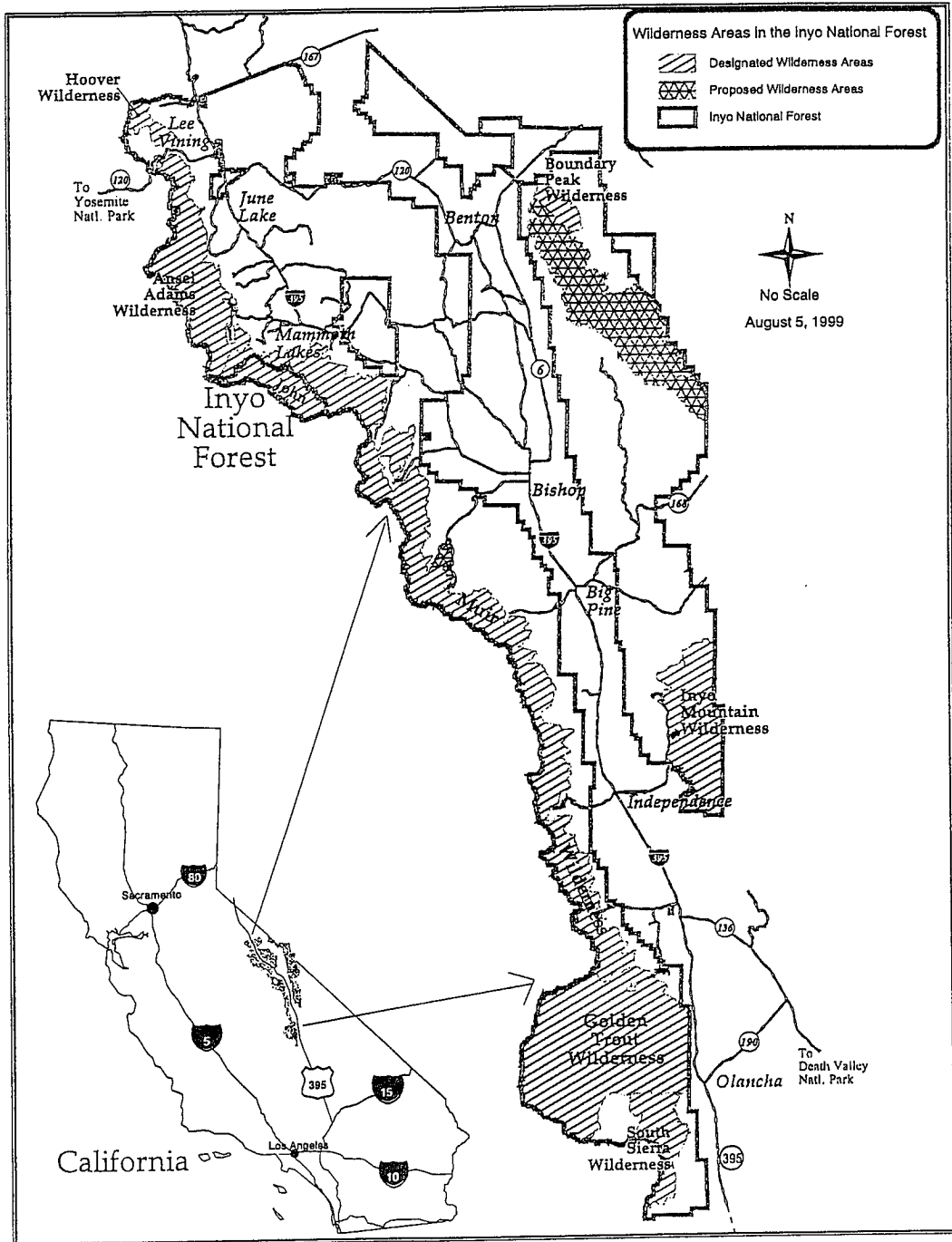
The BLM's Interim Management Policy for Lands Under Wilderness Review is currently under revision. When finalized, the proposed action will include any changes that may be made in the restrictions and coordination requirements for working in Wilderness Study Areas.

Impacts on Wilderness and Wilderness Study Areas

Some persons interested in Wilderness and Wilderness Study Areas may consider any predator damage management activities to adversely affect the aesthetic quality of the “wilderness experience.” The proposed action would lead to the loss of small numbers of some native predators (mountain lion, bobcat, coyote) and these predator control activities would involve the use of

dogs and firearms which could detract from the wilderness experience for some users. However, implementation of the proposal would likely lead to an increase in the bighorn sheep population from the loss of predators. The USFS has cooperated in all phases of the proposed action planning and in the preparation of this environmental assessment, and will continue to coordinate for all work done on wilderness or any other USFS lands. Coordination ensures that areas of potential conflict are identified and solutions are developed to avoid conflict.

Figure 3



The proposed activities on lands under wilderness review (WSAs) do not conflict with BLM management objectives as set forth in RMPs. Because the proposed action will only remove a small number of predators compared to the populations, and because the proposed action does not involve any development or ground disturbance, the proposed action would have almost no effect on wilderness characteristics: size, naturalness, solitude, aesthetics, primitive or unconfined type of recreation, supplemental values, and possibility of returning to a natural condition as stated in BLM's Wilderness Inventory Handbook from 1978 and the Interim Management Policy. The proposed activities would not interrupt wilderness review processes or impair potential suitability for wilderness designation by Congress.

The proposed action includes conformance with standard operating procedures for work in Wilderness and Wilderness Study Areas that help to ensure no significant impacts on these sensitive areas.

- Predator damage management in Wilderness Areas would be in accordance with FS policy and in conformance with the Wilderness Act.
- Predator damage management in Wilderness Study Areas would be in accordance with BLM policy. Any work is limited to actions allowed in BLM's Interim Management Policy for Lands Under Wilderness Review (H-8550-1, III. G. 5.).
- Should any of BLM's existing WSAs be officially designated as Wilderness Areas during the implementation of the proposed action, wildlife damage management would be performed in accordance with BLM Wilderness Management Policy of 1981 and the enacting legislation.
- All activities under this proposal would comply with guidance established from USFS Land and Resource Management Plans, and BLM Resource Management Plans.
- National MOUs between APHIS-WS and BLM and between APHIS-WS and USFS delineate expectations for predator damage management on public lands administered by these agencies. Work plans detail activities, target species, and mitigation measures to be implemented where bighorn sheep predator damage management may be needed. This ensures that the cooperating agencies are aware of and can avoid or minimize impacts on recreational and cultural resources, hunting, sensitive species, wildlife viewing, and other land uses.

The most likely effect of the proposed action may be a minor impact on the wilderness users' ability to view predators. However, this may be offset by enhancing the wilderness users' opportunities to view bighorn sheep. The impact from removing mountain lions from wilderness is discussed further under the impacts on the mountain lion population.

Because of coordination and conformance with special management area regulations and policies, the proposed action would have no permanent impact on the values of wilderness or wilderness study areas. Removing individual animals does not significantly affect the wilderness users' experience.

4.2 - Alternative 2 - No Action

4.2.1 Impact of predator damage management on the target species populations

4.2.1.1 Impacts on mountain lions

Under this alternative, the cooperating federal agencies would take no action to protect the bighorn sheep from predation by mountain lions. Therefore, no mountain lions would be killed or harassed by federal agencies.

A bill that amended Section 4801 of the Fish and Game Code passed through the California State legislature in August 1999, and was signed into law, effective immediately, as of September 17, 1999 (AB 560, Oller bill, see Appendix C). The Oller bill authorizes CDFG to ". . . remove or take, any mountain lion . . . that is perceived by (CDFG) to be an imminent threat to the survival of any threatened (or) endangered . . . sheep species." (California State Senate 1999). Since CDFG has regained this authority, it could direct its chosen authorized agent to remove mountain lions (e.g. CDFG employee or contracted agent(s)). Therefore, a reasonably foreseeable future action or cumulative impact associated with this alternative may be that CDFG, or its authorized (non federal) agent, would remove approximately the same numbers of mountain lions that would be removed under the Proposed Action Alternative. The evaluation of the impact of the proposed action alternative on mountain lions would then apply to this alternative as an estimate of cumulative impacts on the mountain lion population.

4.2.1.2 Impacts on bobcats

Under a No Action (no federal program) Alternative, bobcats would not be taken by APHIS-WS, but CDFG could implement a program to control impacts on bighorn sheep from bobcats. This may include increased hunting in the proposed project area, or control by CDFG or its authorized agent(s). Approximately the same numbers of bobcats could be taken as described under the proposed action alternative. This is not a significant impact. Under the no action alternative, the impacts on bobcats would not be directly monitored by the APHIS-WS program.

4.2.1.3 Impacts on coyotes

Under this alternative, APHIS-WS would not take coyotes, but CDFG could potentially implement a program to control impacts on bighorn sheep from coyotes. This may include increased hunting in the proposed project area, or control by CDFG or its authorized agent. Approximately the same numbers of coyotes could be taken as described under the proposed action alternative. This is not a significant impact. Under this alternative, the impacts on coyotes would not be directly monitored by the APHIS-WS program.

4.2.2 Effectiveness

The effectiveness of predator damage management is dependent upon the skilled use of the appropriate combination of proven effective tools. This alternative would have no direct effectiveness since there would be no program. A reasonable scenario may be that the State of California would take action. That would be likely to have a lower effectiveness level than the proposed action since cooperating federal agencies would take no action to assist with any predation control plans for the bighorn sheep, they would not coordinate or provide expertise, or assistance. In the scenario of CDFG increasing public hunting efforts to remove coyotes and bobcats from the proposed project area, traps and snares could not be used by the public, only shooting would be allowed. Removing these important tools would greatly reduce the effectiveness of the program. Shooting can only be effective when the hunter is on site and sees the target animal, if in fact the target animal was a threat to bighorn sheep. Hunting would provide only random removal of predators. CDFG or its authorized agent(s) could remove mountain lions that were determined to be an

imminent threat to bighorn sheep (California State Senate 1999), or bobcats, or coyotes to protect bighorn sheep.

The possibility that CDFG would act to control predators is not considered part of the No Action Alternative, but rather a cumulative impact (reasonably foreseeable action). The no action alternative would have no effectiveness, because no action by federal agencies would be taken to protect the bighorn sheep.

4.2.3 Impacts on non-target species

Under this alternative, mountain lions could be taken by CDFG or its agent, and bobcats and coyotes could be hunted by others but not trapped or snared. No non-target species would be removed by federal agencies. Shooting is highly target specific. Few or no non-target animals would be expected to be taken under this alternative.

4.2.4 Impacts on threatened and endangered species

Because few or no non-target species would be expected to be taken, threatened or endangered species would not be expected to be taken under this alternative. However, actions that would be taken by federal APHIS-WS trackers to reduce the potential for lead poisoning of bald eagles or California condors, will not necessarily be employed (see Section 4.1.4). In addition, bighorn sheep would be likely to continue to decline from predators.

This alternative would not allow the cooperating agencies to use their authorities to enhance or recover the endangered sheep, and would not comply with the Federal Endangered Species Act. Some of the bighorn sheep groups (3 out of 9 female demes which comprise the 5 subpopulations) are expected to go extinct if they continue to avoid wintering habitat.

The immediacy of threats to the bighorn sheep as a result of the continuous exposure to predation (primarily by mountain lions), and the effects of avoidance of important habitat, are very significant to the total population of bighorn sheep. The routine listing process is not sufficient to prevent losses that may result in extinction or loss of significant conservation potential. Mountain lions have undermined reintroduction efforts and have caused the virtual extinction of the last 2 native populations of bighorn sheep. If the recent population trend of the remaining native population continues, it will soon approach

extinction (Wehausen 1996). A "No Action" alternative would continue the status quo where bighorn sheep could be expected to continue to decline, and the cooperating federal agencies would not provide the potential for the bighorn sheep to recover.

4.2.5 Humaneness

The No Action Alternative would be more humane for the target species than the proposed action. Mountain lions would not be tracked, captured and killed or harassed by federal wildlife agents. Coyotes and bobcats would not be subject to traps and snares, and would not suffer stress or injury from those tools.

If CDFG chose to increase hunting efforts in the project area, the humaneness would be dependent upon the skill of each hunter. Presumably, individual hunters would not be as skilled as professional predator damage control specialists. This alternative is also likely to be less selective in removing likely or actual predators of bighorn sheep since professional wildlife specialists skilled in identifying offending predators may not be used to the extent of the proposed action alternative.

The No Action Alternative would continue the current scenario for the bighorn sheep. They would likely suffer continued predation and displacement. Some people may consider allowing the bighorn sheep to continue to be killed by predators and to be displaced from winter range where the sheep are exposed to a harsher climate and poorer nutrition to be inhumane.

4.2.6 Impacts on Wilderness and Wilderness Study Areas

This alternative would have no impact on Wilderness or Wilderness Study Areas since no federal program would occur. If non-federal individuals took action to remove predators, impacts on Wilderness or Wilderness Study Areas may occur.

4.3 - Alternative 3 - Nonlethal Control of Mountain Lions with Lethal Control of Coyotes and Bobcats

4.3.1 Impact on the target species populations

4.3.1.1 Impacts on mountain lions

Under this alternative, mountain lions would be captured as discussed under the current program alternative. In cases where a mountain lion would have been killed under the current program, they would be relocated or harassed under this alternative. In this case, a similar number of mountain lions could be removed from the local population. If insufficient sites for relocation are identified, the program would rely more on managing mountain lions through harassment. Relocating mountain lions to other parts of the state may be difficult because the state's mountain lion population covers the entire range of all suitable habitat. Relocation would require approval by the state. Under this scenario, no mountain lions would be killed by the cooperating agencies, but a slight and insignificant impact could occur from removing mountain lions to other locations. Some mountain lions could die from indirect causes of relocation (injuries from fighting, starvation or disease).

4.3.1.2 Impacts on bobcats

Under Alternative 3, the impact on bobcats would be similar to the proposed action.

4.3.1.3 Impacts on coyotes

Under Alternative 3, the impact on coyotes would be similar to the proposed action.

4.3.2 Effectiveness

Because mountain lions are the primary known predator of bighorn sheep, and the result of removing coyotes and bobcats would be similar to the Proposed Action Alternative, the effectiveness of this alternative is dependent largely upon the result of the nonlethal control of mountain lions.

The effectiveness of relocating mountain lions to other parts of the state would depend upon finding suitable habitat, whether or not the mountain lions would remain in the new location, and whether or not the relocation would create a new problem elsewhere. The state's mountain lion population covers the entire range of all suitable habitat and unoccupied habitat is not known to exist. Lacking unoccupied suitable habitat, mountain lion relocation can result in excessive stress to mountain lions in competition with the existing territorial mountain lion, displacement to unsuitable habitat, creation of predation problems in the new location, wounding or death, or they may return to the original home range (J. Brent, pers. comm. 1999, S. Torres, pers. comm. 1999).

A study in New Mexico (Ruth et al. 1998) designed to determine the feasibility of translocating mountain lions as a tool to manage populations and problem individuals, moved 14 adult mountain lions an average of 477 kilometers (km) (296 miles) from their home range. Upon introduction, the mountain lions moved from 3 to 494 km (1.8 to 307 miles). Two of the mountain lions returned to their original home range. Nine of the 14 translocated mountain lions died during the study period.

The effectiveness of mountain lion harassment has been discussed in Hebert and Lay (1996) in studies in British Columbia on a bighorn sheep range. Mountain lions were repeatedly captured and collared. The mountain lions apparently learned to escape the harassment by changing locations within the sheep range and then escaping further capture. The study may indicate that the mountain lions actually learned to avoid the humans and dogs, rather than the sheep range (J. Brent, pers. comm. 1999 and Hebert and Lay 1996). This option could have the effect of making collared mountain lions more difficult to recapture (J. Brent, pers. Comm. 1999).

The harassment option is considered experimental and may not be expected to be effective enough to meet the objectives of the proposal. The effectiveness of relocating mountain lions is not well documented, but is likely to be low for the reasons discussed above. The effectiveness of lethal control of bobcats and coyotes would be as discussed under the proposed action alternative. Overall, this alternative is likely to have a low level of effectiveness.

4.3.3 Impacts on non-target species

The impacts on non target species would be similar to the proposed action.

4.3.4 Impacts on threatened and endangered species

Under this alternative, adverse effects on threatened or endangered species would be similar to the proposed action for coyotes and bobcats and accidentally trapping bighorn sheep, since similar methods would be used to capture predators. However, the potential for lead poisoning of bald eagles or California condors, by lead based ammunition, will be reduced since mountain lions will no longer be shot.

The benefit to bighorn sheep from removing mountain lions would depend upon the effectiveness of the harassment and relocation methods. The benefits to the bighorn sheep would be expected to be less than the proposed action alternative, since the effectiveness of the methods is likely to be lower. If unproven techniques are used, this alternative may not allow the cooperating agencies to fully use their authorities to enhance or recover the endangered sheep, and may not fully comply with the purposes of the Federal Endangered Species Act.

4.3.5 Humaneness

Some people consider any form of nonlethal management of predators to be more desirable than lethal control. Relocating mountain lions may not be considered to be humane for the reasons indicated above under the discussion on effectiveness; relocation may result in excessive stress, injury or death. Harassment may not be considered humane by some, but it is probably considered to be more humane than killing the mountain lion by many people. If harassment is effective, presumably the humaneness of this option would still be an issue if the mountain lion learned to avoid the harassment and left the project area. The discussion on the humaneness of relocating mountain lions may have some application here for displaced mountain lions.

The humaneness of this alternative for bobcats or coyotes would be similar to the proposed action. This alternative would be likely to protect the bighorn sheep more than the No Action Alternative and less than the Proposed Action Alternative (this would be dependent upon the effectiveness of the program). In addition, some people may consider the continued allowance of predation on the remaining bighorn sheep to be inhumane.

4.3.6 Impacts on Wilderness and Wilderness Study Areas

The impacts on Wilderness and Wilderness Study Areas would be similar to the proposed action. Mountain lions would still be tracked and captured.

4.4 Alternative 4 - Nonlethal Control of Mountain Lions, Coyotes and Bobcats

4.4.1 Impact on the target species populations

4.4.1.1 Impacts on mountain lions

The impacts on mountain lions would be as described under Alternative 3 nonlethal control of mountain lions and lethal control of bobcats and coyotes.

4.4.1.2 Impacts on bobcats

Relocating a limited number of bobcats would be possible if suitable habitat can be found where bobcat densities are not high, and with the approval of CDFG. Because bobcat densities range from common to uncommon in California (CDFG 1999a), suitable unoccupied habitat may be identified for relocation. Bobcat relocation may also be acceptable to some land managers because bobcats are a highly valued species, sought by hunters and trappers for its fur (CDFG 1999a). If bobcats were relocated, the impacts on the localized bobcat population in the bighorn sheep range would be similar to the proposed action alternative, since bobcats determined to be a threat to bighorn sheep would be removed from the proposed project area. Immigration could occur into the vacated territories, but at a lesser rate than with coyotes (R. Krischke, pers. comm. 1999). The impact on the bobcat population in California would not change, unless relocation resulted in the death of the relocated or displaced bobcat. In any case, the impact on the bobcat population would not be significant, because the cumulative mortality of bobcats would be low, compared with the allowable harvest, as described under the proposed action alternative. Bobcat relocation would be subject to approval by CDFG.

4.4.1.3 Impacts on coyotes

The survival rates of relocated coyotes is not known (The Service 1999c). Relocated coyotes have been found to return long distances to their original home range, from 100 to 1,000 miles (R. Krischke, pers. comm. 1999). The impact on the local coyote population would not be significant, because coyotes will be recruited into the unoccupied territories, as under the proposed action alternative. Mortality of the

relocated coyotes could occur. However, this would not be a significant impact on the coyote population, for the same reasons discussed under the proposed action alternative.

Coyotes are abundant throughout California, and they cause considerable damage to livestock and other resources⁶. Relocating coyotes may be more difficult from a management perspective.

Coyotes are territorial and defend their home range. Coyotes relocated to an area where suitable habitat is already occupied would likely be forced into unsuitable habitat where they could face considerable stress.

Indirect impacts from relocating coyotes could include spreading disease, and new predation problems from the relocated coyotes in their new territories.

4.4.2 Effectiveness

The effectiveness of this alternative in protecting the bighorn sheep from potential predation would be similar to Alternative 3 for mountain lions. The effectiveness in protecting bighorn sheep from coyotes and bobcats would depend upon whether or not suitable new habitat could be identified for relocation, and also if the relocated predators returned to their original home range. If suitable habitat cannot be located, or if predators returned, the effectiveness would be reduced according to the numbers of predators that were determined to be a threat, and could not be removed.

4.4.3 Impacts on non-target species

The impacts on non-target species would be similar to the proposed action alternative since the methods of capture would be similar to the proposed action, except that shooting would not be used. Very few non-target animals could be captured in the traps and snares set for coyotes and bobcats.

⁶ Coyotes caused an estimated \$2.7 million damage to the livestock and poultry industry in California between 1996 and 1997 (CDFG 1999).

4.4.4 Impacts on threatened and endangered species

The impacts of this alternative on accidentally trapping bighorn sheep, would be similar to the proposed action because the methods for capture are similar. However, the potential for lead poisoning of bald eagles or California condors, by lead based ammunition will be eliminated.

The indirect benefit to the bighorn sheep from removing mountain lion, coyote and bobcat predation threats, would be dependent upon the effectiveness of this alternative.

4.4.5 Humaneness

The issue of humaneness as it relates to management of mountain lions would be as described under Alternative 3. Some people consider any form of nonlethal management of predators to be more desirable than lethal control. However, a closer inspection shows indirect impacts may actually be less humane for the target predators because relocated animals can be killed, wounded or driven out by an existing dominant territorial predator, and may be subjected to starvation, disease, or other undesirable fates. This alternative can be considered more humane than the proposed action if suitable, unoccupied habitat can be identified for relocation. This is most likely not the case for coyotes, and may or may not be the case for bobcats.

4.4.6 Impacts on Wilderness and Wilderness Study Areas

Impacts on Wilderness and Wilderness Study Areas would be similar to the proposed action alternative. Mountain lions, bobcats, and coyotes would still be tracked, captured and relocated.

4.5 Summary and Conclusions

Table 4 presents the major conclusions drawn from the analysis. All of the alternatives would result in no significant adverse impacts on the environment.

The effectiveness of the alternatives, given no significant impact in any of the other evaluation criteria, is probably the most important evaluation criteria (issue) in this assessment because of the current low numbers of bighorn sheep. The effectiveness of any of the alternatives would determine the likelihood that the alternative would help to achieve the objective of the proposal to prevent further decline or even demise of the bighorn sheep, while other measures are ongoing to recover the species.

| Table 4. Summary of Impacts | | | | |
|-----------------------------|---|--|---|--|
| Issue | Proposed Action (Alt. 1) | No Action (Alt. 2) | Nonlethal Control of Lions (Alt. 3) | Nonlethal Control (Alt. 4) |
| Mountain Lion | Removal of low numbers of individuals would have negligible effects on the population | None | Removal or loss of low numbers of individuals would have negligible effects on the population | Removal or loss of low numbers of individuals would have negligible effects on the population |
| Coyote | Removal of low numbers of individuals would have negligible effects on the population | None | Removal of low numbers of individuals would have negligible effects on the population | Removal or loss of low numbers of individuals would have negligible effects on the population |
| Bobcat | Removal of low numbers of individuals would have negligible effects on the population | Low | Removal of low numbers of individuals would have negligible effects on the population | Removal or loss of low numbers of individuals would have negligible effects on the population |
| Effectiveness | Most likely to protect bighorn sheep from predators | None | Unknown (harassment) to low to moderate (relocation) | Low to moderate |
| Nontarget Species | Low | None | Low | Low |
| T&E Species | No adverse effect. Likely to benefit bighorn sheep by maintaining population | No adverse effect | No adverse effect. Unknown to moderate benefit to bighorn sheep | No adverse effect. May have a low to moderate benefit to bighorn sheep |
| Humane-ness | Some people opposed to capture and killing of any wildlife. Methods used to minimize pain and suffering | Humane for predators. No program to protect sheep is not desired | Some may consider this more humane for lions. Fate of lions from relocation may be inhumane | Some may consider this more humane for predators. Fate of predators from relocation may be inhumane. |
| Wilderness | Low | None | Low | Low |
| Cumulative | Low | None | Low | Low |

References and Consultations

References

- Ashman, D. L., G. C. Christensen, M. L. Hess, G. K. Tuskamoto, and M. S. Wickersham. 1983. The mountain lion in Nevada. Nev. Dep. Wildl., Reno. 75pp.
- American Veterinary Medical Association Panel on Euthanasia. 1993. 1993 Report of the AVMA Panel on Euthanasia. Journal of the American Veterinary Medical Association, 202(2):229-249.
- Bighorn News. 1999. Federal listing population survey results.
<http://www.sierrabighorn.org/News>
- Bleich, V.C. 1999. "Mountain sheep and coyotes: patterns of predator evasion in a mountain ungulate". Journal of Mammalogy 80(1):283-289.
- California Department Of Fish and Game. 1999a. Draft environmental document: Furbearing and nongame mammal hunting and trapping. Sec. 265, 460-467 and 472-480, Title 14. California Code of Regulations
- California Department Of Fish and Game. 1999b. State and Federally listed endangered and threatened animals of California. <http://www.dfg.ca.gov/endangered/animals>
- California Department Of Fish and Game. 1997. Licensed Trapping Information Sheet.
<http://www.dfg.ca.gov/enforcement/trapping>
- California Department Of Fish and Game. 1995. Special mountain lion issue. *In* Outdoor California. 57(3):33pp.
- California Department of Fish and Game. 1988. Final Environmental Document Regarding Mountain Lion.
- California Department Of Fish and Game. Undated. Nongame animals.
http://www.dfg.ca.gov/Title/d2_c6 5pp.
- California State Senate. 1999. Current Session Legislation. AB 500 wildlife: mountain lions.
<http://www.sen.ca.gov/htbin/testbin/ca-html>
- Chow L.S. 1991. Population dynamics and movement patterns of bighorn sheep reintroduced in the Sierra Nevada, California. M.S. Thesis, University of California, Berkeley. 157pp.
- Connolly and Longhurst. 1975. The effects of control on coyote populations. Division of Agricultural Sciences University of California Bulletin 1872.

References and Consultations

References Continued

- Cowan, I.M. and V. Geist. 1971. The North American wild sheep. Pp. 58-83 In R. Water, ed. North American Big Game. 1971 ed. Boone and Crockett Club, Pittsburgh. 403 pp.
- Foreyt, W.J. and D.A. Jessup. 1982. Fatal pneumonia of bighorn sheep following association with domestic sheep. *Journal of Wildlife Diseases* 18:163-167.
- Frequently asked questions about the emergency and proposed listing of the Sierra Nevada bighorn sheep. 3pp.
- Hebert, D., and D. Lay. 1996. Cougar-human interactions in British Columbia. In. *Proceedings of the fifth mountain lion workshop*. Pp. 44-45.
- Hicks, L. L. and J. M. Elder. 1979. Human disturbance of Sierra Nevada bighorn sheep. *Journal of Wildlife Management*. 43(4):909-915.
- Hornocker, M. G. 1970. An analysis of mountain lion predation upon mule deer and elk in the Idaho Primitive Area. *Wildlife Monographs*. 21:1-39.
- Inyo National Forest Land Management Plan. 1988. Bishop, California.
- Johnson, G. D. and M. D. Strickland. 1992. Mountain lion compendium and an evaluation of mountain lion management in Wyoming. *Wstrn. Ecosys. Tech., Inc.* Cheyenne, Wyom. 41pp.
- Jones, F.L. 1950. A survey of the Sierra Nevada bighorn. *Sierra Club Bulletin* 35(6):29-76.
- Logan, K.A., L.L. Sweanor, T.K. Ruth, and M.G. Hornocker. 1996. Cougars of the San Andres Mountains, New Mexico - A Final Report for New Mexico Department of Game and Fish. Hornocker Wildlife Institute, Inc. Santa Fe, New Mexico.
- Logan, K.A. 1997. A draft letter dated May 6, 1997 to Ms. Elisabeth Jennings, Sangre de Cristo Animal Protection, Inc. from Kenneth Logan. Hornocker Wildlife Research Institute, Inc. University of Idaho.
- Mansfield, T.M. and R.A. Weaver. 1989. The status of mountain lions in California. *Trans. West. Sect. Wildl. Soc.* 25:72-76.
- Oregon Department Of Fish and Wildlife. 1993. Oregon's cougar management plan 1993-1998. Portland, OR. 28pp.

References and Consultations

References Continued

- Pierce, B.M., V.C. Bleich, and R. Terry Bowyer. Prey selection by mountain lions and coyotes on mule deer: effects of hunting style, body size, and reproductive status. *Journal of Mammalogy* 25: In review
- Pierce, B.M., V.C. Bleich, and R. Terry Bowyer. 1999. Social organization of mountain lions: does a land-tenure system regulate population size. *Ecology*: In press.
- Pierce, B.M., R.T. Bowyer, and V.C. Bleich. 1999. Habitat selection by mule deer: forage or risk of predation by mountain lions. *Journal of Wildlife Research* 24:In review
- Robinette, W.L., J.W. Gashwiler, and O.W. Morris. 1961. Notes on cougar productivity and life history. *Journal of Mammalogy* 42(2):204-217.
- Schmidt, R. H. 1989. Vertebrate Pest Control and Animal Welfare, in *Vertebrate Pest Control and Management Materials: 6th Volume, ASTM STP 1055*. Kathleen A. Fagerstone and Richard D. Curnow, Eds., American Society for Testing and Materials, Philadelphia, 1989, pp. 63 - 68.
- Ruth, Toni K., K. A. Logan, L. L. Sweanor, M. G. Hornocker, and L. J. Temple. 1998. Evaluating cougar translocation in New Mexico. *Journal of Wildlife Management* 62(4):1264-1275.
- Seidensticker IV, J.C., Hornocker, M.G. Wiles, W.V. and J.P. Messick. 1973. Mountain lion social organization in the Idaho Primitive Area. *Wildlife Monographs*. 35:1-60
- Sierra Nevada Bighorn Sheep Interagency Advisory Group. 1997. *A Conservation Strategy for Sierra Nevada Bighorn Sheep*.
- Torres, S.G., T.M. Mansfield, J.E. Foley, T. Ludo, and A. Branches. 1996. Mountain Lion and human activity in California: testing speculations. *Wildlife Society Bulletin* 24(3):451-460.
- U.S. Department Of Agriculture. 1997. Environmental assessment: For the protection of livestock, property and human health and safety. Animal Plant Health Inspection Service. California. 48 pp.
- U.S. Department Of Agriculture. 1995. Final Environmental Impact Statement Animal Damage Control Program.
- U.S. Fish and Wildlife Service. 1999 "Facts about the Sierra Nevada bighorn sheep".

References and Consultations

References Continued

- U.S. Fish and Wildlife Service. 1999a. The Service proposes emergency protection for Sierra Nevada bighorn sheep. New Release. 3 pp.
- U.S. Fish and Wildlife Service. 1999b. Endangered and threatened wildlife and plants; emergency rule to list the Sierra Nevada distinct population segment of California bighorn sheep as endangered. In. Fed. Register 64(75):19300-19309.
- U.S. Fish and Wildlife Service. 1999c. Draft Supplement, Management of Coyotes at the Julia Butler Hansen Refuge for the Columbian White-Tailed Deer.
- Wehausen, J.D. 1996. Effects of mountain lion predation on bighorn sheep in the Sierra Nevada and Granite Mountains of California. Wildlife Society Bulletin 24:471-479.
- Wehausen, J.D. 1979. Sierra Nevada bighorn sheep: an analysis of management alternatives. Coop. Admin. Report, Inyo National Forest and Sequoia, Kings Canyon, and Yosemite National Paks. 92 pp.
- Wehausen, J. D. 1980. Sierra Nevada bighorn sheep: history and population ecology. Ph.D. Thesis, University of Michigan, Ann Arbor, Michigan. 240 pp.

References and Consultations

List of Agencies and Persons Consulted

Preparers

Carl Benz, Division Chief
Lead Agency Representative
U.S. Fish and Wildlife Service
Ventura, California

Diana Craig, Regional Wildlife Program Manager
Cooperating Agency Representative, Forest Service Issues
National Forest Service
Pacific Southwest Region
Vallejo, California

David Graber, Science Advisor
Cooperating Agency Representative, National Park Service Issues
National Park Service
Sequoia and Kings Canyon National Parks
Three Rivers, California

Gary Simmons, California State Director
Cooperating Agency Representative, Predator Damage Management
U.S. Dept. of Agriculture, Animal and Plant Health Inspection Service
Wildlife Services Program
Sacramento, California

Shannon Hebert, Environmental Coordinator
NEPA Coordinator and Primary Writer
U.S. Dept. of Agriculture, Animal and Plant Health Inspection Service
Wildlife Services Program
Portland, Oregon

Steve Torres, Senior Wildlife Biologist
Cooperating Agency Representative, Bighorn Sheep Management
State of California, The Resources Agency
Department of Fish and Game
Sacramento, California

References and Consultations

Persons Consulted

Marcia Abrams
USDA Office of General Council
San Francisco, California

Jeff Brent
Supervisory Wildlife Biologist
APHIS-WS
Portland, Oregon

Laurie Fenwood
Director, Ecosystem Conservation Staff
USDA Southwest Region
Vallejo, California

Barbara Goodyear
USDI Office of the Solicitor
San Francisco, California

Ben Harrison
Regional Environmental Coordinator
U.S. Fish and Wildlife Service
Region 1
Portland, Oregon

Rod Krischke
Assistant State Director
APHIS-WS
Portland, Oregon

Colleen Madrid
Regional Wildlife Program Manager
Intermountain West Region
USDA Forest Service
Ogden, Utah

Jamie Rosen
USDA Office of General Council
San Francisco, California

Mike Spear
CA/NV Operations Manager
US Fish and Wildlife Service
Sacramento, California

References and Consultations

Persons Consulted Continued

Rick Wadleigh
National Environmental Manager
U.S. Dept. of Agriculture, Animal and Plant Health Inspection Service
Wildlife Services Program
Lakewood, Colorado

David Zezulak
Chief, Wildlife Programs Branch
State of California, The Resources Agency
Department of Fish and Game
Sacramento, California

Sierra Nevada Bighorn Sheep Inter-Agency Advisory Group:

Carl Benz, US Fish & Wildlife Service
Vern Bleich, California Department of Fish & Game
Karl Chang, Independent
Les Chow, US Geological Survey
Diana Craig, USDA, Forest Service
Ben Gonzales, California Department of Fish & Game
Dave Graber, National Park Service
Peggy Moore, US Geological Survey
Lee Ann Naue, US Fish & Wildlife Service
Kathy Noland, USDA, Forest Service
Richard Perloff, USDA, Forest Service
Bonnie Pritchard, USDA, Forest Service
Denyse Racine, California Department of Fish & Game
Terry Russi, Bureau of Land Management
Steve Thompson, National Park Service
Brian Tillemans, L.A. Department of Water & Power
Steve Torres, California Department of Fish & Game
Jan Van Wagtendonk, US Geological Survey
John Wehausen, Independent

APPENDIX A - Frequently Asked Questions About the Emergency and Proposed Listing of the Sierra Nevada Bighorn Sheep, April 1999

FREQUENTLY ASKED QUESTIONS ABOUT THE EMERGENCY AND PROPOSED LISTING OF THE SIERRA NEVADA BIGHORN SHEEP

What is the Action Being Taken by the U.S. Fish & Wildlife Service? The Service is emergency listing the Sierra Nevada bighorn sheep population as endangered, under the provisions of the Endangered Species Act (Act). Also, at this time the Service has published a proposed rule to list this population as endangered.

What Do Sierra Nevada Bighorn Sheep Look Like? Sierra Nevada bighorn sheep are large mammals. Their coats are generally pale brown with white rump patches. Males stand approximately three feet high at the shoulder, can weigh 220 pounds, and have massive coiled horns. Females are not as large as the males, and have smaller horns. Sierra Nevada Bighorn sheep breed in the fall; the ewes produce one lamb in the spring or early summer.

Are Sierra Nevada Bighorn Sheep Related to California Bighorn Sheep? Yes, the Sierra Nevada bighorn sheep is a distinct population segment of California bighorn sheep (*Ovis canadensis californiana*). The Sierra Nevada population is defined by its geographic isolation from other bighorn sheep populations and qualifies for listing under these conditions.

Why is the Sierra Nevada Bighorn Sheep Population Being Emergency Listed? Populations of Sierra Nevada bighorn sheep have declined significantly since 1990. Currently, there are only an estimated 100 individuals living in five herds located in Inyo and Mono counties. These herds are isolated from each other. Isolation and the reduced population size make this population extremely vulnerable to extinction. The population's small size also makes it vulnerable to significant losses from random events such as avalanches. Adverse effects caused by mountain lions and the potential for the transfer of disease by contact with domestic sheep are some of the significant threats that should be addressed immediately. The emergency listing will provide the means to address these threats.

How Does Emergency Listing Differ From the Regular Listing Process? Emergency listing of a species provides immediate protection under the provisions of the Act for a period of 240 days. The regular listing process takes longer, and has two major components: a proposed rule and a final rule. After publication of a proposed rule, the Service has up to one year to publish a final rule. However, the Service intends to make a final decision on the proposal before the emergency listing expires in 240 days.

Why Did the Service Wait So Long to Propose Listing the Sierra Nevada Bighorn Sheep Population? The Service has been monitoring the Sierra Nevada bighorn sheep population since the early 1980s. During that time, an interagency team drafted a recovery plan and several tasks associated with the plan were implemented. By the late 1980s, the bighorn sheep population increased from two to five herds and a sound conservation program appeared to be in place. However, with the passage and enactment of Proposition 117 in 1990, mountain lions received an unprecedented level of protection, and all resource agencies became concerned about the potential impact of mountain lion predation on bighorn sheep.

The Service continued monitoring bighorn sheep conservation efforts while waiting for a clarification to be made regarding the impact of Proposition 117 on management of mountain lions that were known to prey on bighorn sheep. In the fall of 1998, the Service learned that the State could not control mountain lions in order to protect bighorn sheep, and actions to protect this species from domestic sheep diseases were difficult to implement. At that point, the Service initiated the listing process under the Endangered Species Act.

Haven't Mountain Lions Always Preyed Upon Bighorn Sheep? Predation by mountain lions was probably a natural occurrence and, given a healthy distribution and abundance of bighorn sheep, was part of the balance of nature. Until the 1960s, a bounty was offered on mountain lions which kept their numbers limited. In the 1970s, mountain lion hunting ceased and the number of lions increased. Given the small population of bighorn sheep, predation by mountain lions became a more significant factor that affected the bighorn sheep population's growth. The California Department of Fish and Game initiated management of problem mountain lions in bighorn sheep areas in the 1980s. Management actions included the removal of lions known to prey upon bighorn sheep.

What is Proposition 117 and How Does it Affect Management of Mountain Lions in Bighorn Sheep Areas? In 1990, voters in California passed Proposition 117 which limits the taking of mountain lions except in cases where a lion is posing a threat to people, pets, or livestock. There is no provision within Prop. 117 for managing lions that pose a threat to wildlife species.

Following the passage of this proposition, populations of mountain lions increased. Mountain lions inhabit portions of bighorn sheep habitat utilized by the species in the winter. It is possible that bighorn sheep are remaining at higher altitudes during the winter months to avoid areas where lions exist. Sierra Nevada Bighorn sheep that remain at high altitudes during the winter months are at greater risk of mortality due to avalanches and loss of conditioning due to a lack of adequate forage.

If Sierra Nevada Bighorn Sheep are Federally Listed as an Endangered Species, Will the Service Have the Authority to Control Mountain Lions that Threaten the Sheep? Yes. Once listed, the Act requires the Service and other Federal agencies to use their authorities to protect and conserve listed species. The Service will work with the California Department of Fish and Game, U.S. Forest Service, Bureau of Land Management, and National Parks Service to implement a plan to protect Sierra Nevada bighorn sheep from mountain lions.

Has a Captive-breeding Program Been Established? At this time there is no captive-breeding program for Sierra Nevada bighorn sheep; however, the California Department of Fish and Game, bighorn sheep experts, and others are currently developing an action plan for a captive-breeding program.

Is There Enough Habitat Left to Support a Large Population of Bighorn Sheep? Yes, there is ample high-quality habitat available to support healthy populations of bighorn sheep. The

primary causes of the near extinction of this species earlier this century included illegal hunting and disease from domestic sheep. Almost all of the historic habitat utilized by bighorn sheep is managed by the U.S. Forest Service, Bureau of Land Management, and National Park Service. This habitat is not degraded or fragmented.

Appendix B - Federal Register Emergency Final Rule to List the Sierra Nevada Bighorn Sheep as Endangered

from the Commission's copy contractor, International Transcription Service, Inc., 1231 20th Street, NW., Washington, DC 20036. (202) 857-3800.

We wish to clarify that although Channel 276C1 currently appears in the FM Table of Allotments at Anchorage, it was downgraded to Channel 276C2 on August 26, 1994, at the request of the former licensee of Station KMXS(FM) (see File No. BPH-931229IA). An editorial amendment to the Table of Allotments was never made to reflect the change at Anchorage. Therefore, it is not necessary to amend the Table of Allotments with respect to that community. However, Morris Communications Corporation is expected to abide by the requirements of Section 1.1104(3)(1) of the Commission's Rules when filing its application to implement the upgrade for Station KMXS(FM) at Anchorage.

List of Subjects in 47 CFR Part 73

Radio broadcasting.

Part 73 of Title 47 of the Code of Federal Regulations is amended as follows:

PART 73—[AMENDED]

1. The authority citation for part 73 reads as follows:

Authority: 47 U.S.C. 154, 303, 334, 336.

§73.202 [Amended]

2. Section 73.202(b), the Table of FM Allotments under Alaska, is amended by adding Sterling, Channel 231C2.

3. Section 73.202(b), the Table of FM Allotments under Alaska, is amended by adding Channel 265C2 at Wasilla.

Federal Communications Commission.

John A. Karousos,

Chief, Allocations Branch, Policy and Rules Division, Mass Media Bureau.

[FR Doc. 99-9766 Filed 4-19-99; 8:45 am]

BILLING CODE 6712-01-P

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

RIN 1018-AF59

Endangered and Threatened Wildlife and Plants; Emergency Rule To List the Sierra Nevada Distinct Population Segment of California Bighorn Sheep as Endangered

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Emergency rule.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), exercise our authority to emergency list the Sierra Nevada distinct population segment of California bighorn sheep (*Ovis canadensis californiana*), occupying the Sierra Nevada of California, as endangered under the Endangered Species Act of 1973, as amended (Act). The Sierra Nevada bighorn sheep is known from five disjunct subpopulations along the eastern escarpment of the Sierra Nevada totaling about 100 animals.

All five subpopulations are very small and are imminently threatened by mountain lion (*Puma concolor*) predation and disease. Because these threats constitute an emergency posing a significant risk to the well-being of the Sierra Nevada bighorn sheep, we find that emergency listing is necessary. This emergency rule provides Federal protection pursuant to the Act for this species for a period of 240 days. A proposed rule to list the Sierra Nevada bighorn sheep as endangered is published concurrently with this emergency rule in this same issue of the Federal Register in the proposed rule section.

DATES: This emergency rule becomes effective immediately upon publication and expires December 16, 1999.

ADDRESSES: The complete file for this rule is available for inspection, by appointment, during normal business hours at the U.S. Fish and Wildlife Service, Ventura Fish and Wildlife Office, 2493 Portola Rd. Suite B, Ventura, California 93003.

FOR FURTHER INFORMATION CONTACT: Carl Benz, at the address listed above (telephone 805/644-1766; facsimile 805/644-3958).

Background

The bighorn sheep (*Ovis canadensis*) is a large mammal (family Bovidae) originally described by Shaw in 1804 (Wilson and Reeder 1993). Several subspecies of bighorn sheep have been recognized on the basis of geography and differences in skull measurements (Cowan 1940; Buechner 1960). These subspecies of bighorn sheep, as described in these early works, include *O. c. cremnobates* (Peninsular bighorn sheep), *O. c. nelsoni* (Nelson bighorn sheep), *O. c. mexicana* (Mexican bighorn sheep), *O. c. weemsi* (Weems bighorn sheep), *O. c. californiana* (California bighorn sheep), and *O. c. canadensis* (Rocky Mountain bighorn sheep). However, recent genetic studies question the validity of some of these subspecies and suggest a need to re-evaluate overall bighorn sheep

taxonomy. For example, Sierra Nevada bighorn sheep appear to be more closely related to desert bighorn sheep than the *O. c. californiana* found in British Columbia (Ramey 1991, 1993). Regardless, the Sierra Nevada bighorn sheep meets our criteria for consideration as a distinct vertebrate population segment (as discussed below) and is treated as such in this emergency rule.

The historical range of the Sierra Nevada bighorn sheep (*Ovis canadensis californiana*) includes the eastern slope of the Sierra Nevada, and, for at least one subpopulation, a portion of the western slope, from Sonora Pass in Mono County south to Walker Pass in Kern County, a total distance of about 346 kilometers (km) (215 miles (mi)) (Jones 1950; Wehausen 1979, 1980). By the turn of the century, about 10 out of 20 historical subpopulations survived. The number dropped to five subpopulations at mid-century, and down to two subpopulations in the 1970s, near Mount Baxter and Mount Williamson in Inyo County (Wehauer 1979). Currently, five subpopulations of Sierra Nevada bighorn sheep occur at Lee Vining Canyon, Wheeler Crest, Mount Baxter, Mount Williamson, and Mount Langley in Mono and Inyo counties, three of which are reintroduced subpopulations established from sheep obtained from the Mount Baxter subpopulation from 1979 to 1986 (Wehausen *et al.* 1987).

The Sierra Nevada bighorn sheep is similar in appearance to other desert associated bighorn sheep. The species' pelage shows a great deal of color variation, ranging from almost white to dark brown, with a white rump. Males and females have permanent horns; the horns are massive and coiled in males, and are smaller and not coiled in females (Jones 1950; Buechner 1960). As the animals age, their horns become rough and scarred with age, and will vary in color from yellowish-brown to dark brown. In comparison to many other desert bighorn sheep, the horns of the Sierra Nevada bighorn sheep are generally more divergent as they coil out from the base (Wehausen 1983). Adult male sheep stand up to a meter (m) (3 feet (ft)) tall at the shoulder; males weigh up to 99 kilograms (kg) (220 pounds (lbs)) and females 63 kg (140 lbs) (Buechner 1960).

The current and historical habitat of the Sierra Nevada bighorn sheep is almost entirely on public land managed by the U.S. Forest Service (USFS), Bureau of Land Management (BLM), and National Park Service (NPS). The Sierra Nevada is located along the eastern boundary of California, and peaks vary

in elevation from 1825 to 2425 (m) (6000 to 8000 ft) in the north, to over 4300 m (14,000 ft) in the south adjacent to Owens Valley, and then drop rapidly in elevation in the southern extreme end of the range (Wehausen 1980). Most precipitation, in the form of snow, occurs from October through April (Wehausen 1980).

Sierra Nevada bighorn sheep inhabit the alpine and subalpine zones during the summer, using open slopes where the land is rough, rocky, sparsely vegetated and characterized by steep slopes and canyons (Wehausen 1980; Sierra Nevada Bighorn Sheep Interagency Advisory Group (Advisory Group) 1997). Most of these sheep live between 3,050 and 4,270 m (10,000 and 14,000 ft) in elevation in summer (John Wehausen, University of California, White Mountain Research Station, pers. comm. 1999). In winter, they occupy high, windswept ridges, or migrate to the lower elevation sagebrush-steppe habitat as low as 1,460 m (4,800 ft) to escape deep winter snows and find more nutritious forage. Bighorn sheep tend to exhibit a preference for south-facing slopes in the winter (Wehausen 1980). Lambing areas are on safe steep, rocky slopes. They prefer open terrain where they are better able to see predators. For these reasons, they usually avoid forests and thick brush if possible (J. Wehausen, pers. comm. 1999).

Bighorn sheep are primarily diurnal, and their daily activity show some predictable patterns that consists of feeding and resting periods (Jones 1950). Bighorn sheep are primarily grazers, however, they may browse woody vegetation when it is growing and very nutritious. They are opportunistic feeders selecting the most nutritious diet from what is available. Plants consumed include varying mixtures of graminoids (grasses), browse (shoots, twigs, and leaves of trees and shrubs), and herbaceous plants depending on season and location (Wehausen 1980). In a study of the Mount Baxter and Mount Williamson subpopulations, Wehausen (1980) found that grass, mainly *Stipa speciosa* (perennial needlegrass), is the primary diet item in winter. As spring green-up progresses, the bighorn sheep shift from grass to a more varied browse diet, which includes *Ephedra viridis* (Mormon tea), *Eriogonum fasciculatum* (California buckwheat), and *Purshia* species (bitterbrush).

Sierra Nevada bighorn sheep are gregarious, with group size and composition varying with gender and from season to season. Spatial segregation of males and females occurs

outside the mating season, with males more than 2 years old living apart from females and younger males for most of the year (Jones 1950; Cowan and Geist 1971; Wehausen 1980). Ewes generally remain all their lives in the same band into which they were born (Cowan and Geist 1971). During the winter, Sierra Nevada bighorn sheep concentrate in those areas suitable for wintering, preferably Great Basin habitat (sagebrush steppe) at the very base of the eastern escarpment. Subpopulation size can number more than 100 sheep, including rams (this was observed at a time when the population size was larger than it is currently) (J. Wehausen, pers. comm. 1999). By summer, these subpopulations decrease in size as more habitat becomes available. Breeding takes place in the fall, generally in November (Cowan and Geist 1971). Single births are the norm for North American wild sheep, but twinning is known to occur (Wehausen 1980). Gestation is about 6 months (Cowan and Geist 1971).

Lambing occurs between late April to early July, with most lambs born in May or June (Wehausen 1980, 1996). Ewes with newborn lambs live solitarily for a short period before joining nursery groups that average about six sheep. Ewes and lambs frequently occupy steep terrain that provides a diversity of slopes and exposures for escape cover. Lambs are precocious, and within a day or so, climb almost as well as the ewes. Lambs are able to eat vegetation within 2 weeks of their birth and are weaned between 1 and 7 months of age. By their second spring, they are independent of their mothers. Female lambs stay with ewes indefinitely and may attain sexual maturity during the second year of life. Male lambs, depending upon physical condition, may also attain sexual maturity during the second year of life (Cowan and Geist 1971). Average lifespan is 9 to 11 years in both sexes, though some rams are known to have lived 12 to 14 years (Cowan and Geist 1971; Wehausen 1980).

Distinct Vertebrate Population Segment

Recent analyses of bighorn sheep genetics and morphometrics (size and shape of body parts) suggest reevaluation of the taxonomy of Sierra Nevada bighorn sheep (*Ovis canadensis californiana*) is necessary (Ramey 1991, 1993, 1995; Wehausen and Ramey 1993, 1998). A recent analysis of the taxonomy of bighorn sheep using morphometrics (e.g., size and shape of skull components) failed to support the current taxonomy (Wehausen and Ramey 1993). However, this and other research (Ramey 1993) support

taxonomic distinction of the Sierra Nevada bighorn sheep relative to other nearby regions.

The biological evidence supports recognition of Sierra Nevada bighorn sheep as a distinct vertebrate population segment for purposes of listing, as defined in our February 7, 1996, Policy Regarding the Recognition of Distinct Vertebrate Population Segments (61 FR 4722). The definition of "species" in section 3(16) of the Endangered Species Act of 1973, as amended (Act) (16 U.S.C. 1531 *et seq.*) includes "any distinct population segment of any species of vertebrate fish or wildlife which interbreeds when mature." For a population to be listed under the Act as a distinct vertebrate population segment, three elements are considered—(1) the discreteness of the population segment in relation to the remainder of the species to which it belongs; (2) the significance of the population segment to the species to which it belongs; and (3) the population segment's conservation status in relation to the Act's standards for listing (i.e., is the population segment endangered or threatened?) (61 FR 4722).

The distinct population segment (DPS) of bighorn sheep in the Sierra Nevada is discrete in relation to the remainder of the species as a whole. This DPS is geographically isolated and separate from other California bighorn sheep. There is no mixing of this population with other bighorn sheep, and this is supported by evaluation of the population's genetic variability and morphometric analysis of skull and horn variation (Ramey 1993, 1995; Wehausen and Ramey 1993, 1994; Wehausen and Ramey 1999 (in review)). Researchers suggest that all other populations of *O. c. californiana* be reassigned to other subspecies, leaving *O. c. californiana* (i.e., the DPS that is the subject of this rule) only in the central and southern Sierra Nevada (Ramey 1993, 1995; Wehausen and Ramey 1993, 1994; Wehausen and Ramey 1999 (in review)).

Sierra Nevada bighorn sheep DPS is biologically and ecologically significant to the species to which it belongs in that it constitutes the only population of California bighorn sheep inhabiting the Sierra Nevada. This DPS extends from Sonora Pass to Walker Pass, and spans approximately 346 km (215 mi) of contiguous suitable habitat in the United States. The loss of Sierra Nevada bighorn sheep would result in the total extirpation of bighorn sheep from the Sierra Nevada in California.

Status and Distribution

Historically, bighorn sheep populations occurred along and east of the Sierra Nevada crest from Sonora Pass (Mono County) south to Walker Pass (Olancho Peak) (Kern County) (Jones 1950; Wehausen 1979). Sheep apparently occurred wherever appropriate rocky terrain and winter range existed. With some exception, most of the populations wintered on the east side of the Sierra Nevada and spent summers near the crest (Wehausen 1979).

Subpopulations of Sierra Nevada bighorn sheep probably began declining with the influx of gold miners to the Sierra Nevada in the mid-1880s, and those losses have continued through the 1900s (Wehausen 1988). By the 1970s, only 2 subpopulations of Sierra Nevada bighorn sheep, those near Mount Baxter and Mount Williamson in Inyo County, are known to have survived (Wehausen 1979). Specific causes for the declines are unknown. Market hunting may have been a contributing factor as evidenced by menus from historic mining towns such as Bodie, which included bighorn sheep (Advisory Group 1997). However, with the introduction of domestic sheep in the 1860s and 1870s, wild sheep are known to have died in large numbers in several areas from disease contracted from domestic livestock (Jones 1950; Buechner 1960). Large numbers of domestic sheep were grazed seasonally in the Owens Valley and Sierra Nevada prior to the turn of the century (Wehausen 1988), and disease is believed to be the factor most responsible for the disappearance of bighorn sheep subpopulations in the Sierra Nevada. Jones (1950) suggested that scabies was responsible for a die-off in the 1870s on the Great Western Divide. Experiments have confirmed that bacterial pneumonia (*Pasteurella* species), carried normally by domestic sheep, can be fatal to bighorn sheep (Foreyt and Jessup 1982).

By 1979, only 220 sheep were known to exist in the Mount Baxter subpopulation, and 30 in the Mount Williamson subpopulation (Wehausen 1979). Conservation efforts by several Federal and State agencies from 1970 to 1988 were aimed at expanding the distribution of Sierra Nevada bighorn sheep by translocating sheep back into historical habitat. Sheep were obtained from the Mount Baxter subpopulation and transplanted to three historic locations. Consequently, Sierra Nevada bighorn sheep now occur in five subpopulations in Mono and Inyo counties: Lee Vining Canyon, Wheeler Crest, Mount Baxter, Mount Williamson,

and Mount Langley. The Sierra Nevada bighorn sheep population reached a high of about 310 in 1985-86. Subsequently, population surveys have documented a declining trend (J. Wehausen, pers. comm. 1999).

The following table best represents the total Sierra Nevada bighorn sheep population over various time periods. These totals represent the numbers of sheep emerging from winter in each of these years, and best document the status of the population by incorporating winter mortality, especially of lambs born the previous year. These totals are not absolute values; numbers have been rounded to the nearest five (J. Wehausen, pers. comm. 1999). The continuing decline of the Sierra Nevada bighorn sheep has been attributed to a combination of the direct and indirect effects of predation (Wehausen 1996).

TABLE 1. SIERRA NEVADA BIGHORN SHEEP POPULATION NUMBERS, BY YEAR (J. WEHAUSEN, PERS. COMM. 1999)

| Year | Number of populations | Total sheep |
|------------|-----------------------|-------------|
| 1978 | 2 | 250 |
| 1985 | 4 | 310 |
| 1995 | 5 | 100 |
| 1996 | 5 | 110 |
| 1997 | 5 | 130 |
| 1998 | 5 | 100 |

Previous Federal Action

In our September 18, 1985, Notice of Review, we designated the Sierra Nevada bighorn sheep as a category 2 candidate and solicited status information (50 FR 37958). Category 2 candidates were those taxa for which we had information indicating that proposing to list as endangered or threatened was possibly appropriate, but for which sufficient data on biological vulnerability and threats were not currently available to support a proposed rule. Category 1 taxa were those taxa for which we had sufficient information on file to support issuance of proposed listing rules. In our January 6, 1989 (54 FR 554), and November 21, 1991 (56 FR 58804), Notices of Review, we retained the Sierra Nevada bighorn sheep in category 2. Beginning with our February 28, 1996, Notice of Review (61 FR 235), we discontinued the designation of multiple categories of candidates, and we now consider only taxa that meet the definition of former category 1 as candidates for listing. At this point, the Sierra Nevada bighorn

sheep was identified as a species of concern.

The processing of this emergency rule conforms with our listing priority guidance published in the Federal Register on May 8, 1998 (63 FR 25502). This guidance clarifies the order in which we will process rulemakings giving highest priority (Tier 1) to processing emergency listings and second highest priority (Tier 2) to resolving the listing status of outstanding proposed listings, resolving the conservation status of candidate species, processing administrative findings on petitions to add species to the lists or reclassify species from threatened to endangered status, and delisting or reclassifying actions. The lowest priority actions, processing critical habitat designations, are in Tier 3. This emergency rule constitutes a Tier 1 action.

Summary of Factors Affecting the Species

After a thorough review and consideration of all information available, we have determined that the Sierra Nevada bighorn sheep warrants classification as an endangered distinct population segment. We followed procedures found at section 4 of the Act and regulations (50 CFR part 424) promulgated to implement the listing provisions of the Act. We may determine a species to be endangered or threatened due to one or more of the five factors described in section 4(a)(1). These factors, and their application to the Sierra Nevada bighorn sheep distinct population segment (*Ovis canadensis californiana*), are as follows:

A. *The present or threatened destruction, modification, or curtailment of its habitat or range.* Habitat throughout the historic range of Sierra Nevada bighorn sheep remains essentially intact; the habitat is neither fragmented nor degraded. However, by 1900, about half of the Sierra Nevada bighorn sheep populations were lost, most likely because of introduction of diseases by domestic livestock, and illegal hunting (Advisory Group 1997). Beginning in 1979, animals from the Mount Baxter subpopulation were translocated to reestablish subpopulations in Lee Vining Canyon, Wheeler Crest, and Mount Langley in Mono and Inyo counties (Advisory Group 1997). Currently, Sierra Nevada bighorn sheep are limited to five subpopulations. Almost all of the historical and current habitat is administered by either the USFS, BLM, or NPS. Some small parcels of inholdings within the species' range are owned by the Los Angeles Department

of Water and Power. Also, there are some patented mining claims in bighorn sheep habitat, but the total acreage is small.

B. *Overutilization for commercial, recreational, scientific, or educational purposes.* During the period of the California gold rush (starting about 1849), hunting to supply food for mining towns may have played a role in the decline of the population (Wehausen 1988). Besides being sought as food, Sierra Nevada bighorn sheep were also killed by sheepmen who considered wild sheep as competitors for forage with domestic sheep. The decimation of several wildlife species in the late 1800s prompted California to pass legislation providing protection to deer, elk, pronghorn antelope, and bighorn sheep (Jones 1950; Wehausen 1979).

Commercial and recreational hunting of Sierra Nevada bighorn sheep is not permitted under State law. There is no evidence that other commercial, recreational, scientific, or educational activities are currently a threat. Poaching does not appear to be a problem at this time.

C. *Disease or predation.* Disease is believed to have been the major contributing factor responsible for the precipitous decline of Sierra Nevada bighorn sheep starting in the late 1800s (Foreyt and Jessup 1982).

Bighorn sheep are host to a number of internal and external parasites, including ticks, lice, mites, tapeworms, roundworms, and lungworms. Most of the time, parasites are present in relatively low numbers and have little effect on individual sheep and populations (Cowan and Geist 1971).

Cattle were first introduced into the Sierra Nevada in 1860s but were replaced with domestic sheep that could graze more extensively over the rugged terrain (Wehausen *et al.* 1987; Wehausen 1988). Large numbers of domestic sheep were grazed seasonally in the Sierra Nevada prior to the turn of the century, and the domestic sheep would use the same ranges as the wild sheep, occasionally coming into direct contact with them. Both domestic sheep and cattle can act as disease reservoirs. Scabies, most likely contracted from domestic sheep, caused a major decline of bighorn sheep in California in the 1870s to the 1890s and caused catastrophic die-offs in other parts of their range (Buechner 1960). A die-off of bighorn sheep in the 1870s on the Great Western Divide (Mineral King area of Sequoia National Park) was attributed to scabies, presumably contracted from domestic sheep (Jones 1950).

Die-offs from pneumonia contracted from domestic sheep is another important cause of losses. In 1988, a strain of pneumonia, apparently contracted from domestic sheep, wiped out a reintroduced herd of bighorn sheep in Modoc County. Native bighorn sheep cannot tolerate strains of respiratory bacteria, such as *Pasteurella* species, carried normally by domestic sheep and close contact with domestic animals results in transmission of disease and subsequent deaths of the exposed animals (Foreyt and Jessup 1982). Bighorn sheep can also develop pneumonia independent of contact with domestic sheep. Lungworms of the genus *Protostrongylus* are often an important contributor to the pneumonia disease process in some situations (J. Wehausen, pers. comm. 1999). Lungworms are carried by an intermediate host snail, which is ingested by a sheep as it is grazing. Lungworm often exists in a population, but usually doesn't cause a problem. However, if the sheep are stressed in some way, they may develop bacterial pneumonia, which is complicated by lungworm infestation. Bacterial pneumonia is usually a sign of weakness caused by some other agent such as a virus, parasite, poor nutrition, predation, human disturbance, or environmental or behavioral stress that lowers the animal's resistance to disease (Wehausen 1979; Foreyt and Jessup 1982). Bighorn sheep in the Sierra Nevada carry *Protostrongylus* species (lungworms), but the parasite loads have been low, and there has been no evidence of any clinical signs of disease or disease transmission (Wehausen 1979; Richard Perloff, Inyo National Forest, pers. comm. 1999).

Currently, domestic sheep grazing allotments are permitted by the U.S. Forest Service in areas adjacent to Sierra Nevada bighorn sheep subpopulations. Domestic sheep occasionally escape the allotments and wander into bighorn sheep areas, sometimes coming into direct contact with bighorn sheep (Advisory Group 1997). For example, in 1995, 22 domestic sheep that were permitted on USFS land wandered away from the main band and were later found in Yosemite National Park, after crossing through occupied bighorn sheep habitat (Advisory Group 1997; Bonny Pritchard, Inyo National Forest, pers. comm. 1999; R. Perloff, pers. comm. 1999). Other stray domestic sheep, in smaller numbers, have been known to wander up the road in Lee Vining Canyon into bighorn sheep habitat (B. Pritchard, pers. comm. 1999). Based on available information, and

given the susceptibility of bighorn sheep to introduced pathogens, disease will continue to pose a significant and underlying threat to the survival of Sierra Nevada bighorn sheep until the potential for contact with domestic sheep is eliminated.

Predators such as coyote (*Canis latrans*), bobcat (*Lynx rufus*), mountain lion, gray fox (*Urocyon cinereoargenteus*), golden eagle (*Aquila chrysaetos*), and free-roaming domestic dogs prey upon bighorn sheep (Jones 1950; Cowan and Geist 1971). Predation generally has an insignificant effect except on small populations such as the Sierra Nevada bighorn sheep. Coyotes are the most abundant large predator sympatric (occurring in the same area) with bighorn sheep populations (Bleich 1999) and are known to have killed young Sierra Nevada bighorn sheep (Vernon Bleich, California Department of Fish and Game, pers. comm. 1999). In the late 1980s, mountain lion predation of Sierra Nevada bighorn sheep increased throughout their range (Wehausen 1996). This trend has continued into the 1990s, as evidenced by Table 1.

Predation by mountain lion probably was a natural occurrence and part of the natural balance of this ecosystem. From 1907 to 1963, the State provided a bounty on mountain lions; the State also hired professional lion hunters for many years. The bounty most likely kept the mountain lion population reduced such that bighorn sheep predation was rare and insignificant. Between 1963 and 1968, mountain lions were managed as a nongame and nonprotected mammal, and take was not regulated. From 1969 to 1972, lions were re-classified as game animals. A moratorium on mountain lion hunting began in 1972 and lion numbers likely increased. In 1986, the species was again classified as a game animal, but the California Department of Fish and Game (CDFG) hunting recommendations were challenged in court in 1987 and 1988 (Torres *et al.* 1996). In 1990, a State-wide ballot initiative (Proposition 117) passed into law prohibiting the killing of mountain lions except if humans or their pets or livestock are threatened. Another ballot measure, Proposition 197, which would have modified current law regarding mountain lion management failed to pass in 1996, largely because of the public's concern that the change may allow mountain lion hunting (Torres *et al.* 1996). With the removal of the ability to control the mountain lion population, lion predation has become a significant limiting factor for the Sierra Nevada bighorn sheep.

The increased presence of mountain lions appears to have changed Sierra Nevada bighorn sheep winter habitat use patterns. Wehausen (1996) looked at mountain lion predation in two bighorn sheep subpopulations, one in the Granite Mountains of the eastern Mojave Desert, and the other was the Mount Baxter subpopulation in the Sierra Nevada. He found that the lions reduced the subpopulation in the Granite Mountains to eight ewes between 1989 and 1991, and held it at that level for 3 years, after which lion predation decreased and the bighorn sheep subpopulation increased at 15 percent per year for 3 years. All the mortality in that subpopulation was attributed to mountain lion predation. The Mount Baxter bighorn sheep subpopulation abandoned its winter ranges, presumably due to mountain lion predation. Forty-nine sheep were killed by lions on their winter range between 1976 and 1988 out of an average subpopulation size of 127 sheep. These mortalities from mountain lion predation represented 80 percent of all mortality on the winter range, and 71 percent for all ranges used. There is also evidence that many of the bighorn sheep killed were prime-aged animals (J. Wehausen, pers. comm. 1999).

The bighorn sheep on Mount Baxter moved to higher elevations possibly to evade lions. By avoiding the lower terrain and higher quality forage present during the spring, sheep emerge from the winter months in poorer condition. Consequences from the change in habitat use resulted in a decline in the Mount Baxter subpopulation due to decreased lamb survival, because lambs were born later and died in higher elevations during the winter. This may have also been the case with the Lee Vining subpopulation decline, when the bighorn sheep ran out of fat reserves at a time when they should have been replenishing their reserves with highly nutritious forage from low elevation winter ranges. Because of the winter habitat shift by the bighorn sheep, the Mount Baxter subpopulation has declined significantly. With the large decline of bighorn sheep on Mount Baxter, the total population of Sierra Nevada bighorn sheep has now dropped below what existed when the restoration program began in 1979 (Wehausen 1996; Advisory Group 1997). In a 1996 survey on Mount Williamson, there was no evidence of groups of sheep, and this subpopulation was the last one found using its low-elevation winter range in 1986. Mountain lion predation may have led to the extirpation of this subpopulation, one of the last two

native subpopulations of Sierra Nevada bighorn sheep (Wehausen 1996; J. Wehausen, pers. comm. 1999).

The Sierra Nevada bighorn sheep restoration program used the Mount Baxter subpopulation as the source of reintroduction stock from 1979 to 1988. The three reintroduced subpopulations at Lee Vining Canyon, Wheeler Mountain, and Mount Langley all suffered from mountain lion predation shortly after translocation of sheep (Wehausen 1996). The Lee Vining Canyon subpopulation lost a number of sheep to mountain lion predation, threatening the success of the reintroduction effort (Chow 1991, cited by Wehausen (1996)). The subpopulation was supplemented with additional sheep and the State removed one mountain lion each year for 3 years, which helped reverse the decline of this subpopulation (Bleich *et al.* 1991 and Chow 1991, cited by Wehausen (1996)). Also, because domestic sheep are preyed upon by mountain lions, livestock operators who have a Federal permit to graze their sheep on USFS land can get a depredation permit from the State, and have the U.S. Department of Agriculture, Wildlife Services, remove the mountain lion. The Lee Vining Canyon subpopulation occurs in the general area where domestic sheep are permitted, and has benefitted for the last 4 or 5 years from the removal of two to three mountain lions per year that were preying on domestic sheep (B. Pritchard, pers. comm. 1999).

D. *The inadequacy of existing regulatory mechanisms.* In response to a very rapid decline in population numbers, in 1876, the State legislature amended a 1872 law that provided seasonal protection for elk, deer and pronghorn to include all bighorn sheep. Two years later, this law was amended, establishing a 4-year moratorium on the taking of any pronghorn, elk, mountain sheep or female deer. In 1882, this moratorium was extended indefinitely for bighorn sheep (Wehausen *et al.* 1987; Wehausen *et al.* 1988). In 1971, California listed the California bighorn sheep as "rare." The designation was changed to "threatened" in 1984 to standardize the terminology of the amended California Endangered Species Act (Advisory Group 1997), and upgraded the species to "endangered" in 1999 (San Francisco Chronicle 1999). Pursuant to the California Fish and Game Code and the California Endangered Species Act, it is unlawful to import or export, take, possess, purchase, or sell any species or part or product of any species listed as endangered or threatened. Permits may be authorized for certain scientific,

educational, or management purposes. The California Endangered Species Act requires that State agencies consult with the CDFG to ensure that actions carried out are not likely to jeopardize the continued existence of listed species.

The California Fish and Game Code provides for management and maintenance of bighorn sheep. The policy of the State is to encourage the preservation, restoration, and management of California's bighorn sheep. The CDFG supports the concept of separating livestock from bighorn sheep, by creating buffers, to decrease the potential for disease transmission. Such separation would require the purchase and elimination of livestock allotments. However, the State does not have authority to regulate grazing practices on Federal lands. State listing has not prompted the BLM or USFS to effectively address disease transmission associated with Federal livestock grazing programs.

Since the Sierra Nevada bighorn sheep was listed by the State of California in 1971, the CDFG has undertaken numerous efforts for the conservation of the sheep, including but not limited to—(1) intensive field studies; (2) reestablishment of three additional subpopulations in historical habitat; (3) creation, in 1981, of the Sierra Nevada Bighorn Sheep Interagency Advisory Group, including representatives from Federal, State, and local resource management agencies which has produced the Sierra Nevada Bighorn Sheep Recovery and Conservation Plan (1984) and a Conservation Strategy for Sierra Nevada Bighorn Sheep (1997); and (4) culling four mountain lions that were taking Sierra Nevada bighorn sheep, which played a significant role in the efforts to reestablish one subpopulation (Chow 1991, cited by Wehausen (1996)).

Mountain lion hunting has not occurred in California since 1972 (Torres *et al.* 1996). As a result of passage of Proposition 117 in 1990 prohibiting the hunting or control of mountain lions, the CDFG does not have the authority to remove mountain lions to protect the Sierra Nevada bighorn sheep and secure their survival.

Federal agencies have adequate authority to manage the land and activities under their administration to benefit the welfare of the bighorn sheep. Steps are being taken to enhance habitat through prescribed burning to improve forage and maintain open habitat, and to retire domestic sheep allotments that run adjacent to bighorn sheep habitat. For example, 650 acres were burned in 1997 in Lee Vining Canyon to reduce mountain lion hiding cover, and there

are plans to do more burns in other areas on USFS land (R. Perloff, pers. comm. 1999). However, in some cases, because of conflicting management concerns, conservation efforts are not proceeding as quickly as necessary. Although efforts have been underway for many years, the USFS has been unable to eliminate the known threat of contact between domestic sheep and the Sierra Nevada bighorn sheep by either eliminating adjacent grazing allotments, or modifying allotments such that a sufficient buffer zone exists that would prevent contact between wild and domestic sheep.

In 1971, the State, in cooperation with the USFS, established a sanctuary for the Mount Baxter and Mount Williamson subpopulation of Sierra Nevada bighorn sheep and called it the California Bighorn Sheep Zoological Area (Zoological Area) (Wehausen 1979; Inyo National Forest Land Management Plan (LMP) 1988). About 16,564 hectares (41,000 acres) of USFS land was set aside for these two subpopulations. At the time, it was felt that the reason for the species' decline was related to human disturbance. The sanctuary was designed to regulate human use in some areas, and reduce domestic sheep/wild sheep interaction by constructing a fence below the winter range of the Mount Baxter subpopulation along the USFS boundary (Wehausen 1979). Adjacent summer range on NPS land was also given a restrictive designation to reduce human disturbance (Wehausen 1979). The Zoological Area continues to receive special management by the USFS; it encompasses land designated as wilderness and mountain sheep habitat (LMP 1988; R. Perloff, pers. comm. 1999).

E. Other natural or manmade factors affecting its continued existence. The Sierra Nevada bighorn sheep population is critically small with a total of only about 100 sheep known from five subpopulations. There is no known interaction between the separate subpopulations. The Sierra Nevada bighorn sheep currently is highly vulnerable to extinction from threats associated with small population size and random environmental events.

Although inbreeding depression has not been demonstrated in the Sierra Nevada bighorn sheep, the number of sheep occupying all areas is critically low. The minimum size at which an isolated group of this species can be expected to maintain itself without the deleterious effects of inbreeding is not known. Researchers have suggested that a minimum effective population size of 50 is necessary to avoid short-term

inbreeding depression, and 500 to maintain genetic variability for long-term adaptation (Franklin 1980). Small populations are extremely susceptible to demographic and genetic problems (Caughley and Gunn 1996). Small populations suffer higher extinction probabilities from chance events such as skewed sex ratio of offspring, (e.g., fewer females being born than males). For example, the Mount Langley subpopulation has been declining. In 1996-97, out of a subpopulation of 4 ewes and 10 rams, 5 lambs were born, of which 4 were female. Although a positive event for this subpopulation, it could have been devastating if the female:male ratio of offspring had been reversed (J. Wehausen, pers. comm. 1999).

Small, isolated groups are also subject to extirpation by naturally occurring random environmental events, e.g., prolonged or particularly heavy winters and avalanches. In 1995, for example, a dozen sheep died in a single avalanche at Wheeler Ridge (J. Wehausen, pers. comm. 1999). Such threats are highly significant because currently the subpopulations are small and it is also common in bighorn sheep for all members of one sex to occur in a single group. During the very heavy winters in the late 1970s and early 1980s, there was no notable mortality in the subpopulations because they were using low elevation winter ranges (J. Wehausen, pers. comm. 1999).

Competition for critical winter range resources can occur between bighorn sheep and elk and/or deer (Cowan and Geist 1971). However, competition between these species does not appear significant since deer and bighorn sheep readily mix on winter range, and the habitat overlap between elk and bighorn sheep is slight (Wehausen 1979).

In addition to disease, mountain lion predation, and random natural events, other factors may contribute to bighorn sheep mortality. For example, two subpopulations (Wheeler Ridge and Lee Vining) have ranges adjacent to paved roadways exposing individuals from those subpopulations to potential hazards. Bighorn sheep have been killed by vehicles in Lee Vining Canyon on several occasions (V. Bleich, pers. comm. 1999).

Reason for Emergency Determination

Under section 4(b)(7) of the Act and regulations at 50 CFR 424.20, we may emergency list a species if the threats to the species constitute an emergency posing a significant risk to its well-being. Such an emergency listing expires 240 days following publication in the Federal Register unless, during

this 240-day period, we list the species following the normal listing procedures. We discuss the reasons why emergency listing the Sierra Nevada bighorn sheep as endangered is necessary below. In accordance with the Act, if at any time after we publish this emergency rule, we determine that substantial evidence does not exist to warrant such a rule, we will withdraw it.

Historically, the Sierra Nevada bighorn sheep ranged throughout central and southern Sierra Nevada. The historical habitat of the Sierra Nevada bighorn sheep remains intact. However, the entire range of the species has been reduced to five subpopulations—the Mount Williamson and Mount Baxter subpopulations, which are composed of native sheep, and the Lee Vining Canyon, Wheeler Ridge, and Mount Langley subpopulations, which are descended from sheep taken from the Mount Baxter subpopulation and translocated to historical habitat. These subpopulations have decreased in numbers significantly in the last several years (see Table 1). As discussed under factors C, D, and E in the Summary of Factors Affecting the Species section above, the immediacy of threats to the Sierra Nevada bighorn sheep is so great to a significant proportion of the total population that the routine regular listing process is not sufficient to prevent losses that may result in extinction or loss of significant recovery potential. An emergency posing a significant risk to the well-being and continued survival of the Sierra Nevada bighorn sheep exists as the result of the continual exposure to predation (primarily mountain lion), and the effects of avoidance by bighorn sheep of areas in which they are particularly vulnerable to predation by mountain lions. The Sierra Nevada bighorn sheep is also threatened by the potential increase of contact with domestic sheep in the spring and summer and the transmission of disease. The factors creating an extreme situation are discussed in detail below.

Because Sierra Nevada bighorn sheep exist only as a series of very small subpopulations vulnerable to extinction, the survival of Sierra Nevada bighorn sheep now depends on the most rapid possible increase in as many subpopulations as possible. These small subpopulations are vulnerable to extinction from chance demographic events and the continual loss of genetic variation if they remain small.

Vulnerability to Demographic Problems

Five subpopulations remain that include a total of nine female demes (i.e., local populations) (Mount Langley—eight ewes, Mount Williamson—three ewes, Black Mountain—five ewes, Sand Mountain—five ewes, Sawmill Canyon—two ewes, Wheeler Ridge—17 ewes, Mount Gibbs—two ewes, Tioga Crest—one ewe, Mount Warren—five ewes) (J. Wehausen, pers. comm. 1999). These demes are defined by separate geographic home range patterns of the females. Of these, the Mount Williamson, Black Mountain, and Tioga Crest demes appear not to use low elevation winter ranges at all, and they will probably go extinct as a result (J. Wehausen, pers. comm. 1999). The Black Mountain deme was previously part of the Sand Mountain deme (part of the Mount Baxter subpopulation) and became a separate deme after winter range abandonment occurred in the late 1980s. The five remaining ewes in this deme appear not to know of the Sand Mountain winter range, which lies considerably north of their home range. They were almost certainly all born after winter range abandonment on Sand Mountain. This deme has shown a steady decline in size (J. Wehausen, pers. comm. 1999).

There are six female demes that may persist, but all are still very vulnerable to extinction due to small size. Of the two ewes and lamb that spent February, 1998, at the mouth of Sawmill Canyon (another Mount Baxter subpopulation deme), only a ewe and a lamb remained when last seen there in 1998. Shortly after they were last seen, evidence of a mountain lion was found on the rocks where they had been weathering a month of severe winter storms. When the normal summer range of this deme of females was investigated twice last summer, it was difficult to find evidence of any sheep remaining. This deme may contain only a single remaining ewe, or none (J. Wehausen, pers. comm. 1999).

The Sand Mountain deme has had only four ewes in it for almost this entire decade. During the summer of 1998, Dr. John Wehausen finally documented a yearling female with them, thus the total of five ewes listed above. However, the four adult ewes must now be approaching the ends of their lives, making this deme also very vulnerable to extinction, even if they have been showing some increased winter range use. Without successful births and recruitment of female lambs

into this deme quickly, this deme will experience a decline.

Currently, there is a large lion occupying the winter range areas used by members of the Mount Langley deme. These ewes have been using that winter range enough over the past three winters to be showing a subpopulation increase (recruitment of five lambs for four ewes in the past 2 years). This lion could easily reverse that trend by killing multiple members of this deme and discouraging them from using this winter range. These ewes can be expected to begin appearing on this winter range any day (J. Wehausen pers. comm. 1999).

The Mount Warren deme that uses Lee Vining Canyon as a winter range continues to decline. Besides the loss of numerous ewes last winter or spring to unknown causes, one of two telemetered (radio-collared) ewes was lost to a lion on the winter range in April, 1998. The collar of the other ewe was recently dug out of a snow bank at 3050 m (10,000 ft) in Deer Creek, but biologists will be unable to investigate her cause of death until the summer of 1999 when the snow melts, allowing her carcass to be found. She was last documented alive in late October 1998, but was not with a group of 13 sheep seen in mid-December, thus she may have died in November. This leaves only five ewes in this deme. If the lion that killed at least one ewe in April 1998 returns this spring, it might seriously compromise the future of this deme (J. Wehausen, pers. comm. 1999).

With the likely extinction of some of the existing demes, the remaining demes become all the more important to the persistence of this distinct population segment. We do not know which demes may survive and which may die out. All population dynamics over the past 15 years have been unanticipated (J. Wehausen, pers. comm. 1999). In short, it is not possible to predict population trajectories. Individual mountain lions can do enormous damage to any of these small demes, as can catastrophic events such as snow avalanches. The current larger size of the Wheeler Ridge deme does not preclude it from experiencing a sudden decline, as the Mount Warren deme experienced last winter (J. Wehausen, pers. comm. 1999).

Every deme is critical to the survival of the DPS at this point. We do not know which ewes in each deme may prove to be the ones critical to persistence of those demes. Thus, every remaining female in every deme is critically important to the persistence of their demes.

Lastly, the potential for contact with domestic sheep and the transmission of disease could, by itself, eliminate an entire deme. Domestic sheep continue to stray into Sierra Nevada bighorn sheep habitat. Recently, domestic sheep have come in close proximity to the resident bighorn sheep on numerous occasions, but, by good fortune, domestic sheep have not come into contact with bighorn sheep during these events.

Vulnerability to demographic problems must be viewed as a combination of immediate threats of predation, changed habitat use due to the presence of mountain lions, the resultant decline in ewe nutrition and lamb survivorship, exposure to environmental catastrophes, and the transmission of disease from domestic sheep.

Vulnerability to Genetic Problems

Also unknown is the current distribution of genetic variation among all of these subpopulations. It will be at least a year before fecal DNA research will shed some light on this question (J. Wehausen, pers. comm. 1999). It is likely that each subpopulation has lost some genetic variability thereby reducing its ability for long-term adaptation. The ultimate goal of conserving this DPS must be to preserve as much of its genetic variation as possible. It is likely that all or some of the existing demes now contain some variation not represented in others. Once some measure of this distribution is known through DNA analysis, a possible goal will be to attempt to distribute that variation among as many subpopulations as possible. Until some measure of the distribution of genetic variation exists, every deme should be considered a significant portion of the overall population, just as they should from a demographic perspective. Maintenance of genetic variability requires preservation of rams in addition to ewes.

In summary, it is now necessary to consider that every individual is currently a significant portion of the overall population of Sierra Nevada bighorn sheep because of the small number of sheep remaining and extreme vulnerability of every deme to extinction. Losses from predation and the potential for disease transmission through contact with domestic sheep are threats posing a significant risk to the well-being of the DPS. For these

reasons, we find that the Sierra Nevada bighorn sheep is in imminent danger of extinction throughout all or a significant portion of its range and warrants immediate protection under the Act.

Critical Habitat

Critical habitat is defined in section 3 of the Act as—(i) the specific area within the geographical area occupied by a species, at the time it is listed in accordance with the Act, on which are found those biological features (I) essential to the conservation of the species and (II) that may require special management considerations or protection; and (ii) specific areas outside the geographical area occupied by a species at the time it is listed, upon a determination that such areas are essential for the conservation of the species. "Conservation" means the use of all methods and procedures needed to bring the species to the point at which listing under the Act is no longer necessary.

Section 4(a)(3) of the Act, and implementing regulations (50 CFR 424.12) require that, to the maximum extent prudent and determinable, the Secretary designate critical habitat at the time the species is determined to be endangered or threatened. Our regulations (50 CFR 424.12(a)) state that critical habitat is not determinable if information sufficient to perform required analysis of impacts of the designation is lacking or if the biological needs of the species are not sufficiently well known to permit identification of an area as critical habitat. Section 4(b)(2) of the Act requires us to consider economic and other relevant impacts of designating a particular area as critical habitat on the basis of the best scientific data available. The Secretary may exclude any area from critical habitat if he determines that the benefits of such exclusion outweigh the conservation benefits, unless to do such would result in the extinction of the species.

We find that designation of critical habitat for the Sierra Nevada bighorn sheep is not determinable at this time. We have determined that information sufficient to perform required analysis of impacts of the designation is lacking. We specifically solicit this information in the proposed rule (see "Public Comments Solicited" section) published in this same issue of the Federal Register. When a "not determinable" finding is made, we must, within 2 years of the publication date of the

original proposed rule, designate critical habitat, unless the designation is found to be not prudent. We will protect Sierra Nevada bighorn sheep habitat through section 7 consultations to determine whether Federal actions are likely to jeopardize the continued existence of the species, through the recovery process, through enforcement of take prohibitions under section 9 of the Act, and through the section 10 process for activities on non-Federal lands with no Federal nexus.

Available Conservation Measures

Conservation measures provided to species listed as endangered or threatened under the Act include recognition, recovery actions, requirements for Federal protection, and prohibitions against certain activities. Recognition through listing encourages and results in conservation actions by Federal, State, and private agencies, groups and individuals. The Act provides for possible land acquisition and cooperation with the States and requires that recovery actions be carried out for all listed species. We discuss the protection required of Federal agencies and the prohibitions against taking and harm, in part, below.

Section 7(a) of the Act, as amended, requires Federal agencies to evaluate their actions with respect to any species that is proposed or listed as endangered or threatened, and with respect to its critical habitat, if any is being designated. Regulations implementing this interagency cooperation provision of the Act are codified at 50 CFR Part 402. Section 7(a)(4) of the Act requires Federal agencies to confer informally with us on any action that is likely to jeopardize the continued existence of a proposed species or result in destruction or adverse modification of proposed critical habitat. If a species is subsequently listed, section 7(a)(2) requires Federal agencies to ensure that activities they authorize, fund, or carry out are not likely to jeopardize the continued existence of such a species or to destroy or adversely modify its critical habitat. If a Federal agency action may affect a listed species or its critical habitat, the responsible Federal agency must enter into consultation with us. Federal agency actions that may require conference and/or consultation include those within the jurisdiction of the USFS, BLM, and NPS.

We believe that protection of the Sierra Nevada bighorn sheep requires reduction of the threat of mountain lion predation, particularly during the months of April and May 1999 when bighorn sheep attempt to use low elevation winter ranges to obtain necessary nutrition after lambing, and ewes and lambs are most vulnerable to lion predation. Emergency listing will allow the Service to remove mountain lions that threaten Sierra Nevada bighorn sheep. Removal of mountain lions may not necessarily involve lethal techniques.

We believe that protection of the Sierra Nevada bighorn sheep also requires reduction of the threat of disease transmission from domestic sheep by preventing domestic sheep from coming into contact with bighorn sheep. We will work with the USFS to reduce the threat of disease transmission by domestic sheep. Reduction of this threat may involve elimination of grazing allotments adjacent to bighorn sheep habitat, or modifying allotments to create a sufficient buffer zone that would prevent contact between domestic sheep and bighorn sheep.

The Act and implementing regulations found at 50 CFR 17.21 set forth a series of general prohibitions and exceptions that apply to all endangered wildlife. The prohibitions, as codified at 50 CFR 17.21, in part, make it illegal for any person subject to the jurisdiction of the United States to take (including harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt any such conduct), import or export, transport in interstate or foreign commerce in the course of commercial activity, or sell or offer for sale in interstate or foreign commerce any listed species. It is also illegal to possess, sell, deliver, carry, transport, or ship any such wildlife that has been taken illegally. Certain exceptions apply to our agents and State conservation agencies.

Permits may be issued to carry out otherwise prohibited activities involving endangered wildlife species under certain circumstances. Regulations governing permits are at 50 CFR 17.22 and 17.23. For endangered species, such permits are available for scientific purposes, to enhance the propagation or survival of the species, or for incidental take in connection with otherwise lawful activities.

It is our policy, published in the Federal Register on July 1, 1994 (59 FR 34272), to identify to the maximum extent practical at the time a species is listed those activities that would or would not constitute a violation of section 9 of the Act. The intent of this policy is to increase public awareness of the effect of a listing on proposed and ongoing activities within a species' range. Activities that we believe could potentially result in take include, but are not limited to:

(1) Unauthorized trapping, capturing, handling or collecting of Sierra Nevada bighorn sheep. Research activities involving trapping or capturing Sierra Nevada bighorn sheep will require a permit under section 10(a)(1)(A) of the Act.

(2) Unauthorized livestock grazing that results in transmission of disease or habitat destruction by the accidental or intentional escape of livestock.

Activities that we believe are unlikely to result in a violation of section 9 are:

(1) Possession, delivery, or movement, including interstate transport and import into or export from the United States, involving no commercial activity, of dead specimens of Sierra Nevada bighorn sheep that were collected prior to the date of publication of this emergency listing rule in the Federal Register;

(2) Unintentional vehicle collisions resulting in death or injury to Sierra Nevada bighorn sheep, when complying with applicable laws and regulations; and

(3) Normal, authorized recreational activities in designated campsites or recreational use areas and on authorized trails.

Questions regarding any specific activities should be directed to our Ventura Fish and Wildlife Office (see ADDRESSES section). Requests for copies of the regulations regarding listed wildlife and about prohibitions and permits may be addressed to the U.S. Fish and Wildlife Service, Ecological Services, Endangered Species Permits, 911 Northeast 11th Avenue, Portland, Oregon 97232-4181 (telephone 503/231-2063; facsimile 503/231-6243).

National Environmental Policy Act

We have determined that Environmental Assessments and Environmental Impact Statements, as defined in the National Environmental Policy Act of 1969, need not be prepared in connection with regulations adopted pursuant to section 4(a) of the Endangered Species Act of 1973, as amended. We published a notice outlining our reasons for this determination in the Federal Register on October 25, 1983 (48 FR 49244).

Paperwork Reduction Act

This rule does not contain any new collections of information other than those already approved under the Paperwork Reduction Act, 44 U.S.C. 3501 *et seq.*, and assigned Office of Management and Budget clearance number 1018-0094. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid control number. For additional information concerning permit and associated requirements for endangered species, see 50 CFR 17.21 and 17.22.

References Cited

A complete list of references cited in this rule is available upon request from the Ventura Fish and Wildlife Office of the U.S. Fish and Wildlife Service (see ADDRESSES section).

Author

The primary author of this emergency rule is Carl Benz of the Ventura Fish and Wildlife Office of the U.S. Fish and Wildlife Service (see ADDRESSES section).

List of Subjects in 50 CFR Part 17

Endangered and threatened species, Exports, Imports, Reporting and recordkeeping requirements, Transportation.

Regulation Promulgation

Accordingly, part 17, subchapter B of chapter I, title 50 of the Code of Federal Regulations, is amended as set forth below:

PART 17—[AMENDED]

1. The authority citation for part 17 continues to read as follows:

Authority: 16 U.S.C. 1361-1407; 16 U.S.C. 1531-1544; 16 U.S.C. 4201-4245; Pub. L. 99-625, 100 Stat. 3500, unless otherwise noted.

2. In § 17.11(h) add the following to the List of Endangered and Threatened Wildlife in alphabetical order under MAMMALS:

§ 17.11 Endangered and threatened wildlife.

* * * * *
(h) * * *

| SPECIES | | Historic range | Vertebrate population where endangered or threatened | Status | When listed | Critical habitat | Special rules |
|-------------------------------|--------------------------------------|---|--|--------|-------------|------------------|---------------|
| Common name | Scientific name | | | | | | |
| MAMMALS | | | | | | | |
| Sheep, Sierra Nevada bighorn. | <i>Ovis canadensis californiana.</i> | U.S.A. (western conterminous states), Canada (southwest), Mexico (north). | U.S.A. (CA-Sierra Nevada). | E | 660 | NA | NA |

Dated: April 14, 1999.
Jamie Rappaport Clark,
Director, Fish and Wildlife Service.
{FR Doc. 99-9935 Filed 4-19-99; 8:45 am}
BILLING CODE 4310-55-P

ENVIRONMENTAL PROTECTION
AGENCY

40 CFR Part 62

[KY 111-9914b; FRL-6325-9]

Approval and Promulgation of State
Plans for Designated Facilities and
Pollutants: KentuckyAGENCY: Environmental Protection
Agency (EPA).

ACTION: Proposed rule.

SUMMARY: EPA proposes to approve the Section 111(d) Plan submitted by the Kentucky Division for Air Quality (DAQ) for the Commonwealth of Kentucky on December 3, 1998, for implementing and enforcing the Emissions Guidelines applicable to existing Municipal Solid Waste Landfills. The Plan was submitted by the Kentucky DAQ to satisfy certain Federal Clean Air Act requirements. In the Final Rules Section of this Federal Register, EPA is approving the Kentucky State Plan submittal as a direct final rule without prior proposal because the Agency views this as a noncontroversial submittal and anticipates that it will not receive any significant, material, and adverse comments. A detailed rationale for the approval is set forth in the direct final rule. If no significant, material, and adverse comments are received in response to this rule, no further activity is contemplated in relation to this proposed rule. If EPA receives adverse comments, the direct final rule will be withdrawn and all public comments received will be addressed in a subsequent final rule based on this proposed rule. EPA will not institute a second comment period on this action.

DATES: Comments must be received in writing by May 20, 1999.

ADDRESSES: Written comments should be addressed to Karla McCorkle at the EPA Regional Office listed below. Copies of the documents relevant to this proposed rule are available for public inspection during normal business hours at the following locations. The interested persons wanting to examine these documents should make an appointment with the appropriate office at least 24 hours before the day of the visit.

Environmental Protection Agency,
Region 4, Air Planning Branch, 61
Forsyth Street, SW, Atlanta, Georgia
30303-8960.

Division for Air Quality, Department
for Environmental Protection, Natural
Resources and Environmental
Protection Cabinet, 803 Schenkel Lane,
Frankfort, Kentucky 40601.

FOR FURTHER INFORMATION CONTACT:
Karla McCorkle at (404) 562-9043 or
Scott Davis at (404) 562-9127.

SUPPLEMENTARY INFORMATION: See the
information provided in the Direct Final
action which is located in the Rules
Section of this Federal Register.

Dated: March 24, 1999.

A. Stanley Meiburg,

Acting Regional Administrator, Region 4.

[FR Doc. 99-9596 Filed 4-19-99; 8:45 am]

BILLING CODE 5550-50-P

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

RIN 1018-AF59

Endangered and Threatened Wildlife
and Plants; Proposed Rule To List the
Sierra Nevada Distinct Population
Segment of California Bighorn Sheep
as Endangered

AGENCY: Fish and Wildlife Service,
Interior.

ACTION: Proposed rule.

SUMMARY: We, the U.S. Fish and
Wildlife Service (Service), propose to
make permanent the provisions of the
emergency rule listing the Sierra Nevada
distinct population segment of
California bighorn sheep (*Ovis
canadensis californiana*) as an
endangered species pursuant to the
Endangered Species Act of 1973, as
amended (Act). The emergency rule
listing the population is published
concurrently in this issue of the *Federal
Register*. The population historically
occurred only in the Sierra Nevada in
California from Sonora Pass, Mono
County south to Walker Pass, Kern
County. Currently, the Sierra Nevada
bighorn sheep is known from five
disjunct subpopulations along the
eastern escarpment of the Sierra Nevada
in Mono and Inyo counties, California.
A total of about 100 animals are known
to exist. All five subpopulations are
imminently threatened by mountain
lion predation and disease. We solicit
additional data and information that
may assist us in making a final decision
on this proposed action.

DATES: Comments from all interested
parties must be received by June 21,
1999. Public hearing requests must be
received by June 4, 1999.

ADDRESSES: Submit comments and
materials concerning this proposal to
the Field Supervisor, U.S. Fish and
Wildlife Service, Ventura Fish and
Wildlife Office, 2493 Portola Rd., Suite

B, Ventura, California 93003. Comments
and materials received will be available
for public inspection by appointment
during normal business hours at the
address listed above.

FOR FURTHER INFORMATION CONTACT: Carl
Benz, Assistant Field Supervisor,
Ventura Fish and Wildlife Office, at the
address listed above (telephone 805/
644-1766; facsimile 805/644-3958).

SUPPLEMENTARY INFORMATION:

Background

For a discussion of biological
background information, previous
Federal action, factors affecting the
species, critical habitat, and
conservation measures available to
listed and proposed species, consult the
emergency rule for the Sierra Nevada
distinct population segment of
California bighorn sheep published
concurrently in this issue of the *Federal
Register*.

Public Comments Solicited

We intend that any final action
resulting from this proposal will be as
accurate and as effective as possible.
Therefore, we solicit comments or
suggestions from the public, other
concerned governmental agencies, the
scientific community, industry, or any
other interested party concerning this
proposed rule. We particularly seek
comments concerning:

(1) Biological, commercial trade, or
other relevant data concerning any
threat (or lack thereof) to this species;

(2) The location of any additional
populations of this species and the
reasons why any habitat should or
should not be determined to be critical
habitat as provided by section 4 of the
Act;

(3) Additional information concerning
the range, distribution, and population
size of this species; and

(4) Current or planned activities in the
subject area and their possible impacts
on this species.

In making any final decision on this
proposal we will take into consideration
the comments and any additional
information we receive, and such
communications may lead to a final
regulation that differs from this
proposal.

The Act requires that a public hearing
be held if requested within 45 days of
the date of publication of a proposed
rule.

National Environmental Policy Act

We have determined that an
Environmental Assessment or
Environmental Impact State, as defined
under the authority of the National
Environmental Policy Act of 1969, need

not be prepared in connection with regulations adopted pursuant to section (4)(a) of the Endangered Species Act. We published a notice outlining our reasons for this determination in the Federal Register on October 25, 1983 (48 FR 49244).

Paperwork Reduction Act

This rule does not contain any new collections of information other than those already approved under the Paperwork Reduction Act, 44 U.S.C. 3501 *et seq.*, and assigned Office of Management and Budget clearance number 1018-0094. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid control number. For additional information concerning

permit and associated requirements for endangered species, see 50 CFR 17.21 and 17.22.

Author

The primary author of this proposed rule is Carl Benz of the Ventura Fish and Wildlife Office (see ADDRESSES section).

List of Subjects in 50 CFR Part 17

Endangered and threatened species, Exports, Imports, Reporting and recordkeeping requirements, Transportation.

Proposed Regulation Promulgation

For the reasons given in the preamble to the emergency rule listing the Sierra Nevada distinct population segment of California bighorn sheep as endangered,

published concurrently in the issue of the Federal Register, we propose to amend 50 CFR part 17 as set forth below:

PART 17—[AMENDED]

1. The authority citation for part 17 continues to read as follows:

Authority: 16 U.S.C. 1361-1407; 16 U.S.C. 1531-1544; 16 U.S.C. 4201-4245; Pub. L. 99-625, 100 Stat. 3500; unless otherwise noted.

2. In § 17.11(h) add the following to the List of Endangered and Threatened Wildlife in alphabetical order under MAMMALS:

§ 17.11 Endangered and threatened wildlife.

* * * * *
(h) * * *

| Species | | Historic range | Vertebrate population where endangered or threatened | Status | When listed | Critical habitat | Special rules |
|-------------------------------|---------------------------------------|---|--|--------|-------------|------------------|---------------|
| Common name | Scientific name | | | | | | |
| Mammals: | | | | | | | |
| Sheep, Sierra Nevada bighorn. | <i>Ovis canadensis californiana</i> . | U.S.A. (western conterminous states), Canada (southwest), Mexico (north). | U.S.A. (CA—Sierra Nevada). | E | . | NA | NA |

Dated: April 14, 1999.
 Jamie Rappaport Clark,
 Director, Fish and Wildlife Service.
 [FR Doc. 99-9936 Filed 4-19-99; 8:45 am]
 BILLING CODE 4310-55-P

Appendix C - Text of Assembly Bill 560, Oller Bill - Amending Section 4801 of the California Fish and Game Code

CHAPTER 435

An act to amend Section 4801 of the Fish and Game Code, relating to wildlife, and declaring the urgency thereof, to take effect immediately.

[Approved by Governor September 17, 1999. Filed
with Secretary of State September 17, 1999.]

LEGISLATIVE COUNSEL'S DIGEST

AB 560, Oller. Wildlife: mountain lions.

Proposition 117, an initiative measure approved by the voters at the June 5, 1990, primary election, enacted the California Wildlife Protection Act of 1990. Among other things, the act made the mountain lion a specially protected mammal. The act prohibits the Legislature from changing the special protection of that mammal except by a $\frac{4}{5}$ vote of the membership of both houses of the Legislature and then only consistent with, and in furtherance of, the purposes of the act.

The act authorizes the Department of Fish and Game to remove or take any mountain lion, or authorize an appropriate local agency with public safety responsibility to remove or take any mountain lion, that is perceived to be an imminent threat to public health or safety.

This bill would, instead, authorize the department to remove or take, or authorize an appropriate local agency with public safety responsibility to remove or take, any mountain lion that is perceived to be an imminent threat to public health or safety or that is perceived by the department to be an imminent threat to the survival of any threatened, endangered, candidate, or fully protected sheep species. The bill would state the legislative finding and declaration that this change is consistent with, and furthers the purposes of, the California Wildlife Protection Act of 1990.

The bill would declare that it is to take effect immediately as an urgency statute.

The people of the State of California do enact as follows:

SECTION 1. Section 4801 of the Fish and Game Code is amended to read:

4801. The department may remove or take any mountain lion, or authorize an appropriate local agency with public safety responsibility to remove or take any mountain lion, that is perceived to be an imminent threat to public health or safety or that is perceived by the department to be an imminent threat to the survival of any threatened, endangered, candidate, or fully protected sheep species.

SEC. 2. The Legislature finds and declares that the amendments made by this act to Section 4801 of the Fish and Game Code are consistent with, and further the purposes of, the California Wildlife Protection Act of 1990.

SEC. 3. This act is an urgency statute necessary for the immediate preservation of the public peace, health, or safety within the meaning of Article IV of the Constitution and shall go into immediate effect. The facts constituting the necessity are:

In order to prevent the extinction of the Sierra Nevada Bighorn Sheep as soon as possible, thereby protecting the environment, it is necessary that this act take effect immediately.

