Worksheet
Determination of NEPA Adequacy (DNA)
U.S. Department of the Interior
Bureau of Land Management

OFFICE: Kingman Field Office (KFO)

NEPA DOCUMENT NUMBER: DOI-BLM-AZ-C010-2010-0062-DNA

PROPOSED ACTION TITLE/TYPE: Bighorn sheep capture and monitoring, Black Mountains-2010-2012.

LOCATION/LEGAL DESCRIPTION: Game Management Units 15C, 15B-W, and 15B-E, Black Mountains, Mohave County This project would take place within 5-miles of US Highway 93 north of Mile post 20 and will include NPS, BLM and State Trust lands (Map 1).

APPLICANT (if any): Arizona Game and Fish Department, Phoenix and Kingman, Arizona and BLM-KFO.

A. Description of the Proposed Action and any applicable mitigation measures:

The proposal is to perform a wildlife capture:

A supplemental bighorn capture, collaring, and monitoring is proposed to augment numbers of those caught and collared in 2010-2012 in the Black Mountains. The captures would take place in between October and December of 2010, 2011, and 2012. The 2010 captures would begin on approximately November 27th, 2010, with captures taking place over a 3-5 day period. In wilderness captures are expected to take place on weekdays.

Captures would take place in bighorn habitat along the highway as outlined on the map below but generally would occur along US 93 from mile marker 0 to 20 within 5 miles of either side of the highway.

Up to 10 bighorn would be captured. Approximately five bighorn would be captured within Mount Wilson wilderness. The method used to capture bighorn would be a net-gun fired from a helicopter with the assistance of a spotter fixed-wing aircraft. Once captured the helicopter would land and the bighorn would receive a brown-colored GPS collar and ear tag, a genetic sample may be taken. All work would be done at the site where the bighorn is captured and the animal would be immediately released following processing. Captures would be conducted by the AGFD using personnel from Flagstaff, Phoenix, and Kingman and by volunteers.

Since the collars being deployed have satellite uplink capability, there would be no regular telemetry flights over wilderness or non-wilderness. After approximately two years, the collars would drop-off the bighorn at which point AGFD personnel would recover the collars by hiking or riding in from the ground. Under rare, extenuating circumstances a telemetry flight may be scheduled for monitoring problematic collars. During such a flight, the plane would remain over 2,000 ft above ground level.

Any camping that will occur will be on NPS land. Fueling and staging will be out of Boulder City airport. Occasional short-term staging will occur at MP 2.1 within a previously disturbed location within NPS boundaries. AGFD has already coordinated with NPS for these purposes.

The BLM would notify livestock grazing permittees the week when the project would occur. The recreating public would be notified of the upcoming activities within wilderness via internet posting, news release and posted notification in the visitor lobby of the BLM office.

B. Land Use Plan (LUP) Conformance

LUP Name: *Kingman Resource Management Plan/EIS*
Date Approved: March 1995

The proposed action is in conformance with the LUP, even though it is not specifically provided for, because it is clearly consistent with the following LUP decisions (objectives, terms, and conditions):

Remarks: RMP Decision number and narrative:

SM02/II Special Management- Manage the twelve "Areas of Critical Environmental Concern" designation according to the goals and objectives in the RMP pages 95 to 111. Evaluate land use authorizations, including all existing activity plans, for compatibility with goals and objectives of the area of critical environmental concern.

WL01/VIB Wildlife - Continue implementation and revision of Habitat Management Plans in coordination and cooperation with the state wildlife agency and interested publics. (Page 79, Objectives and Planned Actions section)

BM21/VIC Black Mountain - Promote opportunities for scientific research of ecological and cultural resources.

* SM= Special Management Areas; WL= Wildlife; BM=Black Mountain

B. Identify applicable National Environmental Policy Act (NEPA) documents and other related documents that cover the proposed action.

Black Mountain Ecosystem Management Plan and Environmental Assessment (AZ-025-95-032), 1996 (BME Plan)

1. Pg. 36, #4. BME Plan: Initiate coordination with agencies and individuals that are responsible for management of land adjacent to the Black Mountain ecosystem to delineate and designate movement corridors between the Black Mountain and other ecosystems.

2. Pg. 49, #4, BME Plan: Discusses procedures for wildlife population and capture of wildlife in wilderness. Capture may occur as often as every year. Two methods may be used: net-gun, and remote chemical injection. Methods described in Appendix 4

(Capture methodologies for Bighorn Sheep) pg. 102 BME Plan.

3. Pg. 102, Appendix 4, BME Plan: Capture sites: discussed: wherever bighorn occur, inside or outside of wilderness.

Transplant of desert bighorn sheep into the Artillery Mountains, 1994. Environmental Assessment No: AZ-025-94-057. BLM Kingman Field Office, Arizona: This document analyzes transplant and capture of bighorn sheep within the Kingman Field Office, BLM.

D. NEPA Adequacy Criteria

1. Is the new proposed action a feature of, or essentially similar to, an alternative analyzed in the existing NEPA document(s)? Is the project within the same analysis area, or if the project location is different, are the geographic and resource conditions sufficiently similar to those analyzed in the existing NEPA document(s)? If there are differences, can you explain why they are not substantial?

Documentation of answer and explanation:

The proposed action is essentially the same action as that analyzed in the Transplant of desert bighorn sheep into the Artillery Mountains, 1994 EA No. AZ-025-94-057. The capture routine and location is exactly the same, the project is just for a different purpose. This EA analyzed capture of bighorn sheep within the Black Mountain Range including the wilderness areas located within this range. It also analyzed impacts to wilderness and wildlife from the capture. The collaring of bighorn was part of the original EA however collared animals were anticipated to be encountered in different wildernesses from the new proposed action. Telemetry was to occur in the original EA as well as proposed to occur in the new proposed action. Telemetry in the new action would occur via satellite downlink versus overflights as proposed in the original EA. Telemetry via satellite downlinks would be less obtrusive to wilderness values than was originally proposed.

2. Is the range of alternatives analyzed in the existing NEPA document(s) appropriate with respect to the new proposed action, given current environmental concerns, interests, and resource values?

Documentation of answer and explanation: Yes, the range of alternatives remains the same i.e. 1. Capturing animals outside of wilderness and 2. The No Action alternative. The current environmental concerns, interests, and resources values are unchanged from 1994.

3. Is the existing analysis valid in light of any new information or circumstances (such as, rangeland health standard assessment, recent endangered species listings, updated lists of BLM-sensitive species)? Can you reasonably conclude that new information and new circumstances would not substantially change the analysis of the new proposed action?

Documentation of answer and explanation: There are no new circumstances or information that would change the analysis of the new proposed action. The project area that is located east of US 93 is part of the California condor Nonessential Experimental Population however it has been determined that there would be "no affect" to condors or their habitat (Peck 2009 Biological Evaluation, and AGFD 2010, MRDP).

4. Are the direct, indirect, and cumulative effects that would result from implementation of the new proposed action similar (both quantitatively and qualitatively) to those analyzed in the existing NEPA document?

Documentation of answer and explanation: Yes, bighorn sheep would still be affected by capture. They would still receive indirect effects from collar data. Data would be used to determine movement areas and habitat use. Part of the capture area is within the Black Mountain Ecosystem Management Area of Critical Environmental Concern. The Black Mountain Ecosystem Management plan evaluated the impacts of bighorn capture and monitoring and impacts are essentially similar.. Wilderness values of naturalness and opportunities for solitude and primitive recreation would still be temporarily impaired by the use of aircraft during the capture. Impacts associated with telemetry activities would be less than the original project since telemetry would be more remote via satellite downlink. Telemetry flights with aircraft would rarely occur under the current proposal.

5. Are the public involvement and interagency review associated with existing NEPA document(s) adequate for the current proposed action?

Documentation of answer and explanation: Yes, the original EA was sent out to over 500 individuals and groups which represented those concerned with wilderness impacts, wildlife impacts, and grazing management impacts. There have been no issues or complaints from these individuals or groups following implementation of the original proposed action nor following subsequent captures that have occurred in years 1995, 1999, 2002, 2004, 2008, and 2009.

E. Persons/Agencies/BLM Staff Consulted

Name	Title	Resource/Agency Represented
Len Marceau	Outdoor Recreation Planner, Wilderness	BLM
June Wendlandt	Wild Horse and Burro Specialist	BLM
Jeff Gagnon		Arizona Game and Fish Department

Conclusion

Based on the review documented above, I conclude that this proposal conforms to the applicable land use plan and that the NEPA documentation fully covers the proposed action and constitute BLM's compliance with the requirements of the NEPA.

/s/ Rebecca L. Peck — 09/08/2010
Signature of Project Lead — Date
Rebecca Peck

/s/ David Brock — 09/08/2010
Signature of NEPA Coordinator — Date
David Brock

/s/ Don McClure *for* — 09/08/2010
Signature of the Responsible Official — Date
Ruben Sanchez
Field Manager
Kingman Field Office

References

Arizona Game and Fish Department and the Bureau of Land Management 2010. Minimum Requirements Decision Process (MRDP) for U.S. 93 Bighorn Capture. Arizona Game and Fish Department and the Bureau of Land Management, Phoenix and Kingman, Arizona.

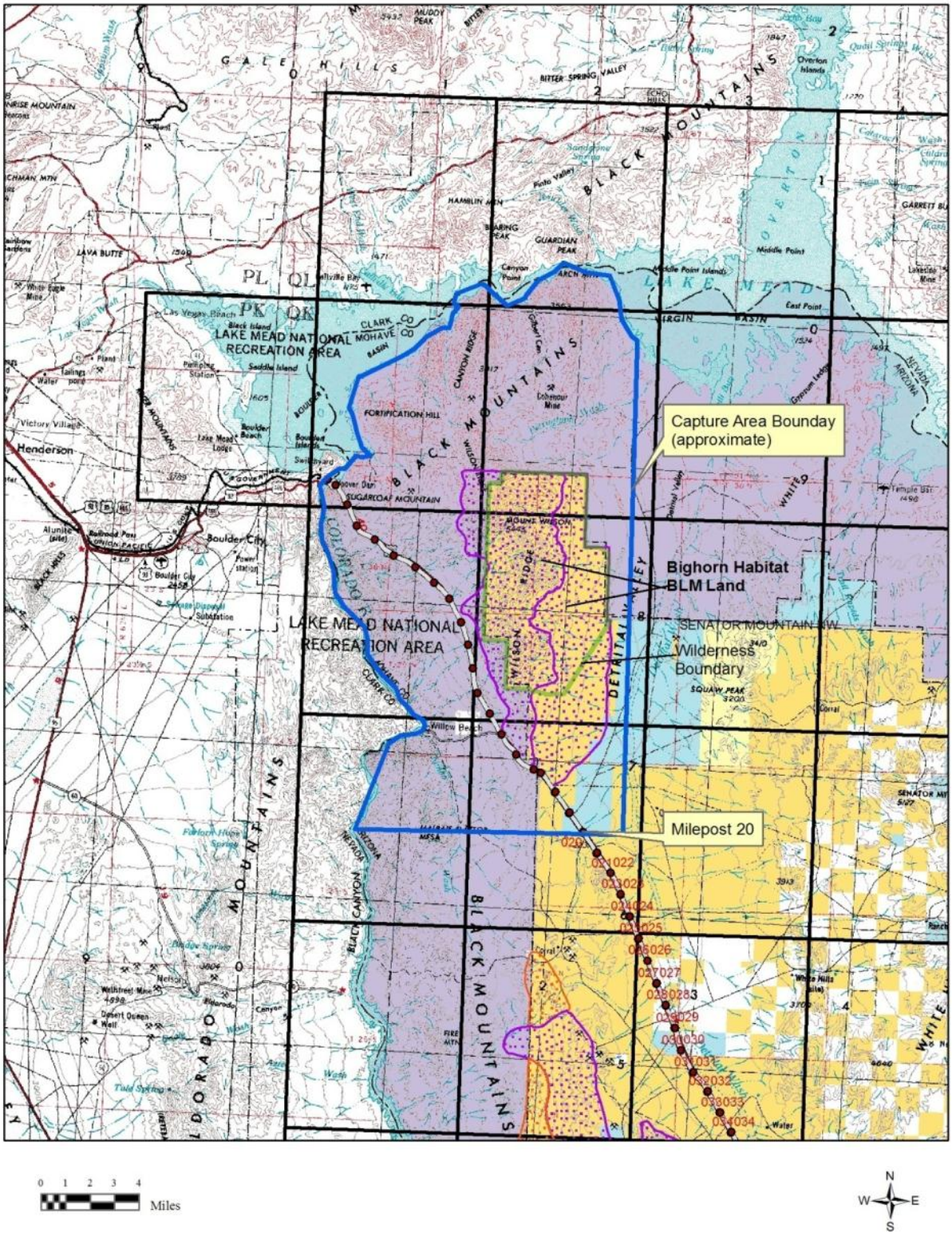
Bureau of Land Management 1994. Transplant of desert bighorn sheep into the Artillery Mountains, 1994. Environmental Assessment No: AZ-025-94-057. Kingman Resource Area, Kingman, Arizona:

BLM 1995. Proposed Kingman Resource Area Management Plan and Final Environmental Impact Statement. Kingman Resource Area, Kingman, Arizona.

BLM 1996. Black Mountain Ecosystem Management Plan and Environmental Assessment (AZ-025-95-032), Kingman Resource Area, Kingman, Arizona.

Peck, Rebecca 2009. Biological Evaluation for bighorn sheep capture and monitoring, Black Mountains-2009. Bureau of Land Management, Kingman, Arizona.

Map 1. Project location.



KINGMAN FIELD OFFICE SCOPING FORM

NEPA Document Number RMP Implementation No. Document Location:

DOI-BLM-AZ-C010-2010-0062 BM21/VIC

BLMshare/Nepa/eaeis/wildlife/BighornCapture2010
_AZ_2010_61_DNA_BighornCapture&Monitoring_2010

Proposal and Location: Capture bighorn sheep in the Black Mountains 5 miles to either side of US 93 milepost 0-20, Black Mountains,Ariozna.
Applicant: Arizona Game and Fish Department

INVOLVEMENT: Indicate in the left column which disciplines need to provide information into the EA.

Needed Input (X)	Discipline	Signature
	Lands	
	Minerals	
x	Range	/s/ David Brock 09/07/2010
x	Wild Horse and Burro	/s/ June Wendlandt 08/30/2010
	General Recreation	
x	Cultural and Paleontological Resources	/s/ Tim Watkins 09/08/2010
x	Wilderness	/s/ Len Marceau 09/07/2010
	Soils	
	Surface and Groundwater Quality/Water Rights	
	Air Quality	
x	Wildlife	/s/ Rebecca L. Peck 08/30/2010
x	Threatened and Endangered Plants and Animals	/s/ Rebecca L. Peck 08/30/2010
x	Migratory Birds	/s/ Rebecca L. Peck 08/30/2010
	Surface Protection	
	Hazardous Materials	
x	Areas of Critical Environmental Concern	/s/ Rebecca L. Peck 08/30/2010
	Visual Resources	
	Socio-Economics/Environmental Justice	
	General Botany/Noxious Weeds	
	Energy Policy	

Writer: /s/ Rebecca L Peck Date: 08/30/2010

Environmental Coordinator: /s/ David Brock Date: 09/08/2010

Field Manager: _____ Date: _____

Minimum Requirements Decisions Process
for
the US 93 Bighorn Sheep Capture

Prepared by

Jeff Gagnon
Arizona Game and Fish Department
Phoenix, Arizona

in coordination with

Rebecca Peck
Bureau of Land Management
Kingman, Arizona

June 21, 2010

Step 1a: Determine if the action proposed by the State agency or Federal-administering agency, to meet conservation objectives for fish and wildlife, *is necessary* to manage the area as wilderness.

This project is necessary to:

Assess long-term, post-construction permeability of US Highway 93 by collecting bighorn sheep movement data from sheep instrumented with Global Positioning System (GPS) collars to determine the effectiveness of the constructed wildlife overpasses. These overpasses, constructed at mileposts 3.3, 5.1, and 12.2 are designed to allow bighorn sheep to maintain natural movements and minimize death from vehicle collisions.

Desert bighorn sheep populations may be fragmented and isolated by highways and dispersal corridors, such as overpasses, can be important in the conservation of their populations. However, limited information exists on the efficacy of overpasses in promoting permeability for desert bighorn sheep populations. Assessing the effectiveness of the US 93 overpasses would determine if the wildlife component of the wilderness resource is being maintained.

1. Options Outside of Wilderness

To ensure that the effectiveness of the overpasses can be fully evaluated, a representative sample of bighorn sheep that inhabit the study area (within 5 miles on either side of US 93 from mile marker 0 to 20) will need to be taken. This sample will include sheep in the Black Mountains outside of the Mount Wilson Wilderness area. However, the western edge of the Mount Wilson Wilderness is within ½ to 5 miles of all three constructed US 93 wildlife overpasses, including a portion within ½ mile of a bighorn sheep crossing structure at milepost 12.2. In addition, bighorn sheep that use the Mount Wilson Wilderness are known to cross US 93 to the west into non-wilderness (McKinney and Smith. 2007). The exclusion of individual sheep from the wilderness is likely to result in an unrepresentative sample.

2. Legal and Policy Consistency
The Proposed Action is located in the BLM Kingman Field Office Resource Management Area.

The BLM (2009) found the Proposed Action and Non-Motorized Alternatives are in compliance with the Kingman Resource Management Plan/EIS (RMP; 1995), the Final Black Mountain Ecosystem Management Plan and Environmental Assessment (1996), as well as all known local, state, and federal laws and regulations.

The RMP identifies this population as an important source of bighorn sheep for transplants throughout Arizona and important for research. The RMP emphasizes the need to establish and maintain wildlife movement corridors and acknowledges that overpasses are needed to maintain wildlife in areas fragmented by roads. The RMP, page 51, says the following:
"….Desert bighorn sheep . . . habitat would continue to receive high priority for management, as outlined in existing habitat management plans. Desert bighorn sheep and other ungulates in the Black Mountains and Mount Wilson would be managed at a level which would ensure the continued existence of all ungulate species."

The proposed action is in conformance with the Land Use Plan (Kingman RMP/EIS), even though it is not specifically provided for, because it is clearly consistent with the following LUP decision(s) (objectives, terms, and conditions): pg. 51, RMP. Desert bighorn sheep . . . habitat would continue to receive high priority for management, as outlined in existing habitat management plans. Desert bighorn sheep and other ungulates in the Black Mountains and Mount Wilson would be managed at a level which would ensure the continued existence of all ungulate species.

The proposed project is also in conformance with the Black Mountain Ecosystem Management Plan (BMEP) and Environmental Assessment (1996), "Biodiversity/Ecosystem Health Objective", pg. 35 which identifies the importance of population viability of populations of all species and which established the procedures for bighorn sheep captures in wilderness areas. Helicopter net-gunning was identified as an appropriate capture method (BLM 1996, pgs. 48, 49 and Appendix 4, pg. 102).

3. Consider Requirements of other Legislation
Migratory Bird Treaty Act: The Proposed Action would not affect nesting birds or their young as the activity would occur outside of the breeding season.

Endangered Species Act: There are no listed species or critical habitat found within the project area with the exception of the California condor. The project area east of US 93 is located within the experimental range of the California condor. It has been determined that there would be "no effect" to the California condor from implementation of the Proposed Action or any of the alternatives.

California Condor
Findings for the California condor: No potential nesting or roosting habitat for the condor would be affected by the capture and collaring of bighorn sheep in the Black Mountains. No foraging condors would be affected by the Proposed Action as condors are not expected nor have they

ever been documented within the project area. This project is not expected to result in the adverse modification or destruction of habitat that is federally-designated as "critical habitat" under the ESA. There would be **"no effect"** to the California condor from implementation of this project.

Background information and analysis:

The project area occurs within the designated nonessential experimental population area established for the California condor. Although condors have not been documented in the project area and no nest or roost sites are known, they could occasionally occur in the project area while foraging. There is no potential for nest or roost sites.

A nonessential experimental population of California condors was established in northern Arizona and portions of Utah and Nevada on October 16, 1996 (USFWS 1996). The designated nonessential experimental population area is bounded by Inter-State 40 on the south, U.S. Highway 191 on the east, Inter-State 70 on the north, and Inter-State 15 to U.S. Highway 93 on the west. For BLM lands in Arizona, the nonessential experimental population area contains almost all of the land administered by the Arizona Strip Field Office and portions of the land administered by the Kingman Field Office.

The nonessential experimental population status applies to condors only when they are within the experimental population area. Any condors outside of the experimental population area are fully protected as endangered.

Most condor activity has occurred within the designated experimental population area (Arizona Condor Review Team 2002). Condors of all ages travel throughout the Grand Canyon complex and along the Colorado River corridor. Condors forage on the Kaibab Plateau and rarely fly into southern Utah and Colorado. . Recently, condors have been foraging on the Kaibab Plateau and occasionally flying into southern Utah. As of the date of the five-year review, condors had moved out of the experimental population area at least six times. The longest movement was to Flaming Gorge Reservoir on the Wyoming/Utah border. Other significant movements include: three birds to Grand Mesa and two to Mesa Verde National Park in western Colorado; one bird to Milford, Utah; one bird to Cedar City, Utah; and one bird to near Parker Dam on the Arizona/California border. Condors are capable of traveling long distances in short periods of time. As numbers of condors increase, the frequency of significant movements and the likelihood of dispersal can be expected to increase.

Condors prefer cliff habitat because cliffs are more likely to produce updrafts for soaring (2005, pers. comm. C. Parish). Both, C. Parish, Peregrine Fund and K. Sullivan, Peregrine Fund, 2005 (pers. comm.) state that they doubted that condors would use the desert areas east of U.S Highway 93.

Condors could potentially occur in the project area while foraging, however they have not been documented in the project area. The current known locations and concentrations of condors are not within the Kingman Field Office boundaries (pers. comm. Chris Parish, Peregrine Fund, Oct. 2009). (The locations are as follows: there is a small number within the Grand Canyon associated primarily with breeding, a small number on the Kaibab and Paria Plateaus. The rest are currently foraging around Kolob Reservoir which is located southeast of Cedar City, Utah. They are in this area because of the large food resource which comes from the seasonal grazing

of domestic sheep and the season hunting of big game (pers. comm. Chris Parish, Peregrine Fund, Oct.2009).

In the past, birds have followed the Colorado River corridor, down to the lakes. However this has not happened in years and is not considered part of the current area where they are now ranging.

4. Consider other Guidance

The Proposed Action and the Non-Motorized Alternatives are in compliance with the Arizona Game and Fish Department's Wildlife Program Management Strategic Plan for the Years 2001–2006 (2001); the Bighorn Sheep Management Plan for the Black Mountains (AGFD 2007), as well as all known local, state, and federal laws and regulations.

Special-status Species: Special-status species identified by the BLM and Arizona Game and Fish Department (AGFD) as potentially occurring in the vicinity of the project areas include the California condor, and banded Gila monster. Other BLM sensitive species that could potentially occur include the chuckwalla, Allen's big-eared bat, big free-tailed bat, cave myotis, Townsend's big-eared bat, and small-footed myotis.

Impacts on these species are as follows:

a. Banded Gila monster
Since there are no ground- disturbing activities associated with the Proposed Action, there are no impacts to the banded Gila monster.

b. Chuckwalla
Since there are no ground- disturbing activities associated with the Proposed Action, there are no impacts to the chuckwalla.

c. Allen's big-eared bat, big free-tailed bat, cave myotis, Townsend's big-eared bat, and small-footed myotis

Though suitable, colonial roosting sites may be present in the immediate vicinity of the bighorn sheep capture site; captures would occur in the day and because of their aerial mobility, captures would not affect these bats' abilities to forage in the area at night. Increased noise levels during captures would be unlikely to affect any potential nearby roost sites. Therefore, the Proposed Action would have no impact on these bat species.

5. Wilderness Character

As stated in the RMP, the Mount Wilson Wilderness is one of the most pristine in the area and provides ruggedness, isolation, and lack of human development.

The Proposed Action will not affect any unique geographic characteristics, ecologically significant or critical areas, and add no human development. Impacts to most natural resources are not expected as no disturbance to soils or vegetation would take place. Impacts to bighorn would be temporary (30 minutes or less) occurring while being net-gunned and collared. Kock

et al. (1987) found that capturing bighorn sheep with a net-gun is safer than other forms of capture (e.g., drop-net, drive-net, and chemical immobilization) because it is less stressful for the sheep and results in fewer accidental deaths. Net-gunning could cause the bighorn to experience increased body temperature and heart rate, and open-mouthed breathing. However, Kock et al. (1987) found that of 137 sheep captured by net-gunning, none died from capture myopathy.

Impacts to naturalness and opportunities for human solitude would be affected in the following ways: Wilderness visitors would be able to see and hear the capture activities for approximately fifteen hours over a 5 day period. Within the wilderness up to 5 bighorn would be captured, collared, and immediately released. The helicopter flight operations in wilderness are expected to take place during the weekdays over a period of up to five days. Approximately five helicopter flights would occur over wilderness. The flights over wilderness would last approximately thirty minutes. Approximately 5 total landings would occur in wilderness. At each capture location the helicopter would land for approximately thirty minutes while the captured animal is collared.

Bighorn sheep are one component of the wilderness character of the Mount Wilson wilderness. Preservation of wildlife movement corridors in the Black Mountains between Mount Wilson and the western part of the Black Mountains will provide connectivity between these two large mountainous areas and assure that bighorn sheep will remain as part of the wilderness landscape and character into the future.

6. Public Purposes of Wilderness

The Proposed Action supports the wilderness public purposes of conservation and scientific research. It supports the public purpose of conservation by improving the usability of high quality habitat for bighorn sheep, and other wildlife. It allows bighorn sheep to survive in the human-modified environment of the Black Mountain ecosystem, where their movements have been altered or blocked by human development such as highways, roads, hydro-electric dams, communication sites, and housing subdivisions. Their movements may also have been altered by uses such as off-highway vehicle activities, powerlines, and commercial sight-seeing tours. The Proposed Action supports the public purpose of opportunity for scientific research by providing opportunity to study bighorn sheep interactions with their environment. The Proposed action also provides the opportunity to research and determine the usefulness and design features needed for creating a successful wildlife overpass/corridor over a major highway that cuts through desert bighorn habitat.

Scenic and recreation public purposes in wilderness are supported as well. Maintenance of a viable population of desert bighorn sheep, inside and outside of wilderness, by assessing their use of wildlife overpasses provides recreation visitors to wilderness the opportunity to view wildlife in a natural setting. The presence of this native species on the landscape enhances the scenic value of the wilderness resource.

Step 1b: Conclusion: *Is the Action Necessary?*

The action is necessary to evaluate the effectiveness of the US 93 wildlife overpasses and bridges in promoting desert bighorn permeability. These overpasses are located on the newly constructed 4-lane highway that cuts through desert bighorn habitat. To *quantitatively* and *objectively* evaluate their efficacy a comparison of pre- and post-construction desert bighorn sheep permeability must be accomplished. The Proposed Action would provide the post-

construction data to make this comparison. The Proposed Action will add greatly to our understanding of desert bighorn sheep-highway relationships and the effectiveness of passage structures to promote permeability. Overall, the Proposed Action supports the preservation of the wilderness resource by helping to maintain a viable bighorn sheep population that is part of the wilderness character and adds to the wilderness experience for visitors to the area.

Step 2a: Determine the *minimum tool*

1. Describe the Proposed Action and Alternative Actions

Proposed Action

The Proposed Action is to capture bighorn and instrument them with GPS collars. The project would occur in the Black Mountains, including the Mount Wilson Wilderness, and require approximately 1 week in October, November, or December in 2010, 2011, and 2012. Flight operations in wilderness are expected to last approximately 5 hours (2 ½ hours flight time and 2 ½ hours on the ground) over a five day period . Approximately five flights of 30 minutes each would occur over wilderness. This project would take place along US Highway 93 from mile marker 0 to 20 mostly within 5 miles of the highway. Captures would take place on public land and National Park Lands.

The method used to capture bighorn sheep would be helicopter/net-gun with the assistance of a spotter fixed-wing plane. Once a bighorn sheep is captured, the helicopter would land and the animal would receive a GPS collar and ear tag and then be released without transport. It is estimated that it will take one hour to net-gun and collar each bighorn. Up to 5 bighorn sheep would be captured in the Mount Wilson Wilderness. All work would be done at the site where the bighorn sheep is captured and the sheep would be released immediately following processing. Captures would be conducted by the AGFD using personnel from Flagstaff, Phoenix, Kingman and volunteers.

Since the collars being deployed have satellite uplink capability, there would be no regular telemetry flights over wilderness or non-wilderness. After approximately two years, the collars would drop-off the sheep at which point AGFD personnel would recover the collars by hiking or riding in from the ground. Under rare, extenuating circumstances a telemetry flight may be scheduled for monitoring problematic collars. During such a flight, the plane would remain over 2,000 ft above ground level. To date, the AGFD has not had to use this method to address problematic collars.

The BLM will notify all grazing permittees within the project area of the action via telephone when this project would occur.

Table 1. Comparison of the Proposed Action and the Non-Motorized Alternative

	Proposed Action			Non-Motorized Alternative		
Action	**Proposed tool**	**Time required to use the proposed tool**	**Feasibility of the proposed tool use**	**Alternative tool**	**Time required to use the alternative tool**	**Feasibility of the alternative tool use**
One fixed-wing pilot and 2 AGFD employee spotters to access Mount Wilson Wilderness airspace and 1 helicopter pilot and 2 AGFD employees to capture within the Mount Wilson Wilderness area.	Fixed-wing spotter plane over the area with one AGFD pilot and 2 AGFD employee spotters, while helicopter with a pilot and 2 AGFD employees (1 net-gunner and 1 mugger) enters and lands in the area no more than 5 times.	1 hour per entry/flight and landing. **3 man-hours/sheep** (1 for the pilot, 1 for the net-gunner, and 1 for the mugger). If the maximum number (five) of sheep are captured, **15 man-hours** would be needed for this action	Feasible: Research has shown net-gunning to be the safest way to capture bighorn sheep; it results in the fewest, if any, capture related sheep mortality. The proposed action also does not expose AGFD personnel to the hazards of hiking in the Mount Wilson Wilderness area. The action also requires the least amount man-hours.	Chemical immobilization - darting. 4 AGFD employees (3 spotters and 1 dart-gunner) backpack into the area, camp, and dart no more than 5 bighorn sheep.	Based on hunting and scouting time requirements, successfully darting a bighorn sheep is projected to take 10 days/sheep. Unlike a rifle, a dart must be "lobbed" from a distance of ~ < 75 meters, to allow safe injection without the dart barrel impaling the animal. This Alternative Tool would require **320 man-hours/sheep** (4 people (1 darter and 3 scouts) X 8 hours/day X 10 days). To capture 5 sheep would require **1600 man-hours**.	Not feasible Chemical immobilization for bighorn sheep has been shown to result in a **23% mortality** rate. In addition, terrain and chemically impaired sheep fleeing make this an unsafe option for personnel. (see discussion below under *Compare the Effects of the Alternatives*). This option would require ~ 1600 man-hours/5 sheep – not reasonable.

Alternatives to the Proposed Action

a. No Action

Under the No Action Alternative no bighorn sheep would be captured in the Mount Wilson Wilderness area.

b. Capture Bighorn Sheep Without the Use of Mechanical Transport

Under this alternative, the use of helicopter/net-gun to capture bighorn sheep in the Mount Wilson Wilderness would not be authorized. AGFD would make an extensive effort to enter the area on foot and capture bighorn sheep using chemical immobilization (e.g., darting) techniques.

To note, terrain makes it virtually impossible to approach sheep in many situations and in some cases may provide serious risk for injury or death for both humans and drugged sheep. However, to capture one sheep by on-the-ground darting, would require four (1 darter and 3 scouts) AGFD employees to enter the area and search for sheep. When an appropriate sheep (an adult in an area that was free of hazardous cliffs, steep slopes and other terrain) was located, the darter would

have to approach the animal to within ~ < 75 meters to safely lob a dart. Unlike riffles, darts, which are flying syringes, must be lobbed in order for the drug to safely inject without the syringe body entering the animal's body. After the sheep was darted, the drug would require 2 to 15 minutes (depending on the location of the injection) to take effect. During this time, the chemically impaired animal would be at risk of serious injury (falling off a cliff or down a steep hill) while fleeing the area. AGFD personnel would track the animal. Once the animal was found, it would be blindfolded, collared, ear tagged, and administered a reversal drug. After the animal fully recovered from the drug, it would be released. To track, dart, and collar a sheep would require 320 man-hours (4 people (1 darter and 3 scouts) X 8 hours/day X 10 days). To capture 5 sheep would require 1600 man-hours. No more than five sheep would need to be captured in the area.

2. Compare the Effects of the Alternatives

a. Proposed Action

There is no potential to affect any unique geographic characteristics, ecologically significant or critical areas. No significant impacts to natural resources would occur as no disturbance to soils or vegetation would take place. Capture activities would take place outside of the migratory bird breeding period. Disturbance to individual bighorn would be for less than one hour during capture and consist of a short (~ < 10 minutes depending on weather conditions) helicopter pursuit, netting, and collaring. Net-gunning has been found to be safer than other forms of capture (e.g., chemical immobilization) because it is less stressful for the sheep and results in fewer accidental deaths (Kock et al. 1987). The net immobilizes the animal and prevents it from fleeing the area; thus, preventing it from falling down steep slopes, cliffs, into canyons, or other rough terrain that could result in serious injury and/or death. The use of a helicopter and net-gun also allows personnel to be placed safely at the site of the sheep without having to negotiate rugged terrain under a time-sensitive situation (i.e., the faster a blindfold is placed over the animals eyes, the quicker the animal's stress is reduced).

b. Capture Bighorn Sheep Without the Use of Mechanical Transport

Accessing the Mount Wilson Wilderness area on foot and attempting to immobilize (dart) bighorn sheep in steep, rocky, and slippery terrain, the sheep's natural habitat, would pose a significant safety hazard to the bighorn sheep and to personnel.

Bighorn sheep, once darted, would still have the ability to flee while the immobilization chemicals took effect. As the chemical gradually entered the sheep's system, their muscle control, balance, and coordination would become increasingly compromised and the likelihood of injury or mortality from falling would become more probable. Bates et al. (1985) found that 34 of 147 (23%) darted bighorn sheep died as a result of the capture method. Personnel attempting to follow the sheep would also be exposed to the increased risk of navigating the steep, rocky, and slippery terrain. In addition, personnel may be faced with the decision of following the drugged sheep over perilous terrain to collar and administer the reversal drug or allowing the sheep to die because it is inaccessible.

c. No Action

The No Action option would affect the opportunity for human solitude as the noise and visual disturbance caused by the helicopter flights and bighorn capture activities would not take place. However, since bighorn sheep are a large part of the wilderness characteristic of the Mount Wilson Wilderness, this character may be affected. Highways block animal movements between seasonal ranges or other vital habitats (Trombulak and Frissell 2000). This barrier effect fragments habitats and populations, reduces genetic interchange (Epps et al. 2005, Riley et al. 2006), and limits dispersal of young (Beier 1995), all serving to disrupt viable wildlife population processes. Long-term fragmentation and isolation renders populations more vulnerable to stochastic events that may lead to extinctions (Hanski and Gilpin 1997). The No Action option would result in not knowing if the wildlife crossing structures are being used by the Mount Wilson Wilderness bighorn sheep; thus, we may not know if the sheep were an isolated population that may need alternative management options

In addition, not capturing bighorn sheep in the Mount Wilson Wilderness is likely to result in an unrepresentative sample of bighorn sheep to evaluate the effectiveness of the newly constructed wildlife overpasses, which were established to maintain wildlife movement corridors across US 93 for bighorn sheep. The unrepresentative sample could lead to spurious research results (e.g., bighorn sheep do not appear to be using the overpasses, when in fact the sheep that reside in the Mount Wilson Wilderness are using the overpasses). These types of false results could ultimately lead to the Arizona Department of Transportation, the Federal Highway Administration, and other researchers to conclude that wildlife overpasses for bighorn sheep and possibly other wildlife are ineffective at providing connectivity in an area fragmented by roadways.

Step 2b: Decision – *What is the Minimum Tool?*

Decision

The *minimum tool* to assess the long-term, post-construction permeability of US Highway 93 in the safest (for humans and bighorn sheep) and most reasonable manner would require the use of a helicopter/net-gun with the assistance of a spotter fixed-wing plane to reduce the safety hazards to bighorn sheep and humans.

Rationale

The use of a helicopter/net-gun with the assistance of a spotter fixed-wing plane to capture bighorn sheep in the Mount Wilson Wilderness would result in a short project timeframe (15 man-hours) while providing for a high degree of safety for both capture personnel and bighorn. This method would cause aircraft noise and the visible appearance of the aircraft to potentially affect naturalness and the opportunities for human solitude for a total of five hours over a five day period (2 ½ hours of helicopter time while net-gunning bighorn and 2 ½ hours of time spent landing while collaring bighorn).

The use of a helicopter/net-gun/spotter fixed-wing plane to capture bighorn would potentially reduce the mortality of bighorn caused by the Non-motorized Alternative (ground capture) from 23% to close to zero (Proposed Action). It would reduce man-hours from 1600 hours to 15

hours. It would reduce the potential of injury to personnel involved in ground capture caused by chasing bighorn in rugged, steep, rocky terrain. The Non-motorized alternative would cause personnel to spend approximately 1600 hours in rugged terrain chasing and collaring bighorn versus 2 ½ hours on the ground in the rugged terrain (while collaring bighorn) caused by aerial capture.

The Non-motorized alternative would exclude individual sheep that reside in the wilderness from the study which would likely result in an unrepresentative sample and spurious results.

The Proposed Action would allow a quantitative and objective evaluation of the long-term, post-construction permeability of US Highway 93 versus the No Action alternative which allows for no post construction evaluation.

Management Requirements for Minimizing Effects

- Limit the number of fixed-wing aircraft spotter flights and helicopter landings to the absolute minimum to limit impacts associated with the noise of the aircraft.
- Conduct the majority of capture activities during weekdays to minimize interference with wilderness visitation. No more than five days of flight over wilderness would be allowed.
- The Arizona Game and Fish Department would conduct public notification via the newspaper to notify visitors of helicopter activities within the Mount Wilson Wilderness.
- The BLM would conduct public notification via the internet and public room postings to notify visitors of helicopter activities within the Mount Wilson Wilderness.
- The BLM would notify all livestock grazing permittees within the project area of the action via telephone when this project would occur.

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