ENVIRONMENTAL ASSESSMENT
CA-370-06-02

Wildlife Water Developments in the High Rock Area

SURPRISE FIELD OFFICE
WINNEMUCCA FIELD OFFICE
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1. INTRODUCTION

Prehistoric and historic records indicate the northwestern Nevada region contained extensive native populations of bighorn sheep (*Ovis canadensis)*, as depicted by Indian petroglyphs, and archeological discoveries of skulls and skeletons. It is believed the sheep were extirpated from the area in the 1920's due to habitat degradation, mining development, competition and disease transmission from domestic livestock, and over hunting. Other significant factors impacting bighorn populations were poaching, agricultural development, and parasites.

In 1982, the Surprise Resource Area's Cowhead/Massacre Management Framework Plan (MFP) (BLM, 1982a) identified the High Rock Area as being potential bighorn sheep habitat and allocated a large area in the Massacre Mountain Allotment for bighorn sheep. That same year the Massacre Mountain/ High Rock Technical Review Team (TRT) recommended that water developments be constructed on the east benches of Pole Canyon primarily for wildlife and wild horses (BLM 1982b). The rationale for the projects was that "the eastern benches are poorly watered, causing wildlife and wild horses to be highly concentrated during dry periods. Construction of additional waters would disperse the animals, potentially increasing carrying capacity. The TRT also recommended that the developments should be designed to have minimal impact upon the wilderness values in the area.

The 1984 High Rock Habitat Management Plan (HMP) (BLM, 1984), a cooperative management plan between Bureau of Land Management (BLM) and the Nevada Department of Wildlife (NDOW), outlined objectives and actions for the High Rock Area. The plan set an objective to "Provide habitat in sufficient quantity and quality capable of supporting a stable population of California bighorn sheep of at least 150 animals on 45,600 acres of suitable habitat within 5 years. The plan also proposed to reintroduce California Bighorn Sheep into Pole Canyon and/or Little High Rock Canyon when domestic sheep are removed from the area…", and to "construct two big game guzzlers on the uplands adjacent to Pole Canyon". Neither the HMP nor specific projects proposed within the HMP were evaluated for consistency with the Interim Management Policy for lands in Wilderness Study status.

In 1989 NDOW initiated the first of several California Bighorn reintroductions into Management Unit 012, a 684,884 acre area in which the East Fork of High Rock Canyon Wilderness Area comprises about 7.7 % of the unit (Map 1,Appendix 1) . Bighorn sheep were reintroduced into High Rock Canyon in 1995. Since 1989 five separate releases of Bighorn Sheep have occurred in the hunt unit, with a total of 93 sheep being released. NDOW censuses of this population have shown increases in numbers (NDOW, 2002). NDOW estimated the population at 190 sheep in 2004 (NDOW, 2004). NDOW data from 2004 shows bighorn sheep occupying 235,169 acres or about 34% of Unit 012.

The legislation that created the Black Rock Desert-High Rock Canyon Emigrant Trails National Conservation Area (NCA) and the East Fork High Rock Canyon wilderness require BLM to "...conserve, enhance and protect for the benefit and enjoyment of present and future generations the unique and nationally important historic, cultural, paleontological, scenic, scientific, biological, educational, wildlife, riparian, wilderness, endangered species, and recreational values…" of the area. The legislation also recognizes "free roaming horses and burros" as one of the areas values (Public Law 106-554 as amended 2001).

In 2000 five Wilderness Areas (High Rock Canyon, East Fork High Rock Canyon, Little High Rock Canyon, Calico Mountains, and High Rock Lake) were designated in the NCA legislation within Unit 012. Wilderness areas are managed to comply with the requirements of the Wilderness Act of 1964 and BLM wilderness regulations and policies.

In December 2003 BLM and NDOW finalized a MOU regarding management of wildlife within designated wilderness within the state of Nevada (BLM 2003a). That MOU included a section on the development of water developments for wildlife within wilderness. Specifically the MOU (§ V.C) states: "In rare instances, facility development and habitat alteration may be necessary to alleviate adverse impacts caused by human activities on fish and wildlife…..Development of new or additional water supplies may be permitted, but only when essential to preserve the wilderness resource and to correct unnatural conditions resulting form human influence".

In 2004 NDOW proposed to construct two water developments, commonly referred to as guzzlers, east of Pole Canyon within the East Fork High Rock Canyon Wilderness to "mitigate for loss of California Bighorn Sheep corridors and alleviate stress due to increased recreation use within High Rock Canyon".

NDOW's request to construct guzzlers for bighorn sheep reflects their concern about the ability of bighorn sheep to fully occupy their potential habitat in the High Rock Canyon area in a stress free environment (NDOW 2004a and 2005a). NDOW identified two factors they feel are currently limiting population expansion in the High Rock Area; expanding recreation use in High Rock Canyon and the poor condition of riparian habitats associated with upland spring sources as a result of heavy wild horse grazing.

1.1. Public Scoping

In June 2004 BLM sent a Notice of Proposed Action (NOPA) (NV025-04-04) to groups and individuals that had previously expressed interest in being notified about proposals within wilderness areas. Six comments were received and issue raised from those comments can be found in Section 1.3. The NOPA identified the NDOW guzzlers and fencing of springheads and associated meadows as alternatives being considered. In December 2005 a preliminary Environmental Assessment was sent to approximately 100 individuals, groups and agencies for comment. Twenty-eight comment letters and several petitions containing a total of 110 signatures were received.

1.2. Purpose and Need

The purpose for NDOW's proposal to construct two wildlife water developments in the High Rock area is to provide water sources for bighorn sheep free of stress from recreational visitors and to mitigate the potential impacts occurring to existing springs from concentrated wild horse and livestock use.

BLM's purpose for preparing this Environmental Analysis (EA) is to ensure that the proposal is in conformance with the Resource Management Plan for the NCA and consistent with existing law, regulation and policy. Preparing the EA also fulfills BLM's responsibility to complete and document appropriate National Environment Policy Act compliance before making a final decision on the proposal as outlined in the Memorandum of Understanding between the BLM and NDOW.

To determine if the proposal was consistent with the Wilderness Act of 1964 a "Minimum Requirements Analysis" was prepared (See Appendix B). This analysis also helped BLM to develop an alternative that would construct exclosure fencing around three springs in the area, addressing in part the need of protecting existing springs and associated meadows.

This EA includes a range of alternatives that directly and indirectly address the issues. The alternatives include:

- NDOW's proposal to construct new wildlife water sources (guzzlers).This is the proposed action.
- Constructing protective exclosure fences on spring sources currently receiving heavy use by wild horses and identified by NDOW as important water sources for bighorn sheep. This alternative attempts to resolve some of the concerns of NDOW that resulted in their guzzler proposal that would attempt to improve habitat conditions and water availability at existing sources for bighorn sheep and other wildlife species.
- A No Action alternative where neither additional water sources nor protective exclosures would be constructed.

1.3. Issues

The following concerns were raised by the public in response to the Notice of Proposed Action and the preliminary Environmental Assessment:

- Bighorn sheep in the High Rock area are not doing as well as other parts of Management Unit 012 and additional waters would help mitigate adverse conditions to bighorn. Comments both supported and questioned this concern.
- Wild horse numbers are too high and are adversely affecting bighorn sheep and habitat for other wildlife species.
- Increasing recreational use levels in High Rock Canyon are adversely affecting bighorn sheep. Comments both supported and questioned this concern.

- The developments are being proposed to support hunting and not enhance wilderness
- The proposal is not consistent with the NDOW/BLM MOU on wildlife management in wilderness areas. Comments both supported and questioned this concern.
- Proposed water developments are prohibited by the Wilderness Act. Comments both supported and questioned this concern.
- If action is needed to alleviate stress to the bighorn sheep then human use should be restricted in High Rock Canyon.

The interdisciplinary staff of the Surprise and Winnemucca Field Offices reviewed the project request and other materials submitted by NDOW, public comments, BLM files, and evaluated resources in the field to identify the appropriate issues for inclusion in this assessment. The following issues were identified:

1. Are applicable Land Health Standards being met?
2. Does current or projected recreational use levels in High Rock Canyon prohibit or discouraging the sheep from using habitat in the canyon during the hot season?
3. What are the impacts of wild horse use on bighorn sheep, other wildlife species and vegetation communities within the High Rock area?
4. Do current conditions require that an action be taken to maintain the naturalness of the springs within the wilderness area and if so, which of the alternatives would be considered the minimum tool for maintaining the naturalness?
5. Are there unnatural human caused conditions that need to be corrected?
6. If an unnatural condition exists that needs to be mitigated, are there other viable methods that would accomplish the objective?

1.4. Land Use Plan Conformance

After preparing the "Minimum Required Analysis" (Appendix B) the actions associated with the alternatives were reviewed for compliance with the Black Rock Desert-High Rock Canyon Emigrant Trail NCA RMP (BLM 2004).

The following objectives and decisions were determined to be applicable to the identified issues and alternatives. The objectives and decisions from the RMP are listed by program area with a brief discussion about the conformance or non-conformance of the actions included in the two alternative approaches to addressing the issues. Objectives are bulleted, while decisions include the decision number from the RMP. Both are delineated in italics.

Land Health Standards

The objective and decision related to Land Health Standards are applicable to all alternatives.

- *To manage public lands to meet the fundamentals of land health.*

LHS-1: Land Health Standards developed with the assistance of Resource Advisory Councils will apply to all uses and programs. The text of the standards is in Appendix B of the RMP.

Implementation of the proposed action and fencing alternatives would be partially consistent with Land Health Standards. The proposed action would aid in achievement of the biodiversity standards by providing year-round water sources away from human and wild horse and burros. It would not help with achieving the riparian standards as degraded conditions would not be repaired. The fencing alternative would aid in achievement of the riparian standards by improving conditions on degraded spring meadows. It would also aid the biodiversity standard by improving water sources used by bighorn sheep and other wildlife species.

The no action alternative would be inconsistent with either the biodiversity or riparian standards and degraded meadow conditions would be maintained.

Wilderness

Two objectives are applicable to the alternatives:

- *To maintain or enhance the natural and untrammeled character of the Wilderness Areas.*

- *To provide outstanding opportunities for visitors to experience solitude and to participate in primitive and unconfined recreation, consistent with the preservation of the area's wilderness character.*

The construction of any development (either guzzlers or exclosure fencing) would include components that would impact the undeveloped character of the wilderness and would be somewhat inconsistent with the objectives. However, if unnatural conditions resulting from human influence exist that require the construction of a development to maintain the naturalness of the area than the developments would also assist in meeting the objectives.

The construction of facilities associated with the proposed action or exclosure fencing alternatives would be in conflict with the objective for providing outstanding opportunities for solitude at least during the construction phase. The continued presence of human developments within wilderness would be locally inconsistent with providing outstanding opportunities for primitive and unconfined recreation.

The no action alternative would be partially consistent with the objectives. Degraded meadow conditions are not consistent with the need to manage wilderness for naturalness. Opportunities for solitude or primitive recreation would not be affected if no projects are undertaken

There were no RMP decisions from the Wilderness Section specific to this proposal

Vegetation

Three objectives are applicable to the alternatives.

- *To achieve native woody, forb, grass, and nonvascular vegetation composition, productivity and community structure within the planning area that is consistent with the indicators described in the Land Health Standards.*
- *To consider the maintenance and enhancement of natural ecological processes as the dominant factor in determining the composition and distribution of plant communities in the Wilderness Zone.*
- *To maintain or achieve, within 15 years, Properly Functioning Condition status for 90 percent of wetland vegetation community sites within the planning area consistent with Land Health Standards.*

The protective fencing alternative would support the achievement of the three objectives by striving to improve riparian conditions.

The proposed action would alter vegetative conditions on fewer than 3 acres.

The no action alternative would not change present vegetative conditions. Degraded spring meadows would not meet the objectives.

There were no RMP decisions from the Vegetation Section specific to this proposal.

Wild Horses and Burros

The two objectives are applicable to the alternatives.

- *To manage sustainable populations of wild horses in nine Herd Management Areas (HMAs) and wild burros in two HMAs consistent with the intent of the NCA Act within established AMLs to maintain a thriving ecological balance among wild horse and burro populations, wildlife, livestock, vegetation resources, and other values and uses.*
- *To maintain free roaming behavior of wild horses and burros.*

The protective fencing alternative would support achievement of the 1st objective. The construction of either proposed action or exclosure fencing would slightly reduce the free roaming behavior of wild horses supported by the 2nd objective.

The no action alternative would be partially consistent with the objectives. Maintenance of degraded spring meadows would not be consistent with the requirement to "maintain a thriving ecological balance". The free roaming behavior of WHB would be maintained.

There were no RMP decisions from the Wild Horse and Burro Section specific to this proposal.

Fish and Wildlife

Six objectives and five decisions are applicable.

- *To provide habitat within the planning area to support a diverse range of game and non-game wildlife species and to give visitors high-quality opportunities to hunt, fish, trap, or view wildlife.*
- *To maintain, restore, or enhance riparian areas and wetlands within the planning area so they provide diverse and healthy habitat conditions for riparian and wetland obligate species and other wildlife species.*
- *To provide high-quality habitats for sagebrush-dependent species, including sage-grouse, in the sagebrush steppe portions of the planning area. All existing lek, breeding, brood rearing, and winter sage-grouse habitats will be conserved during the life of the plan.*
- *To provide habitat for migratory birds, including forage, water, cover, structure, and security, to support healthy populations of resident and migrant species.*
- *To implement management actions for all uses and programs that sustain or improve sage-grouse winter, breeding, nesting, and brooding habitats. Activities that have a high risk of disturbing breeding or brooding sage-grouse will not be allowed within suitable habitats.*
- *Management activities in wilderness will emphasize the protection of native species and natural population dynamics.*
- *Ensure that wildlife populations operate as freely as possible with only minimum human influence.*

FW-2: Habitats for sage-grouse and other sagebrush obligate species will be managed to retain the vegetation and other attributes necessary for the long-term sustainability of sage-grouse and other sagebrush-dependent wildlife species.
FW-3: Activities that may affect migratory bird species will include habitat and population conservation principles, measures and practices appropriate for the affected species and the proposed activities.
FW-4: Construction of new water developments or other wildlife-related projects outside Wilderness may be authorized when the project promotes healthy, viable, and more naturally distributed wildlife populations.
FW-6: The MOU with the NDOW concerning wildlife management in Nevada BLM Wilderness Areas will be used for guidance on all wildlife actions in the Wilderness Areas.
FW-7: Habitat rehabilitation and restoration projects and activities within Wilderness must be consistent with a site-specific minimum required/tool analysis. Examples of such activities and projects include changes in authorized uses; seeding following fires to enhance recovery of wildlife habitats and to prevent establishment and dominance of invasive, exotic plant species; and construction of protective fencing to recover, establish or enhance riparian systems.

The alternatives would vary in their conformance with the objectives and decisions with the protective fencing alternative responding to more of the objectives and decisions because it would directly provide more benefits to sage-grouse, migratory bird species and sagebrush obligate species while the proposed action is primarily focused on bighorn sheep.

The no action alternative would allow degraded wildlife habitat conditions to be retained.

Special Status Species
The one objective is applicable to all of the alternatives.

- *To manage habitats and populations of special status plant taxa and animal species to meet the standards for "secure" ranking within 10 years. Any new listing of threatened or endangered species will require consultation with FWS.*

The alternatives would be consistent with the objectives.

There were no RMP decisions from the Special Status Species Section specific to this proposal.

Visual Resources
One objective and two decisions are applicable to all of the alternatives.

- *To provide a primitive and natural visual setting for visitors.*

VRM-1: Actions and activities within the ten Wilderness areas and the LCT Area will be managed to meet the requirements for VRM Class I as shown on Map 2-8 of the RMP.
VRM-2: Actions and activities within the planning area outside of the ten Wilderness areas and the LCT Area will be managed to meet the requirements of VRM Class II as shown on Map 2-8 of the RMP.

The proposed action would occur entirely within a VRM Class I area, the protective fencing alternative would partially occur within the VRM Class I area. Both of these alternatives are somewhat inconsistent with VRM Class I management. A portion of the protective fencing alternative would be in the area associated with VRM Class II and would be consistent with that decision.

The no action alternative would be consistent with the objective and decisions, if visual impacts are occurring from overuse at the spring sites those impacts would continue if no action were taken.

Water Resources
One objective and one decision would be applicable to the protective fencing alternative.

- *To manage the quality of water resources in the planning area in a way that achieves the chemical, physical and biological integrity that each resource is capable of producing, consistent with Nevada Revised Statute chapter 445A.*

WATER-3: Water quality will be provided for current and future uses through establishment of measurable water quality objectives consistent with EPA, State or Tribal water quality standards, and implement management practices to achieve those

standards. Objectives and practices will be adjusted to conform to changing resource and user conditions.

The protective fencing alternative would support the achievement of the objective and the decision by improving surface water quality.

The proposed action and no action alternative would maintain existing conditions for existing water resources and would not necessarily assist in achieving the objective.

1.5. Relationship to Other Statutes, Regulations, and Policies

1.5.1. Wilderness Law, Regulation, and Policy

The three alternatives have been reviewed with the provisions of the Wilderness Act of September 3, 1964 (P.L. 88-577, 78 Stat. 890; 16 U.S.C. 1121 (note), 1131-1136). Section 4 (B) of the Wilderness Act states: *"Except as otherwise provided in this Act, each agency administering any area designated as wilderness shall be responsible for preserving the wilderness character of the area and shall so administer such area for such other purposes for which it may have been established as also to preserve its wilderness character. Except as otherwise provided in this Act, wilderness areas shall be devoted to the public purposes of recreational, scenic, scientific, educational, conservation and historical use."* In addition, Section 4 (C) states in part: *". . . . except as necessary to meet minimum requirements for the administration of the area for the purpose of this Act (including measures required in emergencies involving the health and safety of persons within the area), there shall be no temporary road, no use of motor vehicles, motorized equipment or motorboats, no landing of aircraft, no other form of mechanical transport, and no* ***structure or installation*** *within any such area."* (emphasis added). Although these actions are generally prohibited by the Wilderness Act, there are times that they can be authorized. Under most circumstances, these prohibitions can only be authorized if they can be shown to be necessary to meet the minimum requirements for the administration of the area as wilderness, as outlined in Section 4(c) of the Wilderness Act.

To determine if a proposed action is necessary for maintaining wilderness values a "minimum required/minimum tool" analysis is conducted. This analysis is a two step process. The first step is to determine if a situation exists that requires a management action to maintain the wilderness values of the area. If it can be shown that a management action is necessary to maintain wilderness values then the analysis would move onto the second step of determining what activity or "tool" for implementing the necessary action would cause the least amount of impact to the wilderness values.

The alternatives have been reviewed with the Wilderness Management Regulations found in 43 Code of Federal Regulations Part 6300. Subpart 6303.1(b) states "BLM may prescribe conditions under which other Federal, State, or local agencies or their agents may use, build, or install such items to meet the minimum requirements for protection and administration of the wilderness area, it's resources and users"

The alternatives have been reviewed for consistency with the MOU between the BLM and NDOW, Wildlife Management in Nevada BLM Wilderness Areas (BLM 2003a). The MOU states that "Development of new or additional water supplies may be permitted, but only when essential to preserve the wilderness resource and to correct unnatural conditions resulting from human influence." This wording is consistent with Section 4(c) of the Wilderness Act in that it requires that the structures be essential to preserve the wilderness resource. If a proposal cannot be shown to be essential to maintaining wilderness values it cannot be authorized.

Section V. of the MOU states "The emphasis is on management of BLM Wilderness Areas and wilderness values as opposed to the management of a particular resource. Where there are competing resource alternatives, wilderness values take precedence and priority". The MOU also recognizes that wildlife are an important wilderness resource.

The "minimum required/minimum tool" analysis for the action alternatives was conducted and is included as Appendix B. This analysis provides the consistency review for all the wilderness laws, regulations and policies.

Several comments on the preliminary EA pointed out that the guzzlers were identified as "an issue for analysis" in 1987 Wilderness Recommendations EIS for the Eagle Lake-Cedarville Study Areas, and questioned why additional analysis is necessary. This EIS was prepared to analyze the impacts and resource trade-offs of BLM's suitability recommendations including the alternatives of "all wilderness, partial wilderness, and no wilderness/no action." The EIS made projections of potential future management actions to allow the analysis of impacts under the Proposed Action and alternatives on the wilderness values associated with the WSA's. The purpose of the analysis was to determine whether or not the identified management actions would constrain Congress's ability to designate all or portions of the WSA as wilderness. A detailed description and impact analysis to ensure consistency with the Wilderness Act is necessary to authorize the proposals.

1.5.2. Other Laws, Regulation, and Policies

The alternatives have been reviewed with provisions of the Black Rock Desert-High Rock Canyon Emigrant Trails National Conservation Area Act of 2000 (P.L. 106-554). Section 5 (a) states: "Management. – The Secretary, acting through the Bureau of Land Management, shall manage the conservation area in a manner that conserves, protects, and enhances its resources and values, including those resources and values specified in subsection 4(a), in accordance with this Act, the Federal Land Policy and Management Act of 1976 (43 U.S.C. 1701 et seq.), and other applicable provisions of law". The two action alternatives are consistent with the NCA legislation. The no action alternative would allow continuation of conditions associated with spring meadows that could be considered inconsistent with the "conserve, protect and enhance" mandate.

In addition, the alternatives have been analyzed within the scope of the following statutes, regulations and policy and been found to be consistent with:

- 1969 National Environmental Policy Act
- 1976 Federal Land Policy & Management Act
- 40 CFR Part 1500 (NEPA), 43 CFR Part 1600 (Planning)
- 43 CFR Part 6300 (Wilderness Management)
- BLM Manual 8560, H-8560-1 (Wilderness Management)
- BLM Manual 1617 (Planning)
- BLM Manual 1745 (Reestablishment of Fish, Wildlife, and Plants)

2. DESCRIPTION OF ALTERNATIVES

2.1. Proposed Action – Construction of two wildlife water developments

The Nevada Department of Wildlife is proposing to construct two catchment type water developments (commonly referred to as guzzlers) for the purpose of providing additional sources of competition free water for wildlife species, primarily bighorn sheep, at the locations shown on Map 2 (Appendix A). Both of these proposed water developments are within the East Fork High Rock Canyon Wilderness.

Each water development, or big game guzzler, would consist of three 1800-gallon polyethylene tanks, which would be partially buried and a 1200 square foot steel apron for catching precipitation, which would cover the tanks. Fifteen steel support posts for the apron would be buried in 3' deep holes within 30' of the tanks. Each guzzler would have a drinker buried 3' deep approximately 30' feet from the tanks. The tank and the drinker would be connected by a buried 2" water pipe. Barbed wire fencing, approximately 240 feet in length, would be installed around each guzzler to exclude wild horses and livestock and a pipe rail fence would be constructed around the drinker. Materials would be painted sage green or light brown to match the surrounding landscape. (See Appendix C for a diagram of the guzzler design)

Explosives would be used to blast the tank pad holes for water storage. Generators, power tools and other hand tools would be used for the actual construction of the developments.

NDOW proposes to haul the construction materials by motor vehicle to the Wilderness Area boundary and then sling load the materials by helicopter short distances to the actual construction sites. NDOW has also requested that BLM participate in on-site evaluation of each project prior to construction to allow for minor adjustments of project location and construction techniques to minimize the visual and disturbance footprint of each development.

Maintenance of the two guzzlers would require yearly inspections and minor maintenance that could be accomplished by walking into each of the two sites. At intervals estimated at 3 to 5 years, more extensive maintenance would need to occur

that would require one or more helicopter trips to transport heavy tools and replacement parts to each site. Construction would occur during the summer of 2006.

NDOW also proposes the removal of the guzzlers upon the achievement of habitat recovery of the springs and associated riparian habitats occurring within the project area.

2.2. Alternative I- Protection of Existing Spring Sources with Exclosures

Under this alternative exclosure fences would be constructed around three existing springs in the project area at the locations shown on Map 2 (Appendix A). These springs were selected among a number of springs identified by NDOW because they were close to the proposed guzzlers, within occupied bighorn habitat and needing protection.

The exclosure fences would use a design that allows bighorn sheep and other wildlife to access the water, but would exclude wild horses and livestock from the spring sources. Access to water for wild horses and burros and livestock for the two eastern springs will be provided as part of the project design. The identified perennial spring sites are located within HMAs. Due to the expected horse pressure on any water site, exclosure fencing would be a buck and rail fence construction or pipe rail fence where horses are likely to pressure barbed wire fencing. Material specifications would be as recommended in Brigham and Stevenson (1997). A gate would be included at each exclosure to provide maintenance access, allow removal of trapped livestock or wild horses or allow access to water for wild horses in emergency situations.

If pipe rails fence materials are used they would be painted sage green or light brown to match the surrounding landscape. A diagram of the fence design is located in Appendix E.

Exclosures would initially be installed around two existing water sources (Buck Springs and HRSP#27) located outside of the Wilderness Area. Approximately 1700 feet of exclosure fence would be installed at Buck Springs and a large tire type trough would be added to provide off-site water for wild horses and livestock. The exclosure would exclude wild horses and livestock from approximately 6 acres around the spring. The existing road would also be rerouted around the springs to stop the impact that motor vehicle use is currently causing to the riparian area associated with Buck Springs.

Approximately 1300 feet of wooden buck and pole exclosure fencing would be installed at HRSP#27. This exclosure would contain approximately 2 acres surrounding the spring, but would provide water available outside the exclosure for wild horses, burros and livestock.

A spring (HRSP#20) within the East Fork High Rock Canyon Wilderness Area would be fenced to protect the spring source from heavy wild horse grazing. It is estimated that approximately 1,000 feet of steel buck and pole style fencing would be constructed at HRSP#20 to enclose about 0.5 acres. A water trough would not be installed at the

spring. Water would flow outside of the exclosure during a short period during the spring of the year. Access for future maintenance will be conducted by foot or horse travel.

Construction of the exclosure fences would occur during 2006.

2.3. Alternative II -No Action

No developments would be constructed.

2.4. Alternatives Considered but Dropped from Detailed Analysis

2.4.1. Additional Restrictions on Visitor Use in High Rock Canyon

An alternative was considered whereby the High Rock Canyon road would be closed to motorized vehicles during the hottest part of the year (July through August each year). The closure would occur at the gates about 5 miles below Stevens Camp and at the mouth of the canyon. This would be in addition to the current vehicle closure in the canyon from January 31st through the second weekend in May.

The RMP increased the length of the original 1986 vehicle closure by an additional six weeks. RMP decisions also included closure of the canyon to rock climbing and required the designation of specific low impact areas for camping. The impact of those new RMP decisions and directions has not been evaluated as to their affects on wildlife and other resources in the canyon. Therefore this alternative is not being considered in additional detail.

2.4.2. Adjustment to Appropriate Management Levels or Herd Management Area Boundaries

An alternative was considered that would decrease the Appropriate Management Levels (AMLs) of the High Rock and/or Warm Springs Canyon Herd Management Areas (HMAs). The Warm Springs Canyon HMA was last gathered by the Winnemucca Field Office in December 2004. Currently, estimated wild horse and burro populations are within their established AML ranges (105 to175 horses and 14 to 24 burros) with a 2006 estimate of 139 horse and 21 burros. The High Rock HMA population is currently estimated at 482 horses, well above the AML range of 78 to 120 animals. The High Rock HMA is scheduled to be gathered in 2006 to the lower end of the AML range.

The Warm Springs Canyon HMA has been gathered six times since 1986. However, due to the free roaming nature of wild horses and burros from neighboring fenced and unfenced HMAs it has been difficult to achieve and maintain AML populations in this area. However, the Surprise and Winnemucca BLM Offices are currently working closely together to coordinate management actions such as census, gathers, and field monitoring across administrative boundaries, including two grazing allotments. This coordination

is essential to adequately maintain wild horse and burro populations within established AML ranges.

Once wild horse and burro AMLs are achieved, monitoring of resource conditions would provide data to reaffirm or reestablish AML numbers to achieve and maintain a thriving natural ecological balance and multiple-use relationship. Any adjustments to AML must be accomplished with sufficient utilization, trend, actual use, and seasonal production data through a reasoned interdisciplinary analysis and Environmental Assessment, including public involvement and appropriate coordination (4710 Handbook). Adjustments to AML are indicated if monitoring indicates wild horses or burros to be a causal factor in non-attainment of resource objectives. Both BLM Field Offices are currently collecting monitoring data in support of future AML or HMA reviews.

Additional scoping would be required so that publics and agencies interested in wild horse and burro related issues and management would be aware of any alternatives that propose changes in AMLs or HMAs pertaining to wild horse and burro populations. In addition, HMA boundary adjustments would require a land use plan amendment. Either option would require substantial time and BLM is seeking to respond to NDOW's request to address impacts of wild horses on springs in a timely manner.

2.4.3. Exclosure Construction on Additional Springs

In 2004 NDOW field reviewed 25 -30 springs in the vicinity of the two guzzler projects and identified some as needing improvement in vegetation and wildlife habitat conditions. Three of these springs are included for protection in Alternative I of this assessment. Since this spring assessment was completed, BLM has gathered wild horses in the Warm Springs Canyon HMA, modified the livestock grazing system on the Soldier Meadows allotment, made gathering excess wild horses from the High Rock HMA the 1st priority for 2006, and scheduled repair of the boundary fence between the two HMAs for before the gather in 2006. The cumulative impact of these actions has already or is likely to improve conditions some springs identified by NDOW. Ongoing monitoring of springs and associated meadows will aid BLM is identification of future spring protection projects and priorities. BLM will continue to coordinate with NDOW and other individuals, groups and agencies to develop future projects to achieve desired riparian conditions.

3. DESCRIPTION OF THE AFFECTED ENVIRONMENT

3.1. General Information

Only those resources, uses and mandatory critical elements related to the issues will be discussed in detail. Background material related to other resources is available in the Surprise Field Office files in Cedarville, CA and the Winnemucca Field Office in Winnemucca, NV. An overview of resources and uses of the High Rock Canyon area is contained in the BLM's 2003 Final Environmental Impact Statement and Proposed

Resource Management Plan for Black Rock Desert-High Rock Canyon Emigrant Trails National Conservation Area and Associated Land in Nevada (BLM 2003). Table 1 lists all Critical Elements, whether they are present and affected by the alternatives and references their location in the document. Table 2 lists other resources affected by the alternatives and references their location in the document.

3.2. Critical Elements

Table 1 lists the critical elements of the human environment whose review is mandated by law, regulation, or executive order. Those marked as not affected will not be impacted by the proposed action or the No Action Alternative, or are not present in the project area.

Table 1. Critical Elements Checklist

Critical Element	Present	Affected	EA Sections
Air Quality	Yes	No	
Area of Critical Environmental Concern (ACEC)	Yes	No	
Cultural Resources	Yes	Yes	3.2.1, 4.1.1, 4.2.1, 4.3.1
Environmental Justice	No	No	
Floodplains	No	No	
Invasive, Non-native Species	Yes	No	
Migratory Bird Species	Yes	Yes	3.2.2, 4.1.2, 4.2.2, 4.3.2
Native American Religious Concerns	No	No	
Prime or Unique Farmlands	No	No	
Threatened and Endangered Species	Yes	No	
Waste, Hazardous or Solid	No	No	
Water Quality (Surface and Ground)	Yes	Yes	3.2.3, 4.1.3, 4.2.3, 4.3.3
Wetlands and Riparian Zones	Yes	Yes	3.2.4, 4.1.4, 4.2.4, 4.3.4
Wild and Scenic Rivers	No	No	
Wilderness	Yes	Yes	3.2.5, 4.1.5, 4.2.5, 4.3.5

3.2.1. Cultural Resources

There is archaeological evidence that human occupation of the High Rock Canyon area dates back as far as 12,000 years ago. An intensification of use of the highlands started during the Middle Archaic, or roughly 6,500 years ago. In addition to hunting of big game animals, such as bighorn sheep and antelope, wild root crops such as biscuit root, bitterroot, and wild onion became increasingly important (Leach 1988).

Prehistoric archaeological sites associated with these uses that could be impacted by the proposed activities could include temporary base camps located

at or near upland springs and hunting-related sites at canyon rims, ridge tops, and saddles. Isolated artifacts and generalized lithic scatters may also be found. Euroamerican history of the High Rock Canyon area began with the explorations of Frémont during the winter of 1843-44. His explorations were followed with the establishment of the Applegate Trail in 1846. Permanent settlement of the region didn't start until the 1860s, with the establishment of cattle and sheep ranches. Historic archaeological sites associated with Euroamerican use of the project areas that could be impacted by the proposed activities are sheep herder camps or range improvements at springs.

3.2.2. Migratory Birds

Executive Order #13186 requires that migratory bird species considerations be included in federal actions. Neo-tropical migrant birds are bird species that migrate from the temperate portions of the continent to winter in the tropics of North and South America.

The migratory birds species most likely to be affected by any of the alternatives are species associated with sagebrush steppe communities and upland wet meadows including the greater sage-grouse, (*Centrocercus urophasianus*) sage thrasher (*Oreoscoptes montanus*), loggerhead shrike (*Lanius ludovicianus*), and sage sparrow (*Amphispiza belli*) (Lahonton Audubon Soc. 2005, Neel 1999). The thrasher, shrike and sparrow all nest in sagebrush or other shrubs in the sagebrush steppe communities. All are expected to be nesting or foraging in sagebrush areas within the analysis area. The sage-grouse will be discussed below under special status species.

3.2.3. Water Quality (Surface and Ground)

Water quality in the High Rock Canyon area has not been directly measured. However indirect indicators of water quality, primarily riparian vegetation conditions can be used to assess water quality. Water associated with the streams in High Rock Canyon, Mahogany Canyon and the East Fork of High Rock Canyon (Pole Canyon) is typical of healthy low flow streams in the northwestern Great Basin. Water quality is good during the winter and spring runoff period. During the hot portion of the year, flows are low with isolated pools supported by subsurface flows.

The upland springs outside the canyon have a wide range of water quality depending upon levels of past and ongoing disturbance. Based upon field observations, water quality at Buck Spring would likely be the highest of the three springs proposed for protection in Alternative II due to higher flows and the rocky nature of the drainage below the spring. The other two springs would be expected to have lower water quality due to concentrated wild horse use on the spring heads and in the man made ponds below one of the spring heads.

In 2004 and 2005, BLM and NDOW conducted field evaluations of water sources in the High Rock area. The evaluations revealed that a number of water

sources and associated meadows were receiving heavy grazing from wild horses and that some meadow systems did not appear to be achieving one or more Land Health Standards as required by the 2004 Resource Management Plan for the NCA (BLM 2004). Specifically, HRSP #20, HRSP #27 and Buck Springs had indicators of trampling at the spring sources. HRSP #27 and Buck Springs had good vegetative cover in 2005 following WHB gathers the previous winter. The HRSP #20 spring source was producing a minimal flow of water and was severely trampled in the fall of 2005 with a number of horses observed within 0.5 miles of the spring. Although minimum flow was observed, the presence of springsnails at this location indicates perennial flow.

3.2.4. Wetlands and Riparian Zones

Wetland and riparian situations are associated with two environmental settings in the High Rock Canyon area. The interrupted streams that flow in High Rock Canyon, Mahogany Canyon and Pole Canyon support narrow stringers of wet, semi-wet and dry meadow communities and clumped distribution of coyote and yellow willows. Riparian function assessments conducted by BLM within the past 5 years reveal properly functioning or functional at risk with an upward trend conditions. Reaches with a functional at risk rating are associated with the continued upstream progression of a number of head cuts that were started by past agricultural, grazing or vehicle use of the canyon. Livestock grazing and agricultural use within the canyon has been discontinued.

The second type of wetland riparian resources in the area is meadows associated with upland springs. These springs emerge to the surface above restrictive layers of rock. Spring meadows are generally small, less than an acre, and represent less than one percent of the upland landscape. Within the analysis area about 30 spring meadows have been photo documented by NDOW. Limited functional assessments have been conducted by BLM, primarily on the eastern portion of the analysis area but the conclusions of those studies are valid for the entire analysis area. Many of these sites have reduced vegetation cover. The primary factors in the analysis area that influences spring meadow conditions are annual precipitation amounts, year-long grazing by wild horses, intermittent livestock grazing, and structural water developments. The three spring meadows considered for additional levels of protection in Alternative II reflect this pattern. Buck Spring and HRSP #27 were rated as functional at risk in 2003. Visits in 2005 showed both spring meadows with good residual cover and probably upward trend. HRSP #20 was evaluated in 2005 and is considered functional at risk with no apparent trend. This spring is not meeting the land health standard for riparian condition.

Use by wild horses was evaluated in 2005 on meadows associated with each of the three springs during the summer or fall season. Median stubble height measurements at Buck Spring were 12.5 inches on rush species, 12 inches on bluegrass, and 9 inches on sedges. Ungrazed height measurements were 20, 14, and 23 inches respectfully.

Prior to the gather on the Warm Springs HMA in 2004, HRSP#27 had an estimated 4 inch stubble height on rush species and bluegrass associated with wild horse and burro use.

In October 2005 HRSP#20 had no vegetation at the spring source. This barren area continued downstream for about 30 feet. Below that was a 100 foot long semi-wet meadow dominated with annual hairgrass. Stubble height on this section had a median value of 10.8 inches. Below the hairgrass meadow was 200 feet of dry meadow dominated by Great Basin wildrye with a median stubble height of 21.6 inches.

3.2.5. Wilderness

The proposed action would affect a portion of the East Fork High Rock Canyon Wilderness Area. The Wilderness was designated by the Black Rock Desert High Rock Canyon Emigrant Trails Act of 2000.

The East Fork High Rock Canyon Wilderness consists of a large area of broad volcanic uplands dissected by the deeply cut drainages of High Rock and the East Fork of High Rock Canyons. Elevations in the Wilderness range from 4,900 to 6,600 feet. The main vegetation type is sagebrush, with willows and one small stand of aspens occurring in the canyons. The canyons are relatively well watered and support meadow complexes and other riparian vegetation. Remnants of early homesteads can be found in the East Fork of High Rock Canyon (Pole Canyon). Wildlife in the area includes California bighorn sheep, mule deer, pronghorn antelope, mountain lions, coyotes, and sage grouse. The canyons also provide outstanding habitat for nesting raptors. The Applegate-Lassen Emigrant Trail is located in High Rock Canyon which forms the western boundary for the area.

The Wilderness Act also mandates that wilderness areas be managed in such a manner as to maintain or enhance the values of naturalness, untrammeled and undeveloped character, and opportunities for solitude, opportunities for primitive or unconfined recreation, and any special features found in the areas. Descriptions of these values are found below;

- "Naturalness" is used to describe one aspect of wilderness and comes from the Wilderness Act which mandates that wilderness areas be "protected and managed as to preserve it's natural conditions". Naturalness refers to the ideal that wilderness ecological systems are substantially free of the effects of modern civilization.

- "Untrammeled" is used to describe the unhindered and unrestrained aspect of wilderness. The ideal is an area free from human control or manipulation.

- "Undeveloped" refers to the quality that wilderness areas are ideally without permanent improvements or human occupation. The majority of the East Fork High Rock Wilderness is undeveloped however, the area does contain 13 small livestock reservoirs, two windmills, 22 miles of fence, and 37 miles of old vehicle routes, that have now been closed and reclaimed. These developments were identified in the wilderness inventories of the area and did not preclude the area from being considered and eventually designated as wilderness. The presence of these existing structures and developments does have an impact on the undeveloped character of the wilderness.

- "Opportunities for Solitude or Primitive and Unconfined Recreation". Solitude is generally defined as the state of being alone or remote from society and civilization. Primitive recreation generally refers to travel or recreation by nonmotorized and nonmechanical means. It also encompasses reliance on personal skills to travel and camp in an area, rather than reliance on facilities and outside help. The Wilderness provides outstanding opportunities for both solitude and primitive recreation. The National Desert Trail is located along the western boundary of the Wilderness, and Pole Canyon provides good opportunities for day hikes, backpacking and horseback trips. Details on recreation use in the area can be found in the Recreation Section of this EA.

- "Special Features". Special features may be present in a wilderness area but are not required. As outlined in the Wilderness Act special features include ecological, geological, or other features of scientific, educational, scenic, or historical value. Several special features of the East Fork High Rock Canyon Wilderness that were specifically mentioned in the BRHR NCA Act of 2000. They include; historic inscriptions, evidence of early homesteading, prehistoric and historic Native American sites, sensitive plants, a broad representation of Great Basin land forms and plant and animal species including bighorn sheep, and a largely untouched emigrant trail view shed.

3.3. Other Affected Resources

Table 2. Other Affected Resources

Resource	Present	Affected	EA Sections
Recreation	Yes	Yes	3.3.1, 4.1.6, 4.2.6, 4.3.6
Wildlife (including Special Status Species)	Yes	Yes	3.3.2, 4.1.7, 4.2.7, 4.3.7
Visual Resources	Yes	Yes	3.3.3, 4.1.8, 4.2.8, 4.3.8
Wild Horse and Burro	Yes	Yes	3.3.4, 4.1.9, 4.2.9, 4.3.9
Livestock Grazing	Yes	Yes	3.3.5, 4.1.10, 4.2.10, 4,3.10

3.3.1. Recreation

The High Rock Canyon area is a popular destination for the more adventurous recreation users in the NCA. Recreation use of High Rock Canyon and adjacent canyons consists primarily of dispersed recreation activities, but also includes limited commercial recreation use that is managed under Special Recreation Permits. The primary uses include vehicle tours through the canyons along portions of the emigrant trail outside designated wilderness, dispersed hunting use, camping, rock-hounding, hiking, and wilderness exploration. Several commercial outfitters and organized groups also use the canyons for hunting and vehicle tours. High Rock Canyon and the surrounding wilderness complex are managed for primitive recreation experiences and minimal human alterations to visual resources.

Visitor Use

Visitor use data collected over the last ten years indicates an increase in visitation within the main canyon. BLM records indicate that the recreational use occurs in the canyons from the opening of the High Rock Canyon road in mid-May through the chukar hunt (the end of January). Two periods during the year have distinctly elevated use: 1) the spring and early summer when vegetation is blooming and the days are relatively cool; 2) the late summer and fall hunting seasons. Traffic counter data indicate that less than a third of visitors do not travel through the entire canyon but enter through the bottom or top and return the same way, with the majority of use occurring in the bottom four miles of the canyon. Difficult access to the canyon continues to limit visitation and BLM has no plans to improve access to or through the canyon.

The estimated visitor use that occurred prior to the designation (1990 -2000) was around 1000-1200 vehicles a year. Data collected in 2003-2005 showed 1,897 and 1,541 vehicles using the canyon during the 2004 and 2005 visitor use years respectively. Vehicle counts were about 20% less during 2005 than observed in 2004. Using 20% variability and an estimated 1.5 persons per vehicle, a range of 1,518 to 2,276 vehicles are estimated to have used the canyon in 2004, or about 2,277 to 3,414 visitors. In 2005 use was estimated to be 1,233 to 1,849 vehicles which correspond to 1,850 to 2,774 visitors. Traffic counter data shows that about 50% of vehicles that entered the upper portion of the canyon returned the same way, 70% of vehicles that entered the lower canyon returned the same way and that about 23% of the total number vehicles that enter the canyon from either end, or about 358 vehicles in 2004 and 295 vehicles in 2005, traveled all the way through the canyon.

Nevada is one of the fastest growing states in the country. Population growth from 1980 to 2000 was 66%. This increase in population leads to increased use of the public lands. In 2002, 235 million outdoor recreation visitor days occurred in Nevada. By 2010 and estimated 277 million outdoor recreation visitor days are projected for the state, an increase of 18% (Deloney 2004). The potential change in recreational use in the High Rock area is unknown.

Camping Use
Dispersed camping occurs within the canyon but is somewhat limited due to the narrow nature of the canyon. Eleven user established campsites have been documented within the canyon bottom. Very little backcountry camping is known to occur off of the primary travel corridor.

Hunting Use
Opportunities for hunting big game (mule deer, pronghorn antelope and bighorn sheep) and upland game bird species are a primary source of visitation to the canyon. The actual amount of use varies from year to year depending on wildlife populations. Hunting is generally conducted in small groups of one to three people. However, chukar hunting groups have been observed in larger numbers. While big game tags remain fairly constant over time, fluctuations in chukar populations results in highly variable numbers of hunters from year to year. Chukar hunters commonly use dogs to pursue their quarry. Bighorn hunting in NDOW Unit 012 occurs yearly with the issuance of less than 10 tags.

Hiking Use
The High Rock Area provides excellent opportunities for primitive recreation such as hiking, backpacking, horseback riding, wildlife viewing and nature study. The National Desert Trail, East Fork High Rock Canyon, Mahogany Creek and another unnamed canyon are the biggest attractions for hikers. The majority of the hiking use on the Desert Trail occurs along the High Rock Canyon Road. The overall use associated with hiking and backpacking is estimated to be less than 100 user days a year in the High Rock area.

Commercial and Organized Recreation Uses
Commercial users of High Rock Canyon include group tours of the emigrant trail and hunting outfitters and guides. There are currently over 80 outfitters statewide who compete for clients participanting in the NDOW 012 hunts. While the actual number of outfitters who use the area may change from year to year, the overall visitation resulting from this use is expected to remain constant relative to the number of big game tags issued. Commercial and organized group uses along the emigrant trail are also popular activities. Currently two commercial permits are issued annually for vehicle tours and several historic trail organizations and four-wheel drive clubs are known to utilize the area. Permitted groups are discouraged from camping in the canyon.

Proposed Recreation Management Actions
The RMP for the NCA included decisions to restrict recreational use in High Rock Canyon to mitigate potential impacts to bighorn sheep from recreation use. The impacts related to these actions are yet unknown, but they are expected to alleviate the potential for human caused stress to bighorn and other wildlife species in the canyon.

These restrictions include:

- The canyon is now closed to motor vehicles from about January 31st to the second weekend in May, approximately 40% of the year. Overnight camping will only be allowed in designated sites in High Rock Canyon. Approximately 4-5 of the documented sites will be designated for continued use. Campsites that are currently located near water will be closed and restored to natural conditions.

- Rock Climbing is prohibited within the High Rock Canyon ACEC to prevent disturbance to bighorn sheep and raptors as well as minimize impacts to other visitors to historic sites at the base of the highest cliffs.

3.3.2. Wildlife (including Special Status Species)

Terrestrial wildlife resources within the East Fork High Rock Canyon Wilderness Area are typical of much of the Northern Great Basin. The analysis area for this assessment will also include portions of High Rock Canyon west of the wilderness area and areas east of the wilderness area within the Soldier Meadows allotment.

This section will be divided into two sections covering priority species and special status species. Where riparian areas are referenced, they include meadows, streambank, and spring vegetative communities.

3.3.2.1. Priority Species

Priority wildlife species for the analysis area include pronghorn antelope and California bighorn sheep. Greater sage-grouse are considered in the Special Status Species section below. These species were chosen because they are mobile and expected to respond in a relatively predictable manner to the actions proposed in the alternatives. There are many other wildlife species that occupy habitats within the area including mule deer, migratory bird species, raptors, predators, small mammals, reptiles, amphibians, and small game species. However, the priority species identified above are considered good indicator species for the area and wildlife habitats affected by the alternatives.

3.3.2.2. Pronghorn Antelope (*Antilocapra americana*)

The pronghorn antelope is a relatively common ungulate of the sagebrush steppe zone within the Great Basin. Pronghorns are found on low, rolling topography primarily on slopes below 30% with sagebrush heights of about 0.5 meter (Kindschy, Sundstrom and Yoakum, 1982; O'Gara and Yoakum, 2004). Pronghorn require free water and will generally be found within 5 km of water (Sundstrom, 1986). Pronghorn also make extensive use of meadows associated with upland springs, as these locations often provide the only green forage during the hot season.

Pronghorn antelope are widely distributed on the open portions of Management Area 012 where they are yearlong residents within the sagebrush habitats. The pronghorn habitat within the High Rock area was rated using the method described in Kindschy, Sundstrom and Yoakum (1982). The rating yielded a score of 78 % of optimum for summer range and 77 % for winter range and revealed that the limiting factor is percent cover of forbs.

NDOW data for 2001 to 2003 indicate that pronghorn populations within the Unit 012-014, which includes all of the analysis area, has been healthy based upon fawn production of greater than 30 fawns per 100 does (NDOW, 2001, 2002 and 2003). Northern Washoe and western Humboldt counties showed increasing populations each year during the 1999 to 2003 period and kidding ratios improved an average of 25% during the same period in spite of drought conditions observed during this period (NDOW, 2003).

3.3.2.3. Bighorn sheep (*Ovis canadensis*)

Bighorn sheep, also known as "rimrock sheep" and "lava beds bighorn" historically inhabited northern Nevada, large portions of the Sierra Nevada Mountains in California, southern Oregon, western Idaho, east of the Coast Ranges in Washington and northward into south-central British Columbia (Cowan, 1940; Buechner, 1960). Until recently these sheep were considered the California subspecies (*0vis canadensis californ*ia). However Wehausen and Ramey (2000) assigned the original sheep that occupied NW Nevada to desert bighorn (*O. c. nelsoni*). These sheep were extirpated by 1940 and the sheep that currently occupy the region are based upon sheep transplanted from British Columbia which Wehausen and Ramey now call Rocky Mountain bighorn (*O. c. canadensis*).

Regionally, bighorn occupied an area from the north end of McGee Mountain south to Idaho Canyon and along the breaks over Summit Lake Mountain to Little High Rock Canyon and south along the Calicos. California bighorn remains or other evidence of bighorn sheep have been found in northwestern Nevada on the Pine Forest, Jackson Mountains, and Badger Mountain ranges. Bighorn populations disappeared in northwestern Nevada by 1940 due to combination of factors including habitat loss, over harvest, disease and other human related causes (USFWS, 1963).

Existing populations are the result of numerous NDOW-initiated reintroductions and supplemental releases in northwestern Nevada that began in the 1960s and are still ongoing. Sheep were first reintroduced into the NDOW 012 Management Unit in 1989 (Map 1, Appendix A). During the winter of 1996, 17 bighorn sheep, captured from British

Columbia, were released in High Rock Canyon. The population was augmented in 1997 with an additional 17 sheep from Humboldt County, NV. In 1999 an additional 23 sheep were released into Little High Rock Canyon. The total Unit 012 population is estimated to be about 190 sheep (NDOW, 2004a). The NDOW survey data for the Unit 012 population shows excellent fall recruitment of lambs, which is indicative of bighorn sheep populations that are healthy and viable (NDOW; 2002, 2003b and 2004b). NDOW describes the population increase in the Unit as "spectacular" (NDOW, 2002) and "has sharply increased in numbers" (NDOW, 2003b and 2004b). NDOW captured and removed an estimated 20 sheep from Unit 012, including sheep from the analysis area in December 2004 to augment other populations in Nevada (NDOW 2005a). In 2005 NDOW (2005a) estimated the population at 170 animals citing the removal of sheep in 2004 as the cause of the drop from the previous high of 190 sheep.

In 2005 NDOW (2005b) estimated that the bighorn population in the High Rock Canyon area at 50 sheep, or 30% of the 012 unit population and the High Rock complex, including Little High Rock Canyon, at 95 sheep, or 56% of the 012 population. They also feel that the High Rock area population is not growing at a rate consistent with the potential of the area. NDOW also estimated potential sheep populations in the entire High Rock complex at 150 to 250 sheep. They attribute the lack of adequate growth in the High Rock bighorn population to competition for water and forage with wild horses and increased recreational us in High Rock Canyon. In 2004 NDOW mapped the area occupied by bighorn sheep in the state. The distribution for the High Rock area is shown on Map 5 (Appendix A).

NDOW (2005b) also provided two potential 012 bighorn populations in 10 years (2016) based upon present rates of lamb recruitment to ideal rates. The assumption NDOW used is that the present rate of lamb recruitment is being depressed by wild horse and burro impacts on key water sources and loss of habitat due to increased recreational use. Their models predict at present growth rates the 012 bighorn population would be 270 sheep in 2016 and with improved growth rates, the population would be 437 sheep a difference of 167 sheep.

NDOW began issuing hunt permits for Unit 012 in 1997 and through 2003 had issued a total of 19 tags for the harvest of bighorn rams. Eighteen rams were harvested by hunters from 1997 to 2003 (NDOW, 2003 and 2004b).

NDOW also requested approval in 2004 to capture and remove bighorn sheep from the East Fork High Rock Canyon and Calico Mountains Wilderness Areas. This action was addressed in EA #CA-370-05-01.

The capture was authorized and 20 bighorn sheep were captured and removed from within Unit 012 in December of 2004. The capture was implemented to primarily to support reintroductions in other areas but also to reduce bighorn numbers to minimize disease risk and lessen competition occurring on degraded water sources.

Bighorn sheep occupy mountainous areas with extensive areas dominated by rock outcrops, rim rocks and cliffs that serve as escape cover (Van Dyke et al, 1986). Bighorn diets are roughly 60 percent grasses, 30 forbs and 10 shrubs (Yoakum, 1964). They are dependant upon free water, especially when forage plants have cured (Van Dyke et al, 1986).

Bighorn are also associated with areas free of human related disturbances (Van Dyke et al., 1986; King, 1985). A good overview of the habitat requirements of bighorn sheep can be found in Van Dyke et al (1986). Additional information related to specific habitat factors within the High Rock area will be discussed in more detail below.

Escape Cover:

Escape cover is associated with rugged terrain. Rugged terrain includes cliffs, rimrocks, rock outcrops, steep slopes, talus slopes, terraces and ledges. Areas of continuous tall cliffs are not desirable.

Areas of smooth, although steep, terrain is less valuable to bighorn that broken country (Bleich et al. 1992, Van Dyke et al.., 1986). Larger patches of escape terrain are more valuable to bighorn sheep than small patches (McKinney et al. 2003). Areas of escape terrain were calculated for the 012 Unit using the procedures described in Appendix E. The escape terrain within the Unit 012 includes 59,992 acres which corresponds to 8.8 percent of the management unit.

Areas of feeding, water sources and bedding are commonly adjacent to escape terrain. For this discussion a 400 meter buffer was chosen to establish high probability areas for potential bighorn use within the 012 Unit. Based upon a 400m escape cover buffer described above, potential bighorn habitat within the unit is 224,864 acres which corresponds to 32.8 percent of Unit 012. This area is shown on Map 3a (Appendix A) as potential bighorn habitat.

A 400m buffer was selected based upon the work of Hansen (1982) at Hell Creek on the Sheldon National Wildlife Refuge about 20 miles north of the analysis area. The Hell Creek area contains similar terrain and vegetation types to the High Rock Canyon area. Hansen estimated the percentage of time that bighorn spent at various distances from escape terrain. He found that on a yearlong basis from 23,190

observations, only 4 percent of the time bighorn spent was at distances greater than 400 meters from escape terrain. During fall and winter, between 8.2 and 9.2 percent respectively of bighorns' time was spent at distances greater than 400 meters away from escape terrain. No observations were made of bighorn at distances greater than 500 meters from escape terrain. The importance of escape terrain to bighorn sheep is reflected in an observation of Geist et al. (1985) that heart rates in bighorn increase exponentially with increasing distance from escape terrain.

Water:

Bighorn sheep appear to require free water, particularly at times of the year when the water content of forage plants is low. Bighorn spent most of their time within one mile of water, but may occasionally travel further (Van Dyke et al., 1986). Bighorn sheep on the Sheldon National Wildlife Refuge spent over 90 percent of their time within 1.0 kilometer from water sources year round (Hansen, 1982). NDOW (2005c) recommended methods that reference bighorn crucial habitat within 2 miles of water sources. Bighorn will use artificial waters in or adjacent to suitable escape cover (Campbell and Remington 1970).

Waters sources within the analysis area were identified from past inventories and USGS 1:24,000 topographic maps. A number of water sources that were not well inventoried were visited in September 2004. Water sources, both streams and springs, that have a high probability of providing dependable water during the late summer and fall were selected and buffered with a one mile and two miles radius.

High probability bighorn habitat within 1 mile of dependable water sources corresponds to 111,703 acres or 16.3 percent of the 012 unit (Map 3a, Appendix A). With a two mile water buffer the high probability bighorn habitat increases to 185,741 acres or 27.1 % of the unit (Map 3b, Appendix A).

During the late summer and fall of 2004 BLM and NDOW looked at a number of spring sources within the analysis area for their ability to provide water during the driest part of a dry year and for the quantity and quality of the water for use by wildlife. Both agencies observed that springs in or adjacent to open, rolling terrain used by wild horses were often heavily impacted by heavy wild horse use. Impacts included removal of wetland vegetation surrounding spring outflows, physical trampling of spring sources into muddy holes, and in one instance a wild horse physically hazing a bighorn sheep away from a spring source (NDOW 2005c). Other springs associated with steep, rocky terrain or physically limiting to horse impacts were in good condition.

Development of artificial water sources for bighorn sheep and other wildlife species has generated controversy over the past decade, particularly in the American southwest. Broyles (1995) challenged the need for artificial waters in support of bighorn populations stating that artificial waters may inflate bighorn populations above the actual carrying capacity and also inflate predator populations around the water sources. Rosenstock et al. (1999) provides an overview of the issue, a summary of applicable studies and makes management recommendations on when artificial water sources may be an appropriate choice. Any artificial water sources should: 1) have a solid biological basis, 2) reflect clear management objectives, and 3) include formal cost/benefit analysis.

Human Disturbance:

Bighorn sheep require areas free of human disturbance (King, 1985). The High Rock Canyon road allows humans to access areas of bighorn escape terrain and water sources. A good overview of human disturbance related to bighorn sheep can be found in King (1985). Measurement of bighorn reaction to humans in their habitat has been accomplished through studies of behavioral responses and changes in heart rate of bighorn sheep. Both types of studies have shown that bighorn sheep exhibit a wide range of responses to humans in their habitat and that bighorn sheep regularly exposed to humans become habituated to humans (Geist et al. 1985; King 1985, McCarty and Bailery, 1994, Papouchis et al. 2001; King and Workman 1986). Physiological studies indicate that bighorn sheep have negative immune system function when exposed to protracted stress. Some immune system function returned to normal after a month of stress indicating bighorn can adjust to ongoing stress (Beldon et al. 1990).

The location of humans within bighorn habitat has also been shown to be a key variable in bighorn response. Humans in vehicles, including mountain bikes, on roads have less impact on bighorns that hikers at the same level or above bighorn sheep (Hicks and Elder, 1979 ; the presence of dogs with humans elicts an even greater reponse (MacArthur et al. 1979; MacArthur et al. 1982; Geist et al. 1985; Miller and Smith, 1985).

The response of bighorn sheep to human at various distances has also been studied extensively. Studies have identified a wide range of variability in the distance that humans can approach bighorn before there is a measurable behavioral or heart rate response. However a number of studies have identified 200 meters as a threshold for human activities influencing bighorn heart rates or behavior (MacArthur et al. 1979; MacArthur et al. 1982; Geist et al. 1985; Sayre et al. 2002).

The number of humans using bighorn habitat is also an important factor. Where human use very high, bighorn have abandoned what appears to be otherwise suitable habitat (King, 1982; Harris, 1992). Other studies have found continued sheep use adjacent to areas of high levels of human use (Hamilton, 1982; Papouchis et al., 2001; Jorgensen, 1974, King, 1985). Papouchis et al. (2001) reported that bighorn in high visitor use areas were found further from roads and used 15 percent less of the available habitat when compared to low human use areas. The human use in the High Rock area is much closer to the "low visitor use areas" than the "high visitor use areas". Smith et al. (1991) recommended exclusion of 100 meters or 150 meters of areas receiving low to moderate and high levels of visitor use respectively from a model of suitable bighorn habitat. High visitor use was defined as greater than 500 visitors per year. However several studies that tested the Smith model found that bighorn were not sensitive to visitor use except in extremely high use areas and instead recommended 150 meter buffers for area where human disturbance was severe enough to elicit bighorn avoidance (Johnson and Swift 2000, Zeigenfuss et al. 2000).

The area where human uses reduces bighorn sheep use within the 012 unit was considered those areas within 200 meters of roads receiving more than 2,000 vehicles or visitor use days per year. This is twice the minimum distance that bighorn were displaced in human-bighorn interaction studies (Light 1971, Smith et al. 1991), twice the distance excluded from a habitat suitability model developed by Krausman (2004) and greater than the distance recommended by Johnson and Swift 2000 and Zeigenfuss et al. 2000).

The potential for bighorn sheep to be disturbed by human visitors to the High Rock Canyon area was recognized long before bighorn were reintroduced. The 1986 High Rock Canyon Area of Critical Environmental Concern (ACEC) Plan included a closure of the High Rock Canyon Road from February 15th thought March 31st each year to reduce disturbance to nesting raptors and bighorn sheep lambing. The 2004 RMP for the NCA extended this closure to the period after chukar hunting season (about the end of January until the 2nd weekend in May. The RMP also closes the canyon to rock climbing and provides for the designation of camping sites in low impact areas.

Total Available Habitat:

Areas within 400 meters of escape terrain, 1 or 2 miles of dependable waters, and outside a 200 meter buffer of roads receiving more than 2,000 visitor days per year were combined into a single layer to indicate the areas of highest probability of bighorn sheep use. For the 1 mile water buffer, this area corresponds to 108,862 acres of suitable bighorn sheep habitat (Map 3a, Appendix A). For the 2 mile water buffer, this

area corresponds to 181,332 acres of suitable bighorn sheep habitat (Map 3b, Appendix A). These figures represent 46% (1 mile from water) and 77% (2 miles from water) of the 235,169 acres of bighorn sheep occupancy in Unit 012 as identified by NDOW in 2004.

3.3.2.4. Special Status Terrestrial Species

Special status species that occur within the analysis area include those terrestrial species listed or proposed for listing under the Endangered Species, species designated by the USFWS and candidates for listing and species contained in the BLM's Nevada Species of Concern list.

3.3.2.5. Pygmy rabbit (*Brachylagus idahoensis*)

This species is the smallest North American rabbit and sagebrush obligate (McAllister, 1995). The rabbit uses tall, dense stands of big sagebrush, primarily basin big sagebrush, with deep, friable soils typically loamy in texture (Orr, 1940). The Pygmy rabbit mates in early spring and summer. Its primary food is sagebrush, which makes up to 98% of its winter diet. Grasses are important during the summer, comprising as much as 30-40% of its diet (Green and Flinders, 1980).

Potential sites within the High Rock area include the edges of floodplains in the upper portions of watersheds and degraded floodplains at lower elevation where channel down-cutting has allowed for the invasion of basin big sagebrush into sites that were formerly occupied by wet and semi-wet meadows. These conditions occur in High Rock and Pole Canyons. There is a low probability of pygmy rabbit occurrence on upland sites each of High Rock and Pole Canyons based upon the shallow, rocky nature of the soils. Limited inventory was conducted in 2004 by BLM with confirmed sightings of pygmy rabbits and their burrows in upper High Rock Canyon. No rabbits were found in High Rock Canyon below Stevens Camp.

3.3.2.6. Greater sage-grouse (*Centrocercus urophasianus*)

This species is a common large bird of the sagebrush zone. The species is also on the BLM Nevada species of concern list.

Sage-grouse are sagebrush obligates and require large areas of contiguous sagebrush communities. Sagebrush is the primary nesting cover and for much of the year sagebrush leaves form the major component of their diet. This species is highly dependent upon the presence of several species and subspecies of shrubs, notably Wyoming, mountain, and basin big sagebrushes. Other species such as low and Lahontan sagebrush are also important. These species contribute most of the sagebrush cover in the High Rock area.

A good overview of the population biology and habitat requirements of sage-grouse can be found in Connelly et al. (2000). The following material is derived from that source. A basic requirement of nesting cover is concealment of the sage-grouse hen and her nest. Quality nest sites offer shelter from above by branches, good growth of understory grasses, and sagebrush within 70 cm of the nest.

Nesting tends to occur at mid-elevation habitats that support adequate shrubby and herbaceous plant cover. Spring, summer, and fall ranges with a good compliment of native grasses and forbs are associated with productive sage grouse habitat. During the winter, sage grouse forage almost exclusively on one or more sagebrush species.

Hens with broods require well-sheltered areas that provide protection from predators and the weather. Proximity to preferred forbs and insects is important for hen and chick nutrition. Chicks have limited mobility, so suitable food such as forbs and insects must be readily available. As plants mature and dry, broods move to areas still supporting succulent vegetation, especially native meadows and high elevation drainages. These areas are important as a source of forbs, insects, and free water. Adult and juvenile birds congregate in these wetter areas during late summer and early fall.

As these areas dry, sage grouse consumption of sagebrush increases and the grouse move to areas with sagebrush that is taller than the snow for the winter season. During the winter, sage-grouse feed almost entirely on sagebrush leaves. Typical winter ranges are large expanses of sagebrush (>10% canopy cover) with an average height of 25 cm. This association with sagebrush stands typically begins in September and continues through the breeding season.

The High Rock area contains about 100,000 acres of potential sage-grouse habitat, as well as 6 known leks (communal breeding sites). Recent BLM habitat classifications have been completed as part of the Nevada sage-grouse conservation planning effort. The classifications indicate that about 59 percent of the habitat within the analysis area contain the required sage-grouse habitat components, 41 percent have adequate sagebrush cover but are lacking in appropriate amounts of herbaceous cover and 3 percent do have not potential for sage-grouse habitat The deep canyons associated with High Rock and areas of badlands are not considered sage-grouse habitat.

Little specific information is known about potential nesting habitat within the analysis area but based upon the presence of leks nesting does occur. Drawing from vegetation inventories in similar elevation, soils and topography west of the analysis area, it is expected that some

portions of the analysis area contains all the desirable habitat traits associated with high quality nesting habitats. Summer and brooding habitats are somewhat limited in the analysis area. Limited water, poor meadow conditions, relatively low elevations, few north facing slopes and relatively shallow, rocky soils result in few areas with the potential to produce succulent forbs required by sage-grouse broods during the summer months. Winter conditions are considered adequate with continuous sagebrush cover and low snow depths.

3.3.3. Visual Resources

The project area includes lands within both VRM Class I and Class II zones. The proposal to construct the two big game guzzlers and one of the exclosures proposed under Alternative II would occur within designated wilderness which is managed as a VRM Class I. The objective for Zone I management is to preserve the existing character of the landscape. The level of change to the characteristic landscape should be very low and must not attract attention.

Two of the existing spring sites (Buck Springs and HRSP#27) where exclosures would be constructed under Alternative II are located within VRM Class II. The objective for Zone II management is to retain the existing character of the landscape. The level of change to the existing landscape should be low.

The existing landscape around all of the proposed projects (guzzlers and exclosure fences) is characterized by rolling sage covered uplands with numerous basalt rim rocks within the viewshed. Deeply incised canyons and higher peaks can be seen in the distance from all of the proposed guzzler and exclosure sites.

3.3.4. Wild Horse and Burro

BLM is responsible for the protection and management of wild horses and burros (WH&Bs) on public lands as designated by the Wild and Free-Roaming Horse and Burro Act of 1971 (PL 92-195) as amended and with all applicable regulations found in 43 CFR (Code of Federal Regulations) 4700 and policies. A key provision of the law is to protect and manage these WH&Bs in a manner designed to achieve and maintain a thriving natural ecological balance and multiple-use relationship. A key regulation is to manage as self-sustaining populations of healthy animals in balance with other uses and the productive capacity of their habitat (CFR 4700.0-6). The appropriate management level (AML) is the number of animals determined through a Multiple Use Decision to be consistent with the objectives of achieving and maintaining healthy populations and a thriving natural ecological balance and multiple-use relationship in a Herd Management Area (HMA).

The area affected by the alternatives includes portions of two HMAs (Map 4, Appendix A). One HMA is managed by the Winnemucca BLM Field Office (Warm Springs Canyon) while the other, High Rock is managed by the Surprise

BLM Field Office. Wild horses and burros are managed in the Warm Springs Canyon HMA, while only wild horses are managed in the High Rock HMA. BLM establishes an AML range for each HMA consistent with the ability of the HMA to support wild horses and burros and other desired resources and uses. Information regarding each HMA and associated AML is contained in Table 3. Additionally the High Rock HMA is divided into two home ranges, west and east of High Rock. The portion of the AML allocated for the east of High Rock home range is 30 to 40 horses.

The two HMA are divided by a barbed-wire fence which historically has been in poor repair. Horses are regularly observed to pass freely between the two HMAs on a daily and seasonal basis. Inventories by BLM wild horse specialists indicate that some horses summer in the Warm Springs HMA and winter in the High Rock HMA.

When WH&B populations exceed the upper AML range and monitoring data supports the findings of excess animals, excess animals are gathered and removed to the lower AML range. The lower AML range is a function of the estimated annual grow rate over a gather cycle of four years. At this level, it is estimated to take four years until numbers exceed the upper AML range. The current population estimates and dates of last gathers are shown in Table 3 for each of the HMAs within the analysis area.

Table 3: Herd Management Areas

HMA	AML Range	2006 Population Estimate	Last Gather
High Rock	78-120	482	July 2001
Warm Springs Canyon	105-175H 14-24B	139 H 21 B	Dec 2004

Wild horse habitat is rolling terrain with slopes generally less than 30%, containing stands of grasses, and within several miles of water. About 85% of the High Rock area meets these criteria. Wild horses are successful in their use of this potential habitat in northwestern Nevada; BLM census data consistently shows wild horse population increases of 15 to 20% per year.

The High Rock HMA was last gathered in 2001 and is planned for gather in 2006. The Warm Spring Canyon HMA was gathered in December 2004 with 302 wild horses removed. Fertility control was administered to all release mares. Fertility control application is expected to reduce the fecundity of mares in 2006, 2007, and 2008 which should reduce the annual rate of population growth during this period.

In order to maintain wild horses in both HMAs within the AML range, gathers must be conducted at 3 to 4 year intervals

3.3.5. Livestock Grazing

There are two livestock grazing allotments within the area affected by the alternatives. The Massacre Mountain allotment includes the High Rock Canyon area and benches both east and west of the canyon. The High Rock Canyon portion of the allotment is closed to scheduled livestock grazing and no permitted grazing has occurred for more than 10 years.

The portion of the Soldier Meadows allotment associated with the alternatives in this document is within the Warm Springs use area. The use area encompasses about 55,700 acres and is currently authorized for cattle grazing for three months during the late spring early summer (344 head, 1,023 AUMs) alternating with a two month season during the late summer (344 head, 690 AUMs). The two allotments are shown on Map 4 (Appendix A). Additional information on the Soldier Meadows allotment and the grazing strategy are contained in Soldier Meadows Multiple Use Management EA (BLM, 2003b).

4. ENVIRONMENTAL CONSEQUENCES

4.1. Environmental Consequences of Proposed Action –NDOW Guzzlers

4.1.1. Cultural Resources

The two proposed guzzler sites were inventoried for cultural resources (BLM report CR2-2920[P]). No cultural resources were found at either site, and guzzler installation would have no effect on cultural resources.

4.1.2. Migratory Bird Species

Construction of two guzzlers east of the East Fork High Rock Canyon would have few impacts on nesting or foraging sage thrashers, loggerhead shrikes or sage sparrows. The guzzler sites would result in the long-term loss of about two acres of sagebrush habitats. The creation of a new water source, and additional perches associated with the fence and the guzzler apron structure may locally change bird species composition on a much larger area around each guzzler. This change is likely to increase competition for nest sites and forage and the potential for predation on an area that is a fraction of a percent of the entire analysis area. At most this would affect a few pairs of breeding birds.

4.1.3. Water Quality (Surface)

Guzzlers collect and store water in buried tanks. During the dry season as water is consumed by wildlife and lost due to evaporation from the exposed drinker water quality has been postulated to decline (Broyles, 1995). Rosenstock *et al*. (2005) evaluated natural and artificial wildlife waters in the southwestern deserts for 21 chemical constituents and found no significant differences between water quality in natural and artificial sources.

Water quality associated with heavily grazed natural springs would continue to be reduced from potential due to concentrated use by wild horses in the immediate vicinity of these springs.

4.1.4. Wetlands and Riparian Zones

Implementation of the proposed action would have no impact on wetlands and riparian zones. However the gathers of wild horses in 2005 and planned for 2006 would decrease wild horse use in the upland areas east of High Rock and Pole Canyons. This decrease should lead to improvement in the amount of residual meadow vegetation left on these sites. However, due to the small size of the upland meadows, grazing by wild horses would still be expected to result in heavy grazing each year during the spring, summer and fall on some sites. As horse numbers increase this grazing intensity would also increase. The net result would be little change in upland riparian conditions. HRSP #20 would not meet the riparian land health standard.

4.1.5. Wilderness

Specific impacts from the proposed action to the wilderness characteristics of naturalness, untrammeled and undeveloped character, opportunities for solitude and primitive recreation and special features are found below. Additional impacts to the wilderness character of the area can be found in Appendix B.

4.1.5.1. Naturalness, Untrammeled and Undeveloped Character

The guzzlers would directly impact a total of about two acres of the naturalness in the Wilderness Area. Vegetation would be removed and soil would be excavated within the foot print of the developments and the developments themselves would be an obvious impact to the appearance of naturalness in the short distance viewshed (approximately 95 acres).

The developments could also potentially be a beneficial impact to naturalness by potentially mitigating impacts that may be occurring from increasing recreational use and wild horses to the bighorn sheep in the area.

The construction of water developments would impact the untrammeled character of the area by artificially changing the amount and location of water in an area where water is not naturally available.

The proposal would impact the undeveloped character of the wilderness by adding structures in two portions of the wilderness that presently do not contain human developments.

4.1.5.2. Opportunities for Solitude/Primitive or Unconfined Recreation

Opportunities for solitude would be impacted during the construction of the guzzlers by the sounds and sights associated with the possible use of helicopters, work crews, explosives, and motorized equipment. The crews

and helicopter use would probably be visible from many areas within the adjacent Wilderness and the sound from the construction would carry for long distances. However these impacts would be relatively short in duration, about one week and would be likely to affect less than 5 visitors.

The developments would impact the visitor's sense of being in a remote area away from the signs of civilization on about 95 acres of the Wilderness. This impact would vary among visitors, some would see it as a significant impact to the primitive recreation experience, and other visitors would not. However based upon the projections of recreational use this would affect fewer than 5 visitors per year.

Use of helicopters for major maintenance would also impact the opportunities for solitude in the area. However, it is anticipated that major maintenance activities would generally only be required once every ten years.

Observing native bighorn sheep in the Wilderness Area generally adds to a visitor's sense of being in a remote place and adds to the primitive recreation experience. However, this opportunity currently exists in the Wilderness and it is not clear as to whether that the construction of additional water sources is necessary to maintain this opportunity.

4.1.5.3. Special Features

Potential impacts to bighorn sheep can be found in the wildlife section. No impacts would occur to any other Special Features.

4.1.6. Recreation

Recreation opportunities or users in the High Rock Canyon Complex would not be impacted by the proposed water development, with the exception of some backcountry users. The overall number of hunting opportunities in Nevada is limited by tag numbers, which is decided by State wildlife management officials. This project is not expected to increase sheep habitat to an extent that would provide increased hunting or wildlife viewing opportunities. Big game hunting and viewing opportunities would be expected to remain constant.

The proposed water developments could have impacts to primitive recreation users as described in the Wilderness section.

4.1.7. Wildlife (including Special Status Species)

4.1.7.1. Priority Species

Pronghorn Antelope

Construction of two guzzlers would increase the availability of summer and fall water for pronghorn antelope east of High Rock Canyon. This would allow the existing population of antelope to

better utilize forage during that time of the year in areas they currently utilize only during the spring. During the summer and fall periods the forage quality of forbs is low and sagebrush, the primary food during the fall, is abundant in the analysis area.

Addition of the two new wildlife waters would not change the overall quality of antelope habitat within the analysis area. The 78% and 77% of optimum scores for summer and winter habitat respectively, would not change. Additionally the limiting factor for antelope population during both seasons, the percent cover of forbs, would not change. Therefore, no impact on herd health or population levels would be expected. Some spring meadows, important to summering antelope, would remain is degraded condition.

California Bighorn Sheep

California bighorn sheep are the primary target species for the two proposed guzzlers. In support of their application, and in additional correspondence NDOW, stated that bighorn sheep are being adversely affected by increased recreational use within the High Rock Canyon area and by harassment and habitat loss from wild horses and concluded that the construction of two new, artificial water sources is necessary to mitigate the adverse impacts to bighorn sheep.

Installation of the two guzzlers would increase the amount of high quality bighorn habitat by 467 acres to 109,329 acres, an increase of 0.4 percent, when a 1 mile use area from waters is considered (Map 5, Appendix A). When a 2 mile bighorn use area from water was evaluated there would be no additional areas of high quality bighorn habitat added due to the construction of the guzzlers. High quality habitat was calculated to include all areas within 400 meters of escape cover, within 1 mile or 2 miles of dependable water and more than 200 meters from roads receiving more than 2,000 vehicles or visitors per year. Based upon an estimate of 3 sheep per square mile, the additional high quality habitat associated with construction of the two guzzlers would support an additional 2 sheep in the analysis area population. The guzzlers themselves could provide water for 50 or more sheep during dry parts of the year.

There currently no direct evidence that recreational use is limiting sheep populations in the analysis area. There is some indirect evidence, based upon regular observations of bighorn sheep in high visitor use areas of High Rock Canyon, that humans are having little impact to bighorn sheep at current use levels.

A literature search related on recreation impacts to bighorn sheep indicates that bighorn are tolerant of visitors when the actions of the

visitors are predictable (Geist *et al*. 1985, Hicks and Elder 1979, Johnson and Smith 2000, Miller and Smith 1985, McArthur *et al*. 1979). Visitors that stay on or near roads in vehicles cause bighorns to exhibit behavioral or heart-rate changes only at distances less than 200 meters. Hikers, especially those at the same level or higher than bighorns, or accompanied by dogs yielded the greatest responses from bighorn sheep (Geist *et al*. 1985, McArthur *et al*. 1979).

The vast majority of visitors to High Rock Canyon stay within a short distance of their vehicles. Exceptions to this rule occurs in the late summer and fall when hunters, primarily chukar hunters with dogs but also a few bighorn sheep or antelope hunters, hike through or near bighorn escape cover.

The level of visitation may adversely affect bighorn sheep use of potential habitats. Models of sheep use of potential habitat (Johnson and Smith 2000, Krausman *et al*. 2004, Zeigenfuss *et al*. 2000) indicate that only high levels of visitor use results in displacement of bighorn from otherwise suitable habitats. One road within the High Rock area, the High Rock Lake Road, currently receive human use in excess of the 2,000 visitors per year specified in Krausman *et al*. (2004) as a threshold limiting bighorn use in otherwise suitable habitat. The High Rock Canyon Road below Post Office Cave may receive visitor use that approaches the 2000 visitors per year threshold. The area within 200 meters of these two roads includes 467 acres of otherwise potential high quality habitat (321 acres in High Rock Canyon). The guzzlers would add at most an additional 467 acres of high quality sheep habitat within the High Rock area depending upon whether a one or two mile area from the proposed guzzlers was considered (Map 5, Appendix A). Installation of the two proposed guzzlers would offset the area of potential recreation impact to bighorn sheep. The area near Post Office Cave has frequent visitor sightings of bighorn sheep indicating that sheep have not been eliminated from portions of High Rock Canyon with high visitor use levels.

Visitor use in the analysis area has increased during the past decade. It is unknown what increases will occur in the future. If visitor use doubles from present levels, the area receiving visitor use of greater than 2000 visitors per year would likely expand to include a portion of the upper end of the canyon and an additional 1.5 miles of the lower canyon. This represents an additional loss of about 400 acres of suitable bighorn habitat. Through traffic on the High Rock Canyon Road would continue to remain below the 2000 visitor threshold. The length of time for visitor use to double is unknown. However several factors will tend to lengthen the time period: 1) visitor use associated with hunters would not significantly increase over existing levels, 2)

the RMP included additional restrictions on visitors including an additional six weeks that the High Rock Canyon Road will be closed to visitors, and 3) restrictions are being implemented on where visitors will be allowed to camp in High Rock Canyon.

The additional 467 acres of quality bighorn sheep habitat provided by implementation of the two guzzlers would create water sources free of competition from wild horses and away from almost all recreational visitations. The protective fences surrounding each guzzler would exclude wild horses but allow free passage by bighorn sheep. Bighorn would continue to be periodically harassed by wild horses at spring sites with low water production.

Summary

Suitable bighorn sheep habitat within the analysis area would increase by at most 467 acres or 0.4 % of the 012 area depending upon the distance from water used by bighorn sheep. This would allow the bighorn population within the High Rock area to increase by a few animals. Bighorn water quality and access to water would be less than the natural potential as spring sites currently within suitable bighorn habitat would continue to be impacted by wild horses grazing at some spring meadows.

4.1.7.2. Special Status Species

Pygmy Rabbit

Construction of two guzzlers east of the East Fork High Rock Canyon would have few impacts on pygmy rabbits. The guzzler sites would result in the long-term loss of about two acres of sagebrush habitats. The sagebrush communities at the guzzler sites are dominated by short sagebrush species which are not commonly used by pygmy rabbits due to shallow rocky soils. The creation of each new water source may locally change habitat value for any pygmy rabbits that occur on a much larger area around each guzzler. This change is likely to increase competition for forage and the potential for predation on an area that is a fraction of a percent of the High Rock area. At most this would affect a few rabbits.

Greater Sage-grouse

The guzzler sites would result in the long-term loss of about two acres of sagebrush used primarily as winter or nesting habitats for sage-grouse. Sage-grouse use of guzzlers in winter or nesting habitats has been documented to be minimal (Connelly and Doughty 1989) because sage-grouse obtain moisture from snow or the leaves of forage plants during this period. The fencing around the guzzler aprons and the drinkers would create additional perches for predatory birds,

primarily ravens that could increase the potential for predation of sage-grouse nests habitats within the proximity of each guzzler.

Several sage-grouse leks are within 2 miles of the proposed guzzler sites. Most nesting of non-migratory sage-grouse occurs within the 2 mile area surrounding the lek. It is unknown how much nesting is associated with areas within the influence zone of the two proposed guzzlers but it likely that development of the two guzzlers would adversely affect nesting success of at most a few sage-grouse hens.

Sage-grouse summer brood and loafing habitats associated with tall shrubs adjacent to meadow vegetation would remain in poor condition for sage-grouse summer use due to continued concentrated use by wild horses and seasonal use by livestock at some springs in the High Rock area.

4.1.8. Visual Resource Management

The size and scale of the proposed developments would attract attention within small areas associated with the short distance viewshed from each guzzler and the water developments would alter the existing landscape by adding elements of angular (vertical and horizontal) lines, removing about an acre of vegetation at each project site. Because of this the proposed water developments would not meet the objectives for a VRM Class I area, in the immediate vicinity of the developments (BLM, 2005).

However, the water developments are not visible from the most critical viewpoints along the High Rock Canyon Road and eastern boundary roads and the water development would only be visible from approximately 95 acres within the Wilderness (approximately 1%), so the impact to the overall landscape would be negligible.

The visual impacts from the developments would also be reduced by painting the fencing and apron materials brown or light green and lowering the profile of the apron where appropriate.

4.1.9. Wild Horse and Burros

There would be no measurable impact to wild horses and burros. Implementation of the proposed action would eliminate forage for horses on less than 0.25 acres in areas more than a mile from existing water sources used by wild horses.

4.1.10. Livestock Grazing

There would be no impact to livestock grazing. Implementation of the proposed action would occur in the portion of the Massacre Mountain allotment closed to livestock use.

4.2. Environmental Consequences of Alternative I- - Protection of Existing Spring Sources with Exclosures

4.2.1. Cultural Resources

A prehistoric site was observed at HRSP#27, but not formally recorded. No cultural resources were observed in or around the wet meadows in the canyon bottom at Buck Spring. Cultural resources were observed and recorded at HRSP#20.

If an exclosure is built at HRSP#27, then the site would be recorded and evaluated. If the site is eligible to the National Register of Historic Places, then the exclosure would be designed to avoid adverse impacts to the site. This would most likely mean including the site within the exclosure fence, thereby avoiding impacts from fence construction and minimizing impacts from horse trampling.

If the exclosure at Buck Spring is limited to the slopes above the wet meadow, then no impacts to cultural resources are anticipated. If the exclosure is expanded to include ridge tops above the canyon, then additional cultural resources inventory would be required.

The area around HRSP#20 was inventoried for cultural resources and cultural resources were present. An evaluation of those resources determined that the construction of the exclosure would have no adverse impacts on cultural resources.

4.2.2. Migratory Bird Species

Fencing of three small spring meadows would improve vegetation cover, structure and composition and would benefit migratory bird species, particularly those associated with meadow habitats. However due to the small size of the meadows the area affected would be less than five acres.

4.2.3. Water Quality (Surface)

The fencing of three spring heads and associated meadows would improve water quality and availability by increasing vegetation cover, decreasing compaction from wild horses and livestock, decreasing nutrient and bacterial contamination. Other springs in the area would continue to have decreased water quality and availability due to continued wild horse use.

4.2.4. Wetlands and Riparian Zones

The fencing of three spring heads and associated meadows would improve wetland and riparian zone conditions on less than five acres. The improvement would occur because of the elimination of heavy grazing from primarily wild horses that occurs year round at the three meadows. Meadow size would be expected to expand and vegetation cover, composition and structure would be expected to improve. HRSP#20 would meet the riparian land health standard.

Other spring meadows in the area would continue to have decreased vegetation composition, production and diversity due to continued heavy wild horse use.

4.2.5. Wilderness

Specific impacts from Alternative I to the wilderness characteristics of naturalness, untrammeled and undeveloped character, opportunities for solitude and primitive recreation and special features are found below. Further impacts to the wilderness character of the area can be found in Appendix B.

4.2.5.1. Naturalness/Untrammeled and Undeveloped Character

The exclosure fence will reduce the appearance of naturalness in the immediate area around HRSP#20 (approximately 23 acres). While the exclosure fence would have an impact on the appearance of naturalness in the immediate area, it would also enhance the naturalness of the area inside the exclosure by reducing the impacts that are currently occurring to the riparian areas and the spring morphology from over utilization and trampling by wild horses on about 0.5 acres. The benefits to naturalness of allowing the spring systems to function in a more natural state without heavy grazing use by wild horses is considered to offset the negative impacts associated with the site of a exclosure fence.

Constructing the exclosure is an intentional human management action and would impact the untrammeled quality of the area. However, this would be offset because the exclosure would also reduce the existing impacts to the untrammeled character that wild horses may be causing to the existing springs.

The alternative would impact the undeveloped character of the wilderness by adding a structure in a portion of the wilderness that presently does not contain human developments.

4.2.5.2. Opportunities for Solitude/Primitive or Unconfined Recreation

Opportunities for solitude would be impacted during the construction of the exclosure fence by the sounds and sights associated with the possible use of helicopters and work crews. The crews and helicopter use would probably be visible from many areas within the adjacent Wilderness and the sound from the construction would carry for long distances. However these impacts would be relatively short in duration, about one week.

The exclosure fence would impact the visitor's sense of being in a remote area away from the signs of civilization on about 23 acres of the wilderness within the short distance viewshed of the spring. This impact would vary among visitors, some would see it as a significant impact to the primitive experience, and other visitors would not. However, the exclosure would also enhance the appearance of naturalness around the

spring on about .3 acres which could benefit the primitive recreation experience. Based upon the projections of recreational use as shown on Map 2, this would affect fewer than 5 visitors per year.

Maintenance could also impact the opportunities for solitude in the area. However, it is anticipated that maintenance activities would generally only occur 1 day per year and major maintenance would be required once every ten years.

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4.2.5.3. Special Features

Potential impacts to bighorn sheep can be found in the wildlife section. No impacts would occur to any other Special Features.

4.2.6. Recreation

Recreation users would be largely unaffected by the spring protection projects. However there is the potential to enhance visual aesthetics, opportunities for upland exploration and wildlife viewing. Improved resource conditions at the spring sites and reduced competition from horses and cattle may provide increased wildlife viewing opportunities in the vicinity of the spring sites. Hunting opportunities would likely remain constant. The exclosure areas could also provide a cleaner and more reliable water source for backcountry users.

The alternative could have impacts on primitive recreation as described in the Wilderness Section.

4.2.7. Wildlife (including Special Status Species)

4.2.7.1. Priority Species

Pronghorn Antelope

Fencing of three small spring meadows would improve production of succulent forbs for pronghorn antelope on less than five acres of meadow habitat and improve the quantity and availability of water. Other spring meadows in the area would continue to have decreased forb availability due to continued heavy wild horse use.

Improvement of meadow conditions on less than five acres would not change the overall quality of antelope habitats within the High Rock area. The 78% and 77 % of optimum scores for summer and winter habitat respectively, would not change. Additionally the limiting factor for antelope population during both seasons, the percent cover of forbs, would not change appreciably. Therefore, no impact on herd health or population levels would be expected.

California Bighorn Sheep
Fencing of three small spring meadows would not change the area of high quality bighorn sheep habitat within the High Rock area. Therefore it is unlikely that the potential population of bighorn sheep in the High Rock Canyon area would be increased.

The fences that protect the meadows would allow the three meadows to increase in area and in vegetation production and species diversity by excluding wild horses on all the meadows and occasional livestock grazing on the two eastern meadows. It is also likely that water flows would be increased in both amount and duration due to decreased compaction of soils at spring heads. This would support bighorn by increasing water availability and providing for drinking sites free from wild horse competition.

Impacts to bighorn sheep from recreation use in High Rock Canyon would be the same as described under the Alternative I.

4.2.7.2. Special Status Species

Pygmy Rabbit
Fencing and the exclusion of wild horses from three small spring meadows would have few impacts on pygmy rabbits. The rabbits are not dependent upon free water and meadow sites, with dense grass, are more favorable for cotton-tails rather than pygmy rabbits. The few pygmy rabbits within the immediate vicinity of the improved meadow vegetation could have increased access to succulent forbs due to the improved meadow size and vegetation conditions.

Greater Sage-grouse
The fencing of three meadows would increase the meadow size and vegetation cover, structure and species diversity. These changes would benefit sage-grouse broods during summer months when hens and chicks are largely dependant upon upland meadows for water, cover, insects and succulent forbs. Other spring meadows in the area would continue to have decreased vegetation composition, production and diversity due to continued heavy wild horse use.

Sage-grouse summer loafing habitats associated with tall shrubs adjacent to meadow vegetation would be expected to improve in condition for sage-grouse summer use due the inclusion of these areas within the protective fences.

Several known sage-grouse leks are within 2 miles of the proposed meadow sites. Most nesting of non-migratory sage-grouse hens occurs within the 2 mile area surrounding the lek. It is unknown how much

nesting is associated with areas within the influence zone of the three meadows but it unlikely that fencing could adversely affect nesting success of some sage-grouse hens.

The fencing of three small spring meadows and the springheads would create additional perches for predatory birds, primarily ravens that could increase the potential for predation of sage-grouse chicks using the meadows for summer brood habitat.

4.2.8. Visual Resource Management

Constructing the exclosure fences as outlined in Alternative I at Buck Springs and HRSP 27 would add elements of angular (vertical and horizontal) lines to the existing landscape. However the overall change to the existing landscape would be low because several existing range developments and existing roads already add an element of angular lines around the springs. The change to the characteristic landscape from these two exclosures would be low and they would meet the objectives for a Class II VRM zone.

The exclosure fence around HRSP20 would attract additional attention because it would add angular lines (vertical and horizontal) to an area that is presently absent of human structures and angular lines and would therefore not meet the objectives of a VRM Class I area in the immediate vicinity of the fence. However, this exclosure is not visible from the most critical viewpoints along the High Rock Canyon and eastern boundary roads and the exclosure would only be visible from approximately 23 acres within the Wilderness (> 1%).

While the exclosures would all have some level of impact to the existing landscape they could also improve the visual quality of the areas within the exclosures by allowing native vegetation to occupy the sites.

The visual impacts from the exclosures would also be reduced by painting the fencing materials brown if steel fencing material is used.

4.2.9. Wild Horse and Burros

This alternative proposes fencing three spring heads and associated meadows currently used by wild horses for water and forage. Two of the three meadow fences would maintain summer/fall water availability outside the fences. Perennial waters and water production are extremely limited in this area (especially in drought conditions). Essentially all of the perennial water sources in the Warm Springs Canyon HMA are improved. Water improvements are dependant on the maintenance of functioning structures (pipelines, valves, and troughs). Water may not be available if the structures become non-functioning. Limiting access to any accessible watering site will increase the use on remaining available sites. It is not uncommon to observe between 30 - 100 horses waiting to water when numerous small dirt catchments dry up in the summer and pressure on low volume producing springs increases. This is

especially true if any of the few developed waters become non-functioning during the summer/fall seasons. The result would be to decrease summer/fall water availability in the drier portions of the two HMAs. However the water source that would be eliminated from horse use is of low volume and is only capable of providing water to a few horses during the hottest part of the summer within the High Rock HMA. Loss of this water would reduce the available summer/fall horse habitat by several thousand acres. However the ability of the remaining habitat within the High Rock HMA could be capable of supporting the 30 to 40 head associated with the AML for the east of High Rock home range.

4.2.10. Livestock Grazing

Implementation of Alternative I would result in the fencing of two spring meadows within the Warm Springs use area of the Soldier Meadows allotment. Fencing would slightly increase livestock trailing distances to water but should protect spring sources from hoof compaction and trampling that degrade livestock water quality. The third spring development would occur in the portion of the Massacre Mountain allotment closed to livestock use.

4.3. Environmental Consequences of Alternative II, No Action

4.3.1. Cultural Resources

If cultural resources are presently being impacted from trampling by wild horses the impacts would continue under the No Action.

4.3.2. Migratory Bird Species

No new construction activities would occur within habitats occupied by migratory bird species. Heavily grazed spring meadows would remain unchanged.

4.3.3. Water Quality (Surface)

Impacts would be the same as described for the proposed action.

4.3.4. Wetlands and Riparian Zones

Impacts would be the same as described for the proposed action.

4.3.5. Wilderness

Specific impacts from Alternative II to the wilderness characteristics of naturalness, untrammled character, opportunities for solitude and primitive recreation and special features are found below.

4.3.5.1. Naturalness/ Untrammled and Undeveloped Character

Impacts to the appearance of naturalness associated with constructing structures in the wilderness would not occur.

Impacts that have occurred in the past the existing spring from wild horse use in the area could continue if the horse populations exceed AML and no action is taken to reduce there impacts to the spring sites.

4.3.5.2. Opportunities for Solitude/ Primitive or Unconfined Recreation

No impacts would occur to opportunities for solitude. The alternative could have impacts on primitive recreation. This impact would vary among visitors, some see the current condition of the spring as an adverse impact to the primitive recreation experience, and other visitors would not recognize it as an impact.

4.3.5.3. Special Features

Potential impacts to bighorn sheep can be found in the wildlife section. No impacts would occur to any other Special Features.

4.3.6. Recreation

Recreation users would be largely unaffected from the no-action alternative. Overall the recreation opportunities are expected to remain at current levels.

4.3.7. Wildlife (including Special Status Species)

4.3.7.1. Priority Species

Pronghorn Antelope

No new construction activities would occur within habitats occupied by pronghorn antelope. There would be no impact to pronghorn antelope with the No Action Alternative.

California Bighorn Sheep

The construction of neither additional artificial water sources nor protective fencing on existing water source would occur within California bighorn sheep habitat. There would be no change in the area of high quality habitat available to bighorn sheep. Therefore there would be no increase in the potential population of bighorn sheep in the High Rock area.

Future increases in human activity in High Rock Canyon associated with recreational use, including hunting related recreation, could lead to future reductions of high quality habitat in the lower 5 miles of High Rock Canyon. As discussed in the affects of the proposed action on bighorn sheep, increased visitor use is likely to reduce high quality sheep habitat by an additional 400 acres in High Rock Canyon. This loss would represent about 1.3 percent of the existing high quality habitat in the canyon.

Water quality associated with springs, currently within suitable bighorn habitat and used heavily by wild horses would improve somewhat following the gather of an estimated 400 horses in 2006 from the High Rock HMA. However water quality would continue to be reduced from potential due to heavy grazing by wild horses in the immediate vicinity of these springs. As horse numbers increase following the gather, wild horse use of these sites would also increase. Bighorn would continue to be periodically harassed by wild horses at spring sites with low water production.

4.3.7.2. Special Status Species

Pygmy Rabbit
No new construction activities would occur within habitats occupied by pygmy rabbits. There would be no impact to pygmy rabbits with the No Action Alternative.

Greater Sage-grouse
No new construction activities would occur within habitats occupied by sage-grouse. Spring meadows, important to hens with broods, would continue to have less than optimum vegetative cover, forage availability and forage quality.

4.3.8. Visual Resource Management

Generally no impacts would occur to the Visual Resources of the area. However, potential impacts to the visual resources associated with heavy grazing use at the springs would continue under this alternative. These impacts include the removal of native vegetation leaving noticeable barren areas around the springs.

4.3.9. Wild Horse and Burros

There would be no project development in areas occupied by wild horses and burros. There would be no impact to horses and burros with the No Action Alternative.

4.3.10. Livestock Grazing

There would be no impact to livestock grazing. No actions would occur that would affect livestock.

4.4. Cumulative Impact Analysis

The Council of Environmental Equality (CEQ) regulations implementing NEPA defines cumulative impacts as: "…[T]he impact on the environment which results from the incremental impact of the action when added to other past, present, ore reasonably foreseeable future actions regardless of what agency (Federal or Non-Federal) or person

undertakes such actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.7).

The cumulative impact analysis area for this EA varies by resource. The cumulative impact analysis area for bighorn sheep is NDOW Unit 012 (Map 1, Appendix A), for livestock grazing and wild horses and burros are the High Rock Canyon and Warm Springs Canyon HMAs (Map 4, Appendix A). The cumulative impact area for all other resources is the High Rock Canyon area.

4.4.1. Past, Present, and Reasonably Foreseeable Future Actions

4.4.1.1. Past Actions

The major past uses within all the cumulative impact assessment areas are wildlife management, recreation, wilderness management, livestock grazing, wild horse and burro management. Grazing is the dominant land use that has historically occurred within the assessment area.

Wildlife Management

Bighorn sheep were reintroduced within the analysis area over the last two decades as described in Section 3.2.2.1.

Recreation

Past dispersed recreation uses include camping, hunting, hiking, rockhounding, off highway vehicle (OHV) use, and commercial activities such as motorcycle and OHV racing events. Past BLM management actions for commercial events were addressed through issuance of special recreation permits (SRPs). These activities are described in Section 3.3.1.

Wilderness Management

In the 1980s five Wilderness Study Areas were designated within the analysis area. These areas were managed under the BLM's Interim Management Policy to protect their wilderness values until Congress decided to designate them as wilderness or release them for other purposes. Impacts to these areas have been primarily limited to unauthorized motorized traffic. The NCA Act of 2000 designated the East Fork High Rock Canyon WSA as one of 10 Wilderness areas in or adjacent to the NCA. Past wilderness management actions have included; reclaiming and constructing barriers on closed vehicle routes, and signing wilderness boundaries.

Livestock Grazing

Over the past 15 years, livestock grazing has occurred on a regular basis within the Warm Springs and Hot Springs pastures of the Soldier Meadows Allotment which are in the eastern portion of the analysis

area. During the same period, livestock has not been authorized in the High Rock Canyon area.

Wild Horses and Burros

Over the past 34 years wild horses and burros have occupied both the High Rock Canyon and Warm Springs Canyon HMAs. For most of this period horse numbers in both HMAs exceeded the established AMLs. Horses were last gathered from the High Rock HMA in 2001. Wild horses and burros were gathered in the Warm Springs Canyon HMA in 1986, 1988, 1994, 1996, 2000, and 2004. A cumulative total of 2,055 animals were removed from the HMA over the specified time period.

4.4.1.2. Present Actions

The major present uses within the cumulative impact assessment area are ranching, recreation, wilderness management, livestock, wild horse and burro management, and wildlife management. Grazing is the dominant land use that occurs within the assessment area.

Wildlife Management

Issuance of tags and licenses by NDOW for game species, including bighorn sheep results in the annual harvest of wildlife from the area.

Recreation

Dispersed recreation uses include camping, hunting, hiking, rockhounding, off highway vehicle (OHV) use, and commercial activities such as historic trail tours and hunting related outfitting and guiding continue within the analysis area. These activities are discussed in Section 3.3.1.

Wilderness Management

Current wilderness management actions include; reclaiming and constructing barriers on closed vehicle routes, and signing wilderness boundaries.

Livestock Grazing

Livestock grazing was authorized and occurred in the Warm Springs pasture of the Soldier Meadows allotment during the summer and fall of 2005. Livestock grazing is not authorized in High Rock and adjacent canyons under the direction of the NCA RMP. Livestock grazing was authorized, but little or no grazing occurred in the area west of High Rock Canyon.

Wild Horse and Burro Management

Wild horses were gathered from the Warm Springs Canyon HMA in November 2004 to bring the population down to the lower AML range of 105 head. All release mares were implemented with a fertility control

agent expected to reduce annual growth rates over the next four years. A recent focus to coordinate WH&B management activities between the Surprise and Winnemucca Field Offices is expected to result in the achievement and maintenance of herd numbers within established AML ranges across management boundaries. Monitoring of wild horse and burro use on meadow and uplands vegetation is ongoing.

4.4.1.3. Reasonable Foreseeable Future Actions (RFFAs)

The RFFAs applicable to the assessment area are:

- Issuance of multiple use decisions and grazing permits for livestock operations through the allotment evaluation process.
- Construction and maintenance of projects in support of the achievement of Land Health Standards.
- Periodic wild horse and burro gathers to manage populations with AML range.
- Evaluations and adjustments of HMA boundaries and AMLs.
- Changes in livestock grazing practices to allow the achievement of Land Health Standards.
- Development and implementation of local Sage-grouse Management Plans
- Augmentations or removals of bighorn sheep from NDOW Unit 012.
- Preparation of a Wilderness Management Plant, including monitoring and management actions designed to retain the wilderness characteristics of the East Fork High Rock Canyon wilderness.
- Increased limitations on recreational users within High Rock Canyon as described in Section 3.3.1

4.4.2. Impact Analysis

Unless otherwise specified the following cumulative impact analysis addresses all the alternatives.

4.4.2.1. Cultural Resources

Past Actions

Prior to the establishment of the National Historic Preservation Act of 1966 there was little management to protect cultural resources. This led to increased adverse impacts to these resources.

Present Actions

Current conditions within the analysis area include areas where concentrated livestock, wild horses and burros, and recreation use have removed vegetation exposing cultural artifacts. These activities also remove Native American medicinal plants, thus limiting their

availability. The increased potential for illegal collection and physical damage from trampling resulted from these activities.

RFFAs

Implementation of grazing management practices that ensures the attainment of allotment specific objectives and the Land Health Standards should improve vegetation cover and dispersion of livestock and wild horses, which would reduce impacts to cultural resources and address Native American concerns within the analysis area. The implementation of the NCA RMP will address recreation management, taking into consideration Native American concerns.

Summary

The impacts actions associated with either the proposed action or alternative two would be of a small scale and very localized and contribute few additional impacts when added to impacts associated with past, present and RFFAs for cultural resources. The attainment of allotment specific objectives and Land Health Standards through the implementation of livestock grazing practices and effective management of wild horses and burros would continue to be the dominant human caused impact leading to maintenance or improvement of overall vegetative cover and soil stability. These conditions support stabilization of cultural resource artifacts and sites. Overall, cumulative adverse impacts to cultural resources and Native American resources would be minimal.

4.4.2.2. Wilderness Resources

Past Actions

Past management actions of designating the East Fork High Canyon WSA as a Wilderness, reclaiming closed routes and signing wilderness boundaries has improved the wilderness values of the area.

Present Actions

With the enactment of the NCA Act, management of the Wilderness Area has improved, resulting in increased boundary identification, route rehabilitation, compliance checks, and visitor contacts. These management actions have improved wilderness values for those seeking naturalness and solitude.

RFFAs

The Wilderness Management Plan scheduled for completion in 2007 will include specific projects, guidelines and management prescriptions which should improve wilderness values associated with naturalness and solitude.

Summary

The impacts actions associated with either the Alternative I or Alternative II would be of a small scale and very localized and contribute few additional impacts when added to impacts associated with past, present and RFFAs for wilderness resources. The attainment of allotment specific objectives and Land Health Standards through the implementation of livestock grazing practices and effective management of wild horses and burros would continue to be the dominant human caused impact to wild horse and burro populations. However, the construction of guzzlers or spring exclosures would affect the wilderness resources of naturalness and solitude on much larger areas than the physical footprint of the projects. In the case of Alternative II the spring exclosures would substantially improve the naturalness of the affected meadow systems, somewhat offsetting the adverse impacts to naturalness associated with new fencing. Therefore there would be additional cumulative impacts as a result of implementation of the Alternative I or Alternative II.

4.4.2.3. Recreation

Past Actions

Dispersed recreation use within the analysis area was unconstrained prior to the 1970s and included hunting, rockhounding, hiking, and other outdoor activities. Restrictions on these activities where intiated in the 1970s, wilderness study area and ACEC designations, and seasonal restrictions on winter access to High Rock Canyon.

Present Actions

With the passage of the NCA Act, the BLM is in the process of developing a NCA RMP. A number of these lands are located within the analysis area. Current recreation use, including OHV use, has increased along with changing the diversity of recreation use. The NCA RMP, will manage recreation uses to conserve resources and enhance specific recreational opportunities.

RFFAs

It is anticipated that recreation growth would slowly expand within the analysis area. Commensurate with this growth will likely be increased limitations on recreational activities in accordance with multiple use management and the NCA RMP. Attainment of allotment objectives and the Land Health Standards will increase opportunities for wildlife related recreation.

Summary

The impacts actions associated with either the Alternative I or Alternative II would be of a small scale and very localized and contribute few additional impacts when added to impacts associated with

past, present and RFFAs for recreation resources. The limitations on recreational use in High Rock Canyon associated with seasonal closures and designation of campsites will affect many more users than construction of guzzlers or spring exclosures. The attainment of allotment specific objectives and Land Health Standards through the implementation of livestock grazing practices and effective management of wild horses and burros would continue to be the dominant human caused impact leading to maintenance or improvement of overall habitat conditions for wildlife species, including the game species that are associated with hunting use. Therefore there would be few additional cumulative impacts as a result of implementation of the Alternative I or Alternative II.

4.4.2.4. Wildlife including Special Status Species

Past Actions

Overgrazing by livestock and wild horses and burros adversely impacted habitat for many wildlife species prior to implementation of livestock grazing practices that support improved habitat conditions. Closure of High Rock Canyon and adjacent areas has led to improvements in the condition of wildlife habitats associated with the canyon bottoms.

Present Actions

Current conditions within the analysis area include small areas, primarily meadows, where concentrated livestock and wild horses and burros resulted in degradation of wildlife habitat.

RFFAs

Implementation of livestock grazing management practices that ensure attainment of allotment specific objectives and for Land Health Standards should maintain or improve wildlife habitats within the SMA and adjoining allotments. Adoption of applicable sage-grouse management guidelines from the local sage-grouse management plans should lead to improvements in sage-grouse habitats and populations. Periodic gathers of wild horses and burros and occasional adjustments of AMLs or HMA boundaries should support attainment of Land Health Standards supporting high quality wildlife habitats. Infrequent augmentations or removals of bighorn sheep would support maintenance of healthy bighorn populations in Unit 012 or other areas. Limitations on recreation use in High Rock Canyon would reduce impacts on wildlife habitats and minimize visitor stress on wildlife populations associated with the canyons.

Summary

The impacts actions associated with either the Alternative I or Alternative II would be of a small scale and very localized and contribute few additional impacts when added to impacts associated with

past, present and RFFAs for wildlife resources. The attainment of allotment specific objectives and Land Health Standards through the implementation of livestock grazing practices and effective management of wild horses and burros would continue to be the dominant human caused impact leading to maintenance or improvement of overall habitat conditions for wildlife species, including special status species.

4.4.2.5. Visual Resource Management (VRM)

Past Actions

Visual resources were not considered when making land use decisions until the late 1970s. Impacts, such as range improvement projects, caused adverse impacts to the visual quality within the analysis area.

Present Actions

VRM is considered for all federal actions within the analysis area. Projects, which including range improvement projects, create features that may intrude on visual quality. However, the implementation of VRM techniques and mitigation measures would minimize these impacts within the analysis area.

RFFAs

With the passage of the NCA Act, visual resource management acquired new importance. VRM Classes were modified to maintain higher levels of visual quality than had been mandated in the past. Construction or projects to meet Land Health Standards within the analysis area would negatively impact VRM to some degree, due to the addition of man-made features on the landscape.

Summary

The impacts actions associated with either the Alternative I or Alternative II would be of a small scale and very localized and contribute few additional impacts when added to impacts associated with past, present and RFFAs for visual quality. The higher levels of VRM management specified in the NCA RMP will affect much more area than construction of guzzlers or spring exclosures. However, the construction of guzzlers or spring exclosures in the Alternative I or Alternative II respectively would affect the visual quality on much larger areas than the physical footprint of the projects. Therefore there would be additional cumulative impacts as a result of implementation of the Alternative I or Alternative II.

4.4.2.6. Wild Horses and Burros

Past Actions

Prior to the Wild Horse and Burro Act of 1971, wild horse and burros were unprotected and populations were limited mainly by natural processes and periodic gathers by local ranchers.

Present Actions
Current management of wild horses and burros by BLM has included a number of gathers (see Section 3.3.4). The primary human related factors related to wild horse and burro populations are the BLM's ability to gather and remove excess horses on a periodic basis. There continues to be impacts to herd demographics and herd health in wild horse and burro populations from artificial management related to gathers and to displacement of animals due to fences and other livestock management structures. Seasonal and other movement between neighboring HMAs is also a factor.

RFFAs
Implementation of grazing management actions that ensure allotment specific objectives and Land Health Standards attainment should improve forage availability. Managing wild horse and burro populations at or below AML would result in the stabilization of populations by reducing grazing intensity and improving habitat.

Summary
The impacts actions associated with either the Alternative I or Alternative II would be of a small scale and very localized and contribute few additional impacts when added to impacts associated with past, present and RFFAs for wild horses and burros. However, unintended loss of water access may occur, but should be temporary in nature. The periodic gathers that remove a substantial percentage of wild horse and burro populations would have much more impact on the population and social structure of these animals than construction of guzzlers or spring exclosures. The attainment of allotment specific objectives and Land Health Standards through the implementation of livestock grazing practices and effective management of wild horses and burros would continue to be the dominant human caused impact to wild horse and burro populations. Therefore there would be few additional cumulative impacts as a result of implementation of the Alternative I or Alternative II.

4.5. Residual Impacts

4.5.1. Irreversible and Irretrievable Commitment of Resources

The implementation of actions in accordance with the alternatives is not likely to result in significant impacts that may be characterized as irreversible and irretrievable commitments.

4.5.2. Unavoidable Adverse Impacts

The presence of man made structures in a largely natural landscape associated with guzzler construction or the development of exclosures for spring meadows

would negatively affect the visual resources and wilderness resources of naturalness and solitude. The implementation of actions associated with the Alternative I or Alternative II has been designed to reduce to these impacts as much as possible.

4.5.3. Relationship between Local Short-term Uses and Long-term Productivity

For the purposed of this analysis, short-term is defined as anticipated to occur within 1 to 5 years. Long-term is defined as more than 5 years and through the effective life of any on-the-ground projects.

Implementation of either the Alternative I or Alternative II would result in various short-term effects; such as increased localized soil disturbance, decreased solitude and decrease naturalness in the vicinity of project construction. The long-term productivity of resources within the areas associated with these projects would generally be retained. However, the wilderness resources of naturalness and solitude would continue to be reduced within the immediate viewshed of the projects. Improvements to small spring meadow conditions associated with exclosures in Alternative II would partially offset decreased long-term impacts to wilderness naturalness.

5. MITIGATION AND MONITORING

No additional mitigation would be needed beyond what has been in identified in the alternatives. The Minimum Tool Analysis was used to identify the mitigation measures identified for the fencing alternative.

Due the large size and weight of the fencing materials (pipe rail or buck and rail) fencing materials will be slingloaded to HRSP#20 via helicopter and work crews will walk into and out of the site to minimize the amount of helicopter use required for the project.

The Nevada BLM, Winnemucca Field Office and the California BLM, Surprise Field Office would be responsible for monitoring any alternative to ensure conformance with wilderness regulations and policy.

6. CONSULTATION AND COORDINATION

A Notice of Proposed Action (NOPA) was sent to the Black Rock High Rock NCA's wilderness mailing list. Six comments were received. Specific comments are described in the Section 1.3 of this document.

During the preparation of the Preliminary EA two meeting were held with NDOW to discuss the proposal and to identify data needs and alternatives. Four interoffice meetings were also held with staff from the BRHR NCA, Winnemucca Field Office, Surprise Field Office, California State Office and Nevada State Office of the BLM. One of these

meetings included a field trip with BLM Resource Specialists to several of the springs in the area.

In December 2005, the Preliminary EA was sent to groups and individuals who had expressed interest in wilderness and wildlife issues, wild horse and burro interest groups and to both the North East California and Sierra Front-Great Basin Resource Advisory Councils. A notice of availability was also sent to 55 additional individuals, agencies and groups notifying them that the Preliminary EA was available for review and comment.

The comment period for the Preliminary EA ended on February 10, 2006. 28 separate comment letters and three petitions with a total of 110 signatures were received on the preliminary EA. The majority of the respondents were in favor of constructing the water developments, some respondents were opposed to the construction of the water developments but supported the exclosures, and some were in favor of both alternatives. The signatories of petitions were in favor of constructing the water developments.

7. PARTICIPATING STAFF

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Appendix A: Maps Referenced in the Text

Map 1	NDOW Management Unit 012
Map 2	Proposed Projects
Map 3a	Bighorn Habitat within 1 Mile of Waters
Map 3b	Bighorn Habitat within 2 Mile of Waters
Map 4	High Rock Area Herd Management Areas & Livestock Grazing Allotments
Map 5	Additional Bighorn Habitat Provided by Guzzlers

Appendix B: Minimum Requirement/Tool Analysis

MINIMUM REQUIREMENTS DECISION GUIDE

WORKSHEETS

Step 1: Determine if any administrative action is necessary.

Description: Briefly describe the situation that may prompt action.

NDOW has indicated that the bighorn sheep population in the East Fork High Rock Canyon Wilderness is not achieving a natural population level. NDOW has asserted that two factors are impeding the sheep population in the area;

1) Increased recreational use in High Rock Canyon and
2) Impacts resulting from excessive use of the existing springs in the area from livestock and wild horses.

NDOW has proposed constructing two water developments to alleviate the impacts.

To determine if administrative action is necessary, answer the questions listed in A - F on the following pages.

A. Describe Valid Existing Rights or Special Provisions of Wilderness Legislation

Are there valid existing rights or is there a special provision in wilderness legislation (the Wilderness Act of 1964 or subsequent wilderness laws) that allows consideration of action involving Section 4(c) uses? Cite law and section.

Yes: ☒ **No:** ☐ **Not Applicable:** ☐

Explain:
The only exception in the Wilderness Act of 1964 that applies to wildlife management actions that use one of the prohibited acts (i.e. motorized transport and equipment, structures, landing of aircraft) is Section 4(c) which states "*except as necessary to meet minimum requirements for the administration of the area for the purpose of this Act….*" A wildlife management action that is considered the minimum requirement may be authorized.

The Black Rock Desert-High Rock Canyon Emigrant Trails National Conservation Area Act of 200 (the enabling legislation for the affected wilderness area) does not contain any special provisions for wildlife management.

Section 8(e) of the Technical Amendment of 2001 to the enabling legislation provided two additional statements concerning "Hunting, Trapping, and Fishing". Section 8(e) (1) of the enabling legislation states "Nothing in this Act diminishes the jurisdiction of the State of Nevada with respect to fish and wildlife management, including regulation of hunting and fishing on public land in the areas designated as wilderness under subsection (a) Section 8(e)(2) of the Technical Amendment that states "Any action in the areas designated as wilderness in subsection (a) shall be consistent with the Wilderness Act…".

B. Describe Requirements of Other Legislation

Do other laws require action?

Yes: ☒ **No:** ☐ **Not Applicable:** ☐

Explain:
The Wild Free Roaming Horse and Burro Act of 1971, Section 3(a) states "The Secretary shall manage wild free-roaming horses and burros in a manner that is designed to achieve and maintain a thriving natural ecological balance on the public lands."

The purpose of the enabling legislation is to "conserve, protect, and enhance" the unique and nationally important resources found in the Black Rock Desert High Rock Canyon Emigrant Trails National Conservation Area. These resources include wilderness, Great Basin plant and animal species (including bighorn sheep) and free roaming wild horses.

C. Describe Other Guidance

Does taking action conform to and implement relevant standards and guidelines and direction contained in agency policy, unit and wilderness management plans, species recovery plans, tribal government agreements, state and local government and interagency agreements?

Yes: ☒ **No:** ☐ **Not Applicable:** ☐

Explain:
Currently no approved wilderness management plan exists for the wilderness area. Management is based on law, regulation, and policy and the Resource Management Plan for the NCA, and other existing plans, such as the High Rock Canyon Habitat Management Plan. Below are explanations of existing law, policy and guidance.

Law

The Wilderness Act allows for the use of motor vehicles, motorized equipment, landing of aircraft and placement of structures only if they can be shown to be minimum required action for managing the area as wilderness.

Policy

The NDOW/BLM MOU for wildlife management in Nevada BLM Wilderness Areas and the BLM Manual 8560-1: *Management of Designated Wilderness Areas* allows for the construction of new water developments "only when essential to preserve the wilderness resource and to correct unnatural conditions resulting from human influence".

Management Plans

In 1982 a Technical Review Team (TRT) recommended several actions for the High Rock Canyon area two of which were to reintroduce bighorn sheep into the area and to construct two water developments on the east bench above the East Fork of High Rock Canyon (Pole Canyon) the rationale for this recommendation was "The eastern benches are poorly watered, causing wildlife and wild horses to be highly concentrated during dry periods. Construction of additional waters would disperse the animals, potentially increasing carrying capacity. Additionally, these water developments would benefit prescriptive livestock grazing."

The management situation at the time of the recommendation was somewhat different than the present situation. There was an assumption that pending special designation for the area would greatly increase recreation use, that visitor facilities may be constructed in the area, there was a proposal to construct a new access road to private lands in the East Fork of High Rock Canyon, and it appeared that domestic sheep would still be grazed on the west side of the canyon. The recommendation was primarily viewed as partial mitigation for these actions. Currently, it does not appear that there has been a dramatic increase in recreation use, the inholdings in the East Fork of High Rock Canyon have been acquired by the BLM and are now within the Wilderness, and domestic sheep have been removed from the entire area.

The TRT recommendations were carried forward into the 1984 High Rock Habitat Management Plan, which outlines several objectives and management actions for California Bighorn Sheep in the area. Because this plan was prepared prior to wilderness designation all objectives and actions must be analyzed to ensure they are consistent with the wilderness designation that occurred in 2000.

The HMP sets the objective of providing habitat in sufficient quantity and quality capable of supporting a stable population of California bighorn sheep of at least 150 animals on 45,600 acres of suitable habitat within five years". Currently NDOW estimates the population of the entire hunt unit 012 (of which the High Rock Canyon Area is a part of) at 190 bighorn sheep.

Other actions outlined in the HMP relevant to bighorn management include; reintroducing California bighorn sheep, constructing two big game guzzlers and developing two springs for bighorn use and meadow recovery. Although these actions are recommended by the HMP they must still be consistent with the Wilderness Act.

The NCA RMP of 2004 cites the construction of water developments along the rim of High Rock Canyon as an example of a project meeting the minimum requirement criteria, *if* monitoring shows that human uses in the High Rock Canyon area is adversely impacting the ability of bighorn to obtain water in the canyon bottom without being subject to significant stress.

Taking some form of management action in this case would help to meet objectives set in the NCA RMP for vegetation, wild horses and burros, water resources, wildlife, special status species and wilderness.

D. Describe Options Outside of Wilderness

Can this situation be resolved by an administrative activity outside of wilderness?

Yes: ☒ **No:** ☒ **Not Applicable:** ☐

Explain:

Yes

Impacts to bighorn population could be implemented outside the wilderness area to mitigate a portion of the impacts.

-Further restricting recreational use in High Rock Canyon by closing the canyon to motor vehicles during the hottest or driest portion of the year (June through August) and/or restricting the amount of use in the High Rock and East Fork High Rock Canyon Wilderness Areas.

-Restoring existing springs and seeps in the area. Several springs in the area have been inventoried and are currently not in a desirable condition for use by wildlife including bighorn sheep. Restoring these springs could increase the amount of available surface water in the area and would increase the naturalness of the riparian areas associated with the springs. Several reliable springs for bighorn are found outside of the Wilderness along the eastern boundary (Buck Springs and HRSP#27). Restoring these springs would assist in mitigating potential

impacts occurring from wild horse use in the area and would not require the placement of structures inside the wilderness

-Reducing the Appropriate Management Level or eliminating wild horses in the High Rock and Warm Springs Canyon Herd Management Areas. This action would reduce or eliminate the potential impact that they are having on existing water sources and the bighorn sheep population.

No
Large blocks of suitable bighorn sheep habitat in the area are located within wilderness. One of the springs (HRSP#20) identified by NDOW as receiving excessive use from wild horses and important to the bighorn sheep population is within the Wilderness, actions to improve the naturalness of this spring would have to occur with the wilderness.

E. Wilderness Character

Is it necessary to take administrative action to preserve wilderness character, as described by the qualities listed below?

Untrammeled: **Yes:** ☒ **No:** ☐

Explain: Several springs in the area within bighorn habitat are currently be impacted by wild horses and livestock. Because both livestock and wild horses are non-native animals and are intentionally and consciously managed by BLM their impacts could be considered a "trammeling" effect on the wilderness. This may require some form of action to reduce the impact to the areas "untrammeled" character.

Undeveloped: **Yes:** ☐ **No:** ☒

Explain: No action is necessary to preserve the undeveloped character of the wilderness

Natural: **Yes:** ☒ **No:** ☐

Explain: Currently several springs in the area within bighorn sheep habitat (one within wilderness and two on the boundary) are in an undesirable condition for wildlife use. This impacts the naturalness of the area and to maintain this quality a management action may be necessary.

Outstanding opportunities for solitude or a primitive and unconfined type of recreation:
Yes: ☐ **No:** ☒

Explain: No action is necessary to preserve the opportunities for solitude or primitive recreation.

Other unique components that reflect the character of this wilderness:
Yes: ☒ **No:** ☐ **Not Applicable:** ☐

Explain: Observing native bighorn sheep in the Wilderness Area adds to the primitive recreational experience. Decreasing human/bighorn contact and improving water sources

used by bighorn and other native wildlife populations would support these unique NW Great Basin ecosystems. However, this opportunity currently exists in the Wilderness and there is controversy that the construction of additional water sources is necessary to maintain this opportunity.

F. Describe Effects to the Public Purposes of Wilderness

Is it necessary to take administrative action in support of the public purposes for wilderness (as stated in Section 4(b) of the Wilderness Act) of recreation, scenic, scientific, education, conservation, and historical use?

Scenic: **Yes:** ☐ **No:** ☒ **Not Applicable:** ☐

Explain: No action is necessary to support this public purpose

Scientific: **Yes:** ☐ **No:** ☒ **Not Applicable:** ☐

Explain: Research and monitoring of potential impacts from recreation use in High Rock Canyon would lead to more effective management of the area.

Education: **Yes:** ☐ **No:** ☒ **Not Applicable:** ☐

Explain: No action is necessary to support this public purpose

Conservation: **Yes:** ☒ **No:** ☐ **Not Applicable:** ☐

Explain: If the bighorn sheep and existing spring and riparian areas are being impacted by excessive wild horse use than a management action may be necessary.

Historical use: **Yes:** ☐ **No:** ☒ **Not Applicable:** ☐

Explain: No action is necessary to support this public purpose

Step 1 Decision: **Is any administrative action necessary?**

Yes: ☒ **No:** ☐ **More information needed:** ☐

Explain: If existing spring and riparian areas are not meeting Land Health Standards and are in an unnatural condition than then a management action is necessary. Additionally if visitor use in High Rock Canyon is likely to disturb sheep then active management will be required.

If action is necessary, proceed to Step 2 to determine the minimum activity.

Step 2: Determine the minimum activity.

Description of Alternatives

For each alternative, describe what methods and techniques will be used, when the activity will take place, where the activity will take place, what mitigation measures are necessary, and the general effects to the wilderness resource and character.

(Proposed Action) Construction of two wildlife water developments

Description:

Construct two water developments (guzzlers) to provide additional water for bighorn sheep and other wildlife. Each project would consist of one 5400-gallon water catchment for use by wildlife. Each includes three 1800-gallon polyethylene tanks, which will be partially buried and a 1200 square foot steel apron, for precipitation catchment, will cover the tanks. A total of 15 support posts for the apron will be dug 3'deep within 30' of the tanks. Both projects will have a drinker buried 3' deep in front of the tanks approximately 30'. From the tanks to the drinker there will be a trench dug 1' – 3' deep for 2" drisco pipe. Barbed wire fencing, approximately 240 feet in length, would be installed around each guzzler to exclude wild horses and livestock and a pipe rail fence would be constructed around the drinker. Materials would be painted sage green or light brown to match the surrounding landscape.

Explosives would be used to blast the tank pad holes for water storage. Generators, power tools and other hand tools would be used for the actual construction of the developments.

NDOW proposes to haul the construction materials by motor vehicle to the wilderness boundary and then sling load the materials by helicopter short distances to the actual construction sites.

Maintenance of the two guzzlers would require yearly inspections and minor maintenance that could be accomplished by walking into each of the two sites. At intervals estimated at 3 to 5 years, more extensive maintenance would need to occur that would require one or more helicopter trips to transport heavy tools and replacement parts to each site. Construction would occur during the summer of 2006.

Effects:

Wilderness Character

"Untrammeled"

Because the construction of water developments are an intentional human management action they would impact the untrammeled character of the area. The water developments would artificially change the amount and location of water in an area where water is not naturally available.

"Undeveloped"

The proposal would impact the undeveloped character of the wilderness by adding structures in two portions of the wilderness that presently do not contain human developments.

"Natural"

The guzzlers would directly impact a total of about two acres of the naturalness in the wilderness area. Vegetation would be removed and soil would be excavated within the foot print of the developments and the developments themselves would be an obvious impact to the appearance of naturalness in the surrounding area (approximately 95 acres based upon a 400 m viewshed).

The developments could also potentially be a beneficial impact to naturalness by potentially mitigating impacts that may be occurring from wild horses or recreational user on the bighorn sheep in the area.

The impacts that are currently occurring to the naturalness of the existing spring (HRSP#20) would continue under this alternative.

"Outstanding opportunities for solitude or a primitive and unconfined type of recreation"

Opportunities for solitude would be impacted during the construction of the guzzlers by the sounds and sights associated with the possible use of helicopters, work crews, explosives, and motorized equipment. The crews and helicopter use would probably be visible from many areas within the adjacent Wilderness and the sound from the construction would carry for long distances. However these impacts would be relatively short in duration, about one week.

The developments would impact the visitor's sense of being in a remote area away from the signs of civilization. This impact would vary among visitors, some would see it as a significant impact to the primitive experience, and other visitors would not. However based upon the projections of recreational use as shown on Map 2, this would affect fewer than 5 visitors per year.

Use of helicopters for major maintenance would also impact the opportunities for solitude in the area. However, it is anticipated that major maintenance activities would generally only be required once every ten years.

Heritage and Cultural Resources

If cultural resources are present at HRSP#20 and impacts are occurring from trampling they would continue.

Maintaining Contrast and Skills

The proposal would not necessarily provide that the wilderness is managed in contrast with surrounding lands. Water developments are a relatively common wildlife management action throughout Nevada and small game water developments are located in adjacent public lands.

Special Provisions

No Special Provisions are involved with the proposal.

Safety of Visitors, Personnel, and Contractors

No special concerns with the saftey are involved with the proposal.

Economic and Time Constraints

NDOW has funding available to construct the water developments.

Alternative # 1 Protection of Existing Spring Sources with Exclosures

Description:

Construct three separate exclosure fences around existing springs to mitigate impacts of heavy wild horse and livestock use. Only one of the exclosure fences would be within the Wilderness. The exclosure fences would use a design that allows bighorn sheep and other wildlife to access the water, but would exclude wild horses and livestock from the spring sources. Due to the expected horse pressure on any water site, all exclosure fencing would follow the buck and rail fence construction or pipe rail fence and material specifications recommended in Brigham and Stevenson (1997).

Due to the weight and size (i.e. 16' long poles and 6,000 lbs) of the materials that are required to construct a fence capable of excluding wild horses, packing the materials to the site on horseback would not be feasible. The exclosure fencing would be sling loaded by helicopter to the site. Work crews would walk to the site. Exclosure materials would be drilled and prepared off-site to minimize the amount of work that will occur within the wilderness.

If pipe rails fence materials are used they would be painted sage green or light brown to match the surrounding landscape

HRSP#20 within the Wilderness Area would be fenced to protect the spring source from excessive wild horse use. It is estimated that approximately 750 feet of fencing would be constructed to enclose about 0.6 acres. Troughs would not be constructed at the spring, but water would be allowed to flow outside of the exclosures for wild horse use during the spring season. Access for future maintenance will be conducted by foot or horse travel.

Construction of the exclosure fences would be proposed to be initiated during the summer of 2006.

Effects:

Wilderness Character

"Untrammeled"

Because the exclosure is an intentional human management action it would impact the untrammeled quality of the area. However, this would be offset because the exclosure

would also reduce the existing impacts to the untrammeled character that wild horses may be causing to the existing springs.

"Undeveloped"

The alternative would impact the undeveloped character of the wilderness by adding a structure in a portion of the wilderness that presently does not contain human developments.

"Natural"

The exclosure fence will impact the appearance of naturalness in the immediate area around HRSP#20 (approximately 23 acres). While the exclosure fence would have an impact on the appearance of naturalness in the immediate area, it would also enhance the naturalness of the area inside the exclosure by reducing the impacts that are currently occurring to the riparian areas and the spring morphology from over utilization and trampling by wild horses. The benefits to naturalness of allowing the spring systems to function in a more natural state without heavy grazing use by wild horses would offset the negative impacts associated with the site of the exclosure fence.

"Outstanding opportunities for solitude or a primitive and unconfined type of recreation"

Opportunities for solitude would be impacted during the construction of the exclosure fence by the sounds and sights associated with the possible use of helicopters and work crews. The crews and helicopter use would probably be visible from many areas within the adjacent Wilderness and the sound from the construction would carry for long distances. However these impacts would be relatively short in duration, about one week.

The exclosure fence would impact the visitor's sense of being in a remote area away from the signs of civilization. This impact would vary among visitors, some would see it as a significant impact to the primitive experience, and other visitors would not. However, the exclosure would also enhance the appearance of naturalness around the spring which could benefit the primitive recreation experience. Based upon the projections of recreational use this would affect fewer than 5 visitors per year.

Maintenance could also impact the opportunities for solitude in the area. However, it is anticipated that maintenance activities would generally only occur 1 day per year and major maintenance would be required once every ten years.

Heritage and Cultural Resources

If cultural resources are present and being impacted around HRSP#20, the exclosure fence would reduce or eliminate any possible impacts resulting from excessive wild horse use at the spring.

Maintaining Contrast and Skills

The proposal would not necessarily provide that the wilderness is managed in contrast with surrounding lands. Exclosure fencing is a relatively common wildlife management and range management action throughout Nevada.

Special Provisions

No Special Provisions are involved with the proposal.

Safety of Visitors, Personnel, and Contractors

No special concerns with the saftey are involved with the proposal.

Economic and Time Constraints

Funding for the exclosure fencing would need to be provided

Alternative # 2 No Action

Description:

No Action

Effects:

Wilderness Character

"Untrammeled"

Impacts occurring from horse use at HRSP#20 would continue.

"Undeveloped"

No impact would occur to the undeveloped character of the Wilderness.

"Natural"

Impacts occurring from horse use at HRSP#20 would continue.

"Outstanding opportunities for solitude or a primitive and unconfined type of recreation"

No impacts would occur to opportunities for solitude. The alternative could have impacts on primitive recreation. This impact would vary among visitors, some see the current condition of springs it as an adverse impact to primitive recreation experience, and other visitors would not recognize it as an impact.

Heritage and Cultural Resources

If cultural resources are present at HRSP#20 and impacts are occurring from trampling by wild horses they would continue under the No Action.

Maintaining Contrast and Skills

The No Action alternative would not place any additional developments in the Wilderness and would therefore be providing a contrast in management between wilderness and adjacent public lands.

Special Provisions

No Special Provisions are involved with the proposal.

Safety of Visitors, Personnel, and Contractors

No concerns with the saftey are involved with the proposal.

Economic and Time Constraints

No additional funding would be required to implement the proposal.

Adjustment to Appropriate Management Levels of Herd Management Area Boundaries

Reducing the Appropriate Management Level or eliminating wild horses in the High Rock and Warm Springs Canyon Herd Management Areas. This action would reduce or eliminate the potential impact that the horses are having on existing water sources and the bighorn sheep population.

Methods of removal would be those commonly used in the area for regular horse gathers (i.e. helicopter herding to trap sites outside of the Wilderness).

Effects:

Wilderness Character

"Untrammeled"

The impacts that wild horses have on the untrammeled character of the wilderness would be reduced or eliminated.

"Undeveloped"

No impact would occur to the undeveloped character of the Wilderness.

"Natural"

This alternative would enhance the naturalness of the area by reducing or removing a non-native ungulate and their associated impacts from the Wilderness.

"Outstanding opportunities for solitude or a primitive and unconfined type of recreation"

Opportunities for solitude would be impacted during the removal of wild horses by the sounds and sights associated with the possible use of helicopters and work crews. The crews and helicopter use would probably be visible from many areas within the adjacent Wilderness and the sound from the construction would carry for long distances. However these impacts already occur during the regularly scheduled wild horse gathers and would be relatively short in duration, about one week.

The alternative could have impacts on primitive recreation. This impact would vary among visitors, some would see it as a benefit to the primitive recreation experience because of the potential improvement in vegetation and riparian areas, and other visitors would see it as an adverse impact because viewing wild horses adds to some visitors primitive recreation experience.

Heritage and Cultural Resources

The alternative could potentially have a beneficial impact to cultural resources, because the impacts from trampling by wild horses would be reduced or eliminated.

Maintaining Contrast and Skills

The alternative would provide a contrast in management between wilderness and adjacent public lands. Wild horses are relatively common throughout Nevada and the Great Basin. Removing horses from the Wilderness would eliminate impacts to naturalness and would provide that natural processes are relatively less impacted than in other portions of public lands in Nevada.

Special Provisions

No Special Provisions are involved with the proposal.

Safety of Visitors, Personnel, and Contractors

No special concerns with the saftey are involved with the proposal.

Economic and Time Constraints

Funding for the removal would need to be provided.

Additional Restrictions on Visitor Use in High Rock Canyon

Description:

Further restrict recreational use in High Rock Canyon by closing the canyon to motor vehicles during the hottest portion of the year (June through August) and/or restricting the amount of use in the High Rock and East Fork High Rock Canyon Wilderness Areas.

Effects:

Wilderness Character

"Untrammeled"

No impacts would occur to the untrammeled character of the Wilderness.

"Undeveloped"

No impact would occur to the undeveloped character of the Wilderness.

"Natural"

This alternative would not necessarily enhance the naturalness of the Wilderness area. It could have a beneficial impact on the bighorn population that uses High Rock Canyon as a water source.

"Outstanding opportunities for solitude or a primitive and unconfined type of recreation"

Opportunities for solitude in the Wilderness Areas adjacent to High Rock Canyon would probably be enhanced because the chance of seeing or hearing other users or motor vehicles would be reduced for an additional 3 months of the year.

The alternative would have impacts on unconfined recreation. If use restrictions were placed on the Wilderness Areas the opportunity for users to access the areas would be reduced and their sense of being unconfined would be reduced.

Heritage and Cultural Resources

No impacts to cultural resources would be expected from the alternative.

Maintaining Contrast and Skills

The alternative would not necessarily provide a contrast in management between wilderness and adjacent public lands, other than access for recreation would be reduced.

Special Provisions

No Special Provisions are involved with the proposal.

Safety of Visitors, Personnel, and Contractors

No special concerns with the saftey are involved with the proposal.

Economic and Time Constraints

No additional funding would be required to implement the proposal.

Step 2 Decision: What is the Minimum Activity?

The selected alternative is:

If recreation use in the area was occurring at levels that were having an adverse impact to the bighorn population in the area the alternative that would mitigate this impact with the least impact to the wilderness character of the area would be to place further restrictions on recreation use in High Rock Canyon. Currently it does not appear that recreation use is occurring at a level that is impacting the bighorn population, so further restrictions would be unnecessary at this time.

If existing spring and riparian areas are not meeting Land Health Standards and are in an unnatural condition than the alternative that would reduce these impact with the least impact to the wilderness character of the area would be to reduce the AML or eliminate wild horses from the area. While reduction of AML or elimination of horses from the area may be the alternative with the least impact on the wilderness quality of the area it may be not be fully consistent with other existing laws regarding wild horse management and management of the NCA. If selection of this alternative is not possible than the alternative of constructing the exclosure fence around the three springs within bighorn habitat (one within wilderness), would be the alternative with the least impact to wilderness character while maintaining the naturalness of the wilderness area, and would be considered to be the minimum activity or tool necessary to maintain the naturalness of the Wilderness.

Monitoring will continue after the High Rock HMA is gathered during the summer of 2006 and the exclosures are constructed to determine if an adjustment in AML is necessary.

Because wire fencing is not the most effective means for excluding horses and livestock from the spring sources and would require more maintenance than other materials, it is determined that

the exclosure fence would be constructed of pipe rail or wooden buck and rail material. Due to the size and weight of these materials they are essentially impossible to transport on horseback. Sling loading the materials to the spring site with a helicopter would be considered to be the minimum tool for transporting the materials to HRSP#20. All work crews will access the site by foot or horseback to minimize the amount of helicopter use occurring over the Wilderness.

Describe the rationale for selecting this alternative:

Constructing an exclosure fence within the Wilderness would impact the undeveloped character and would also have impacts on opportunities for solitude in the area. However, constructing the exclosure and restoring the existing naturally occurring water source would benefit the wilderness as a whole by both mitigating potential impacts from the degraded spring to native wildlife and benefiting the naturalness of the riparian areas (i.e. vegetation, stream morphology) around the spring. Because the exclosure would restore the existing spring to a more natural condition it would be less of a human manipulation of the area than constructing new water developments and providing water in areas where it does not naturally occur and would have less of an impact on the untrammeled character of the Wilderness

Maintenance requirements:
Access for maintenance will be conducted by foot or horse travel.

Standards and designs that apply
The exclosure will be built to meet wildlife specifications that will allow them to access the water.

Mitigation measures that apply
If steel posts are used they will be painted brown or sage green to minimize their impacts on the visual resources of the area.

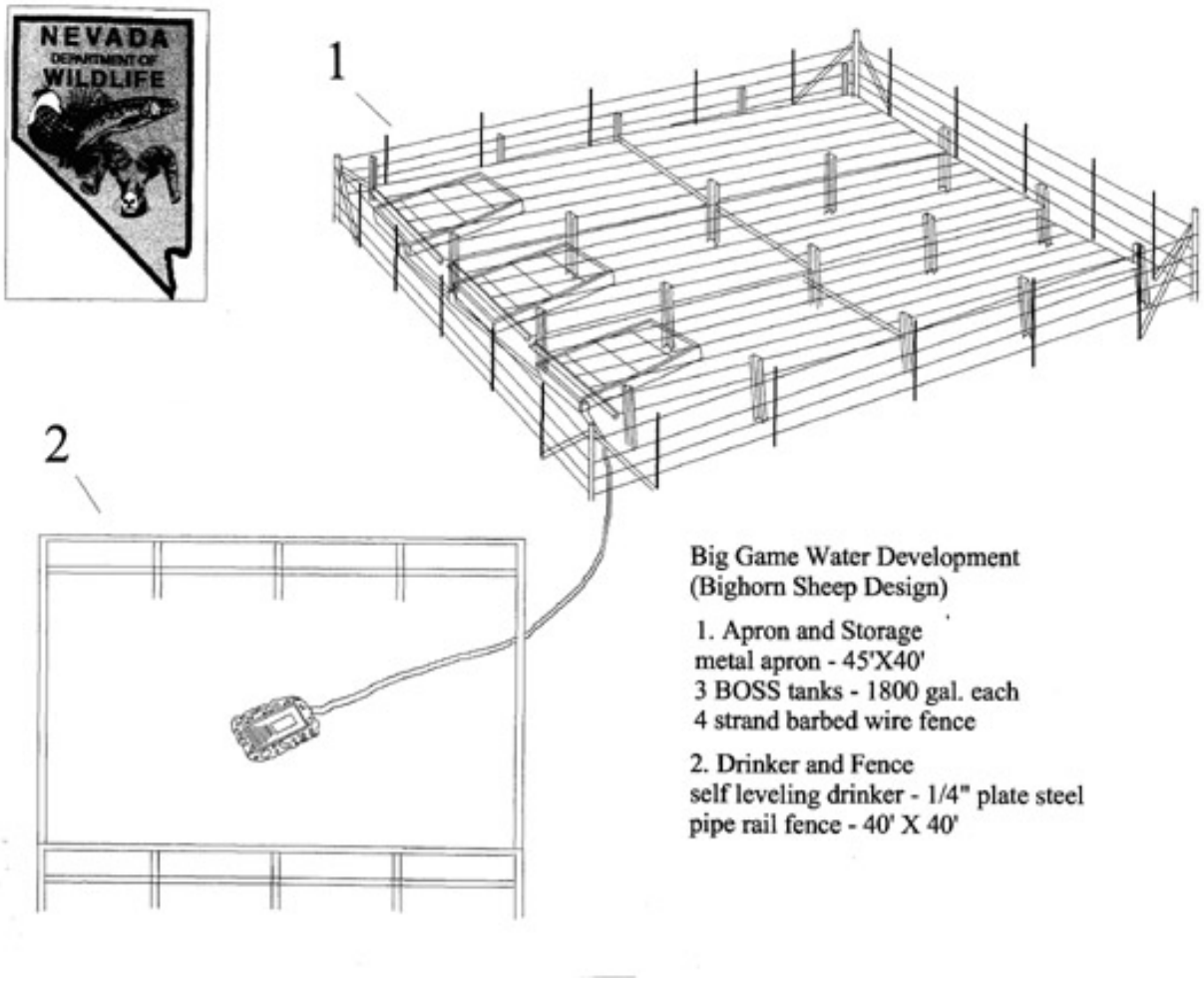
Monitoring
Motion detecting cameras will be installed at the exclosure site to determine it's effectiveness and monitor the number and species of wildlife using the site.

Please check any Wilderness Act Section 4(c) uses approved in this alternative:

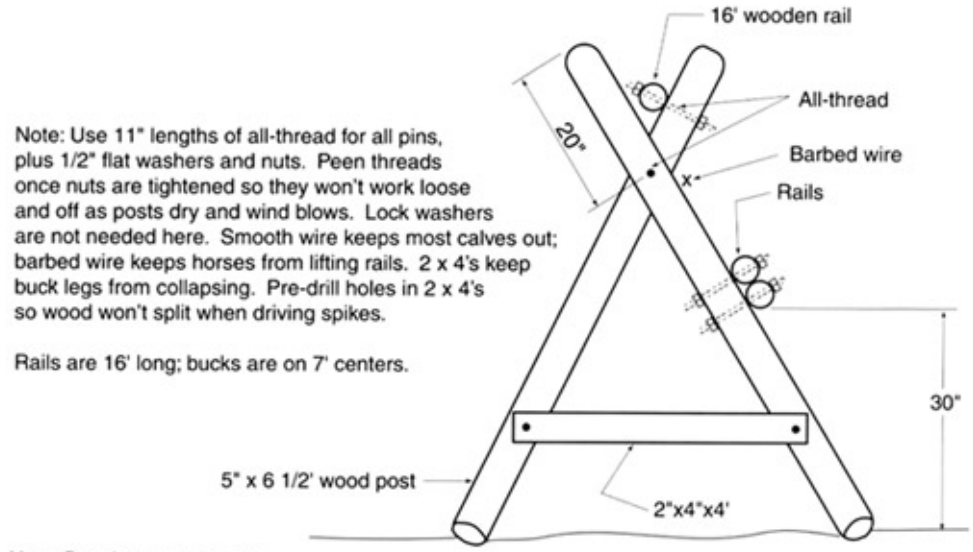
- ☐ mechanical transport
- ☐ motorized equipment
- ☐ motor vehicles
- ☐ motorboats
- ☒ landing of aircraft
- ☐ temporary road
- ☒ structure or installation

Be sure to record and report any authorizations of Wilderness Act Section 4(c) uses according to agency procedures.

Appendix C: Diagram of the proposed Big Game Guzzlers



Appendix D: Diagram of proposed Exclosure Fencing

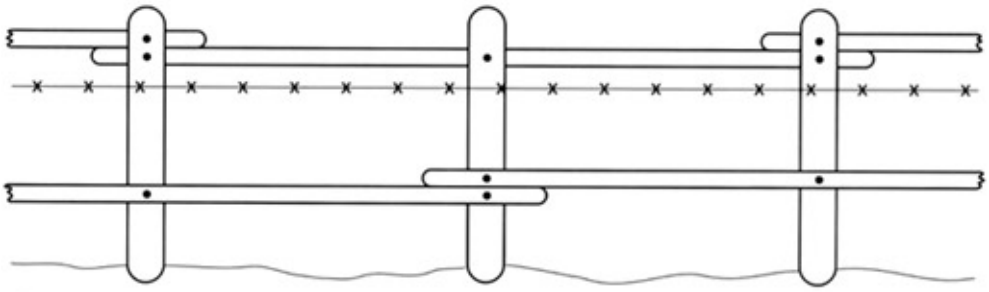


Note: Use 11" lengths of all-thread for all pins, plus 1/2" flat washers and nuts. Peen threads once nuts are tightened so they won't work loose and off as posts dry and wind blows. Lock washers are not needed here. Smooth wire keeps most calves out; barbed wire keeps horses from lifting rails. 2 x 4's keep buck legs from collapsing. Pre-drill holes in 2 x 4's so wood won't split when driving spikes.

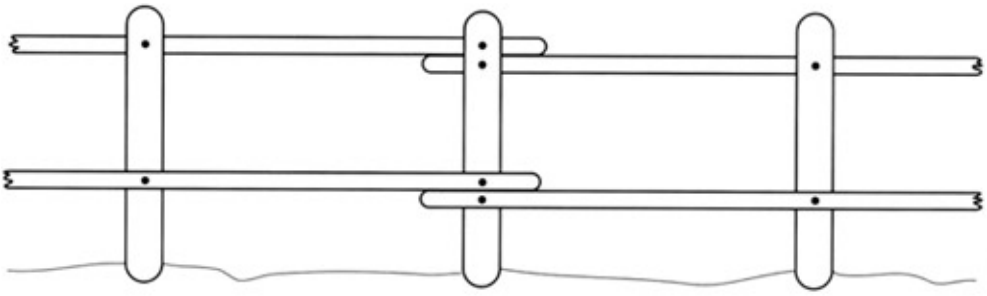
Rails are 16' long; bucks are on 7' centers.

Note: Drawings not to scale.

Pattern for straight stretches of fence—alternating overlap of rails.



Pattern for curved sections of fence—top and bottom rails overlap on same buck.



Appendix E: Bighorn Habitat Evaluation Procedure

A U.S. Geological Service 10 meter DEM was used to derive to terrain roughness layer. Because roughness of terrain is more important to bighorn than just steep terrain, the standard deviation of elevations values within a 7 by 7 cell area were calculated for each cell. The calculated standard deviation values ranged from zero (flat areas) to 54.31 (most complex terrain) within NDOW Management Unit 012. The distribution of standard deviations was strongly skewed toward low values that represented flat, gently rolling or even slope conditions.

The top decile (10%) of standard deviation values (> 15.49) was selected. This subset of the most rugged terrain included a large number of very small clumps of cells. The resulting layer was then converted to a polygon layer. This resulted in the creation of 1,385 polygons totaling 61,086 acres that ranged in size from 0.13 to 10,888 acres (median 4.53 acres). Because larger areas of escape terrain have greater value to bighorn than small areas polygons greater than the median polygon size were selected from the polygon layer. The 692 discarded polygons corresponded to 1,094 acres of potential escape terrain. The selected area corresponded to 59,992 acres of escape cover.

Escape cover was buffered by 400m to produce a layer of potential habitat within easy reach of bighorn escape cover (224,864 acres). Potential habitat was clipped to the area within the 1 mile and 2 mile buffers of dependable water sources. These distances were chosen to correspond to thresholds identified in the literature. Van Dyke *et al*. (1983) cite studies where bighorn spent most of their time within 1 mile of water but were observed as far as 2 miles from water. They also reported several studies where water more than 0.3 miles from escape terrain was avoided by bighorn. Dunn 1996) and Janke (1985) refer to a 2 mile use area from water. NDOW in a letter to BLM endorsed the methodology used by Janke (NDOW 2005d). Potential habitat within 1 mile of dependable water corresponded to 111,703 acres and within 2 miles of dependable water corresponded to 185,741 acres of bighorn use areas.

Finally areas within 200 meters of roads receiving more than 2,000 visitor use days per year were deleted from the potential habitat areas. For the 1 mile water buffer the final potential habitat were 108,862 acres (170 mi^2) for the habitat within 1 mile of dependable water and 181,332 acres (283 mi^2) for the habitat within 2 miles of dependable water.

The two guzzlers locations proposed by NDOW were analyzed to determine what changes in habitat availability would occur if they were constructed. The 4,021 acres within 1 mile of the two guzzlers contained 2,478 acres of potential habitat. However 2,011 acres of this habitat was within 1 mile of existing dependable water sources. Therefore the net increase in habitat available to bighorn sheep using a 1 mile water buffer would be 467 acres or 0.73 mi^2. Using a less conservative 2 mile bighorn use area from water, there would be no net increase in available bighorn habitat due to construction of the two NDOW guzzlers.