PRELIMINARY ENVIRONMENTAL ASSESSMENT

DOI-BLM-NV-W000-2013-0001-EA

WINNEMUCCA DISTRICT DROUGHT RESPONSE PLAN

February 2013

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BLM

Winnemucca District Office/Nevada

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WINNEMUCCA DISTRICT
DROUGHT RESPONSE PLAN

HUMBOLDT & PERSHING COUNTIES
Portions of WASHOE, LYON, & CHURCHILL COUNTIES
NEVADA

Preliminary Environmental Assessment
DOI-BLM-NV-W000-2013-0001-EA

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U.S. Department of the Interior
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I. INTRODUCTION/PURPOSE AND NEED FOR ACTION

1.0 Introduction and Background

The Bureau of Land Management (BLM) Winnemucca District (WD) has prepared this Environmental Assessment (EA) to address potential environmental impacts associated with livestock and wild horse and burro management actions carried out during drought.

The WD boundary encompasses approximately 11.1 million acres located in all of Humboldt and Pershing counties, and portions of Washoe, Lyon and Churchill counties in the northwest corner of Nevada. The WD manages 74.6% of these lands, or approximately 8.3 million acres of public lands, which is administered in two field offices, the Humboldt River Field Office (HRFO) and the Black Rock Field Office (BRFO) (see Map 1). The WD also administers two grazing allotments for the Battle Mountain BLM District. The WD is located within the Central and Northern Basin and Range ecoregions defined by the Western Ecology Division of the United States Environmental Protection Agency (see Map 2). Drought is considered a recurring event within both ecoregions.

Drought has been defined by the Society for Range Management as, "(1) A prolonged chronic shortage of water, as compared to the norm, often associated with high temperatures and winds during spring, summer, and fall. (2) A period without precipitation during which the soil water content is reduced to such an extent that plants suffer from lack of water." (Bedell 1998).

The effects of drought are often times far reaching, impacting the environment and economy of an area. This EA will focus primarily on the environmental impacts of drought. Specific impacts depend on drought severity, but often include:

- Increased number and severity of fires
- Lack of forage and drinking water
- Decreased vigor and production of plants
- Damage to plant community dynamics
- Increased wind and water erosion of soils
- Reduction and degradation of fish and wildlife habitat
- Increased mortality of wildlife, wild horses and burros and livestock

Drought is a recurring, albeit unpredictable, environmental feature which must be included in planning (Thurow and Taylor 1999). The degree to which drought impairs the range depends on the intensity, frequency and timing of grazing (Howery 1999). A Drought Response Plan (DRP) does not currently exist for the WD. A DRP would:

1. Provide for early detection of drought conditions.
2. Identify and minimize degradation to affected resources on lands affected by drought.
3. Provide for the rapid implementation of Drought Response Actions (DRAs) to alleviate the impacts of authorized uses and activities on natural resources.

This EA analyzes a range of management drought response actions that may be implemented to mitigate the effects of drought and to address emergency situations. Emergency situations include but are not limited to wild horse and burro, livestock and wildlife starvation, water deprivation and mortality, major soil erosion events, rangeland degradation, etc.

1.1 Purpose and Need

The purpose of the DRP is to provide the BLM a range of management options that will allow for a flexible and rapid response to drought in order to alleviate the impacts of authorized uses and activities on natural resources that are at risk of being adversely affected by drought.

The need of the proposed action is to ensure that livestock and wild horse and burro management during drought does not adversely impact the range and compromise the WD's ability to meet the fundamentals of rangeland health as mandated by management plans and policies brought forward in sections 1.2 and 1.3 of this document.

1.2 Conformance with Land Use Plans

The Proposed Action and Alternatives described below are in conformance with the following plans:

- Sonoma-Gerlach Management Framework Plan (MFP), 1982;
- Paradise-Denio MFP, 1982
- Black Rock Desert-High Rock Canyon-Emigrant Trails National Conservation Area and Associated Wilderness RMP, 2004

1.3 Relationship to Statutes, Regulations, Policy or other Environmental Analysis and Plans

The Proposed Action and Alternatives would be in conformance with the following:

- Taylor Grazing Act of 1934
- National Environmental Policy Act of 1969 (NEPA)
- National Historic Preservation Act of 1966, as Amended (NHPA)
- Wild Free-Roaming Horses and Burros Act of 1971 (WFRHBA)
- Endangered Species Act of 1973
- Federal Land Policy and Management Act of 1976 (FLPMA)
- Sierra Front-Northwestern Great Basin RAC Standards and Guidelines, 1997, as amended
- Sonoma-Gerlach Rangeland Program Summary, 1992
- Public Rangelands Improvement Act of 1978
- Wilderness Act of 1964
- 43 CFR §§4100 and 4700

1.4 Additional Guidance

BLM Nevada Handbook NV H-1730-1 Resource Management during Drought includes guidance on the development and implementation of responsive management actions when it is

anticipated or evident that temporary measures are necessary to protect public land resources due to the impacts of drought.

1.5 Issues

Scoping was conducted during January of 2013. A letter regarding the BLMs proposal was sent to nearly 400 potentially affected interests including individuals and organizations. The letter was also provided on the Winnemucca District web page. In conjunction with the scoping letter, a news release was issued.

Consultation letters were sent out to the following tribes on December 26, 2012: the Battle Mountain Band, the Fallon Paiute-Shoshone Tribe, Fort McDermitt Paiute-Shoshone Tribe, the Lovelock Paiute Tribe, the Pyramid Lake Paiute Tribe, the Reno-Sparks Indian Colony, and the Summit Lake Paiute Tribe.

A letter was received from the Nevada Department of Wildlife generally supporting the BLM efforts to improve rangeland management during drought conditions. Concerns brought forward include the increased stress of wildlife species at water sources; encouragement to focus on vegetation management and plant health during decision making; and utilizing a wide range of tools for livestock and wild horse and burro management.

Anytime modification of grazing permits is considered, it is controversial in nature. Several letters were received from permittees voicing concern about any modification to their permits.

Internal scoping resulted in a list of potentially affected supplemental authorities and additional resources. These are presented in Chapter 3 Tables 1 and 2.

II. DESCRIPTION OF THE PROPOSED ACTION & ALTERNATIVES

2.0 Proposed Action

The Proposed Action is to implement the Winnemucca District Drought Detection and Monitoring Plan (DDMP) (refer to chapter 2 and for more detail, Appendix 1) and the Drought Response Actions (DRAs) identified in this EA. The DDMP would be used to facilitate the detection and monitoring of drought conditions. The DRAs could be implemented, either separately or in combination, to minimize the impacts of authorized uses and activities on natural resources that are at risk of being adversely affected by drought.

The early detection and rapid response to drought is needed to minimize degradation to affected natural resources. Drought indicators (section 2.0A and DDMP) would be used to identify drought afflicted areas. Once these areas have been identified, site specific monitoring would occur to determine if one or more of the Drought Response Triggers (DRTs) (section 2.0B and DDMP) have been met or exceeded. If it is determined that DRTs have been met or exceeded, the authorized officer would determine what DRAs (section 2.0C and DRP) to implement, if any.

DRAs would be implemented through the issuance of full force and effect decisions pursuant to 43 CFR §4110.3-3(b), after consultation with, or a reasonable attempt to consult with, affected permittees or lessees. Decisions would be implemented within all applicable laws, regulations and policies.

Full force and effect decisions would be supported by site-specific monitoring data collected as outlined in the DDMP. Justification for wild horse and/or burro drought gathers would be thoroughly documented within a site-specific drought gather plan (see Appendix 2 for a Drought Gather Plan Outline). All drought gather decisions would be implemented effective upon issuance pursuant to 43 CFR §4770.3(c). If it is determined that wild horse and/or burro removal from a Herd Management Area(s) (HMA) is warranted, pursuant to 43 CFR §4710.5, areas of allotment(s) that overlap with the HMA(s) would be temporarily closed to livestock grazing if necessary to protect the health of wild horses and burros or their habitat.

All DRAs implemented through full force and effect decisions would remain in place until written notice is provided by the authorized officer indicating otherwise. Prior to lifting DRAs, the BLM would ensure the impacts to resources which caused DRAs to be implemented (i.e. the triggers) have been alleviated. This would be accomplished by using the Drought Monitor to determine when an area is believed to no longer be in drought, allowing the DRA area to recover for one full growing season with the DRA(s) in place, and monitoring at the end of the growing season to affirm that impacts have been alleviated. If impacts from drought persist, DRA(s) would remain in place for another growing season. This process would continue until the area has been determined to no longer display the effects of drought which triggered the implementation of the DRA.

A. Drought Indicators

Drought indicators are observations signaling the start or continuation of a drought. The following discussion identifies the indicators that the WD would use to determine the onset and/or continuation of a drought.

To determine if there is a chronic shortage of water, as compared to the norm, the U.S. Drought Monitor (http://droughtmonitor.unl.edu/)[1] would be consulted to identify drought afflicted areas. Site visits to the drought afflicted areas would be used to evaluate the current condition of water resources and determine if water shortages exist.

To determine if vegetation is suffering from the lack of water, the U.S. Drought Monitor and the Vegetation Drought Response Index (VegDRI) (http://vegdri.unl.edu/)[1] would be consulted to determine drought afflicted areas and vegetation condition as it pertains to drought stress. Site visits to drought afflicted areas would be used to evaluate the current condition and production of key species as described in the associated Ecological Site Descriptions (ESDs) for the area. In instances where key species referenced in the ESD are absent, alternative key species would be identified using site-specific and/or past monitoring data. Evaluations would be used to

[1] In the event the U.S. Drought Monitor or the Vegetation Drought Response Index is abandoned or another more accurate service becomes available, the BLM will consult with the most widely recognized source of relevant data.

determine if plants are exhibiting signs of drought stress and if vegetation shortages exist. Signs of drought stress include, but are not limited to reduced shoot and leaf growth, reduction in seed head development, induced senescence (i.e., premature aging) and plant mortality.

B. Drought Response Triggers

Drought Response Triggers (DRTs) are thresholds associated with vegetation and water resources that indicate the need for site-specific drought response. DRTs would be used separately or in combination to activate DRAs. The DRTs have been placed into two categories: water and vegetation. The following is a list of the DRTs for each category (refer to Appendix 1 for a more detailed description of the DRTs):

1. Water

This DRT is based on the presence or absence of available water. Field visits would be conducted in drought afflicted areas to determine if there are adequate water sources (natural and/or developed) to provide for the management and/or distribution of fisheries, wildlife, wild horses and burros and livestock while maintaining riparian area functionality and the health of upland areas surrounding developed water sources (e.g.,, wells, pipelines, guzzlers, etc.). Water would be classified as available or unavailable. Available is defined as an amount of water sufficient to provide a safe and reliable source of water for fisheries, wildlife, wild horses and burros and livestock while maintaining resource values. Resource values associated with riparian areas include riparian vegetation, bank stability, wildlife habitat and water quantity and quality. Resource values associated with upland areas include vegetation, nutrient cycling, soil site stability, hydrologic function and wildlife habitat.

Unavailable is defined as an absence of water or quantity/quality of water that is insufficient to provide a safe and reliable source of water for fisheries, wildlife, wild horses and burros and livestock while maintaining resource values.

Field observations and professional judgment would be used to determine availability. Criteria such as reduced quantity/quality of water, noticeable accumulation of animal waste and unsafe conditions due to mud or unstable banks would be used.

2. Vegetation

To survive, perennial plants must accumulate both above ground (shoot growth) and below ground (root growth) biomass through the process of photosynthesis, transpiration, and respiration (Howery 1999). A lack of available soil moisture usually reduces the length of the growing season. A shorter growing season directly impacts above and below ground production and ultimately vegetation quantity. The degree to which drought impairs the range's potential for future production depends on the intensity, frequency, and timing of grazing (Howery 1999). Drought afflicted rangelands are unable to support pre-drought stocking levels. Overutilization during drought can negatively impact plant health and impair the ability (in the future) to meet, or make significant progress towards fulfillment of the standards and guidelines for rangeland health.

The following DRTs associated with vegetation are intended to ensure proper utilization levels of upland and riparian key species, as described in the associated ESD. In instances where key species referenced in the ESD are absent, alternative key species would be identified using site-specific and/or past monitoring data. Appropriate utilization levels provide adequate residual matter for the maintenance of plant health especially during a drought. These DRTs have been organized into three categories; utilization and stubble height by vegetation community, livestock distribution and plant production/drought stress.

Utilization and Stubble Height

Utilization triggers were developed using the guidelines proved by Holechek et al. (1988). The guidelines provide a range of use associated with rangeland condition. The lower utilization levels will be the trigger which is consistent with the levels suggested for ranges in poor condition. These were chosen due to the reduced vigor and production of plants resulting from drought. The following utilization levels would function as drought response triggers within each respective vegetation community and would trigger the implementation of DRAs. Stubble height triggers were developed to ensure adequate residual matter remains to maintain riparian plant communities. Generally, stubble heights of 4 to 6 inches provide effective stream bank protection, prevent sedimentation that is out of balance with the water and sediment being applied, and maintain or improve plant communities (USDI 1999-2001). Key species would be identified using the ESD for a specific area. In instances where key species referenced in the ESD are absent, alternative key species would be identified using site-specific and/or past monitoring data.

- **Salt Desert Shrub**
    - 25 % utilization of key species.
- **Sagebrush Grassland**
    - 30% utilization of key species.
- **Pinyon-Juniper Woodland**
    - 30% utilization of key species.
- **Mountain Shrub**
    - 30% utilization of key species.
- **Riparian Zones**
    - 6 inch stubble height of key riparian species.
    - 20% utilization of key woody species.

Livestock\Wild Horse and Burro Distribution

A pattern of use or distribution of livestock and/or wild horses and burros resulting in a concentration of animals, which contributes to grazing in excess of the aforementioned utilization levels and/or stubble heights, would trigger DRAs to improve animal distribution and minimize rangeland degradation.

Plant Production and/or Drought Stress

The following plant production and/or drought stress indicators would trigger DRAs:

- Drought induced senescence or reduced production of key upland and/or riparian species which results in an insufficient quantity/quality of vegetation for wildlife, wild horses and burros and/or livestock;
- Drought induced senescence of key riparian herbaceous species which results in insufficient plant growth/height to provide for stubble heights equal to or greater than six inches within riparian areas; and
- Noticeable signs of drought stress which impede the ability of key species to complete their life cycle (e.g., drought induced senescence, reduced seed head development, etc.).

C. Drought Response Actions

The following DRAs would be implemented either separately or in combination upon reaching the criteria described in the Winnemucca District Drought Detection and Monitoring Plan (DDMP, Appendix 1). DRAs have been placed into two categories: livestock and wild horses and burros. They have been separated due to the differing nature and capabilities for management. DRAs would be selected based on site-specific information. In areas where livestock and wild horse and burro use overlap, both livestock and wild horse and burro DRAs would be implemented concurrently.

Design Measures

- An interdisciplinary team would review all planned DRAs. Implemented DRAs would be reviewed and monitored on a yearly basis to determine if the DRAs are appropriate or if a different DRA or suite of DRAs is more suitable.

- BLM would not bar or prevent traditional practitioners from gaining access to existing and known medical/edible plant locations, and other culturally important sites. Any temporary fences constructed would be designed in a manner that would allow access at all current access points (e.g., trails, roads, etc.).

- Implementation of proposed DRAs would be coordinated with BLM archaeologists; those with the potential to adversely affect cultural resources would be identified. The presence of significant cultural resources would be determined at that time and all such resources would be avoided with an appropriate buffer in compliance with the NHPA, and the Nevada State Protocol Agreement between the BLM, Nevada and the Nevada State Historic Preservation Office (SHPO). In rare instances where avoidance is impractical, further NEPA evaluation will be necessary.

- Any implementation of proposed DRAs within the Black Rock Desert/High Rock Canyon Emigrant Trails National Conservation Area (NCA) would also require avoidance of travel on pristine trail traces as identified by BLM archaeologists.

- Prior to implementing DRAs, an evaluation and potential inventory would be completed and identified paleontological resources would be avoided.

- Implementation of all DRAs would be coordinated with a BLM wildlife biologist to determine special requirements that need to be implemented for specific plant and animal species or their habitat (e.g., flight diverters, nesting surveys, etc.)

- Temporary fencing, water hauling and temporary above ground pipelines would not be placed within an ACEC, Wilderness or Wilderness Study Areas. Fencing may be used to restrict livestock and wild horses and burros from the ACEC. Temporary water hauls or above ground pipelines may be utilized to draw livestock and wild horse and burros away from an ACEC, Wilderness or Wilderness Study Area to reduce impacts during drought.

- Native American consultation is ongoing with this document. The proposed action would be implementable based on this EA. However, tribes would be provided further input at the time of implementation. Since the BLM must attempt to limit, reduce, or possibly eliminate any negative impacts to Native American traditional/cultural/spiritual sites, activities and resources, consultation with Native American tribes would occur through the decision process prior to the implementation of any actions. The amount of time for further consultation would be dependent upon the urgency of the situation.

- Water haul sites and their supply routes, temporary fencing, and above ground pipelines would be evaluated for the known or potential existence of BLM sensitive plant species to avoid impacts associated with vehicular traffic and livestock grazing (e.g., soil compaction and trampling). Preferred water sources for water augmentation would be wells. Additional water sources would be coordinated with the water right holder to prevent water usage from LCT occupied and recovery streams and from water sources with other special status species (e.g., springsnails).

- Precautions would be taken prior to setting up trap sites and holding facilities to avoid areas where noxious weeds, invasive or non-native species exist to lessen the chance of spread. The Contracting Officers Representative (COR), Project Inspector (PI), or other qualified specialist would examine proposed holding facilities and traps sites prior to construction to determine if noxious weeds were present. If noxious weeds were found, a different location would be selected. Areas disturbed specifically by gather operations would be monitored, re-vegetated (if appropriate), and treated for potential new infestations of non-native invasive plants as a result of gather operations.

- Previously disturbed areas, such as gravel pits, would be selected as temporary trap sites and holding facilities when feasible. Areas disturbed specifically by gather operations would be monitored, re-vegetated (if appropriate), and treated for potential new infestations of non-native invasive plants as a result of gather operations.

1. Livestock

DRAs would be selected on a case-by-case basis using site-specific monitoring data collected as outlined in the DDMP. The following process would be used to determine which DRA(s) would be implemented:

Step 1: Conduct field visits to drought afflicted areas to assess DRTs. Field visits would assess water and vegetation availability at predetermined sites using the monitoring methods as outlined in the DDMP.

Step 2: Pursuant to 43 CFR §4110.3-3(b), consult with, or make a reasonable attempt to consult with, affected permittees or lessees to determine appropriate DRA(s) to alleviate drought impacts. DRAs would be selected using site-specific monitoring data and chosen on case-by-case basis suited to site-specific conditions. More than one DRA could be selected depending on conditions. Efforts should be made to select DRAs that could be implemented in a subsequent fashion to respond to changes in drought conditions.

Step 3: Implement DRAs in selected order. Order would be determined based on site-specific monitoring data.

Step 4: Resort to partial or full closure of an allotment. Partial or full closure of an allotment would be implemented if: 1) a permittee or lessee fails to cooperate in the implementation of appropriate DRA(s) after "a reasonable attempt" (43 CFR 4.110.3-3(b)) has been made to consult with that permittee or lessee, 2) all feasible livestock DRAs have been exhausted and immediate protection of resources on the allotment is required, or 3) if the BLM conducts a wild horse and/or burro drought gather, the area within the HMA will be temporarily closed to livestock grazing concurrently until drought cessation and recovery.

All DRAs would be evaluated against restrictions related to special land status (designated wilderness, wilderness study areas, etc.) and actions previously approved by the US Fish and Wildlife Service (USFWS) related to special status species. DRAs would either be designed to avoid impacts or not considered for implementation if conflicts were to be identified. Where Lahontan Cutthroat Trout or other species protected by the Endangered Species Act are present, DRAs would be designed to prevent impacts and if not originally addressed during consultation with USFWS new consultation would be completed.

The following is a list of DRAs that would be used either separately or in combination to reduce the impacts of authorized livestock grazing on natural resources during drought.

Temporary Partial Closure of an Allotment(s)

During drought, the vegetation resources and overall condition of affected allotments would be assessed. Portions of an allotment(s) that lack vegetation and/or water, are in poor condition, or are identified as important areas to provide vegetation and/or water for fisheries, wildlife and/or wild horses and burros could be closed to livestock grazing (43 CFR §4710.5). Partial closures

would be accomplished by employing a combination of the other DRAs such as temporary fencing, temporary water hauls, active livestock herding, strategic supplementation, etc.

Temporary Complete Closure of an Allotment(s)

If it is determined that drought conditions (lack of vegetation and/or water, poor condition, and/or important areas that provide vegetation and/or water for fisheries, wildlife and/or wild horses and burros) exist over the entire allotment and all other livestock DRA options have been exhausted or deemed impractical, complete closure could occur (43 CFR §4710.5).

Temporary Partial Reduction in Animal Unit Months (AUMs)

During drought, a reduction in livestock numbers could be necessary to ensure that adequate vegetation is available to meet fisheries, wild horse and burro, wildlife and livestock requirements.

Temporary Change in Season of Use

Modify the season of use to remove grazing during the critical growth period of key upland species (as described in the ESD associated with the site) and/or during the hot season (July 1 through September 30) for riparian areas. The actual dates for the critical growing period would vary dependent upon the vegetation community type. In instances where key species referenced in the ESD are absent, alternative key species would be identified using site-specific and/or past monitoring data.

Temporary Reduced Grazing Duration

During stress periods such as drought, growth slows and plants should be rested longer (Hanselka and White 1986). Duration of use could be reduced, increasing periods of rest, by moving livestock across an allotment or pasture more quickly. Periods of deferment should be varied according to the timing and rate of growth of key species.

Temporary Change in Livestock Management Practices

The following methods/tools could be used either separately or in combination to improve livestock distribution:

- Strategic placement of salt and/or mineral supplements away from water and in areas un-grazed or lightly grazed in previous years.
- Increased herding of livestock to previously un-grazed or lightly grazed areas.
- Concentrating livestock into a single herd in order to increase control and encourage uniform grazing. Herd sizes would be dependent on water availability; therefore, adequate water sources must be present to provide water to fisheries, wildlife, wild horses

and burros and livestock while maintaining riparian functionality. Use would not exceed utilization and stubble heights identified in the DDMP.

Temporary Fencing

During drought, temporary electric or other temporary fencing could be used to exclude livestock from important areas such as riparian areas, meadows, aspen stands, wildlife habitat, etc. Temporary fences may also be used to confine livestock to communities of invasive annual species. All temporary fences, constructed due to drought, would be removed after drought cessation or sooner as indicated by written notice from the authorized officer.

Temporary Targeted Grazing of Upland Invasive Annual Communities

Targeted grazing of invasive annual communities (e.g., cheatgrass) could be used to alleviate grazing pressure on other areas that are dominated by native species. Invasive annual communities would be identified through site-specific monitoring. On these sites, prescribed livestock grazing could be applied with little concern for native plants. Grazing would be focused during the spring and/or fall months to take advantage of early spring and fall growth of the annuals. Livestock would be removed upon reaching a two-inch average stubble height of the annuals in order to leave residual vegetation for protection from wind and water erosion. Animals would be confined to these areas using temporary fence or herding. If an existing water source is not available, the use of temporary water hauls or temporary above ground pipelines may be used.

Temporary Change in Kind or Class of Livestock

This DRA refers to the temporary change of the current kind or class of authorized livestock such as cattle to sheep or sheep to cattle. Temporary changes to sheep would not be authorized in areas of occupied bighorn sheep habitat or areas within nine airline miles of occupied bighorn sheep habitat (WAFWA 2007).

Temporary Water Hauls

Temporary water hauls could be used in circumstances where: 1) adequate vegetation exists to support wildlife, wild horses and burros and the existing permitted number of livestock, but water resources are insufficient due to drought or 2) to improve livestock distribution in areas located long distances from existing water sources, which have received limited use by livestock in previous years or 3) to reduce or eliminate impacts to riparian and wetland areas. Additionally, the BLM could authorize the use of temporary water hauls to augment existing water sources. Whenever possible, water haul sites would be located in invasive annual communities in order to provide for targeted grazing of those species while providing rest of native perennial vegetation. Temporary water haul sites would consist of livestock water troughs of various size and material, placed on public lands and filled as needed with portable water tenders or water trucks. Previously disturbed sites would be selected when available and all significant cultural resources would be avoided with appropriate buffers. All areas would be

inventoried for cultural resources prior to implementation (see Design Measures for specifics) and bird ramps would be installed in water troughs to protect avian species. All temporary water structures, installed due to drought, would be removed after drought cessation and recovery or sooner as indicated by written notice from the authorized officer.

Temporary above Ground Pipelines

Temporary pipelines would consist of an above ground pipeline, which would transport water from the end point of an existing pipeline to new temporary livestock water trough(s) of various size and material, placed on public lands and fitted with a float valve to prevent overflow and saturated soil conditions around the trough(s). Temporary above ground pipelines could be implemented in circumstances where: 1) adequate vegetation exists to support wildlife, wild horses and burros and the existing permitted number of livestock, but water resources are insufficient due to drought or 2) to improve livestock distribution in areas located long distances from existing water sources, which have received limited use by livestock in previous years or 3) to reduce or eliminate impacts to riparian and wetland areas. Whenever possible, temporary pipelines would serve invasive annual communities in order to provide for targeted grazing of those species while providing rest of native perennial vegetation. Any temporary above ground pipelines would require approval from the Nevada Division of Water Resources. Previously disturbed sites would be selected when available and all significant cultural resources would be avoided with appropriate buffers. All areas would be inventoried for cultural resources prior to implementation (see Design Measures for specifics) and no new ground disturbance associated with the installation of a temporary pipeline(s) would be authorized. Bird ramps would be installed in water trough(s) to protect avian species. All temporary above ground pipelines and associated troughs would be removed after drought cessation and recovery or sooner as indicated by written notice from the authorized officer.

2. Wild Horses and Burros

DRAs would be selected on a case-by-case basis using site-specific monitoring data collected as outlined in the DDMP. The following process would be used to determine which DRA(s) would be implemented:

Step 1: Conduct field visits to drought afflicted areas to assess DRTs. Field visits would assess water and vegetation availability at predetermined sites using the monitoring methods as outlined in the DDMP.

Step 2: DRAs would be selected based on the evaluation of site-specific monitoring data, best available HMA specific population data and known animal behavior and distribution patterns. DRAs would be chosen on a case-by-case basis suited to site-specific conditions. More than one DRA could be selected depending on conditions. Efforts should be made to select DRAs that could be implemented in a subsequent fashion to respond to changes in drought conditions (e.g., temporary water haul followed by drought gather, if needed).

Step 3: Implement DRA(s) in selected order. If a drought gather is included as a DRA, interested public would be notified with drought gather being implemented through an effective upon issuance decision with an attached site-specific gather plan. Site-specific data

related to the drought gather would be provided in the decision and drought gather plan documents.

The following is a list of DRAs that would be used either separately or in combination to ensure the welfare of wild horses and burros on public lands administered by the BLM during drought:

Temporary Water Hauls

In circumstances where it is determined that adequate forage exists to maintain the existing population of wild horses and/or burros, but water resources are deficient due to drought conditions, the BLM could employ temporary water hauls to augment existing water sources. Water haul sites would consist of water troughs of various size and material and possibly storage tanks, placed on public lands and filled as needed with portable water tenders or water trucks. Water haul locations would be determined based on animal population density and distribution, and placed in previously disturbed areas when possible. Troughs could be placed at the existing water sources that are either dry or inadequate to maintain healthy animals. The use of water hauls would continue until the existing waters are able to support the population or a drought gather occurs. All areas would be inventoried for cultural resources prior to implementation (see Design Measures for specifics) and all significant cultural resources would be avoided with appropriate buffers. In addition, bird ramps would be installed in water troughs to protect avian species. No new water hauls would be developed within wilderness or wilderness study areas.

Within HMA Wild Horse and Burro Relocation

If monitoring data indicates that another area within an HMA has adequate forage and water resources capable of supporting the existing population of wild horses and/or burros, those animals could be relocated to the selected area. Relocation could be accomplished by moving animals with a helicopter or by capture and transport (helicopter capture and bait and water trapping). If appropriate, animals could be "lured" from one area to another using temporary water hauls or bait. Justification for wild horse and/or burro within HMA relocations would be thoroughly documented within a site-specific decision and gather plan. Luring animals using bait or water would not require a gather plan. If capture and transport is used, animals would be released at water sources. Subsequent monitoring would be collected to ensure forage and water availability and that the horses and/or burros are remaining at the relocation area. Animals would be painted with temporary livestock marking paint for identification. This DRA would be limited to moving wild horses and burros within HMAs and would not involve moving wild horses and burros from one HMA to another.

This DRA would be used when it is likely that the animals will not attempt to make their way back to the location they are removed from as this would cause added stress and loss of body condition.

Wild Horse and Burro Removal

A drought gather would be employed as a last resort and would only occur if the following conditions apply:

1) It is determined that drought conditions have resulted in insufficient amounts of forage and/or water to support the existing population of wild horses and/or burros within a HMA.
2) All other feasible DRAs have been exhausted and removal is needed for immediate protection of wild horses and burros and rangeland resources.

Pursuant to 43 CFR §4710.5, areas of allotment(s) that overlap with the HMA(s) would be temporarily closed to livestock grazing if necessary to protect the health of wild horses and burros or their habitat.

If a drought gather is implemented, wild horses and/or burros would be removed from the range at varying levels in order to prevent suffering and death due to drought conditions on the range and minimize degradation of resources affected by drought.

The following DRAs would be used either separately or in combination:

a. Bait or Water Trapping

When feasible and appropriate, bait and/or water trapping would be considered to capture wild horses or burros that need to be removed from the range in response to drought. Bait or water trapping may be selected unless the following circumstances apply:

- The number of water sources results in wild horses and/or burros being too dispersed;
- The location of water sources are too remote and restrict access for trap set up and animal removal;
- The area lies within a wilderness or wilderness study area;
- The urgency of animal removal (i.e. significant decline in animal body condition, death of animals) requires immediate action and utilization of alternate removal methods;
- The number of animals needing to be removed is in excess of bait or water trapping capabilities; or
- The animals needing to be removed are too wary of human activities and presence and an attempt to water or bait trap would cause suffering and potential death to wild horses or burros due to their own hesitation to enter a trap.

Bait and/or water trapping requires many days and weeks to remove a substantial number of animals from an area. This option could be employed where small numbers of animals need to be removed, where it is deemed that the geography and resources of the HMA would ensure success, or in combination with helicopter gathers.

b. Helicopter Capture

The helicopter capture method would use a helicopter to drive wild horses and/or burros to a trap site and transporting them to a facility for processing and removal. This method would be used when deemed necessary. The use of roping from horseback, to assist the helicopter capture, could also be used when necessary. Multiple gather sites (traps) could be used to gather wild horses and/or burros from within and/or outside HMA boundaries.

Traps would be constructed outside wilderness and wilderness study areas. No mechanized vehicles other than the helicopter would be used within wilderness or wilderness study areas except in case of emergency. No helicopter landings within wilderness or wilderness study areas would occur except in case of emergency.

Removal Numbers

Removal numbers would be based on the assessment of forage, climate, water, rangeland health and the use of the range by wild horses or burros. Removal numbers would be identified to ensure that healthy animals remain on the range and have adequate resources for survival and that rangeland degradation is minimized in order to allow for post drought recovery. The long term health and welfare of the wild horses and burros would be the overarching goal of a drought gather. The removal numbers would be determined on an HMA basis. Removal of wild horses and/or burros below the Appropriate Management Level (AML) may be necessary. A summary of the data and rationale for the removal numbers would be documented in the decision and attached gather plan issued prior to a gather commencing.

a. Removal of Small Localized Wild Horse and Burro Populations

When it is determined that a specific group or groups of wild horses and/or burros need to be removed due to a lack of water and/or forage and other DRAs have been exhausted, those groups identified could be removed. This would be most advantageous in isolated populations. Wild horses and burros within the HMA where adequate forage and water sources remain would not be gathered. For example, localized removal could be used when: 1) a water source or multiple water sources within a portion of an HMA have dried up while other water sources within the HMA remain adequate; 2) it is determined that HMA relocation is not feasible or appropriate due to horse and/or burro condition; or 3) other factors exist that may pose a risk of potential injury to animals (e.g., the location and number of fences pose a high risk of injury during relocation) or could limit the success of relocations (e.g., forage and water conditions are only capable of supporting horses occupying other areas within the HMA).

b. Removal of Sufficient Animals to Achieve the High AML

This situation would apply when the population is in excess of the high AML and assessment of existing forage and water resources warrants limited removal of wild horses and/or burros to the high AML. This would also be implemented to restrict the number of animals removed due to constraints on holding space and long term holding costs. This option could be implemented in combination with temporary water hauls.

c. Removal of Sufficient Numbers of Animals to Achieve the Low Range of AML

Where the assessment of forage and water indicates that some relief is needed through removal of excess wild horses and/or burros, a gather could be conducted to achieve the established low range of AML. This would occur where the current population exceeds the low AML and adequate resources do not exist to maintain healthy wild horses or burros at the current population level. This option could be implemented in combination with temporary water hauls.

d. Removal of Animals below the Low AML

During a prolonged drought, forage and water resources could become severely limited to a point that wild horses and/or burros must be removed below the low range of AML in order to prevent widespread suffering and death. The post gather population target would be determined based on the existence and reliability of remaining resources. This option would be implemented in order to prevent subsequent emergency conditions due to ongoing or worsening drought conditions. This option could be implemented in combination with temporary water hauls.

e. Complete Removal of All Animals in an HMA

In extreme situations, the complete lack of forage and/or water in certain locations could warrant the removal of all locatable wild horses and burros to prevent their death. This situation would only apply as a last resort, and could involve holding wild horses or burros in contract facilities with release back to the range when adequate resources exist. Subsequent release of horses and/or burros would be subject to Nevada and Washington BLM office approval and could occur several months after the gather. If complete removal and subsequent release is chosen, population control methods could be implemented prior to wild horses being released back to the HMA.

Population controls could be used in order to slow population growth rates, lengthen the time before another gather is necessary and enhance post drought resource recovery. Population controls include the application of fertility control vaccine to mares, and sex ratio modification to favor studs. Fertility control would be applied to all mares released to the range. Sex ratio adjustment could be applied alone or in combination with fertility control. A Sex ratio adjustment would include 60 percent studs and 40 percent mares.

f. Removal of Animals Outside of HMAs

Areas outside of established HMAs are not managed for wild horses or burros. Gather of these areas may be necessary to minimize impacts to rangeland resources and the suffering and death of wild horses and burros do to the lack of water and/or forage during drought. This option could be implemented in combination with temporary water hauls.

Type of Removals

For drought related gathers, gate cut removals would be the primary method employed to limit additional stress on wild horses and burros within a defined gather area. Wild horses and/or burros would be gathered and removed regardless of age to reach the post gather target. Very few or no animals would be returned to the range and no population controls would be implemented. When appropriate, animals exhibiting superior condition and health may be returned to the range. Gathers would remove animals from areas most affected by drought and resource deficits.

2.1 Grazing Closure Alternative

Under the Grazing Closure Alternative, all areas determined to be affected by drought (refer to Appendix 1) would be closed to livestock grazing. Closures would be in effect for the duration of the drought plus one growing season following the cessation of drought. After which, the DRTs used for closure would be re-evaluated to determine drought recovery. Written notice from the authorized officer would be required to reopen areas to grazing. Grazing closures would remove livestock grazing from the public lands to eliminate the impacts of grazing during drought and provide rest for plant recovery following the cessation of the drought.

DRAs for wild horses and burros would be implemented as identified in the proposed action.

2.2 No Action Alternative

Under the No Action alterative, DRAs would still be proposed, however site specific environmental evaluations would be necessary. Due to the time involved to evaluate DRAs as they are proposed, current livestock and wild horse and burro management would likely continue, in many instances without modification. Wild horse and burro gather operations would need to be scheduled according to National and State priorities.

2.3 Alternatives Considered, but Eliminated from Detailed Analysis

Supplemental Feeding of Livestock and Wild Horses and Burros

The BLM considered a Supplemental Feeding Alternative if drought conditions create insufficient forage to meet wild horse and burro and livestock needs; however, this Alternative was eliminated from detailed analysis because supplemental feeding of livestock or wild horses and burros on rangelands during times of drought would adversely affect areas on or near the location that feed is being supplied. Supplemental feed could contain weed seed, which could lead to the introduction of invasive and/or noxious weeds. Providing supplemental feed would concentrate animals, thereby, increasing utilization and trampling of native species; cause soil compaction in affected area(s); increase soil erosion and adversely affect water sources due increased sedimentation due to soil erosion.

Additionally, providing supplemental feed to wild horses and burros and livestock could lead to a myriad of safety and health-related impacts to the animals. For example, providing hay in areas without adequate water could lead to colic in horses and providing nutrient rich feed to cattle following low-quality feed could lead to bloat. Furthermore, supplying supplemental feed would be cost prohibitive and unsustainable due to the inability to predict when the cessation of a drought would occur.

III. AFFECTED ENVIRONMENT/ENVIRONMENTAL CONSEQUENCES

3.0 General Setting

The general setting of the project area is the administrative boundary of the WD and two grazing allotments for the Battle Mountain BLM District. The WD is located in northwestern Nevada. The main portion of the district is administered by the HRFO and is characteristic of the Central Basin and Range ecoregion. The western portion administered by the BRFO has characteristics of the Northern Basin and Range ecoregion.

The WD is generally characterized as, "Basin and Range" topography with broad bedrock pediments and fault block mountain ranges predominantly running in a north-south orientation separating vast, flat playa sinks or alluvial valley bottoms. Elevations range from 4,000-5,000 feet in the valleys to 7,500-9,500 feet in the mountains. Annual precipitation varies from five to seven inches at lower elevations and up to 15 inches in the mountains.

3.1 Supplemental Authorities of the Human Environment

To comply with the NEPA, the BLM is required to consider specific elements of the environment that are subject to requirements specified in statute or regulation or by executive order (BLM 1988, BLM 1997, BLM 2008). The following tables outline the elements that must be considered in all environmental analyses, as well as additional resources deemed necessary for evaluation by the BLM, and denotes if the Proposed Action or Alternatives affects those elements.

Table 1: Supplemental Authorities

Supplemental Authority	Not Present	Present/Not Affected	Present/May be Affected	Rationale
Air Quality			X	See discussion in Section 3.3A
Area of Critical Environmental Concern (ACEC)			X	See discussion in Section 3.3B
Cultural Resources			X	See discussion in Section 3.3C
Environmental Justice			X	See discussion in Section 3.3D
Floodplains		X		The Proposed Action or Alternatives do not meet the definition of "Actions Affecting or Affected by Floodplains" as described in 44 CFR Ch. 1§ 9.4.
Invasive Non-Native Species			X	See discussion in Section 3.3E
Migratory Birds			X	See discussion in Section 3.3F
Native American Religious Concerns			X	See discussion in Section 3.3G
Prime or Unique Farmlands	X			No Federally designated farmlands, prime or unique, exist within the WD.
Threatened and Endangered Species			X	See discussion in Section 3.3H
Waste – Hazardous/Solid	X			No wastes, hazardous or solid, would be utilized, stored, or encountered by implementing the Proposed Action or Alternatives contained in this EA.
Water Quality (surface and ground)			X	See discussion in Section 3.3I for surface water quality. Ground water quality is not expected to be impacted
Wetlands & Riparian Zones			X	See discussion in Section 3.3J
Wild & Scenic Rivers	X			No Federally designated wild and scenic rivers exist within the WD.
Wilderness			X	See discussion in Section 3.3K

Elements Not Present/Not Affected:

The following critical elements of the human environment are not present or would not be affected by the Proposed Action or Alternatives in this EA:

- Floodplains
- Prime or Unique Farmlands
- Wastes, Hazardous or Solids
- Wild & Scenic Rivers

3.2 Additional Affected Resources

Additional affected resources of the human environment that have been considered for this environmental assessment (EA) are listed in the table below. Elements that may be affected are analyzed in the EA. Rationale for those elements that would not be affected by the Proposed Action and Alternative is listed in the table below.

Table 2: Additional Affected Resources

Additional Affected Resources	Not Present	Present/Not Affected	Present/May be Affected	Rationale
Fisheries			X	See discussion in Sections 3.3H and 3.3X
Lands & Realty			X	See discussion in Section 3.3L
Lands with Wilderness Characteristics			X	See discussion in Section 3.3M
Minerals		X		Mineral resources exist on the WD; however, no major soil disturbing activities would occur under the Proposed Action or Alternatives. Therefore, mineral resources would not be impacted.
National Conservation Area			X	See discussion in Section 3.3N
Paleontological Resources			X	See discussion in Section 3.3O
Rangeland Management			X	See discussion in Section 3.3P
Recreation			X	See discussion in Section 3.3Q
Social and Economic Values			X	See discussion in Section 3.3R
Soils			X	See discussion in Section 3.3S
Special Status Species			X	See discussion in Section 3.3T
Vegetation			X	See discussion in Section 3.3U
Visual Resources		X		No large structures would be constructed and no major disturbances would occur under the Proposed Action or Alternatives. Therefore, visual resources would not be impacted.
Wild Horses and Burros			X	See discussion in Section 3.3V
Wilderness Study Areas			X	See discussion in Section 3.3W
Wildlife			X	See discussion in Section 3.3X

Elements Not Present/Not Affected:

The following resources would not be affected by the Proposed Action or Alternatives in this EA:

- Minerals
- Visual resources

3.3 Resources Present and Brought Forward for Analysis

Supplemental Authorities

A. Air Quality

Affected Environment

The arid to semiarid climate of the area results from a rain shadow effect of the Sierra Nevada Mountain Range, which lies between the Pacific Ocean and Nevada. The Sierra Nevada absorbs most storm-front moisture moving east across the area. Annual precipitation varies from five to seven inches at lower elevations and up to 15 inches in the mountains. Seventy percent of the precipitation occurs in the late fall, winter, and spring. Summer precipitation is light and infrequent. Average monthly temperatures vary from highs of about 40ºF in January, to 95ºF in July, and lows from around 20ºF in December and January to about 60ºF in July. Prevailing wind from the west is strongest April through June. Wind gusts often reach 30 miles per hour and occasionally get higher. During other seasons, the wind is light and variable, occurring when weather fronts pass through the area, or as a result of daily heating and cooling of land surfaces. During the summer, air quality is adversely affected by dust storms and wildfire.

Air quality and the emission of air pollutants are regulated under both Federal and Nevada law. The Federal Clean Air Act (CAA) requires the US Environmental Protection Agency (EPA) to identify national ambient air quality standards (NAAQS's). The CAA also requires EPA to place selected areas within the United States into one of three classes, designed to limit the deterioration of air quality. The air quality class for the entire WD is Prevention of Significant Deterioration (PSD) Class II. PSD Class II allows for temporary, moderate deterioration of air quality. The State of Nevada, Bureau of Air Quality-Department of Environmental Protection air quality standards under NRS 445B.100 closely mirror the Federal standards.

1. Environmental Consequences of the Proposed Action

Under the Proposed Action, DRAs would be implemented to maintain vegetation within the WD to minimize the potential for accelerated erosion events. DRAs such as temporary water hauls could result in the short-term increase of wind born particulate matter and vehicle emissions during the hauling of water. However, water hauls along with the other DRAs are designed to protect vegetation and stabilize soils and would decrease wind born particulate matter in the long-term. Any airborne particulate matter caused by the implementation of DRAs would not exceed air quality standards.

2. Environmental Consequences of the Grazing Closure Alternative

The Grazing Closure Alternative would remove all grazing from public lands determined to be affected by drought (refer to Appendix 1). Removing grazing during drought would benefit the

growth of vegetation and ensure an adequate amount of cover remains. Wind velocity, and its potential to detach and transport dry soil, exponentially increases near the ground as vegetation's sheltering effect is reduced (Marshal 1973).

3. Environmental Consequences of the No Action Alternative

Under the No Action Alternative, DRAs would still be implemented, but would require separate evaluations under NEPA, which would delay drought response times and potentially result in a continuation of management practices that are employed during times of normal precipitation. Current management practices may be poorly suited to drought. Drought reduces the health and production of vegetation. Without the prompt implementation of management strategies, the effects of drought can be compounded by improper livestock and wild horse and burro use, which may lead to a further reduction in vegetation cover. Inadequate plant cover can lead to substantial wind or water erosion of valuable top soil (Reece et al. 1991). Wind erosion increases the amount of airborne particulate matter, which could reduce air quality causing public safety issues such as poor visibility or respiratory problems. Delayed implementation of DRAs could also increase the potential for invasion of undesirable plant species, which are less likely to stabilize soils.

B. Area of Critical Environmental Concern (ACEC)

Affected Environment

An ACEC is an area of public land where special management attention is required to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources, or other natural systems or processes or to protect life and safety from natural hazards. The restrictions associated with an ACEC designation are determined at the time the designation is made and are designed to protect the values or serve the purposes for which the designation was made. There are three ACECs within the administrative boundary of the WD.

The Osgood Mountain Milkvetch ACEC, approximately 60 acres, is habitat for the Osgood Mountain milkvetch (*Astragalus yoder-williamsii*), state listed as critically endangered.

The High Rock Canyon ACEC, approximately 5,664 acres, contains exceptional scenic values, important wildlife habitat including bighorn sheep habitat and high-density raptor nesting, National Register quality archaeological sites and districts, and 18 miles of the Applegate Trail (a National Historic Trail) with extant emigrant graffiti.
The Soldier Meadow ACEC, approximately 2,077 acres, is a complex of hot springs which contains endemic fish, plant, and invertebrate species. The area also is near the Applegate Trail and contains archaeological sites and districts considered eligible for the National Register of Historic Places. Most of the Soldier Meadows ACEC is within a fenced exclosure, excluding both livestock and wild horses and burros. The portion of the ACEC within the exclosure would not be affected by any of the actions and is dismissed from further analysis.

1. Environmental Consequences of the Proposed Action

Changes in livestock management practices (e.g., change in season of use, reduced grazing duration, partial reduction in AUMs, partial or complete closure of an allotment(s), targeted grazing of invasive annual communities, and temporary change in kind or class of livestock) under the Proposed Action would have a beneficial impact on ACECs. These actions would allow the rangeland and riparian resources to recover from drought without the added impacts from livestock. These impacts could include, but are not limited to, vegetation trampling, soil compaction, erosion, over-utilization of vegetation, establishment and expansion of weed populations, and water contamination. Although the Osgood Mountain milkvetch is not consumed by livestock or wild horses and burros, it is vulnerable to trampling and erosion.

Temporary fencing, water hauling and temporary above ground pipelines would not be placed within an ACEC. Fencing may be used to restrict livestock and wild horses and burros from the ACEC. Temporary water hauls or above ground pipelines may be utilized to draw livestock and wild horse and burros away from an ACEC to reduce impacts during drought.

Wild horse and burro removal under the Proposed Action would have a beneficial impact on the rangeland and riparian resources within ACECs. Wild horses and burros utilize rangeland and riparian resources for forage and water. If unmanaged under drought conditions, this usage can cause negative impacts. Negative impacts could include, but are not limited to, vegetation trampling, soil compaction, erosion, establishment and expansion of weed populations, and water contamination.

Relocating wild horses and/or burros within HMAs would have similar impacts to the impacts for hauling water and conducting drought gathers, and would be congruent with the numbers of animals moved. The portion of the HMA where animals were moved from would endure benefits similar to those that would be expected following a drought gather to remove all or some of the wild horses and/or burros.

2. Environmental Consequences of the Grazing Closure Alternative

The Grazing Closure Alternative would have a beneficial impact on ACECs. These actions would allow the rangeland and riparian resources to recover from drought without the additional impact from livestock grazing. These impacts could include, but are not limited to, vegetation trampling, soil compaction, erosion, establishment and expansion of weed populations, and water contamination.

3. Environmental Consequences of the No Action Alternative

The No Action Alternative would not allow for timely changes in livestock grazing management or wild horse and burro management to adjust to drought conditions. During drought conditions, livestock and wild horses and burros would congregate in areas with a higher abundance of moisture, especially riparian areas. Riparian areas that are within the ACECs could be degraded. This degradation could include, but is not limited to, vegetation trampling, establishment and expansion of weed populations, soil compaction, erosion, and water contamination.

C. Cultural Resources

Affected Environment

Cultural resources are past and present expressions of human culture and history in the physical environment and include prehistoric and historic archaeological sites, structures, natural features, and biota which are considered important to a culture, subculture, or community. Cultural resources also include aspects of the physical environment that are a part of traditional lifeways and practices, and are associated with community values and institutions. Historic properties are a subset of National Register of Historic Places (NRHP).

The cultural resources of the WD cover a period beginning at least 12,000 years ago (YA) and ending just 50 YA. This time span covers a period of significant environmental change with the end of the last glacial period and the relatively rapid disappearance of Lake Lahontan and other pluvial lakes in northern Nevada. The earliest inhabitants of the WD utilized the resource rich shores of Lake Lahontan and left behind scatters of tools and tool making debris along the old lake shores. Later peoples took advantage of the significant marsh areas that developed and the steadily growing areas of pinyon-juniper forest in the uplands of some parts of the District. These peoples, too, left their mark on the WD in the form of occupational debris forming thousands of archaeological sites representing 10,000 to 13,000 years of human occupation.

Beginning perhaps as early as 1500 YA, cultural change accelerated in the WD. The bow and arrow replace the atlatl, or spear thrower, and dart as the hunting weapon. Language and other ephemeral aspects of the cultures of the WD also change significantly with the appearance of the ancestral forms of modern Shoshone and Paiute. This period is also abundantly represented in the cultural resources of the WD.

Another significant cultural change takes place in the WD beginning about 150 years ago with the initial arrival of Euro-Americans in the region, first as trappers, then as emigrants moving to California and Oregon. More stable occupation of the region, and more disruptive of the preceding cultures of the region, comes with the arrival of the railroads, ranches, mines, and towns establishing Euro-American culture permanently in the region. Again, there is abundant evidence of this last period in the mines, trails, railroads and settled community life throughout the district.

Based on this history, cultural resources have been organized into prehistoric resources (13,000 YA to 150 YA), historic resources (150 YA to 50 YA), and ethnographic resources which have no specified age. Prehistoric resources refer to any material remains, structures, landscape modifications, and all items used or modified by people before Euro-Americans established a presence in northern Nevada. Historic resources include material remains and the landscape alterations that have occurred since the arrival of Euro-Americans but may represent any other ethnic group. Ethnographic resources are places associated with the cultural practices or beliefs of a living community. These sites are rooted in the community's history and are important in maintaining cultural identity. The vast majority of the recorded cultural resources on the land in the WD area are archaeological sites.

The vast majority of the recorded cultural resources on the land in the WD, approximately 1.8 million acres, or about 21 percent of the public lands administered by the WD, have been inventoried for cultural resources, documenting approximately 8,600 prehistoric and historic archaeological sites. Many sites have been determined to be eligible for the NRHP, but few have been formally nominated for listing on the NRHP, and many others have not been evaluated. The BLM is organizing and automating all cultural resource records and reports.

As an aid to management of the District's cultural resources, a sensitivity map (King and Young 2006) was prepared as part of the preparation of the new RMP, currently in draft form. This map sees the WD's public lands as having four levels of the likelihood of the occurrence of cultural resources: Low, Moderate, High, and Very High. These categories apply to all classes of archaeological sites without regard to historical period or site function but the model is aimed primarily at prehistoric sites. The terms are self-explanatory but it must be made clear that they do not represent a quantitative model of site distribution. Rather, these areas are simply locales in which environmental factors believed to play a significant role in site selection are weakly to strongly expressed. The proportions of public lands in the WD falling in each category are provided in Table 3.

Table 3 Cultural Resources Sensitivity Areas in the WD (King and Young 2006: Table 7)

Sensitivity	Low	Moderate	High	Very High	Total
% of Public Lands	29.4	40.8	28.7	1.2	100.1
Test Case Site Density/Km²	2.2	3.0	7.6	34.2	

These data tell us that we can expect high to very high cultural resources density in locales with low to moderate slopes and proximity to permanent surface water sources and transportation corridors.

The area administered by the WD was included in an ethnographic overview of lands in northern Nevada which provides the contextual basis for ongoing consultations between the BLM and contemporary tribes in northern Nevada on traditional cultural properties (TCPs), sacred sites, traditional use areas, and other culturally important places. The overview is a review, an analysis, and a synthesis of the ethnographic and ethnohistoric literature and archival materials (Bengston 2003). The BLM has recently prepared an ethnographic assessment focusing specifically on the WD and is actively consulting with tribal groups to support this EA (Bengston 2006). There may be places within the WD that are important to other contemporary communities, such as those associated with ranching or sheepherding traditions and lifeways.

Section 106 of the National Historic Preservation Act (NHPA) requires Federal agencies to consider the effects of a proposed action on properties included in, or eligible for, the National Register of Historic Places before approving or funding an action. The NHPA also requires Federal agencies to complete a cultural resources inventory prior to Federal actions or ground disturbing activities that occur on Federal lands and, in some cases, including private lands if those lands are subject to disturbance though a Federal undertaking.

Given the extensive area covered by this analysis, it is impossible to provide detailed, site-specific discussions of the all the archaeological resources within the WD. However, the BLM

can summarize some relevant information in terms of the variability of site occurrence within the District, as well as the distribution of known sites among the four classes of standing for listing in the National Register of Historic Places (NRHP); Listed, Eligible for Listing, Not Eligible for Listing, and Unevaluated. The Unevaluated sites are treated as Eligible for Listing until they can be properly evaluated.

It must be understood that the data in Table 4 are drawn from the current GIS database. It is probable that a number of sites recorded in the early days of cultural resources management efforts by the BLM were not captured in the process of digitizing the WD's site records. However, it is likely that the proportions found in each NRHP status classes in that missing sites do not vary significantly from the percentages presented in Table 4.

Table 4 identifies the current number of sites in the WD listed in the National Register, eligible for the Register and those that remain unevaluated. This is a constantly changing set of figures as new inventories are completed for the various undertakings on public lands within the WD. For the purposes of Section 106 compliance, all sites considered Eligible for Listing, including those in the Unevaluated class, are considered historically significant and must be considered for mitigation. Consequently, nearly 67 percent of the known cultural resources in the WD would potentially need to be considered for mitigation if threatened by any undertaking.

Table 4 National Register Eligibility of Sites within the WD

	NRHP Listed	Eligible for Listing	Not Eligible	Unevaluated	Total
Number of Sites	2	831	2,946	4,859	8,638
Percentage	.02	9.62	34.1	56.25	99.99

The WD Cultural Resource Management Program is responsible for the study, evaluation, protection, management, stabilization and inventory of cultural resources. Standard Operating Procedures (SOPs) and agency guidance would reduce the likelihood of impacts to cultural resources. Before proceeding with vegetation treatments, the effects of BLM actions on cultural resources would be addressed through compliance with the NHPA, as implemented through a National Programmatic Agreement and the BLM-Nevada SHPO protocol agreement. The BLM 8100 and 8120 manuals series addresses the process for identifying and evaluating cultural resources and includes relevant Native American consultation.

1. Environmental Consequences of the Proposed Action

Implementation of proposed DRAs would be coordinated with BLM archaeologists; those with the potential to adversely affect cultural resources would be identified. The presence of significant cultural resources would be determined at that time and all such resources would be avoided with an appropriate buffer in compliance with the NHPA, and the Nevada State Protocol Agreement between the BLM, Nevada and the Nevada State Historic Preservation Office (SHPO).

2. Environmental Consequences of the Grazing Closure Alternative

Drought response measures to alleviate the impacts of grazing through reduction in authorized access would act to reduce the severity of potential impacts to cultural resources generated by livestock.

3. Environmental Consequences of the No Action Alternative

The No Action alternative could result in increased damage to cultural resources through accelerated erosion caused by trampling, and by the effect of trampling itself on newly exposed resources. Further, exposure would also increase the potential for illegal collection.

D. Environmental Justice

Affected Environment

The Fort McDermitt Paiute-Shoshone reservation, a community of mixed Paiute and Shoshone tribes, holds grazing permits that could potentially be affected by DRAs. The current population of the reservation is approximately 800 people, and the population of Fort McDermitt and the surrounding area has been in decline in recent years as a result of limited economic opportunities. There is no incorporated town within the reservation, and the town of Fort McDermitt offers only minimal services. The tribal community consists of scattered, somewhat isolated ranchsteads that were originally established when tribal lands were distributed to individual tribe members in the late 1800s and then further subdivided in the early 1900s. Ranching productivity related to the BLM range allotments held by the tribal community has been marginal in recent years since past fires have severely reduced the amount of vegetation available to livestock, reducing the economic benefits generated by existing grazing permits.

1. Environmental Consequences of the Proposed Action

Some impact to tribal ranchers is likely to occur under the Proposed Action. If livestock are removed from the allotment, it is likely that the tribe would have to buy hay to sustain the livestock on the reservation. However, implementation of DRAs which do not require removal of livestock would benefit the tribe in allowing their livestock to remain on the allotment.

2. Environmental Consequences of the Grazing Closure Alternative

Some impact to tribal ranchers is likely to occur under this alternative. If livestock are removed from the allotment, it is likely that the tribe will have to buy hay to sustain the livestock on the reservation.

3. Environmental Consequences of the No Action Alternative

Under the No Action Alternative, DRAs would still be implemented, but would require separate evaluations under NEPA and would be expected to lead to delays in action and subsequently further damage the range when drought conditions occur. Any resulting negative impacts to

ecosystem resilience and forage productivity could in turn result in long-term negative economic impacts on tribal permit holders.

E. Invasive Non-Native Species

Affected Environment

Weeds can be native or nonnative, invasive or noninvasive, and noxious or not noxious. Legally, a noxious weed is any plant designated as undesirable by a federal, state, or county government as injurious to public health, agriculture, recreation, wildlife, or property. Noxious weeds are nonnative and invasive, and their control is based on resource or treatment priorities and is governed by budgetary constraints.

Noxious weeds and invasive, non-native species are spread directly or indirectly by people, equipment, animals or transported by wind and water. Weed infestations rise proportionally with increased human activities like mining extraction/exploration, road maintenance, livestock grazing, recreational activities/off-highway vehicles (OHVs) and general soil disturbing activities. The BLM's strategy for noxious weed management is to, "sustain the condition of healthy lands, and, where land conditions are degraded, to restore desirable vegetation to more healthy conditions" (USDI FES 2007). Weeds threaten public lands by spreading into and infesting sensitive riparian ecosystems, important rangelands, wildfire scars and developed lands such as rights of way and recreational areas. Threats can come in the form of reduced biodiversity, a weakened ecosystem, a higher propensity for soil erosion, increased frequency of wildfires and limited food resources for wildlife. Weeds on private lands have the potential to spread onto public lands and vice versa.

Weed species affect all resources that depend to some degree on vegetation. Weeds have degraded rangeland health and diversity by changing fire regimes. The primary invasive plant in the planning area, cheatgrass (*Bromus tectorum*), has led to an increase in continuous fine fuel and an earlier fire season than what occurred historically. Approximately 3.3 million acres of public lands in the Great Basin desert are reported to be dominated by cheatgrass, with an additional 76.1 million acres either infested with or susceptible to cheatgrass invasion (Pellant 1996). Management emphasis is directed toward areas where cooperative management strategies are already in place and for which data exists though studies or GIS compilations. In addition to the species that are well documented in the planning area, new species are appearing and may be even more disruptive to native plant communities than species that have existed in the planning area for a greater period of time.

Many state and county governments in the west have designated noxious weed lists. The Nevada Department of Agriculture maintains the Nevada State Noxious Weed List (Nevada Department of Agriculture 2007), which includes 47 different species of weeds that are designated noxious by state law. Of these 47 species, 15 are commonly found on lands administered by the WD (Table 5).

Table 5 Noxious Weed Species in the WD

Scientific Name	Common Name
Acroptilon repens	Russian knapweed
Anthemis cotula	Mayweed
Cardaria draba	Hoary cress
Centauria maculosa	Spotted knapweed
Centaurea solstitialis	Yellow starthistle
Cirsium avense	Canada thistle
Conium maculatum	Poison hemlock
Cynoglossum officinale	Houndstongue
Euphorbia elsua	Leafy spurge
Hysocyamus niger	Black henbane
Isatis tinctoria	Dyer's woad
Lepidium latifolium	Perennial pepperweed
Lythrum salicaria	Purple loosestrife
Onopordum acanthium	Scotch thistle
Salvia aethiopis	Mediterranean sage
Taeniatherum caput-medusae	Medusahead
Tribulus terrestris	Puncturevine
Tamarix ramosissima	Salt cedar (tamarisk)
Taeniatherum caput-medusae	Musk thistle

Plants that are considered weeds in other areas and that are actively managed elsewhere, but which do not show up on Nevada's noxious weed list, have been found within the WD. Weed inventory data have been collected at numerous locations in the decision area and compiled in a database maintained by the Natural Resources Conservation Service (NRCS). The WD performs a yearly ongoing weed inventory that is based on fund availability. Currently, the most widespread species are perennial pepperweed, hoary cress, saltcedar, Russian knapweed and Scotch thistle (Messmer 2007).

1. Environmental Consequences of the Proposed Action

Noxious weeds and non-native invasive species are more likely to invade areas that are in poor rangeland condition. Areas that maintain a healthy and diverse population of native species are more resistant to invasion. Drought or water stress affects virtually every physiological and biochemical process in plants (Hanselka and White 1986). Plants that are stressed are more vulnerable to grazing. The degree to which drought impairs the range depends on the intensity, frequency and timing of grazing (Howery 1999). The utilization of perennial bunchgrasses increases significantly during drought years (Bedell and Ganskopp 1980). Therefore, precautions must be taken to ensure proper management occurs in order to avoid overutilization and further degradation of range conditions during drought. The Proposed Action is designed to reduce the impacts of authorized uses and activities on natural resources. This would maintain existing plant communities and limit the degradation of range resources, which would reduce the potential for invasion by noxious weeds and invasive annual species.

The Proposed Action provides for targeted grazing of annual communities (e.g., cheatgrass stands). Targeted grazing of invasive annual communities would be used to reduce grazing pressure on areas dominated by native species. On these sites, prescribed livestock grazing can be applied with little concern for non-target plants (Peischel and Henry 2006). Grazing would be focused during the spring and/or fall months to take advantage of early spring and fall growth of the annuals. Livestock would be removed upon reaching a two-inch average stubble height of the annuals in order to provide protection from wind and water erosion. This, in turn, would result in the reduction of invasive annual species and limit adverse impacts to native perennial species.

A wild horse or burro drought gather could result in the spread of existing populations of noxious weeds, invasive or non-native species. Precautions would be taken prior to setting up trap sites and holding facilities to avoid areas where noxious weeds, invasive or non-native species exist to lessen the chance of spread. The Contracting Officers Representative (COR), Project Inspector (PI), or other qualified specialist would examine proposed holding facilities and traps sites prior to construction to determine if noxious weeds were present. If noxious weeds were found, a different location would be selected.

Temporary trap sites and holding facilities would be selected in previously disturbed areas such as gravel pits. Areas disturbed specifically by gather operations would be monitored, re-vegetated (if appropriate), and treated for potential new infestations of non-native invasive plants as a result of gather operations.

2. Environmental Consequences of the Grazing Closure Alternative

The Grazing Closure Alternative would provide rest for all drought afflicted areas. Resting these areas would provide the vegetation an opportunity to take full advantage of available soil moisture and nutrients. Uninterrupted growth would increase plant cover and reduce the potential for soil erosion. This would limit the opportunity for noxious weeds and invasive annuals to invade those communities.

The Grazing Closure Alternative would not provide for the targeted grazing of invasive annual species, which would limit the opportunity to reduce the vigor of invasive species that may compete with native vegetation for soil moisture and nutrients.

DRAs for wild horses and burros would be implemented as identified in the Proposed Action and would result in similar effects as described above, for the Proposed Action.

3. Environmental Consequences of the No Action Alternative

Grazing management practices before, during, and following a drought influence the ability of native rangeland vegetation to recover (Encinias and Smallidge 2009). Lagged responses toward drought pose a threat to sustainable management of rangelands (Thurow and Taylor 1999). Although all rangelands are adversely affected by drought regardless of condition, rangeland in fair or poor condition is more adversely affected and recovers slower than rangeland in good or excellent condition (Howery 1999). Under the No Action Alternative, DRAs would still be

implemented, but would require separate evaluations under NEPA, which would delay drought response times and potentially result in a continuation of current management practices. Delaying the implementation of livestock and/or wild horse management strategies that are appropriate for drought conditions would increase the potential of noxious weed and invasive species establishment and spread by extending the period of time the range is in a poor or stressed condition.

F. Migratory Birds

Affected Environment

"Migratory bird" means any bird listed in 50 CFR 10.13. All native birds commonly found in the United States, with the exception of native resident game birds, are protected under the Migratory Bird Treaty Act (MBTA) of 1918, as amended (16 U.S.C. 703 et seq.). The MBTA prohibits taking of migratory birds, their parts, nests, eggs, and nestlings without a permit. Executive Order 13186 signed January 10, 2001, directs federal agencies to protect migratory birds by integrating bird conservation principles, measures, and practices.

Additional direction comes from the Memorandum of Understanding (MOU) between the BLM and the USFWS signed April 12, 2010. The purpose of this MOU is to strengthen migratory bird conservation through enhanced collaboration between the BLM and USFWS in coordination with state, tribal, and local governments. The MOU identifies management practices that impact populations of high priority migratory bird species including nesting, migration, or over-wintering habitats on public lands, and develops management objectives or recommendations that avoid or minimize these impacts.

Because of the varied habitat and resources found in the WD, a variety of migratory birds including passerines, raptors, shorebirds can be found throughout the district, some being year round residents.

A representative, but not all inclusive list of migratory birds occurring within the WD can be found in Table 6.

Table 6 Representative List of Migratory Birds Occurring within the Winnemucca District

Common Name	Scientific Name	Common Name	Scientific name
American avocet	*Recurvirostra americana*	common nighthawk	*Chordeiles minor*
American robin	*Turdus migratorius*	horned lark	*Eremophilia alpestris*
American white peclican	Pelecanus erythrorhynchos	rock wren	*Salpinctes obsoletus*
bank swallow	*Riparia riparia*	loggerhead shrike	*Lanius ludovicianus*
barn swallow	*Hirundo rustica*	lark sparrow	*Chondestes grammacus*
Bewick's wren	*Thryomanes bewickii*	yellow-billed cuckoo	*Coccyzus americancus*
black-chinned hummingbird	*Archilochus alexandri*	Pinyon jay	*Gymnorhinus cyanocephalus*
black-headed grosbeak	*Pheucticus* melanocephalus	northern mockingbird	*Mimus polyglottos*
black-throated sparrow	*Amphispiza bilineata*	Bullock's oriole	*Icterus bullockii*

Common Name	Scientific Name	Common Name	Scientific name
Brewer's blackbird	*Euphagus cyanocephalus*	northern rough-winged swallow	*Stelgidopteryx serripennis*
Brewer's sparrow	*Spizella breweri*	blue-gray gnatcatcher	*Polioptila caerulea*
broad-tailed hummingbird	*Selasphorus platycercus*	red-naped sapsucker	*Sphyrapicus nuchalis*
calliope hummingbird	*Stellula calliope*	sage thrasher	*Oreoscoptes montanus*
canyon wren	*Catherpes mexicanus*	song sparrow	*Melospiza melodia*
Cassin's finch	*Carpodacus cassinii*	spotted sandpiper	*Actitis macularia*
dusky flycatcher	*Empidonax oberholseri*	Says's phoebe	*Sayornis saya*
gray flycatcher	*Empidonax wrightii*	western kingbird	*Tyrannus verticalis*
green-tailed towhee	*Pipilo chlorurus*	western meadowlark	*Sturnella neglecta*
house finch	*Carpodacus mexicanus*	bushtit	*Psaltriparus minimus*
house wren	*Troglodytes aedon*	willow flycatcher	*Empidonax traillii*
killdeer	*Charadrius vociferus*	violet-green swallow	*Tachycineta thalassina*
lazuli bunting	*Passerina amoena*	Wilson's warbler	*Wilsonia pusilla*
lesser goldfinch	*Carduelis psaltria*	yellow warbler	*Dendroica petechia*
Lewis' woodpecker	*Melanerpes lewis*	yellow-breasted chat	*Icteria virens*
mourning dove	*Zenaida macroura*	tree swallow	*Tachycineta bicolor*
northern flicker	*Colaptes auratus*	sage sparrow	*Amphispiza belli*
Spotted towhee	*Pipilo maculatus*	warbling vireo	*Vireo gilvus*
Western snowy plover	*Charadrius alexandrinus nivosus*	black rosy-finch	L*eucosticte atrata*
white-crowned sparrow	*Zonotrichia leucophyrs*	vesper sparrow	*Pooecetes gramineus*
American kestrel	*Falco sparverius*	northern goshawk	*Accipiter gentilis*
bald eagle	*Haliaeetus leucocephalus*	northern harrier	*Circus cyaneus*
burrowing owl	*Athene cunicularia*	Peregrine falcon	*Falsco peregrines*
Cooper's hawk	*Accipiter cooperii*	Prarie falcon	*Falco mexicanus*
ferruginous hawk	*Buteo regalis*	red-tailed hawk	*Buteo jamaicensis*
golden eagle	*Aquila chrysaetos*	sharp-shinned hawk	*Accipiter striatus*
great horned owl	*Bubo virginianus*	Swainson's hawk	*Buteo swainsoni*

1. Environmental Consequences of the Proposed Action

DRAs having the same or similar impacts on the resource have been analyzed together. Those DRAs that could not be categorically grouped are analyzed individually.

In general, passerines ("songbirds") are directly impacted by drought conditions due to the loss of vegetation which provides cover and food (either by direct consumption or predation of insects that consume vegetation), and lack of free-standing water.

Raptors are dependent upon prey, which are in turn dependent upon vegetation. Whether the prey is primary, secondary or tertiary consumers, losses or degradation of vegetation decreases or eliminates the raptors' prey base. Raptors utilize vegetation to various degrees to build nests, but are more impacted by the loss of vegetation as indirect food source.

Temporary Water Hauls and above Ground Pipelines

Migratory birds in the Great Basin ecosystem require free water (in varying amounts) as opposed to relying solely on metabolic water or fluids ingested from prey. In addition to the impacts of this DRA noted in the Wildlife section (3.3X) of this EA, installed or augmented water sources impact migratory birds, particularly during the nesting season. In most cases, brooding, feeding, and protection of the nest are constant requirements for successful reproduction. Nest abandonment can occur if food and water resources are not adequately proximal to the nest site allowing the adults to maintain themselves as well as provide for the chicks. Water troughs create a drowning hazard for migratory birds, but this impact can be lessened by the placement and maintenance of bird ladders within the troughs

Temporary Fencing

In general, migratory birds are not impacted by the type of fencing that would be used in the implementation of this DRA. Fences can provide safe perches for birds and/or provide vantage points for foraging. Restricting livestock access to riparian areas, wet meadows and aspen stands during drought conditions would alleviate competition for these resources thus providing vegetation for cover, nesting, food and water sources. Further impacts to migratory birds are the same or similar to those discussed in the Wildlife section (3.3X).

Temporary Change in Livestock Kind or Class

Impacts to migratory birds from implementing this DRA are the same or similar as those discussed in the Wildlife section (3.3X).

Because of the different foraging habits of livestock species, and the potential impacts to plant community composition associated with them, food and nesting substrate/materials could be deficient. A potential decrease in successful avian reproduction could be expected and result in potentially short and long-term population effects.

Temporary Targeted Grazing of Invasive Annual Communities

Numerous migratory birds utilize dense stands of any vegetation for cover and nesting. Because timing of nesting often coincides with the applicable grazing regimen, eggs and chicks of ground nesting birds are particularly susceptible to destruction by livestock hooves, although non-ground nests are susceptible as well. A potential decrease in successful avian reproduction could be expected and result in potential short and long-term population effects. Additional impacts to migratory birds are the same or similar to those discussed in the Wildlife section (3.3X).

Temporary Complete or Partial Closure of Allotments, Temporary Reduction of AUMs, Temporary Change in Season of Use and Duration, and Temporary Change in Livestock Management Practices.

Impacts to migratory birds in implementing this DRA are the same or similar to those discussed in the Wildlife section (3.3X).

Within HMA Wild Horse and Burro Relocation

Surveys for nesting migratory birds would be conducted prior to selection of a trap site to avoid nest destruction, disturbance, or abandonment.

Impacts to migratory birds in implementing this DRA are the same or similar to those discussed in the Wildlife section (3.3X).

Removal of Wild Horses and Burros

Impacts to migratory birds in implementing this DRA are the same or similar to those discussed in the Wildlife section (3.3X).

2. Environmental Consequences of the Grazing Closure Alternative

Implementation of this alternative would reduce or prevent the impacts from livestock on water resources such as streambank destabilization, sedimentation, deposition and riparian degradation and alteration of vegetative components of the natural habitat that wildlife rely upon either directly or indirectly. Plants stressed under drought conditions are more susceptible to the effects of livestock grazing. Removal of livestock grazing pressures would enhance a plant's ability to survive thus becoming available for use by wildlife during the drought and subsequent seasons.

This alternative would implement DRAs for wild horses and burros in the same way as described under the proposed action alternative. Refer to impacts disclosed under the proposed action alternative with regard to wild horse and burro DRAs.

3. Environmental Consequences of the No Action Alternative

Impacts to migratory birds under this alternative are the same or similar to those discussed in the Wildlife section (3.3X).

G. Native American Religious Concerns

Affected Environment

Native American tribes with interest in the WD are the Battle Mountain Band, the Fallon Paiute-Shoshone Tribe, the Fort McDermitt Paiute-Shoshone Tribe, the Lovelock Paiute Tribe, the Pyramid Lake Paiute Tribe, the Reno-Sparks Indian Colony, the Summit Lake Paiute Tribe, and

the Winnemucca Indian Colony. These tribes are within or close to the counties or have economic or cultural interests in the planning area. Tribal members contribute to local and regional economies by purchasing goods and services, disbursing salaries, and providing contractual services and general operating expenses.

Larger reservations within the project area include the Summit Lake Indian Reservation and Fort McDermitt Indian Reservation, both of which fall within the northern region of the planning area in Humboldt County. The Summit Lake Paiute Indian Reservation consists of approximately 10,098 tribal land acres and 765 allotted acres. The Summit Lake Paiute tribe grazes only a few cattle on the reservation. The Fort McDermitt Paiute-Shoshone Indian Reservation covers approximately 16,355 tribal land acres, 145 allotted acres, and 160 acres of tribal fee land (Inter-Tribal Council of Nevada 2004). The Fort McDermitt tribe's stockmen association holds two grazing allotments on the WD.

Indian Trust Assets are legal interests in property, physical assets, or intangible property rights held in trust by the United States for Indian tribes or individual Indians. Common examples of trust assets may include lands, minerals, hunting and fishing rights, water rights, other natural resources, and money. This trust responsibility requires that all federal agencies ensure their actions protect Indian Trust Assets. There are no known BLM Indian Trust Assets present in the planning area.

Tribes have expressed interest in general land use and natural resource management issues in the planning area and in access and use of traditional lands, religious areas, and resources. In accordance with the NHPA (P.L. 89-665), the NEPA(P.L. 95-341), the FLPMA (P.L. 94-579), the American Indian Religious Freedom Act (P.L. 95-341) the Native American Graves Protection and Repatriation Act (P.L. 101-601), Executive Order 13007 and 13175, and Secretarial Order 3317, the BLM must also provide affected tribes an opportunity to comment and consult on proposed projects.

Consultation letters were sent out to the following tribes on December 26, 2012: the Battle Mountain Band, the Fallon Paiute-Shoshone Tribe, Fort McDermitt Paiute-Shoshone Tribe, the Lovelock Paiute Tribe, the Pyramid Lake Paiute Tribe, the Reno-Sparks Indian Colony, and the Summit Lake Paiute Tribe.

1. Environmental Consequences of the Proposed Action

Native American consultation is ongoing with this document. The proposed action would be implementable based on this EA. However, tribes would be provided further input at the time of implementation. Since the BLM must attempt to limit, reduce, or possibly eliminate any negative impacts to Native American traditional/cultural/spiritual sites, activities and resources, consultation with Native American tribes would occur through the decision process prior to the implementation of any actions. The amount of time for further consultation would be dependent upon the urgency of the situation.

It is believed that Native American resources and sites of cultural, traditional and spiritual use maintain their physical and spiritual integrity due to their undisturbed and pristine locations. Not

to say that certain areas lose their importance and sacredness due to being physically impacted. Some areas within the WD have experienced past and present ground disturbance, but still maintain spiritual integrity. The fact that an important site has been disturbed in the past does not lessen its sacredness. However, ongoing disturbance can have an impact to the existing cultural/traditional/spiritual activities that currently take place in certain areas.

The Proposed Action is designed to alleviate the impacts of livestock and wild horses and burros during drought. The implementation of the DRAs described in the Proposed Action would reduce the probability of soil erosion, which would have a beneficial impact on the protection of Native American resources. Any of the DRAs that have the potential to be ground disturbing (e.g., temporary water hauls, fences and above ground pipelines) would be surveyed for cultural resources prior to implementation (See Chapter 2 Design Measures). The specific placement of temporary projects is flexible and would avoid any known cultural resources and National Register of Historic places eligible traditional cultural properties (TCPs). BLM would not bar or prevent traditional practitioners from gaining access to existing and known medical/edible plant locations, and other culturally important sites. Any temporary fences constructed would be designed in a manner that would allow access at all current access points (e.g., trails, roads, etc.).

The Fort McDermitt Paiute and Shoshone Tribe's (FMPST) stock men's association holds two grazing permits in the District. A full or partial closure of one of their allotments could create a potential economic hardship. This issue is further discussed in Socio Economic Section (3.3R).

2. Environmental Consequences of the Grazing Closure Alternative

The implementation of the Grazing Closure Alternative would protect vegetation and reduce the probability of soil erosion, which would have a beneficial impact on the protection of Native American religious and cultural resources.

The closure could affect FMPST's stockmen association. This issue is further discussed in Socio Economic Section (3.3R).

3. Environmental Consequences of the No Action Alternative

Under the No Action Alternative, DRAs would still be implemented, but would require separate evaluations under NEPA, which would delay drought response times and result in a continuation of current management practices, which are often poorly suited to drought. Drought reduces the health and production of vegetation. Without the prompt implementation of management strategies, the effects of drought can be compounded by improper livestock and wild horse and burro use. This may lead to a further reduction in plant cover and increased soil erosion. An increase in soil erosion would provide the potential for the degradation of important cultural resources. Edible and medicinal plants may be reduced or eliminated from traditional cultural sites if overgrazing occurs during drought. Riparian areas may experience heavy use by livestock and/or wild horses and burros as upland vegetation dries out and becomes less palatable and water resources become scarce. The delayed implementation of DRAs under the No Action Alternative would have impacts on Native American resources.

H. Threatened, Endangered Species

Note: for the purpose of this analysis, candidate species are addressed in this section as well.

Affected Environment

BLM is required by the Endangered Species Act of 1973, as amended to ensure that no federal action jeopardizes a threatened, endangered, or proposed species. A species list was requested from the United States Fish and Wildlife Service (USFWS) for the proposed project area, per their online version (12-20-12; http://ecos.fws.gov/ipac/). The USFWS from three states (Nevada, Oregon, and Idaho) provided an official species list.

The Nevada USFWS responded on December 20, 2012 with an electronic version of an official species list. The species list showed the following listed, proposed and candidate species which may occur within the project area:

Cui-ui (*Chasmistes cujus*) an endangered species,
Lahontan cutthroat trout (*Oncorhynchus clarkii henshawi*) a threatened species,
Desert dace (*Eremichthys acros*) a threatened species,
Greater sage-grouse (*Centrocercus urophasianus*) a candidate species,
Columbia spotted frog (*Rana luteivertris*) a candidate species, and
Soldier Meadows Cinquefoil (*Potentilla basaltica*) a candidate species.

Although these species may occur near the project area in Nevada, some of these species have not been documented within the project area. Using information provided on the USFWS website and NNHP, only five of the six listed, proposed and candidate species occur or are likely to occur within the project area. The five species that will be discussed are Lahontan cutthroat trout, Desert dace, Greater sage-grouse, Columbia spotted frog, and Soldier Meadows Cinquefoil. The other species (Cui-ui) have been dismissed from further analysis as they do not occur on the Winnemucca District. Whitebark pine (*Pinus albicaulis*) was discussed with the USFWS and was determined to be a candidate species which may occur within the WD so will be discussed below.

The Oregon USFWS responded and referred to their on-line process for agencies to obtain a species list by county. On December 20, 2012, an on-line species list was obtained for Harney and Malheur counties in Oregon. The species list showed the following listed, proposed and candidate species which may occur in those two Oregon counties:

Borax Lake chub (*Gila boraxobius*) an endangered species,
Lahontan cutthroat trout (*Oncorhynchus clarkii henshawi*) a threatened species,
Bull trout (*Salvelinus confluentus*) a threatened species,
Malheur wire-lettuce (*Stepanomeria malheurensis*) an endangered species,
Howell's spectacular thelypody (*Thelypodium howellii ssp. spectabilis*) a threatened species,
Greater sage-grouse (*Centrocercus urophasianus*) a candidate species,
Yellow-billed cuckoo (*Coccyzus americanus*) a candidate species,
Columbia spotted frog (*Rana luteivertris*) a candidate species, and

North American wolverine (*Gulo gulo luscus*) a candidate species.

These species may occur within the Harney and Malheur counties in Oregon and some have not been documented within the project area. The project area contains only a small southern portion of both counties. Using information provided on the USFWS website, only three of the nine listed, proposed and candidate species occur or are likely to occur within the project area. The three species that will be discussed are Lahontan cutthroat trout, Greater sage-grouse, and Yellow-billed cuckoo. The other six species (Borax Lake Chub, Bull Trout, Malheur wire-lettuce, Howell's spectacular thelypody, Columbia spotted frog, and North American wolverine) have been dismissed from further analysis as they do not occur on the Winnemucca District portion that is within Oregon.

The Idaho USFWS responded and referred to their on-line process for agencies to obtain a species list by county. On December 20, 2012, an on-line species list was obtained for all the counties in Idaho. The species list showed the following listed, proposed and candidate species which may occur in the Owyhee county:

Bruneau Hot Springsnail (*Pyrgulopsis bruneauensis*) an endangered species,
Snake River Physa (*Haitia natricina*) an endangered species,
Bull trout (*Salvelinus confluentus*) a threatened species,
Greater sage-grouse (*Centrocercus urophasianus*) a candidate species,
Yellow-billed cuckoo (*Coccyzus americanus*) a candidate species, and
Columbia spotted frog (*Rana luteivertris*) a candidate species.

Although these species may occur within the Owyhee County in Idaho, some have not been documented within the project area. The project area is only in Nevada, a small part of Oregon, and to the border of Idaho. Since the project area does not contain area in Idaho, the species on the list above will be dismissed.

Lahontan Cutthroat Trout (*Threatened*)
Lahontan cutthroat trout is a threatened fish species native to lakes and streams throughout the physiographic Lahontan Basin of northern Nevada, eastern California, and southern Oregon. Current populations exist in approximately 155 streams and six lakes in the Lahontan Basin. However, the current populations within the WD exist in approximately 23 streams and one lake. Potential LCT habitat has been identified within the LCT Recovery Plan (USFWS 1995), and more potential LCT habitat may be identified in the future. The principal threats to the subspecies include livestock grazing, urban and mining development, water diversions, poor water quality, hybridization with nonnative trout, and competition with other species of nonnative trout.

The population recovery strategy for LCT includes managing populations for genetic variation, establishing metapopulations, and increasing distribution and abundance through reproduction and reintroductions. The strategy also includes habitat management that involves many BLM land uses and management strategies. Habitat provision strategies include providing adequate water, water quality, and cover for spawning and rearing through streamside management, monitoring, and research.

Desert dace (*Threatened*)

Desert dace, *Eremichthys acros*, a federally listed threatened fish species since 1985 (50 Federal Register 50304), is the only member of the *Eremichthys* genus and is endemic to the Soldier Meadows area of the planning area. Desert dace occupy a variety of habitats in Soldier Meadows, including spring pools, spring outflow streams, alkali marsh areas, and earthen irrigation ditches. They have the highest temperature tolerance of any minnow in western North America (Nyquist 1963) and occupy habitats that vary in temperature from 64 ºF to 104 ºF. Water temperature is a determining factor in desert dace distribution within a spring system. Cooler habitats (73 ºF to 84 ºF) downstream of springheads generally have the highest fish densities. Within the outflow streams, desert dace occur predominantly in upstream sites with higher velocities, but also occupy lower velocity reaches where water temperatures are relatively high (Vinyard 1988). Desert dace habitat is found within the Soldier Meadows Area of Critical Environmental Concern (ACEC). The Soldier Meadows ACEC is an area of 2077 acres designed to protect the habitat of the desert dace. The ACEC protects portions of the area important for the Desert dace, but not the full extent of the species occupied habitat within the planning area. The occupied Desert dace habitat on public land was fenced in 2005 to protect them from livestock and wild horse grazing. The proposed activities are outside of the fenced area. For these reasons, the proposed activities are judged to have no impact on this species or its critical habitat and will be dismissed from further analysis.

Greater Sage-Grouse (Candidate)

To aid in the management of Greater sage-grouse and its habitat, areas of intact, suitable habitat were delineated throughout the state in a collaborative effort with NDOW, USFWS, and BLM. Habitat meeting certain criteria were further placed in one of two categories-Preliminary General Habitat (PGH) and Preliminary Priority Habitat (PPH). PGH are areas of relatively intact sagebrush communities which provide certain habitat requirements for sage-grouse. PPH are areas offering the highest quality sage-grouse habitat based upon bird density, lek location, community composition, intactness, or other variables. In 2012, the WD managed approximately 505,350 acres of PGH and 1,983,584 acres of PPH. Of those acres, wildfires burned 202,760 of PGH and PPH combined. An additional 14,832 acres of sage-grouse habitat were burned on USFS and privately owned property.

"The greater sage-grouse is a granivore, herbivore and insectivore and is associated with both tall and short sagebrush types. In the autumn and winter it forages almost exclusively on sagebrush leaves. Sage-grouse are a species that requires large blocks of contiguous sagebrush habitats.

Male and female sage-grouse gather into flocks in the winter, as do broodless hens in early summer. Female sage-grouse mature in one year though they may not nest until their second year. Breeding typically occurs in the fall when male and female flocks come together. Breeding habitat is generally located within 3 km of a historic strutting ground established by the male birds. However, some hens will move long distances from the strutting grounds to nest. Sage-grouse breed in areas known as leks, where numerous males perform mating displays to attract females. Eggs are incubated for 25 to 27 days by the female sage-grouse. Female sage-grouse tend the newly hatched young, who are able to fly within 7 to 14 days (Northwest Nevada Sage-grouse Working Group 2002, Sibley 2000).

Historical records maintained by NDOW indicate that the current population of sage-grouse in the project area is in decline.

Greater Sage-grouse is found in foothills, plains and mountain slopes where sagebrush is present, or where a mixture of sagebrush and meadow occur in close proximity. This species is highly dependent on the presence of large stands of sagebrush, notably Wyoming, mountain and Great Basin sagebrush. Nesting habitats, which tend to occur at mid-elevations, are typically associated with big sage/low sagebrush habitat complexes. Successful nests are associated with dense sagebrush canopies, residual herbaceous vegetation and a diversity of forbs and insects. Spring, summer and fall ranges are associated with productive sage-grouse habitat. During the winter, sage-grouse forage almost exclusively on either big sagebrush or low sagebrush depending on severity of snowfall and migratory habitats of populations (Northwest Nevada Sage-grouse Working Group 2002).

Mountain meadows, riparian areas and moist upland range sites all provide sources of succulent green forage and insects that are important food for sage-grouse during the spring, summer and fall. Access to meadow habitats is important for young birds for forbs and insects." (BLM, 2004)

The species requires extensive sagebrush cover for forage and shelter, healthy meadows for succulent forage and insect food sources, and herbaceous cover in sagebrush stands for nesting.

Columbia Spotted Frog (Candidate)

"Columbia spotted frogs are found closely associated with clear, slow-moving or ponded surface waters, with little shade (Reaser 1997). Reproducing populations have been found in habitats characterized by springs, floating vegetation, and larger bodies of pooled water (e.g., oxbows, lakes, stock ponds, beaver-created ponds, seeps in wet meadows, backwaters) (Idaho Department of Fish and Game (IDFG) et al. 1995; Reaser 1997). A deep silt or muck substrate may be required for hibernation and torpor (Morris and Tanner 1969). In colder portions of their range, Columbia spotted frogs will use areas where water does not freeze, such as spring heads and undercut stream banks with overhanging vegetation (IDFG et al. 1995). Females may lay only one egg mass per year; yearly fluctuations in the sizes of egg masses are extreme (Utah Division of Wildlife Resources 1998). Successful egg production and the viability and metamorphosis of Columbia spotted frogs are susceptible to habitat variables such as temperature, depth, and pH of water, cover, and the presence/absence of predators (e.g., fishes and bullfrogs) (Morris and Tanner 1969; Munger et al. 1996; Reaser 1996b)" (USFWS 2003).

Only one occurrence of this species has been noted within the project area (NNHP 2003). This location occurs on private land northeast of Soldier Meadows ranch. According to the USFWS (2003) "…Columbia spotted frogs in Nevada are found in the central (Nye County) and northeastern (Elko and Eureka Counties) parts of the state, usually at elevations between 1,700 and 2,650 meters (5,600 and 8,700 feet), although they have been recorded historically in a broader range including Lander County in central Nevada and Humboldt County in northwest Nevada (Reaser 2000). The Great Basin population of Columbia spotted frogs in Nevada is geographically separated into three distinct subpopulations; the Jarbidge-Independence Range,

Ruby Mountains, and Toiyabe Mountains subpopulations". These geographic areas lie to the east of the District and are outside of the project area.

Threats to the species include: 1) destruction, modification and curtailment of habitat and range; 2) disease and predation; 3) inadequacy of existing regulatory mechanisms; and 4) other natural or manmade factors affecting its continued existence (USFWS 2003).

No known occurrences of Columbia spotted frog exist within the project area on public land. There are potential habitats within the riparian areas and perennial drainages throughout the project area. Ongoing management actions to protect riparian areas will directly and indirectly support the maintenance of the habitat that may be potentially utilized by the species in the future. These actions include the incorporation of riparian health considerations into grazing evaluations and wild horse and burro gathers operations. (BLM, 2004)

Western Yellow-Billed Cuckoo (Candidate)

The Western yellow-billed cuckoo requires trees and shrubs in open woodlands with dense undergrowth and in the West are typically associated with riparian cottonwoods and willows. The cuckoo nests in trees utilizing twigs and other materials. Preferred food includes insects, small amphibians, berries and other fruits. The Yellow-billed cuckoo usually gleans these items from foliage or branches, sometimes hovering or flying from perch to perch to capture prey on the wing. Breeding often coincides with the appearance of large numbers of cicadas and other large insects.

One location was documented on private land east of the Sheldon Wildlife Refuge. Extensive areas of riparian and aspen vegetation that could seasonally support the bird are located in the northern portion of the project area. Suitable habitat for the yellow-billed cuckoo is very limited in Nevada with most areas of cottonwood forests being too fragmented (NDOW 2001). Most of the suitable habitat along the Truckee, Carson and Walker rivers has been modified or destroyed (NDOW 1990, 1985).

Threats to the species include: 1) destruction, modification and curtailment of habitat and range; 2) disease and predation; 3) inadequacy of existing regulatory mechanisms; and 4) environmental, demographic and genetic vulnerability to random extinction (FWS 2000). Actions associated with livestock grazing, wild horse and burro grazing and recreational uses that reduce the structure, areal extent, or vigor of woody riparian vegetation within the project area would decrease the potential habitat value for Western yellow-billed cuckoo.

There are potential habitats along some of the streams in the project area with the potential to support large patches of woody riparian vegetation. Ongoing management actions to protect riparian areas will directly and indirectly support the maintenance of the habitat that may be potentially utilized by the species in the future. These actions include the incorporation of riparian health considerations into grazing evaluations and wild horse and burro gathers operations. (BLM, 2004)

Soldier Meadow Cinquefoil (*Potentilla basaltica*)

The Soldier Meadow cinquefoil is a low-growing, rhizomatous, herbaceous perennial that was first identified in 1982. The type specimen was collected in 1983, and the species was described by Tiehm and Ertter (1984). The Soldier Meadow cinquefoil is known from only four sites in Humboldt County, Nevada and one site in northeastern California. The species occurs in the upper northwestern arm of the Black Rock Desert, at elevations ranging between 4,200 and 4,600 ft. (1,281 and 1,400 m) (Knight 1990). One occurrence has been documented at about 5,000 ft. (1,525 m) elevation in Lassen County, California (CDFG 2002). Vegetation at these sites is dominated by either sagebrush steppe or riparian meadows. Both vegetation types are characterized by low growing, perennial herbs and shrubs (Knight 1990). It is a perennial herbaceous plant with prostrate stems up to five cm long extending from a rosette-forming basal area, with bright yellow flowers in loose clusters at the ends of the stem. Primarily located in moist areas in valleys and foothills and typically associated with seepages in alkaline meadows.

In Nevada, its occurrence is limited to the moist meadow ecosystem in the northwest portion of Soldier Meadow or Mud Meadows, at the north end of the Calico Range, where Knight (1990) observed 10 small subpopulations of the species on a total of about 70 acres (28 hectares). Despite extensive surveys of suitable habitat in the Soldier Meadow region, no additional populations of the species have been located (Knight 1990). The known sites were visited in 2002 and mapping efforts using Global Positioning System technology revealed that the species occupies approximately 24 acres of habitat (9.7 hectares) (Jody Fraser, USFWS, pers. obs. 2002).

Soldier Meadow cinquefoil begins flowering in May and continues through the summer (Knight 1990). It is believed that this species is capable of self-pollination (Knight 1990); insect pollination has not been documented or researched (USFWS 1997). Little research has been conducted to understand the life history of this species, its ecological requirements, population biology, and genetic variability.

Soldier Meadow cinquefoil is found on moist salt-crusted clay/silt micro sites in alkaline meadows, seeps and occasionally marsh habitats bordering thermal springs, outflow streams and depressions. Generally found on southeast facing slopes. Often found in association with rubber rabbit brush (*Crysothamnus nauseosus*), greasewood (*Sarcobatus vermiculatus*), desert saltgrass (*Distichlis spicata* var. *stricta*), wire rush (*Juncus balticus*), rabbitsfoot grass (*Polypogon monspeliensiis*), alkali muhly (*Muhlenbergia asperifolia*), slender goldenweed (*Haplopappus racemosus*), and Nevada blue-eyed grass (*Sisyrinchium halophilum*).

In Soldier Meadows, alkali meadows typically have moist to saturated soils and are dominated by short to moderately tall perennial grasses and herbs (Nachlinger 1991). The meadows can be fairly open or have dense plant cover. Alkali seeps may have saturated soils or shallow standing water. Alkali seep communities are dominated by grasses (Nachlinger 1991) while alkali marshes typically have standing water of variable depth and a high cover density of medium tall to tall vegetation, primarily grasses (Nachlinger 1991).

The wetland communities occupied by Soldier Meadow cinquefoil have also been subject to invasion by nonnative plant species. Some of the common nonnative species include, but are not

limited to, smotherweed (*Bassia hyssopifolia*), Russian olive (*Elaeagnus angustifolia*), peppergrass (*Lepidium perfoliatum*), and cocklebur (*Xanthium strumarium*) (Nachlinger 1991). These nonnative species may compete with or displace native species including Soldier Meadow cinquefoil in disturbed areas or under conditions that favor their growth (USFWS 1997). Invasion by nonnative species also causes degradation of native habitats and can result in monotypic stands of undesirable species.

The most significant threats to the species continue to be recreational use of spring outflows for bathing and grazing. The spring systems and riparian areas are attractive to native and domestic grazers due to the presence of water, succulent vegetation adjacent to streams, and gentle topography (Minshall *et al.* 1989). Over the long term, grazing affects the landscape by altering, reducing or eliminating vegetation. Springs and riparian areas are also negatively affected through channel widening, bank degradation, lowering of the water table, and increased sedimentation into streams……Removal of vegetation by grazing can expose soils, increase erosion potential, modify the hydrologic regime, and encourage invasion by nonnative species. Grazing also results in the loss of individuals and trampling of habitat." (BLM, 2004)

Soldier Meadows cinquefoil habitat is found within the Soldier Meadows ACEC. The Soldier Meadows ACEC is an area of 2,077 acres designed to protect the populations of the cinquefoil. The ACEC protects portions of the areas of important for the cinquefoil habitat within the WD. All documented populations in the district are within exclosures constructed in part to eliminate impacts to the species. For this reason, the proposed activities are judged to have no impact on this species or its habitats and will be dismissed from further analysis.

Whitebark pine (*Pinus albicaulis*)
There are two known populations of Whitebark pine within the WD. The two populations are found in the Black Rock Range and the Pine Forest Range. The population in the Black Rock Range is protected in the Paiute Peak Wilderness and the population in the Pine Forest Range is protected in the Alder Creek WSA.

Since the populations are within a wilderness area and a WSA, the proposed activities are judged to have no impact on this species and will be dismissed from further analysis.

1. Environmental Consequences of the Proposed Action

Implementation of DRAs would not affect LCT or their habitat, with the exception of the ones noted.

DRAs having the same or similar impacts on the resource have been analyzed together. Those DRAs that could not be categorically grouped are analyzed individually.

Due to the inherent vulnerability associated with Threatened, Endangered or Candidate species, results of impacts, either negative or positive, would be intensified.

Temporary Water Hauls and Temporary above Ground Pipelines

Impacts associated with temporary water hauls and above ground pipelines are the same as those described in the Wildlife section (3.3X). Maintaining quality riparian habitat in stream reaches occupied by LCT is vitally important in the continued existence of these species.

Temporary Fencing

Impacts associated with temporary fencing are the same as those described in the Wildlife section (3.3X), although the resulting impacts would be magnified due to the circumstances surrounding Threatened, Endangered or Candidate species.

Greater sage-grouse appear to be particularly vulnerable to fatal fence collisions (Christiansen, 2009). Strategic placement of fence diverters has been an effective way to decrease the collision impacts associated with installing fences in sage-grouse habitat (Sutton).

Temporary Change in Livestock Kind or Class

Impacts associated with changes in livestock kind or class is the same as those described in the Wildlife section (3.3X). The resulting impacts are magnified due to the circumstances surrounding Threatened, Endangered or Candidate species.

Loss of vegetation and vegetative structure impacts Greater sage-grouse by eliminating food and cover resources. Because of the different foraging habits of livestock species and the potential impacts to plant community composition associated with them, food, nesting substrate/materials, and vegetation concealment could be deficient resulting in decreased sustenance and reproductive success, and increase predation risks for adults and chicks.

During the first few weeks post-hatching, the chick's diet is primarily insects and forbs. The nutritional value of insects consumed during this time directly affects the robustness of the bird's health throughout its life. Reduction or elimination of native forbs and vegetation that attracts insects would result in malnourishment of the chicks. The resulting population decrease would further compromise the listing status of this species.

Temporary Targeted Grazing of Invasive Annual Communities

Impacts associated with targeted grazing of invasive annual communities are the same as those described in the Wildlife section (3.3X). The resulting impacts are magnified due to the circumstances surrounding Threatened, Endangered or Candidate species.

Invasive annual grasses are not specifically utilized by the above mentioned species. It is possible Greater sage-grouse may nest or brood in these areas if there is a sufficient sagebrush component as well. Nest destruction could occur.

Temporary Complete or Partial Closure of Allotments, Temporary Reduction of AUMs, Temporary Changes in Season of Use and Duration, and Temporary Change in Livestock Management Practices.

Impacts associated with these DRAs are the same as those described in the Wildlife section (3.3X). The resulting impacts are magnified due to the circumstances surrounding Threatened, Endangered or Candidate species.

Within HMA Wild Horse and Burro Relocation, Wild Horse and Burro Removal

Impacts associated with these DRAs are the same as those described in the Wildlife section (3.3X). The resulting impacts are magnified due to the circumstances surrounding Threatened, Endangered or Candidate species.

The wild horse and burro gather(s) could have some direct impacts to LCT that would be minimal, due to the short term duration of the gather(s). Although animals may cross streams during gather operations causing some trampling in riparian areas and stream banks, any impacts would be short-term and minor. The stream banks could receive greater impacts than under normal wild horse and burro movement crossing a stream due to the speed at which the animals might cross the stream when being herded by the helicopter. The proposed action of the gather(s) could have some indirect effects to LCT that would be beneficial and would include reduced use of riparian areas by horses and burros.

Greater sage-grouse could be impacted by wild horse and burro gathers in the form of temporary displacement and disturbance of leks and nesting areas.

Because sage-grouse utilize various habitats seasonally, the intensity of the impacts would depend upon the time of year of the gather and the location of the trap site and round-up routes.

2. Environmental Consequences of the Grazing Closure Alternative

Implementation of this alternative would temporarily reduce or prevent the impacts of livestock grazing on water resources such as streambank destabilization, sedimentation, deposition, dehydration and erosion. This alternative would also provide some degree of protection to vegetative components of the natural habitat that wildlife rely upon either directly or indirectly. Plants stressed under drought conditions are more susceptible to the effects of livestock grazing. Removal of livestock grazing pressures would enhance a plant's to survive and remain available for use by Candidate, Threatened, and Endangered wildlife during the drought and subsequent seasons.

This alternative would implement DRAs for wild horses and burros in the same way as described under the proposed action alternative. Refer to impacts disclosed under the proposed action alternative with regard to wild horse and burro DRAs.

3. Environmental Consequences of the No Action Alternative

Impacts to Threatened, Endangered or Candidate wildlife under this alternative are the same or similar to those discussed in the Wildlife section (3.3X).

Refer to the BLM Special Status Species section (3.3T) under this alternative for impacts to Candidate plants.

I. Water Quality (Surface)

Affected Environment

Water uses in the planning area include agricultural (mainly for irrigation, with a much smaller amount used for stock watering), potable (including municipal, small public water systems, and individual domestic wells), and industrial (mainly mining and milling). Geothermal groundwater production is significant, but geothermal waters are typically saline and non-potable. Recreation and fish and wildlife uses are also important but as a rule do not consume appreciable quantities of water and are generally incidental to other uses. Stock watering is an important use on public lands. If water for livestock is not otherwise available, it is developed by various means on grazing ranges and other places of need, though quantities are not great.

The Nevada Division of Water Resources (NDWR) has designated 14 Hydrographic Regions within the state. The WD overlies eight hydrographic regions: Northwest Region, Black Rock Desert Region, Snake River Basin, Humboldt River Basin, West Central Region, Truckee River Basin, Carson River Basin, and Central Region. The WD boundaries do not correspond to NDWR region or basin boundaries. These regions are characterized by internal surface drainage and ground water flows.

Surface Water

Most of the land administered by the WD receives low rainfall, due to the shadow effect created by the Sierra Nevada Mountains. Average annual precipitation in the planning area varies between 5 and 15 inches, with most occurring as snow from November through March. Numerous small mountain streams flow within the area, many of which are perennial within their respective headwaters. Many of the streams are in terminal basins, and many basins contain deposits of salts remaining from evaporated Pleistocene lakes. In addition, because evaporation greatly exceeds rainfall in the valleys, salts tend to be transported from the higher elevations to the valleys, where they accumulate. Therefore, water quality tends to decline as it moves downstream within the basin.

Most stream flow occurs during the spring in direct response to the melting of the snow pack. Typical stream flow originates at the upper elevations and enters the stream by way of overland flow and shallow groundwater discharge (interflow). As this flow exits the mountain block and moves onto the alluvial fan, the surface expression is quickly lost as it infiltrates into the alluvium. Riparian vegetation exists in the mountainous areas prior to the water being lost as recharge to the alluvial aquifer. There are approximately 891 miles of perennial streams on lands

administered by the WD, featuring three primary drainage features that have helped shape the landscape. These are the Quinn, Owyhee, and Humboldt Rivers.

Surface Water Quality

The chemical character and quality of a natural water source is determined by mineral content of the rock that water flows across or through and the ease with which the rock minerals dissolve into the water. Among the variables that influence the concentrations of dissolved constituents in water are contact time between water and rock minerals, evaporation (which reduces the volume of water and causes salts to concentrate), temperature (which influences solubility), and the concentration and character of the mineral constituents in the rock or sediment.

Perhaps the two most important physical water quality indicators are temperature and turbidity. (Turbidity is the opposite of clarity and results from suspension of particles, such as fine sediment, in the water column. This causes the water to appear cloudy or muddy). Temperature is important because many species are adapted to a specific range of temperatures. Temperature also affects water chemistry, especially the concentration of oxygen that can be dissolved in the water. Elevated water temperatures can result from both natural and human-related causes. For example, removal of shade vegetation along streams can increase the amount of solar energy that reaches the stream. Shallow water tends to heat faster than deep water, so sediment deposition in a stream channel, which can cause a stream to become wider and shallower, can lead to increased water temperature. Slower stream velocity allows more time for water to equilibrate to ambient temperature and increases heat from solar radiation, so anything that causes a reduction in flow can also result in increased water temperatures. On the other hand, high flows can prevent sediment deposition and can cause scouring of the channel. Bedrock tends to heat faster than sediment and stores more solar energy.

Biological indicators of water quality are of two types: those that are used as a direct measure of water quality, such as pathogens; and those that indirectly reflect the quality of the water, such as excessive algae production (which may be an indicator of elevated nutrient concentrations) or presence and abundance of indicator species or populations, such as trout or amphibians. Pathogens include a large variety of organisms that are present in the digestive systems of birds and mammals and are harmful to human health when present in drinking water, including fecal coliform bacteria, giardia, and cryptosporidia. Although pathogens may be present under natural conditions, elevated concentrations of pathogens suggest a human-caused condition, such as improper discharge or disposal of human or animal waste, or livestock watering at a stream or spring.

Within the WD there are many activities which may impact surface water quality to some extent, ranging from occasional stream crossings by off highway vehicles to large scale mining operations. The most widespread cause however, of water quality alteration related to the parameters listed above is the utilization of the landscape by livestock and wild horses and burros. Because of the nature of natural water sources in the WD, surface water quality is highly dependent on the quality of riparian habitat adjacent to the water source.

Marlow (1985) studied the distribution pattern of livestock in Montana during August and September and observed 80% of the forage came from the riparian and wetland resources, which

comprised less than 4% of the pasture. Similar distribution patterns have been observed within the WD. It is expected that livestock and wild horses and burros would utilize riparian and wetland resources to a greater degree as drought conditions worsen due to reduced production and palatability of upland vegetation during drought. As livestock and/or wild horse and burro use of riparian areas increases, the probability of disease-causing organisms contaminating human water supplies increases (Belsky 1999). Increased animal waste associated with riparian grazing also introduces nutrients to aquatic systems. This could increase the food base for the aquatic system and if excessive, could lead to large algae blooms and subsequent decomposition. This could lead to low dissolved oxygen concentrations and endanger aquatic organisms (Belsky 1999).

The concentrated use of preferred areas in the landscape results in uneven distribution of animal impact, drought compounds the effects of herbivory, providing periods of accelerated deterioration (Teague et al. 2004). This could lead to an increase in sedimentation and a reduction in overall water quality.

During periods of drought, water quality generally decreases. Prior to completely drying up, surface water sites (both lentic and lotic) will generally experience elevated TDS due to concentration from evaporation; elevated temperatures due to decreased groundwater inputs, decreased shading from plants, and decreased water depth/ volumes; and increased algal or bacterial activity due to increased temperatures and decreases in water movement.

1. Environmental Consequences of the Proposed Action

In general, the DRAs described in the Proposed Action are designed to limit the time livestock and/or wild horses and burros spend in riparian areas during drought which would, for the most part, lead to direct and indirect impacts to water quality. During periods of drought stress, it is expected that conservative triggers related to riparian vegetation (e.g. stubble height of 6 inches and woody plant utilization of 20%) relative to most standard grazing restriction within the WD would allow for greater resiliency of the vegetation once drought conditions cease.

Reduction of utilization pressure on riparian areas due to implementation of the proposed action would have the potential to have direct and indirect impacts on water quality at all surface water sources within HMAs and grazing allotments. Reduction of use would decrease sediment and nutrient loading during use. Promotion of more resilient and better functioning riparian vegetation which would reduce erosion and help filter sediments for an extended period of time (throughout the drought and beyond, subject to future utilization). The degree of impact would be determined by the type or degree of DRA imposed. Change in season of use or class of livestock without additional DRAs would likely have the least impact to water quality relative to current conditions. Allotment closures and fencing of important areas would likely have the greatest impact to water quality.

Depending on the action(s) selected, impacts to water quality would vary. Because of this, each DRA needs to be discussed individually. Because of the complexities related to the many different livestock use agreements, the large scale and landscape variability within the proposed

action area, and the uncertainty of actual future climate and landscape conditions; effects on water quality cannot be quantified, but are discussed qualitatively below.

Livestock

Temporary Partial Closure of an Allotment(s)

Once drought triggers are met, the impacts of livestock on water quality would be completely eliminated in the areas of partial closure. This would be expressed by an immediate elimination of the introduction of bacteria and nutrients through urine and feces, an immediate elimination of the introduction of sediments through hoof action, a reduction in the erosion of sediments caused by hoof action or poor riparian plant functionality,

Temporary Complete Closure of an Allotment(s)

The impacts from this DRA would be identical to those describe immediately above with the exception that impacts would occur over an entire allotment.

Temporary Partial Reduction in Animal Unit Months (AUMs)

This DRA may be accomplished either by reducing the number of livestock permitted or by reducing the amount of time the currently permitted number of livestock may graze. In the event where the number of livestock permitted to graze is decreased, there is likely to be little or no measureable change to water quality. Where sediment loading is the primary concern, the functionality of riparian vegetation prior to grazing would determine water quality. Riparian areas with highly resilient and functional vegetation under currently existing grazing patterns would likely resist the erosion causing actions of livestock with or without a reduction in numbers. Riparian areas with degraded vegetation functionality under currently existing grazing patterns would likely continue to exhibit increased erosion regardless of the number of livestock. Where nutrient loading (from urine or feces) is the primary concern, a reduction in the number of livestock would reduce the total amount of nutrients introduced to water sources, however it would be expected that a smaller volume of water would be available at surface water sources. With this no measureable change in nutrient loading would be expected. In the event that livestock grazing duration is decreased, a measureable impact to water quality may be observed depending on how the timing is altered. If grazing durations were altered to avoid use during the driest periods, riparian vegetation would likely retain a greater level of resiliency and functionality. When this is the case, decreased sediment loading would be expected. Additionally, decreased duration of grazing may alter the timing of nutrient loading impacts. Nutrients would be introduced at the same rate when livestock are present, but the total amount of time the nutrient loading would occur would be reduced. This may lead to higher concentrations (due to lower volumes of water) while livestock are present as well as a longer period of time for nutrients to be removed from the system. The overall impact in this case would likely be an apparent decrease in water quality while livestock are present.

Temporary Change in Season of Use

It is unlikely that there would be an overall change in water quality if livestock use times were moved without changes in duration or number of animals. The most likely impact would be if utilization were moved to periods when surface water would be frozen or non-existent (i.e. the driest part of the year). Because the proposed action is intended to reduce stress from lack of water, the latter would not occur. If use were moved to periods when surface water is frozen, water quality would only change briefly during the spring melt as nutrients are incorporated into the runoff or infiltrate into the soil. This impact would be very short in duration, but occur over a larger area.

Temporary Reduced Grazing Duration

Implementing this DRA alone would lead to an increased number of livestock in order to meet currently permitted AUMs. As with the Temporary Change in Season of Use, if duration were changed to only occur during periods when surface water is frozen, no immediate water quality impacts would occur. However, a brief, more widespread impact would occur during the spring melt as nutrients were incorporated into surface runoff. If this DRA were to result in a reduced duration that occurred during warmer periods, there would likely be a negative impact to water quality. A larger number of livestock over a shorter period of time can lead to increased sediment loading due to increased hoof action and increased utilization of riparian vegetation. While the decreased duration would allow for longer periods of rest, the impact to water quality during use would be measureable.

Temporary Change in Livestock Management Practices

The intent of this DRA is to encourage more even distribution of livestock or provide for an increased ability to manipulate where livestock occur. In both cases, if the DRA were successful, water quality would remain static or improve relative to conditions during non-drought periods. If this DRA were successful, water quality would be greatly improved relative to No Action Alternative. This DRA would decrease the amount of time that livestock "loaf" in riparian areas and reduce the amount of riparian vegetation utilization. This would reduce nutrient and sediment loading.

Temporary Fencing

While this DRA isn't specific to riparian areas, they are included as one of the possible important areas. Where riparian habitats are determined to be important areas that would be enclosed by a fence which prohibits livestock utilization, the water quality inside the fenced area would improve. Inside the fence there would be a reduction or elimination of bank alteration from hoof action, a reduction of riparian vegetation utilization, and a reduction of urine and feces deposition. The degree of reduction would be dependent on when the fence is erected and its effectiveness. However, by removing the availability of an important area, utilization pressure on similar areas without fence protection would likely be realized. This could lead to a decrease in water quality in other riparian habitats. All of the effects would be compounded if the fenced riparian area occurred inside an HMA due to the change of utilization by wild horses or burros.

Temporary Targeted Grazing of Invasive Annual Communities

Because this DRA is only intended to target upland invasive annuals, it would not result in a decrease of water quality. If the entirety of livestock use during drought were targeted on upland areas, water quality would likely increase due to the lack of use of riparian areas. If only a portion of livestock use were targeted on upland areas, water quality could increase or may remain static depending on the amount of livestock use that is managed in a targeted manor.

Temporary Change in Kind or Class of Livestock

This DRA would not be expected to have a measureable impact to water quality. Changing the kind or class of livestock would not likely cause any reduction in utilization of riparian areas during drought due to the presence of water. Changing kind or class of livestock may alter the type of use (e.g. targeting different types of vegetation), but hoof action and nutrient loading would still occur.

Temporary Water Hauls

Depending on the placement of water haul sites, this DRA may improve or degrade water quality. Due to reduction in expense and a likelihood of utilization by cattle, previously existing troughs are a logical place to consider hauling water when drought has resulted in reduced spring flow. Because part of the intent of this DRA is to encourage use in areas where adequate vegetation exists, but adequate water does not, water may be hauled to troughs at mostly dry spring locations. In these cases, if surface moisture is still present, hauling water to the site may encourage livestock use of the area. This would lead to a decrease in water quality through nutrient and sediment loading. This scenario would likely be decidedly rare due to the likelihood that vegetation proximate to any amount of surface water would likely be utilized more than more distant vegetation. However, the majority of the intent of this DRA would reduce the impact to water quality by increasing livestock distribution or specifically reducing utilization of riparian areas. In these cases, water quality would increase due to decreased nutrient loading as well as reduced sediment loading related to decreased hoof action and riparian vegetation utilization. Additionally, while it would seem apparent, it should be noted that if water were hauled to a location where water had not previously existed, a new source of water would be created that would need to be considered for water quality. Imported water would reflect any water quality concerns of the water source.

Temporary above Ground Pipelines

The impacts to water quality from this DRA would be identical to those described under the "Temporary Water Haul" DRA.

Wild Horses and Burros

Temporary Water Hauls

The effects from this DRA would be identical in type to those described under the Livestock Temporary Water Hauls DRA. The impacts would only occur within HMA boundaries. There would be a difference, however, in the likelihood of impacts occurring at previously existing water sources. Within the WD, wild horses have been observed to avoid or ignore new water sources (e.g. Rodear Flat in the Little Owyhee HMA) while continuing to use stagnant water or investigating desiccated sites. Because of this, most effective water hauls for WH&B would likely occur at or immediately adjacent to previously existing water sources. Where this is the case, water quality would likely be degraded due to both nutrient and sediment loading. During drought, WH&B will spend more time at these locations leading to increased utilization of vegetation, increased soil punching and/or compaction, increased deposition of urine and feces (i.e. stud piles). If water haul sites were successfully established away from previously existing watering sites, water quality would potentially increase.

Within HMA Wild Horse and Burro Relocation

Overall, this DRA would likely lead to no net change in water quality across an HMA. If WH&Bs are found to be over-utilizing an area, there will likely be a local decrease in water quality due to increased nutrient and sediment loading. If animals are moved to another area, the original local degradation will cease, but the impacts will be moved to other water sources.

Wild Horse and Burro Removal

This DRA would have the greatest impact to water quality. As noted above, WH&Bs can become very dependent on one watering source with little likelihood of moving on to another source (natural or otherwise). This can lead to very degraded surface water sources. WH&Bs are known to dig into moist soils to find additional water or to wade into water sources with standing water. Both actions can lead to sediment loading to the point where available water is lost by creation of mud slurry. Removal of WH&Bs at the first signs of drought impacts (drought triggers) would help minimize this impact or prevent it altogether. Removal of WH&Bs would help decrease the utilization of riparian vegetation and alteration of riparian soils. This would lead to longer term maintenance of water quality or prevent future degradation of water quality related to nutrient loading. Removal of WH&Bs would also decrease or eliminate the direct introduction of nutrients to water sources. Because any instance of a drought related WH&B gather would automatically be accompanied by a partial or full closure to livestock grazing, the beneficial impacts to water quality would be compounded. Unlike livestock, which may be able to go back to pre-drought stocking rates when drought impacts are shown to be alleviated, WH&B removals may cause decreased WH&B populations for an extended time. This would be dependent on the chosen removal target, whether or not the target was achieved, and variability in WH&B reproduction rates. In any case, fewer WH&Bs would equate to a proportionate decrease in use of riparian areas. As stated previously, a reduction in riparian area use will generally equate to increased water quality.

During periods of drought stress, it is expected that a more conservative stubble height trigger of 6 inches will allow for greater resiliency of the vegetation once drought conditions cease.

Reduction of use would also promote more resilient and better functioning riparian vegetation which would reduce erosion and help filter sediments for an extended period of time (throughout the drought and beyond subject to future utilization). Change in season of use would likely have the least impact to water quality relative to current conditions. Partial allotment closures and riparian exclosures would likely have the greatest impact to water quality.

2. Environmental Consequences of the Grazing Closure Alternative

The Grazing Closure Alternative would close all drought-afflicted areas to grazing. The closure would remove livestock grazing from the public lands to eliminate the impacts of grazing during the drought. Rest of these areas would allow riparian vegetation the ability to make the best use of limited resources during drought. Improved root and shoot growth of vegetation aids in bank stability, water retention, reduces sedimentation and leads to a better functioning riparian system. No new animal waste from livestock would be deposited in or near water, which would reduce the introduction of bacterial contamination and nutrient loading. The Grazing Closure Alternative would have a positive effect on water quality. This impact would occur throughout the WD where livestock grazing is permitted. Impacts would be greatest where WH&Bs are not present. DRAs for wild horses and burros would be implemented as identified in the Proposed Action and would result in identical effects as described above, for the Proposed Action.

3. Environmental Consequences of the No Action Alternative

Under the No Action Alternative, changes to grazing and WH&B numbers may still occur, however the implementation of the decisions would require project specific NEPA evaluation. Because of the additional workloads, drought response could be delayed or not implemented at all. This would result in a continuation of current management practices, which are often poorly suited to drought. As stated earlier, the concentrated use of riparian areas is exacerbated during drought. This would lead to the increased use of riparian areas by livestock and/or wild horses and burros. The result would be an increase in the introduction of animal wastes, a decrease in vegetative cover and increased erosion. A reduction in water quality would occur and may be long lasting depending on post-drought recovery.

J. Wetland and Riparian Zones

Affected Environment

The term riparian is used here to include both lotic (running water) systems and lentic (standing water) systems. Wetlands occur in both lotic and lentic systems and typically provide livestock/wildlife with green forage, insects, and drinking water. Green forage is especially important for livestock and many wildlife species during the summer and fall, when upland vegetation has dried out. The structure, food, and water provided by these communities make them the most diverse and productive wildlife habitat in the planning area.

Riparian communities occur along the watercourses of the WD and in association with springs. In the Great Basin, riparian communities are dominated by various mixtures of cottonwood, aspen, and willow species. Although riparian zones account for a very small proportion of the total acreage of the planning area, they play a important role as habitat for wildlife. Riparian areas are highly favored by wildlife and livestock. Where site potential allows, vegetation may develop multiple canopies, including trees, shrubs, grasses, forbs, sedges, and rushes. This complex vegetation structure is the goal of riparian management, and it can provide exceptionally valuable habitat for a wide array of wildlife species. PFC is a standardized gauge of whether a riparian system has adequate vegetation, landforms, or large woody debris to perform essential flood control, water quality, erosion control, and habitat functions. PFC can be reached at a lower level of vegetation development than the management goal of Desired Future Condition.

Even riparian areas dominated by herbaceous communities and lacking complex structure are important as sources of water and food for livestock/wildlife. Riparian areas occupy approximately 11,952 acres in the WD. Although this is a small percentage of the land area, the importance of these areas as wildlife habitat far exceeds their size.

Lotic Systems

Lotic Systems occur along flowing water sources such as streams, rivers, etc. Much of the substantial perennially flowing water sources within the WD have been settled, homesteaded, or otherwise removed from the public domain. Because of this, much of the lotic riparian habitat managed by the BLM within the WD is comprised of small, steep mountain streams. These habitats predominantly present themselves as narrow strips of green vegetation originating in higher elevations where they are fed by snow melt and thunderstorms and terminating in alluvial fans where infiltration rates exceed the volume of water being supplied.

Landscape setting (e.g. elevation, aspect, latitude, etc.) generally determines the amount of precipitation available to supply riparian vegetation as well as the vegetative communities present. Steeper, higher elevation streams demonstrate multi-canopy vegetative communities including aspen stands, willows and other shrubs, as well as an herbaceous understory. Mid-slope streams are more heavily dominated by willows as a shrub understory and a low tree-like canopy with interspersed herbaceous communities. Where streams begin losing water through infiltration, riparian species become less abundant with only the most drought tolerant species remaining mixed with upland species.

Utilization by livestock and WH&Bs along with recreation activities and other development can lead to the degradation of lotic habitats. Long term stresses on vegetation can decrease the erosion resistance of these communities and high streamflow events can initiate erosion processes, lateral and vertical, which reduces riparian soils, water retention characteristics, and overall degradation of lotic riparian habitats.

The BLM utilizes a qualitative assessment protocol to describe the overall condition and functionality or riparian habitats, both lentic and lotic. This protocol is not a monitoring tool, but provides the BLM an efficient way to determine the aspects of a healthy riparian area which may

be experiencing degradation. Within the WD, 55% of lotic habitat is estimated to be properly functioning or functioning at risk with an upward trend, 39% are functioning at risk without an upward trend, and 9% are non-functional.

Lentic Systems

Lentic systems include other permanently wet or seasonally wet areas and include lakes, reservoirs, vegetated playas, meadows, and seeps. These areas commonly are found independently of a defined stream channel and can occur at various elevations and in diverse landscape settings. This is particularly true for meadows, springs, and seeps, which may be present in very arid areas and at low elevations. Lentic systems are typically small, and while they are extremely important ecologically, seeps in the planning area typically average less than 0.2 acre in size. Over 100 of these may occur in a grazing allotment, making management very difficult.

Wet meadow habitats generally have a simple structure, consisting of a layer of herbaceous plants. Shrub or tree layers are usually absent or very sparse; they may, however, be an important feature of the meadow edge. In the herbaceous plant community a microstructure is frequently present. Some species reach heights of only a few inches, while others may grow greater than three feet tall. Except where broken by boulders, canopy cover is dense (60 to 100 percent). At the substrate surface, distances between individual shoots may vary from 0.04 to 0.08 inches to as much as 0.8 to 1.2 inches, depending on the species present.

Wet meadows are vulnerable to grazing and other surface-disturbing uses that affect soil stability, water-holding capacity, and plant composition. All meadows are important watershed components that may be functionally impaired by gullies, sagebrush encroachment, and dominance by such species as iris (Iris sp.), which provides greatly diminished wildlife habitat values and indicates poor habitat health.

Springs and seeps occur where water from underground aquifers reaches the surface. Many springs flow directly into streams, but others form small isolated ponds or marshy areas. Springs and seeps may also form channels to flowing streams, or they may lose their surface expression and recharge alluvial fill material or permeable strata.

Springs and seeps are also important to lotic habitat because of the perennial base flow they provide to streams. In winter, especially in small streams, this base flow may prevent formation of anchor ice, which has been found to be detrimental to the survival of salmonids and other aquatic species. In summer, inflow from springs not only provides volume but also helps to lower maximum daily water temperatures and the magnitude of diurnal temperature change.

Depending on soil and topography, extensive riparian areas may be associated with spring sources. Because of the continuous flow and constant temperature of most springs, riparian communities frequently remain permanently green, providing habitat, thermal and physical cover, and forage for wildlife throughout the year.

Some springs are warm or hot because their aquifers are near a geothermal heat source. In addition to their high temperatures (above 95°F) hot springs are often characterized by large quantities of dissolved salts, carbon dioxide, carbon sulfide, or sulfur dioxide. Animals are never abundant at hot springs. In general, 77 to 86°F appears to be the dividing line between a diverse fauna at low temperatures and a poor fauna at high temperatures.

A comprehensive inventory of springs, their condition, and water yield to streams has not been conducted. The BLM estimates that 38% percent of the lentic systems are properly functioning or functioning at risk with an upward trend, 60% are functioning at risk without an upward trend, and 2% are non-functional. The condition of lentic systems is typically linked to its spatial location on the landscape, site characteristics, the surrounding topography, and the type/season of grazing that is occurring.

1. Environmental Consequences of the Proposed Action

In general, the DRAs described in the Proposed Action are designed to limit the time livestock and/or wild horses and burros spend in riparian areas during drought which would, for the most part, lead to direct and indirect beneficial impacts to riparian and wetland zones. During periods of drought stress, it is expected that conservative triggers related to riparian vegetation (e.g. stubble height of 6 inches and woody plant utilization of 20%) relative to most standard grazing restriction within the WD will allow for greater resiliency of the vegetation once drought conditions cease.

Reduction of utilization pressure on riparian areas due to implementation of the proposed action would have the potential to have direct and indirect impacts across all HMAs and grazing allotments. Reduction of use would decrease soil compaction and erosion during use. Promotion of more resilient and better functioning riparian vegetation which would reduce erosion and help filter sediments, helping retain floodplains, for an extended period of time (throughout the drought and beyond, subject to future utilization). The degree of impact would be determined by the type or degree of DRA imposed. Change in season of use or class of livestock without additional DRAs would likely have the least impact to riparian and wetland zones relative to current conditions. Allotment closures and fencing of important areas would likely have the greatest impact to riparian and wetland zones.

Depending on the action(s) selected, impacts to riparian and wetland zones would vary. Because of this, each DRA needs to be discussed individually. Because of the complexities related to the many different livestock use agreements, the large scale and landscape variability within the proposed action area, and the uncertainty of actual future climate and landscape conditions; effects on riparian and wetland zones cannot be quantified, but are discussed qualitatively below.

Livestock

Temporary Partial Closure of an Allotment(s)

Once drought triggers are met, the direct impacts of livestock on riparian and wetland zones would be completely eliminated in the areas of partial closure. Effects from the livestock use on riparian and wetland zones would persist after the closure is implemented. This includes

streambank and soil alteration, alteration of hydrologic function, as well as potentially reduced vigor/resiliency of vegetation. Removal of livestock, however, would allow for recovery to begin earlier and occur over a longer period of time prior to subsequent utilization. Recovery would allow vegetation to regain vigor/resiliency, sediment and water volumes to move toward an equilibrium, and hydrologic functionality to increase. The degree of recovery that may be recognized would be site specific and dependent on, among other variables, the utilization of the site in the immediate and longer term history, the amount of water available for vegetation, and whether or not WH&B use would still occur.

Temporary Complete Closure of an Allotment(s)

The impacts from this DRA would be identical to those describe immediately above with the exception that impacts would occur over an entire allotment.

Temporary Partial Reduction in Animal Unit Months (AUMs)

This DRA may be accomplished either by reducing the number of livestock permitted or by reducing the amount of time the currently permitted number of livestock may graze. In the event where the number of livestock permitted to graze is decreased, there is likely to be little or no measureable change to riparian and wetland zones. Where sediment loading is the primary concern, the functionality of riparian vegetation prior to grazing will determine the habitats ability to absorb utilization pressures. Riparian areas with highly resilient and functional vegetation under currently existing grazing patterns will likely resist the erosion causing actions of livestock with or without a reduction in numbers. Riparian areas with degraded vegetation functionality under currently existing grazing patterns will likely continue to exhibit increased erosion regardless of the number of livestock. If grazing durations were altered to avoid use during the driest periods, riparian vegetation would likely retain a greater level of resiliency and functionality. When this is the case, decreased erosion would be expected. Reduction of grazing duration may also, depending on how timing was changed, result in increased recovery time of riparian and wetland zones between utilization periods. Effects from this would be identical in type to those described under the Partial Closure DRA except that the period of recovery would likely be lesser.

Temporary Change in Season of Use

Because temporary changes in season of use would be implemented to reduce grazing on riparian areas during the hot season, riparian areas would benefit. During these times, the vegetation would utilize more water and energy creating root mass and energy stores (water and energy continue to promote regrowth when continually grazed). Because of this, the riparian vegetation community would more successfully resist erosion, promote water retention, and increase water quality. Overall, the functionality of the sites would be maintained or improved. This effect would be realized both during the drought period and afterward as the improved root systems would promote more vigorous vegetation in subsequent seasons. Additionally, if grazing is altered to avoid the hot season, there will be a greater distribution of utilization between upland vegetation and riparian vegetation leading to greater benefit to riparian habitats.

Temporary Reduced Grazing Duration

Implementing this DRA alone would lead to an increased number of livestock in order to meet currently permitted AUMs. It is difficult to determine if this DRA would have an overall impact on riparian habitats, Greater numbers of livestock would lead to increased utilization of vegetation and increased hoof action on riparian soils, however greater periods of rest would allow for a greater degree of recovery prior to use. Riparian areas with a currently high level of functionality may not show any negative impacts. Riparian areas with a currently low level of functionality may see greater degradation and the greater period of rest may not allow for the same recovery that would occur at more functional sites.

Temporary Change in Livestock Management Practices

The intent of this DRA is to encourage more even distribution of livestock or provide for an increased ability to manipulate where livestock occur. In both cases, if the DRA were successful, riparian habitats would likely improve. Encouraging more utilization of uplands or previously less-utilized areas will reduce utilization of most riparian areas. This would allow riparian vegetation to build or maintain greater root masses which will help retain riparian soils, improve water retention, and improve water quality. This effect would be realized both during the drought period and afterward as the improved root systems would promote more vigorous vegetation in subsequent seasons.

Temporary Fencing

While this DRA isn't specific to riparian areas, they are included as one of the possible important areas. Where riparian habitats are determined to be important areas that would be enclosed by a fence which prohibits livestock utilization, the riparian habitat inside the fenced area would improve. Inside the fence there would be a reduction or elimination of bank alteration from hoof action and a reduction of riparian vegetation utilization. The degree of reduction would be dependent on when the fence is erected and its effectiveness. However, by removing the availability of a important area, utilization pressure on similar areas without fence protection would likely be realized. This could lead to an increase of utilization and decrease in quality in other riparian habitats. All of the effects would be compounded if the fenced riparian area occurred inside an HMA due to the change of utilization by wild horses or burros.

Temporary Targeted Grazing of Invasive Annual Communities

Because this DRA is only intended to target upland invasive annuals, it would not result in degradation in riparian habitat functionality. If the entirety of livestock use during drought were targeted on upland areas, riparian habitats would likely have impacts identical to a complete allotment closure. If only a portion of livestock use were targeted on upland areas, riparian habitat could improve or may remain static depending on the amount of livestock use that is managed in a targeted manor.

Temporary Change in Kind or Class of Livestock

Depending on the type of change, riparian habitat functionality may improve or remain static. A change in type of livestock may lead to utilization of different types of vegetation. This would allow vegetation targeted by the original type of livestock to recover. A change in the class of livestock would not likely result in any change to riparian habitat.

Temporary Water Hauls

Depending on the placement of water haul sites, this DRA may improve or degrade riparian habitat. Due to reduction in expense and a likelihood of utilization by cattle, previously existing troughs are a logical place to consider hauling water when drought has resulted in reduced spring flow. Because part of the intent of this DRA is to encourage use in areas where adequate vegetation exists, but adequate water does not, water may be hauled to troughs at mostly dry spring locations. In these cases, if surface moisture is still present, hauling water to the site may encourage livestock use of the area. This would lead to increased alteration of riparian soils and increased utilization of riparian vegetation. This scenario would likely be decidedly rare due to the likelihood that vegetation proximate to any amount of surface water would likely be utilized more than more distant vegetation. However, the majority of the intent of this DRA would reduce the impact to riparian habitat by increasing livestock distribution or specifically reducing utilization of riparian areas. In these cases, riparian vegetation would be allowed to build or maintain greater root masses which will help retain riparian soils, improve water retention, and improve water quality. This effect would be realized both during the drought period and afterward as the improved root systems would promote more vigorous vegetation in subsequent seasons.

Temporary above Ground Pipelines

The impacts to water quality from this DRA would be identical to those described under the "Temporary Water Haul" DRA.

Wild Horses & Burros

Temporary Water Hauls

The effects from this DRA would be identical in type to those described under the Livestock Temporary Water Hauls DRA. The impacts would only occur within HMA boundaries. There would be a difference, however, in the likelihood of impacts occurring at previously existing water sources. Within the WD, wild horses have been observed to avoid or ignore new water sources (e.g. Rodear Flat in the Little Owyhee HMA) while continuing to use stagnant water or investigating desiccated sites. Because of this, most effective water hauls for WH&B would likely occur at or immediately adjacent to previously existing water sources. During drought, WH&Bs will spend more time at these locations leading to increased utilization of vegetation and increased soil alteration. If water haul sites were successfully established away from previously existing watering sites, riparian habitats would potentially increase.

Within HMA Wild Horse and Burro Relocation

Overall, this DRA would likely lead to no net change in riparian habitat across an HMA. If WH&Bs are found to be over-utilizing an area, there would likely be a local decrease in riparian habitat functionality due to vegetation utilization and soil alteration. If animals are moved to another area, the original local degradation would cease and recovery may begin, but the impacts would be moved to other water sources.

Wild Horse and Burro Removal

This DRA would have the greatest impact to riparian habitat. As noted above, WH&Bs can become very dependent on one watering source with little likelihood of moving on to another source (natural or otherwise). This can lead to very degraded surface riparian habitats. WH&Bs are known to dig into moist soils to find additional water. This damages or destroys both above and below ground plant material and alters riparian soils. Removal of WH&Bs at the first signs of drought impacts (drought triggers) would help minimize this impact or prevent it altogether. This would lead to longer term maintenance of riparian habitat functionality and potentially allow for recovery. Because any instance of a drought related WH&B gather would automatically be accompanied by a partial or full closure to livestock grazing, the beneficial impacts to riparian habitat would be compounded. Unlike livestock, which may be able to go back to pre-drought stocking rates when drought impacts are shown to be alleviated, WH&B removals may cause decreased WH&B populations for an extended time. This would be dependent on the chosen removal target, whether or not the target was achieved, and variability in WH&B reproduction rates. In any case, fewer WH&Bs would equate to a proportionate decrease in use of riparian areas.

2. Environmental Consequences of the Grazing Closure Alternative

The Grazing Closure Alternative would require all drought afflicted areas to be closed to grazing. The closure would remove livestock grazing from the public lands to eliminate the impacts of grazing during the drought. Rest of these areas would allow riparian vegetation to make the best use of limited resources during drought. Improved root and shoot growth of vegetation aids in bank stability, water retention and reduces sedimentation and leads to a better functioning riparian system.

DRAs for wild horses and burros would be implemented as identified in the Proposed Action and would result in similar effects as described above, for the Proposed Action.

3. Environmental Consequences of the No Action Alternative

Under the No Action Alternative, changes to grazing and WH&B numbers may still occur, however the implementation of the decisions would require project specific NEPA evaluation. Because of the additional workloads, drought response could be delayed or not implemented at all. This would result in a continuation of current management practices, which are often poorly suited to periods of drought. As stated earlier, the concentrated use of riparian areas is exacerbated during drought. This would lead to the increased use of riparian areas by livestock

and/or wild horses and burros. The result would be degradation of riparian habitat through decreased vegetative functionality, loss of soils through erosion, and altered hydrologic function. While vegetative function can be restored over long periods of time, loss of soils and original hydrologic function are virtually permanent.

K. Wilderness

Affected Environment

There are ten designated Wilderness areas within the WD administrative boundary, totaling approximately 751,901 acres (Table 7). As described in the Wilderness Act of 1964 (PL 88-577), naturalness occurs when an area generally appears to have been affected primarily by the forces of nature with the imprint of humans substantially unnoticeable. These areas were designated to protect and preserve their natural conditions, outstanding opportunities for solitude and primitive recreation and the integrity of the viewshed of the historic emigrant trails. Management of the areas will focus on protecting these values in such a manner as to leave them unimpaired for future use and enjoyment as wilderness.

Under most circumstances, commercial enterprise, roads, motor vehicles, motorized equipment, motorboats, landing of aircraft, mechanical transport, and structures and installations are not allowed in Wilderness Areas. However, the Wilderness Act allows the BLM to conduct or authorize actions that are generally prohibited by the Act if they are the minimum required action for the management of the area as wilderness. To determine whether a project is the "minimum required" action, a site-specific analysis must be conducted that demonstrates how the project will be required to maintain or enhance the wilderness characteristics (naturalness, opportunities for solitude, and primitive recreation) of the area. The analysis also examines how the project or action will be accomplished and determines which method will have the least impact on wilderness characteristics. This analysis is commonly referred to as the "minimum required/tool analysis."

Table 7 Wilderness Areas within the WD

Wilderness Name	**Total Acreage**
Black Rock Desert	314,835
Calico Mountains	64,968
East Fork High Rock Canyon	52,618
High Rock Canyon	46,465
High Rock Lake	59,107
Little High Rock Canyon	43,395
North Black Rock Range	30,648
North Jackson Mountains	23,439
Pahute Peak	56,890
South Jackson Mountains	54,536
Total	**751,901**

1. Environmental Consequences of the Proposed Action

Under the Proposed Action, rangeland and riparian resources within wilderness would improve due to the installation of temporary water sources (e.g., temporary water hauls, and water pipelines) outside of but adjacent to wilderness. Livestock, wild horses, and burros would be provided with an alternative water source to utilize outside of wilderness areas. This would minimize the negative impacts that could occur. These impacts could include, but are not limited to, vegetation trampling, introduction and expansion of invasive weed populations, soil compaction, erosion, and water contamination that could occur when livestock, wild horses, and burros over utilize rangeland and riparian resources for forage and water.

Changes in livestock management practices (e.g.,, change in season of use, reduced grazing duration, partial reduction in AUMs, partial or complete closure of an allotment(s), targeted grazing of invasive annual communities, and temporary change in kind or class of livestock) under the Proposed Action would have a beneficial impact on wilderness. These actions would allow the rangeland and riparian resources to temporarily recover from the negative impacts of livestock grazing. These impacts could include, but are not limited to, vegetation trampling, introduction and expansion of invasive weed populations, soil compaction, erosion, and water contamination. These impacts could impair wilderness characteristics.

Wild horse and burro removal under the Proposed Action would have a beneficial impact on the rangeland and riparian resources within wilderness. Wild horses and burros utilize rangeland and riparian resources for forage and water. If unmanaged under drought conditions, this usage can cause negative impacts. Negative impacts could include, but are not limited to, vegetation trampling, expansion of invasive weed populations, soil compaction, erosion, and water contamination. These impacts can impair wilderness characteristics.

Relocating wild horses and/or burros within HMAs would have similar impacts to the impacts for hauling water and conducting drought gathers, and would be congruent with the numbers of animals moved. The receiving portion of the HMA would experience an increase in the population, some impacts to vegetation, soils, riparian areas and water could be expected due to the additional travel, trampling, trailing or utilization that could occur. The portion of the HMA where animals were moved from would endure benefits similar to those that would be expected following a drought gather to remove all or some of the wild horses and/or burros.

2. Environmental Consequences of the Grazing Closure Alternative

The grazing closure alternative would positively impact wilderness areas within the WD. Rangeland and riparian resources would be allowed to temporarily recover from livestock grazing. During the closure period, rangeland and riparian resources would not be receiving the negative impacts of excessive livestock utilization during drought (e.g., vegetation trampling, introduction and expansion of invasive weeds, soil compaction, erosion, and water contamination).

3. Environmental Consequences of the No Action Alternative

The No Action Alternative would negatively impact wilderness characteristics within the WD. The No Action Alternative would not allow for changes in livestock grazing management to adjust to drought conditions. During drought conditions, livestock, wild horses, and burros would congregate in areas that receive a higher abundance of moisture, especially riparian areas. Riparian areas would be degraded more rapidly than upland areas. This degradation could include, but is not limited to, vegetation trampling, introduction and expansion of invasive weeds, soil compaction, erosion, and water contamination.

Additional Affected Resources

L. Lands & Realty

Affected Environment

The BLM administers the majority of the land within the WD and provides for land use authorizations for a variety of purposes, both short-term and long-term. Examples of short-term uses include agricultural leases, temporary use permits, and other uses involving minimal land improvements or disturbances. Examples of long-term uses include rights-of-ways for power lines, highways, access roads, communication sites, geothermal, wind energy, solar energy and sand and gravel sites.

1. Environmental Consequences of the Proposed Action

The Proposed Action would reduce the impacts of authorized uses and activities on natural resources that are at risk of being affected by drought. The DDMP identified in the Proposed Action would provide for the early detection and prompt response to drought. A quick response to drought would prevent further degradation to affected resources within the WD.

The maintenance of rangeland health would reduce soil erosion and the potential for noxious weed invasion. This would have an impact on land use authorizations by reducing the maintenance cost of right-of-ways as well as protect access to sites or the sites themselves.

2. Environmental Consequences of the Grazing Closure Alternative

The Grazing Closure Alternative would have similar impacts as the Proposed Action. The removal of grazing would maintain vegetative cover and reduce the potential for soil erosion and noxious weed invasion.

3. Environmental Consequences of the No Action Alternative

The No Action Alternative would increase response time and reduce the effectiveness of management during a drought. In many instances, current livestock and wild horse and burro management actions would continue with no modifications. This would lead to an overall decline in rangeland health associated with a reduction in plant cover and increased susceptibility to soil erosion. Noxious weeds and non-native invasive species are more likely to invade areas

that are in poor condition. Noxious weeds increase the costs for maintenance and soil erosion could damage access to sites or the sites themselves.

M. Lands with Wilderness Characteristics

Affected Environment

As described in the Wilderness Act of 1964 (PL 88-577), naturalness occurs when an area generally appears to have been affected primarily by the forces of nature with the imprint of humans substantially unnoticeable. Wilderness character conditions tend to be more qualitative in nature, measuring the overall landscape and naturalness of an area as a result of changes to levels of recreational activities, development, and surrounding land use trends. Indicators that can quantitatively be measured include changes to route designations, including the number of unauthorized trails, the number of encounters with other users, and anticipated facility development. Human-caused sights and sounds outside the inventory area should not automatically lead to a conclusion that the area lacks wilderness characteristics.

Areas that offer solitude should provide "outstanding" opportunities for individuals to avoid sights, sounds, and evidence of other people in the inventory area. Factors influencing solitude may include natural screening, such as vegetation or topography, or the opportunity for a person to find a secluded spot. Unconfined recreational experiences focus on undeveloped recreational activities or those that do not require facilities or motorized equipment.

During the Winnemucca District Resource Management Plan process, seven areas were identified as possessing wilderness characteristics. In general, the remote and rural natures of the units have helped to protect potential wilderness characteristics. Wilderness characteristics, such as roadlessness, naturalness, and outstanding opportunities for solitude and/or primitive, unconfined recreational experiences were evaluated. Protection of the wilderness characteristics of WCA units is recommended wherever feasible under BLM Manual 6320 Considering Lands with Wilderness Characteristics in the BLM Land Use Planning Process.

1. Environmental Consequences of the Proposed Action

Impacts from the Proposed Action would be similar to those identified in the Wilderness section (3.3K).

2. Environmental Consequences of the Grazing Closure Alternative

Impacts from the Grazing Closure Alternative would be similar to those identified in the Wilderness section (3.3K)

3. Environmental Consequences of the No Action Alternative

Impacts from the Grazing Closure Alternative would be similar to those identified in the Wilderness section (3.3K). Additionally, Lands With Wilderness Characteristics must meet certain criteria in order to be studied further for a determination of suitability as wilderness. Criteria include an area which generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; has outstanding opportunities for solitude or a primitive and unconfined type of recreation; has at least five thousand acres of

land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value (Section 2(c) of the Wilderness Act of 1964). The No Action Alternative would not allow for timely changes in livestock grazing management to adjust to drought conditions. Over time, this could impair the same qualities that the units originally met in order to receive further study regarding their suitability as wilderness. During drought conditions, livestock, wild horses, and burros would congregate in areas that receive a higher abundance of moisture, especially riparian areas. Riparian areas that would be degraded more rapidly than upland areas. This degradation could include, but is not limited to, vegetation trampling, introduction and expansion of invasive weed populations, soil compaction, erosion, and water contamination.

N. National Conservation Area

Black Rock Desert/High Rock Canyon Emigrant Trails National Conservation Area

Affected Environment

The Black Rock Desert/High Rock Canyon Emigrant Trails National Conservation Area (NCA) was established in the Winnemucca District by an Act of Congress in the year 2000. The NCA was established to protect 799,165 acres (which includes 378,329 acres of Wilderness) and to conserve, protect, and enhance resources associated with the historic Oregon and California Emigrant Trails and surrounding areas for the benefit and enjoyment of current and future generations. The area contains nationally significant historic trails (including the Applegate and Nobles Trails and the route of the explorer John Fremont), unique Great Basin biota, and significant cultural, archaeological, paleontological, and geographic resources. Valid and existing rights were preserved with the establishment of the NCA, but it was the intent to limit developments that would change the nature of the existing landscape which in most parts of the NCA still closely resembles that as it appeared in the mid-nineteenth century. Travel in the NCA is confined to existing roads. Grazing rights were not affected by the designation except in the areas of a few specially delineated areas (ACECs, which are discussed in section 3.3B of this document).

1. Environmental Consequences of the Proposed Action

Resources most likely to be affected by the proposed action include cultural resources and more specifically historic trails. Placement of temporary water troughs or above-ground pipelines, active herding, traffic to access watering locations, erection of fences, placement of supplements, and possibly other actions could affect the National Historic Trails in the NCA, if these actions were to be placed in sensitive sections of the trails or on sites along the trails. To avoid these impacts care must be taken to avoid these locations. Concentration of livestock could damage pristine trail traces in sensitive areas. Prehistoric archaeological sites are also especially vulnerable to increased traffic (which could occur from water source and surface disturbance). Any implementation of proposed DRAs within the NCA would also require avoidance of travel on pristine trail traces as identified by BLM archaeologists.

Implementation of proposed DRAs would be coordinated with BLM archaeologists. The presence of significant cultural resources would be determined at that time and all such resources would be avoided with an appropriate buffer in compliance with the NHPA, and the Nevada State Protocol Agreement between the BLM, Nevada and the Nevada State Historic Preservation Office (SHPO).

2. Environmental Consequences of the Grazing Closure Alternative

Drought response measures to alleviate the impacts of grazing through reduction in authorized access would also act to reduce the severity of potential impacts to trail resources currently generated by livestock.

3. Environmental Consequences of the No Action Alternative

The No Action alternative would likely continue damage to cultural resources in vulnerable locations along historic trails through accelerated erosion caused by trampling, and by the effect of trampling itself on newly exposed resources. Further, exposure would also increase the potential for illegal collection.

O. Paleontological Resources

Affected Environment

There has been no systematic field inventory of the paleontological resources of the WD. The most recent review of the paleontological resources of the WD apparently occurred over 30 years ago (Lawler 1978 and Lawler and Roney 1978). Nonetheless, 87 known paleontological localities are present on the WD's public lands representing points on the geological time scale from the Permian to the Pleistocene and yielding evidence of the presence of creatures ranging from the ichthyosaur, a large aquatic reptile of the Triassic, Jurassic, and Cretaceous Periods to camels and horses from the end of the last Ice Age. The WD also has a major locale for plant fossils in the Lund Petrified Forest. These sites, in addition to their macrofossil, content also have important information on past climates of the region.

The probability that the WD may yet provide even more locales with important fossil assemblages is supported by the Potential Fossil Yield Classification (PFYC) which gives us a model of likely and less likely areas for fossil locales. Table 8 breaks out the six classes present in the WD in terms of their mapped area and the percentage they represent of the WD's surface. The classes present in the WD are:

Class 1 (Very Low) - Geologic units not likely to contain recognizable fossil remains.

Class 2 (Low) - Sedimentary geologic units not likely to contain vertebrate fossils or scientifically significant non-vertebrate fossils.

Class 3 (Moderate or Unknown) - Fossiliferous sedimentary geologic units where fossil content varies in significance, abundance, and predictable occurrence; or sedimentary units of unknown fossil potential.

Class 3b (Unknown Potential) - Units exhibit geologic features and preservation conditions that suggest significant fossils could be present, but little information about

the paleontological resources of the unit or the area is known. This may indicate the unit or area is poorly studied, and field surveys may uncover significant finds. The units in this Class may eventually be placed in another Class when sufficient survey and research is performed. The unknown potential of the units in this Class should be carefully considered when developing any mitigation or management actions.

Class 4 (High) - Geologic units containing a high occurrence of significant fossils. Vertebrate fossils or scientifically significant invertebrate or plant fossils are known to occur and have been documented, but may vary in occurrence and predictability. Surface disturbing activities may adversely affect paleontological resources in many cases.

Class 4a – Unit is exposed with little or no soil or vegetative cover. Outcrop areas are extensive with exposed bedrock areas often larger than two acres. Paleontological resources may be susceptible to adverse impacts from surface disturbing actions. Illegal collecting activities may impact some areas.

Class 5 (Very High) - Highly fossiliferous geologic units that consistently and predictably produce vertebrate fossils or scientifically significant invertebrate or plant fossils, and that are at risk of human caused adverse impacts or natural degradation.

Class 5a – Unit is exposed with little or no soil or vegetative cover. Outcrop areas are extensive with exposed bedrock areas often larger than two contiguous acres. Paleontological resources are highly susceptible to adverse impacts from surface disturbing actions. Unit is frequently the focus of illegal collecting activities.

Table 8 Potential Fossil Yield Classes of the WD

PFYC	Class Acreage (GIS)	% of WD
Class 1	3,779,240	33.4
Class 2	1,051,663	9.3
Class 3	5,006,883	44.2
Class 3b	671,163	5.9
Class 4a	763,987	6.7
Class 5a	52,614	0.5
Totals	11,325,551	100

From the foregoing, it is clear that approximately 6.4 million acres or more than 55% of the WD's surface is in areas of moderate to high potential for the presence of fossil producing locales. Over 800,000 acres are areas where exposed fossiliferous deposits are likely to be present and of management concern. For over 5.6 million acres, the likelihood of the presence of fossiliferous locales is either moderate or lacks adequate documentary information to assess the paleontological sensitivity.

1. Environmental Consequences of the Proposed Action

Prior to implementing DRAs, an evaluation and potential inventory would be completed and identified paleontological resources would be avoided.

The effects of BLM DRAs on paleontological resources would be addressed through compliance with the ARPA (P.L. 96-95), PRPA (P.L. 111-011, Title VI, Subtitle D), FLPMA (P.L. 94-579),

as implemented by following the Nevada State Protocol Agreement between the BLM, Nevada and the Nevada State Historic Preservation Office (SHPO).

2. Environmental Consequences of the Grazing Closure Alternative

Drought response measures to alleviate the impacts of grazing through reduction in authorized access would also act to reduce the severity of potential impacts to paleontological resources generated by livestock.

3. Environmental Consequences of the No Action Alternative

The No Action alternative could result in increased damage to surface exposures of some classes of paleontological resources through accelerated erosion caused by trampling, and by the effect of trampling itself on newly exposed resources. Further, exposure would also increase the potential for increased collection under existing statutes cited above.

P. Rangeland Management

Affected Environment

The primary laws that govern grazing on public lands are the Taylor Grazing Act of 1934, the Federal Land Policy and Management Act of 1976, and the Public Rangelands Improvement Act of 1978. The BLM manages grazing lands under 43 CFR Part 4100 and BLM Handbooks 4100-4180, and it conducts grazing management practices through BLM Manual H-4120-1 (BLM 1984). In addition, the BLM must meet or ensure progress is being made toward meeting the Sierra Front-Northwestern Great Basin RAC Standards and Guidelines for Rangeland Health (Appendix 3) for each allotment.

The WD manages livestock grazing on public lands administered by the BLM in Churchill, Storey, Washoe, Pershing, and Humboldt Counties. There are 102 allotments, consisting of over 7,221,769 acres of BLM land, with the largest allotment over one million acres and the smallest allotments averaging 1,500 acres. The district boundary was established after grazing allotments and did not coincide with grazing allotment boundary lines. Therefore, the WD administers a few allotments outside of the WD administrative boundary, and, conversely, there are a few allotments within the WD administrative boundary that are administered by other district offices under a memorandum of understanding with the parent district office. A few examples are:

- The WD administers the Bullhead and Little Owyhee Allotments, whose largest portions lie within the WD boundary and the smaller portions are within the Elko District Office boundary;

- The WD administers the Hole in the Wall Allotment within the Carson City District Office boundary; and

- The North Buffalo and South Buffalo Allotments are within the WD but are managed by the Battle Mountain District Office.

Most of the permittees are licensed to graze cattle with a few authorized to graze sheep and horses. Some grazing allotments are considered to be "common" allotments, meaning that there is more than one permittee authorized to run livestock. The grazing year begins March 1 and runs through February 28, with an average of 334,952 animal unit months (AUMs) harvested annually. Grazing usually begins in spring in the valleys and lower foothills and progresses to higher elevations in early summer. About half the permittees are authorized to graze livestock during the winter. Hay and private pasture provide forage for the remaining livestock through the winter. Most permittees adjacent to the Forest Service lands graze BLM lands in the spring and summer on the National Forest, and then return to BLM or private lands in the fall.

Two large land areas within the WD, Smoke Creek Desert and the Old Gunnery Range, are not allocated to grazing. These two areas are not allocated because the range suitability criteria (Sonoma-Gerlach and Paradise-Denio Grazing EIS) considered land not suitable for grazing because of inadequate vegetation production if the land was not able to produce one AUM of usable perennial vegetation per 32 acres. In order for land to be considered available, it must produce 25 pounds of usable vegetation per acre annually, to provide one AUM on 32 acres. Since these areas are playas and do not produce 25 pounds of useable vegetation per acre annually, they were not allocated for livestock grazing.

1. Environmental Consequences of the Proposed Action

The Proposed Action would result in an increase in grazing management practices or require removal of livestock within drought afflicted allotments. Depending on the DRAs selected, grazing management would be modified. This would lead to increased inputs from permittees. The specific consequences of these inputs have been analyzed within the Social and Economic Values section (3.3R) of this document. Implementation of drought gathers to remove wild horses or burros from drought affected areas would improve recovery from drought, resulting in healthier, more productive plant communities and riparian areas in future years, which would benefit future opportunities for livestock grazing.

2. Environmental Consequences of the Grazing Closure Alternative

The Grazing Closure Alternative could require the removal of livestock from the drought afflicted public lands within the WD. If no livestock were being grazed on public land, no grazing management would be needed. The closure of grazing allotments could cause a financial hardship for permittees resulting from the loss of opportunity to graze livestock on public lands. The impacts to permittees resulting from a grazing closure have been analyzed within the Social and Economic Values section (3.3R) of this document. This could improve the vigor of plants during drought and improve post drought recovery. In the long-term, the Grazing Closure would be beneficial to grazing management, in that it would ensure future opportunities for grazing due to improved rangeland conditions.

3. Environmental Consequences of the No Action Alternative

Under the No Action Alternative, DRAs would still be implemented, but would require separate evaluations under NEPA for individual areas across the WD. This would increase response time and reduce the effectiveness of management during a drought. In many instances current livestock and wild horse and burro management actions would continue with no modifications and therefore there would likely be no short-term impacts to grazing management. However, a continuation of current livestock grazing management during drought could lead to the degradation of rangeland resources. During prolonged drought, rangeland degradation may adversely affect the sustainability of rangeland grazing and create situations where rangelands fail to meet BLM Standards and Guidelines (S&Gs) for rangeland health. If S&Gs for rangeland health are not met, the BLM is mandated to implement changes to management activities so that rangelands "…are, or are making significant progress toward…" meeting rangeland health S&Gs (43 CFR §4180, Fundamentals of Rangeland Health and Standards and Guidelines for Grazing Administration) and the appropriate Resource Advisory Council Guidelines. Additionally, the BLM could cancel portions of or entire permits on allotments that fail to meet S&Gs, which could adversely impact grazing management.

Q. Recreation

Affected Environment

BLM administered lands in the WD provide opportunities for a wide variety of outdoor recreation activities and related benefits including hunting, fishing, camping, shooting, horseback riding, OHV use, hiking, photography, historical sightseeing, rock hounding, wild horse and burro viewing and photography, and nature study. While most recreation users participate in dispersed recreation activities, either individually or in small groups, others participate in organized events as participants or spectators. Many types of dispersed and organized uses provide for a diverse range of visitor needs and expectations. The BLM manages a large percentage of the land base in the region, making BLM lands a critical resource for providing recreation opportunities to visitors.

Dispersed recreation activities include but are not limited to OHV use, camping, hunting and fishing, visiting interpretive and educational exhibits, touring the historic trails, sightseeing, pleasure driving, rock and mineral collecting, photography, picnicking, hiking, mountain biking, and hot spring bathing. This wide range of activities is possible because most of the lands within the WD boundary are public and accessible and offer a variety of settings suitable for different recreation activities.

A variety of commercial, competitive, and organized group uses occur within the WD, all of which are administered under the special recreation permit (SRP) program. SRPs allow specified recreational uses of public lands and related waters. Many of the commercial permits, such as those issued to hunting outfitters and guides, are used throughout the district. Competitive permits, such as motorcycle races, are confined to a preapproved race course. A large percentage of the races that have occurred in the Winnemucca District have taken place in the southwest portion of the district. Other examples of permitted activities include OHV racing, mule racing,

mountain bike races, various horse events, wagon trains, cattle drives, four-wheel drive tours, rocketry, and other miscellaneous events.

The most popular recreation destinations include areas that contain water resources, developed facilities, or trails and opportunities to experience historic and prehistoric sites. Other features that attract visitors include areas with high game populations, opportunities for rock and mineral collecting, and the large, flat dry lakebeds in the district.

1. Environmental Consequences of the Proposed Action

The Proposed Action would have a minimal negative impact on recreation within the WD due to the installation of temporary water sources and fencing (e.g., temporary water hauls, water pipelines, and fencing). These installations could affect the aesthetics of rangeland and riparian resources within the WD, and depending on location, could limit access to areas used for recreation.

Changes in livestock management practices (e.g., change in season of use, reduced grazing duration, partial reduction in AUMs, partial or complete closure of an allotment(s), targeted grazing of invasive annual communities, and temporary change in the kind or class of livestock) under the Proposed Action would enhance recreational experience due to reduced presence of livestock. Recreation within the WD is dispersed and primitive in nature and livestock grazing occurs in areas that coincide with recreational use. Some recreation areas could see a reduction in conflicts with livestock if these actions are implemented.

If gathers are implemented under drought conditions, this could reduce opportunities to view wild horses and burros within the WD in the short-term. However, the Proposed Action would provide for the viewing of healthy wild horses and burros in all years.

Relocating wild horses and/or burros within HMAs would have similar impacts to the impacts for hauling water and conducting drought gathers, and would be congruent with the numbers of animals moved. The receiving portion of the HMA would experience an increase in the population and viewing opportunities. The portion of the HMA where animals were moved from would endure impacts similar to those that would be expected following a drought gather to remove all or some of the wild horses and/or burros.

2. Environmental Consequences of the Grazing Closure Alternative

The Grazing Closure Alternative would remove livestock from the range and reduce the potential for conflicts between livestock and the recreating public. Additionally, safety would improve as the potential for collisions between vehicles and livestock would be eliminated.

3. Environmental Consequences of the No Action Alternative

The No Action Alternative would impact recreation within the WD. Under drought conditions, livestock, wild horses and burros would congregate in areas that receive a higher abundance of moisture, especially riparian areas. Some of these riparian areas could also be used by

recreationist. Potential impacts include the degradation of rangeland and riparian resources. Degradation could include, but is not limited to, vegetation trampling, soil compaction, erosion, and water contamination.

R. Social and Economic Values

Affected Environment

This section discusses the socioeconomic resources of the region of influence (ROI). Socioeconomic resources include population, employment, income, housing, earnings, and schools. The project area encompasses about 11.1 million acres of in west-central Nevada. These lands are within portions of five northwestern Nevada counties: Churchill, Humboldt, Lyon, Pershing, and Washoe. These counties were identified as the ROI for socioeconomic analysis because most of the effects on the population and economy would occur within this local region, including effects on local government tax bases and social services and infrastructure.

The project area is predominantly rural. Project area communities include cities, rural towns, and outlying rural areas. The cities of Winnemucca and Lovelock provide services, shopping, and diverse amenities for leisure and recreation. The region's rural towns, such as Denio, Empire, Gerlach, Golconda, Imlay, and McDermit, have smaller populations. The presence of services, hospitals, affordable housing, schools, shopping, and recreation are directly related to where the counties' populations reside. The employment base for most of these communities is mining, agriculture, industry, gaming, and tourism.

With almost 83 percent of lands in Nevada under federal ownership, Nevada's economy is affected by BLM land management decisions. Humboldt County, which has the largest percentage and total acreage of land under federal ownership in the WD, has the greatest opportunity for effect. Whereas Lyon County, which is composed of approximately 67 percent federal land and has the lowest total acreage of federal lands within the WD planning area, would be less likely to be affected. The recreation, mining, and agricultural sectors are dominant economic interests represented on BLM administered lands within the WD planning area in Nevada; the forestry and timber sectors have a minimal economic presence on WD lands.

The high percentage of BLM lands within the project area counties has made the WD planning area a highly desirable recreation area for activities, including boating, fishing, hiking, hunting, and mountain biking. The counties attract both local visitors and those from other counties. As a result, local economies receive economic benefit from recreation activities that occur nearby through recreation and use fees that are returned to the state and through visitor expenditures in the traveler accommodations industry and for other goods and services. Nevada has the highest per capita receipts generated from travel expenditures within the US, and the traveler accommodation industry is projected to be the fastest-growing employment sector in the state. With the rising popularity of outdoor recreation and the demand for use of federal lands, visitor use of public lands within the WD and local economic activity also can be expected to increase. While most recreational use on public lands does not require a permit, some activities (such as the Burning Man Festival) are permitted activities that provide recreation opportunities to thousands of people while generating significant revenue for the WD.

Grazing revenues are found to be the greatest in those counties with the highest proportion of BLM land, and northern Nevada has been identified as one of these areas (BLM 2000). These areas typically have low population densities and low per capita income. Grazing is most important to the economies in areas that are agriculturally dependent, very rural, and not economically diverse. With three of the five counties (Lyon, Humboldt, and Churchill) among the top five generators of agricultural sales, the economies of these counties are most likely to be affected by grazing management decisions within the WD.

Churchill County

Churchill County is the southernmost county in the planning area, bordered by portions of Washoe and Lyon Counties on the west, Pershing County on the north, Lander County on the east, and portions of Nye and Mineral Counties on the south. The northwestern portion of this county is within the planning area (BLM 2006c). The only urban area in Churchill County is the city of Fallon, and there is property proposed for development between Fernley and Fallon (near Hazen). Churchill County ranked eighth among the seventeen Nevada counties in population in 2010 and tenth in area.

Humboldt County

Humboldt County is in the northern portion of the planning area, bordered by Elko County on the east, Lander County on the southeast, Pershing County on the south, Washoe County on the west, and Oregon on the north (BLM 2006c). In 2010, it ranked ninth among the seventeen Nevada counties in population and fourth in area. Humboldt County is sparsely populated, with most of its population living in the only incorporated city, Winnemucca. The most rapidly growing area of the county is Grass Valley, which is adjacent to and immediately south of Winnemucca. Other urban areas in the county include Denio, McDermitt, Orovada, Paradise Valley, and Golconda.

Lyon County

Lyon County is in the extreme southwest portion of the planning area, bordered by Churchill County on the northeast, Mineral County on the southeast, California on the south, small portions of Douglas and Carson City Counties on the west, and Storey County on the northwest (BLM 2006c). It ranks fourth among the seventeen Nevada counties in population and fourteenth in area. Dayton, Fernley, and Silver Springs are the county's three largest cities. Between 2000 and 2010, the populations of Lyon County grew by 33%, increasing from 34,501 to 51,980.

Pershing County

Pershing County lies in the middle of the planning area, bordered by Washoe County on the west, Churchill County on the south, Lander County on the east, and Humboldt County on the north (BLM 2006c). It ranks eleventh among the seventeen Nevada counties in population and eighth in area. Lovelock is the county's largest city. In 2010 about 28 percent of Pershing County's population, nearly 1,900 of the county's 6,750 resided in Lovelock.

Washoe County

Washoe County is in the far west portion of the planning area, bordered by California on the west, Oregon on the north, Humboldt, Pershing, Churchill, and Lyon Counties on the east, and

Storey and Carson City Counties on the south (BLM 2006c). It ranks second among the 17 Nevada counties in population and seventh in area. Reno, the second largest city in Nevada, is in Washoe County, as are Sparks and Incline Village at Lake Tahoe.

1. Environmental Consequences of the Proposed Action

The Proposed Action is designed to prevent degradation of rangeland resources and protect uplands and riparian areas during drought, which would promote rangeland sustainability for wild horses and burros, livestock, and wildlife. Providing for sustainable grazing management that prevents degradation of habitat conditions for wildlife and wild horses would in turn increase economic opportunities for livestock operations, help sustain livelihoods for the multiple families employed by these ranching operations, and foster more desirable social opportunities.

Continuing viable ranching operations would also enhance the economies of Churchill, Humboldt, Lyon, Pershing, and Washoe Counties through taxes and goods and services purchased by the ranches and people employed by these ranches. By maintaining viable ranching operations and protecting rangeland conditions in the WD, traditions associated with the ranching communities within the WD would be maintained.

Under the Proposed Action, public lands within the WD would continue to contribute environmental amenities such as open space, scenic quality and recreational opportunities (including hunting, bird watching, sightseeing, hiking, and OHV). These amenities would remain but could be reduced if rangeland resources are not protected during drought so that they may provide recreational opportunities such as wildlife viewing and hunting.

Costs associated with the materials, labor, and transportation necessary to implement temporary range improvement projects (i.e., water troughs [water hauls], above ground pipelines, fencing) under the Proposed Action could adversely impact permittees. Conversely, the goods and services purchased by permittees to implement temporary range improvements could enhance the economies of local communities and counties. These economic impacts would be expected to be of short-term duration; however, protecting degradation of rangeland resources (through the use of temporary range improvements) would promote rangeland sustainability thereby providing available forage resource to support livestock grazing in the future.

Under the Proposed Action, temporary reductions in authorized AUMs could impact permittees. As directed in BLM Washington Office instruction memorandum (IM) No. 2012-070, the cost to permittees to find alternative forage in Nevada is estimated at $13.00 per AUM to place livestock on private pasture, which does not include labor, fuel, and equipment for hauling livestock if only distant pasture is available. According to BLM WO IM No. 2012-070 the BLM charges permittees $1.35 per graze livestock on BLM lands; a difference of $11.65 per AUM. The cost of providing hay is variable based upon annual supply and demand, but is likely to be much higher than pasture. Additionally, ranches within the WD may not be able to support their current number of employees, which could have an impact on local economies. Viability and sustainability of the ranches holding grazing permits within the WD could decline in periods of prolonged drought, potentially affecting their way of life.

Changes in livestock grazing management practices (i.e., reduced grazing duration, change in season of use, targeted grazing of invasive, annual communities, etc.) under the Proposed Action would likely have minimal social and economic impacts to permittees or local economies within the WD. Implementing changes in livestock grazing practices would not necessarily include a reduction in AUMs; therefore, minimal material, labor, or transportation cost would be incurred by permittees. It should be noted, however, that if a permittee makes a temporary change in the kind or class of livestock being grazed in order to mitigate drought impacts, the BLM would assess a $4.08/AUM surcharge (BLM WO IM No. 2012-070) if the replacement livestock are leased rather than being owned by the permittee.

If wild horses and burros were gathered under the Proposed Action, impacts to socioeconomics would be temporary in nature and would cease upon gather completion. These impacts would consist of hiring contractors to conduct the gather operations, and contributions to local economies/towns for food and lodging during gather operations. There would be no permanent changes in employment or population from the proposed action or alternatives. Removing wild horses and burros during drought would prevent additional degradation of rangeland resources thereby promoting rangeland sustainability and providing available forage resource to support wild horse and burro populations in the future.

2. Environmental Consequences of the Grazing Closure Alternative

Under this alternative, grazing closure of drought afflicted areas would likely result in short-term adverse impacts to grazing permittees. As referenced above, the cost to permittees to find alternative forage in Nevada is estimated at $13.00 per AUM (BLM WO IM No. 2012-070) to place livestock on private pasture, which does not include labor, fuel, and equipment for hauling livestock if only distant pasture is available. The WD currently authorizes permits for livestock grazing totaling 334,952 AUMs. Under this alternative, the projected annual cost to permittees to graze private land may total up to $4,354,376.00 (assuming 2012 estimated rates). Additionally, the BLM WD would not collect up to $452,185.20 (for 2012 BLM grazing rates are $1.35/AUM) annually in grazing fees from permittees. The cost of providing hay is variable based upon annual supply and demand, but is likely to be much higher than pasture.

Ranches within the WD may not be able to support their current number of employees during periods of drought, which could have temporary impacts on local economies. Viability and sustainability of the ranches holding grazing permits within the WD could decline in periods of prolonged drought, potentially affecting their way of life.

Closing drought afflicted areas to livestock grazing under this Alternative would prevent degradation of rangeland resources and protect uplands and riparian areas during drought. This would have long-term beneficial impacts for livestock grazing permittees by eventually providing for long-term sustainable grazing management, which would in turn increase economic opportunities for livestock operations, help sustain livelihoods for the multiple families employed by these ranching operations, and foster more desirable social opportunities.

Continuing viable ranching operations would also enhance the economies of Churchill, Humboldt, Lyon, Pershing, and Washoe Counties through taxes and goods and services

purchased by the ranches and people employed by these ranches. By maintaining viable ranching operations and protecting rangeland conditions in the WD, traditions associated with the ranching communities within the WD would be maintained.

3. Environmental Consequences of the No Action Alternative

Under the No Action Alternative, DRAs would still be implemented, but would require separate evaluations under NEPA which would delay drought response times and potentially result in a continuation of management practices that are employed during times of normal precipitation. Current management practices may be poorly suited to drought. Under the No Action Alternative, the DRAs contained within the Proposed Action and the Grazing Closure Alternative would not be implemented in a timely manner. Implementation of changes to the current livestock grazing and wild horse and burro management activities would be delayed, leading to potential degradation of conditions within the WD and, in turn, resulting in less-optimal socioeconomic outcomes.

Delays in the implementation of DRAs could result in the continuation of current management and livestock wild horse and burro populations during drought conditions could potentially lead to the degradation of upland and riparian health. If the approval and adoption of changes in management in response to drought conditions were to be delayed for prolonged periods, cumulative degradation of rangeland health could result in grazing allotments failing to meet rangeland S&Gs in the future. If S&Gs for rangeland health are not met, the BLM is mandated to implement changes to management activities so that rangeland "…are, or are making significant progress toward…" meeting rangeland health S&Gs (43 CFR § 4180, Fundamentals of Rangeland Health and Standards and Guidelines for Grazing Administration). Additionally, the BLM could cancel portions of or entire permits on allotments that fail to meet S&Gs, which could adversely impact affected permittees.

If DRAs were slow to be implemented, the No Action Alternative could also affect permittees who are required to implement rangeland improvement projects so that degraded rangelands "…are, or are making significant progress toward…" meeting rangeland health S&Gs. Economic setbacks or other production limitations can sometimes greatly challenge the ability of livestock producers to remain viable. All agricultural enterprises, including livestock-based operations, are inherently risky. Rapidly changing national and global market conditions, climate and weather, and multiple risks to herd animals make it impossible to predict what overall production numbers and profitability will be in any given year. In addition, uncertain resource conditions make it impossible for the BLM to guarantee ahead of time that every existing livestock permittee will be able to continue to manage their herds in the manner to which they are currently accustomed. Permittees must be prepared in advance to adapt to changes in production conditions. This includes monitoring resource conditions and being ready to adjust their management strategies in the event that BLM must cancel portions of or entire permits due to a failure to meet S&Gs.

S. Soils

Affected Environment

The extremes of climate, relief, aspect and geologic type combine to form a wide variety of soil types. Soils vary with differing parent materials, position on the landscape (landform), elevation, slope, aspect and vegetation. Soils range from those on the valley floors that are frequently deep, poorly drained and alkaline with a high salt content to shallow mountain soils formed over bedrock with pH levels near neutral. There are over a hundred different soils within the WD. The overall resource condition for WD soils is good, with some areas demonstrating diminished, unstable, or eroded soils due to rangeland wildfires, overgrazing, and commercial operations.

Biological crusts grow on or just below the surface of the soil. They can also be known as microbiotic, cryptogamic, cryptobiotic, microphytic, or microfloral crusts or soils. The biological crusts are composed of a community of algae, cyanobacteria (blue-green algae), bacteria, lichens, mosses, liverworts, and fungi and their byproducts. They commonly occur in arid and semiarid environments. Because of their functions in rangeland systems, biological soil crusts can be an indicator of rangeland health.

Crusts are well adapted to severe growing conditions, but are extremely susceptible to physical disturbances. Domestic livestock grazing and recreational activities (such as hiking, biking, and off-road driving) disturb the integrity of the crusts. Crust disruption brings decreased organism diversity, soil nutrients, stability, and organic matter. Another indirect physical disturbance occurs through crust burial. When the integrity of the crust is broken, the soil is more susceptible to wind and water erosion. The soil can be moved long distances, covering intact crusts. Crusts tolerate shallow burial by extending sheaths to the surface to begin photosynthesis again. Deeper burial by eroded sediment will kill crusts. Fire can also damage the crust, although recovery depends on the intensity of the fire. Low-intensity fires do not remove all of the crust structure, which allows for regrowth without significant soil loss.

Erosion affects environmental aspects other than biological crusts. It can remove topsoil and bury prime and unique farmlands, degrading their agricultural potential. Erosion can also affect water sources and physical features, such as roads, pipelines, and power lines.

1. Environmental Consequences of the Proposed Action

Soil site stability is an important rangeland health attribute. Stability is important for soil biotic integrity and resistance to erosion. Under the Proposed Action, DRAs would be implemented to maintain vegetation within the WD, which would minimize the potential for accelerated erosion events. A healthy, productive, and diverse plant community plays an important role in the improvement and/or maintenance of soil processes such as permeability and infiltration rates and soil site stability.

Dry soils usually encountered during drought are at risk of erosion. The erosion hazard during a drought is increased when prolonged grazing pressure has further reduced plant cover (Thurow and Taylor 1999). Inadequate plant cover can lead to substantial wind or water erosion of

valuable top soil (Reece et al. 1991). Crusting of surface soils is another problem associated with low vegetation cover. When rain strikes exposed soil the particles are detached by the raindrop energy and are likely to lodge in the remaining soil pores, making them smaller or sealing them completely resulting in a crust (Thurow and Taylor 1999). This reduces water infiltration and increases erosion potential. Standing dead vegetation and litter reduce the impact of raindrops and promotes water infiltration. Soil cover also inhibits crusting by reducing raindrop impact; thereby, reducing water erosion (Gates et al. 2003). The prevention of accelerated erosion depends on the ability to respond to reduced vegetative growth quickly, so that adequate plant and litter cover remain (Reece et al. 1991). The Proposed Action would provide for prompt detection of drought conditions through the DDMP. The triggers defined in the plan would be used to activate the DRAs described in the Proposed Action. These actions are designed to promote proper utilization of vegetation by livestock and wild horses and burros within the WD. As stated earlier, proper utilization would provide for adequate cover needed for soil protection during drought. The specific DRAs selected would depend on the situation. Forage and water conditions would be assessed and monitored using the DDMP referenced in the Proposed Action.

A majority of the DRAs are intended to improve livestock and/or wild horse and burro distribution and prevent the overgrazing of vegetation during drought. DRAs intended to improve distribution include temporary range improvement projects; change in livestock management practices; and temporary change in kind or class of livestock. The remainder of the actions brought forward would be used to address timing and duration of grazing and adjust stocking rates to match forage and water supplies. These include change in season of use, change in grazing duration, temporary partial reduction in AUMs, temporary partial closure of an allotment(s), and wild horse and burro removal.

Actions designed to improve distribution would limit soil erosion by ensuring grazing pressure is distributed across an allotment(s) or HMA(s). Temporary range improvement projects such as water hauls, above ground pipelines or temporary fences would result in a temporary congregation of livestock and/or wild horses and burros within certain areas (i.e., the immediate area near the improvement). The congregation of livestock and/or wild horses and burros near temporary rangeland improvements could lead to an increase in soil compaction, a reduction in vegetative cover and an increased potential for soil erosion. However, the use of temporary range improvement projects would improve the overall distribution of livestock and/or wild horses and burros. This would limit the overuse of vegetation by evenly distributing grazing pressure across allotment(s) or HMA(s). Proper utilization of vegetation, especially during drought is needed to provide adequate vegetative cover needed to reduce soil erosion. Temporary fences could also be used to exclude livestock from important areas such as riparian areas, meadows, important areas for wildlife or areas where soil erosion is likely.

Livestock and wild horse and burro use around temporary improvement projects would be monitored. Once the aforementioned utilization triggers are met, livestock would be removed from the area. In circumstances where wild horses and burros are the primary grazers, conditions would be assessed to determine if an adequate amount of forage and water remain to support the animals. The use of temporary range improvement projects would only be used when it is determined that adequate forage resources exist to allow for continued grazing of an

area in a manner that would not further impact rangeland resources and where these fences would not cause injuries to the WH&B in the area.

DRAs that address the timing and duration of grazing would ensure that grazing occurs at the appropriate time and for the appropriate duration during drought. Reduction of AUMs would adjust livestock grazing to a level consistent with available forage and water supplies. Adjustments would be made according to the availability of water and forage and rangeland condition. Changing the season of use can reduce grazing impacts during drought. In most areas, shifting the season of use to a time outside of the critical growth period would allow forage plants to take full advantage of available soil moisture and nutrients. Allowing plants the opportunity to grow un-grazed by domestic livestock during the critical growth period would enhance vegetation vigor, increase ground cover and reduce soil erosion.

Reductions in grazing duration are often needed during drought to protect rangeland resources from degradation. Grazing durations, as currently permitted, may result in plants being grazed multiple times. Plants that are grazed repeatedly may have little or no opportunity to regrow between successive defoliations and may become stressed (Howery 1999). Reduced grazing durations would provide for an increased amount of rest for plants already stressed by drought and, thereby, increase ground cover and protection from soil erosion.

Targeted grazing of cheatgrass and other non-native annual species could be used to provide forage while providing rest for native species and reduce undesirable plants and hazardous fine fuels. Annual bromes such as cheatgrass can provide a valuable forage resource under drought conditions (Reece et al. 1991). Targeted livestock grazing on annual communities can help reduce fire hazards by disrupting fine fuel continuity and reducing fuel loads (Peischel and Henry 2006). According to Reece et al. (1991), moderate defoliation of annual species can enhance the production of perennial grasses by reducing plant competition and minimizing soil moisture depletion. This would reduce the risk of soil erosion by increasing perennial plant cover.

Temporary partial reduction in AUMs, partial or complete closure of an allotment, and/or wild horse and burro removal are all intended to balance animal stocking rates with forage supply and water availability during drought conditions. If it is determined that forage and/or water supplies are insufficient to meet livestock and/or wild horses and burros needs, temporary partial reduction in AUMs, partial or complete closure of an allotment, and/or wild horse and burro removal may be implemented.

During wild horse or burro drought gathers, direct impacts such as soil displacement and compaction would occur at trap sites (less than 1 acre in size). Trap sites are ideally located in areas previously disturbed. Precautions would be taken during the gather to limit the impacts to soils during gather operations.

Relocating wild horses and/or burros within HMAs would have similar impacts to the impacts for hauling water and conducting drought gathers, and would be congruent with the numbers of animals moved. The receiving portion of the HMA would experience an increase in the population, some impacts to vegetation, soils riparian areas and water could be expected due to

the additional travel, trampling, trailing or utilization that could occur. The portion of the HMA where animals were moved from would receive benefits similar to those that would be expected following a drought gather to remove all or some of the wild horses and/or burros.

2. Environmental Consequences of the Grazing Closure Alternative

The Grazing Closure Alternative would provide rest for all areas afflicted by drought. Resting these areas would provide vegetation an opportunity to take full advantage of available soil moisture and nutrients without interruption. This would ensure adequate cover remains and the potential for soil erosion would be reduced.

DRAs for wild horses and burros would be implemented as identified in the Proposed Action and would result in similar effects as described above, for the Proposed Action.

3. Environmental Consequences of the No Action Alternative

Wind velocity and its potential to detach and transport dry soil, exponentially increases as vegetation cover is reduced (Marshall 1973). Proper use of range forage allows plants to survive dry periods, recover quickly, and provide cover to protect the soil and promote water infiltration (Hanselka and White 1986). Protection of range plants during drought years allows for quick recovery following a drought (Howery 1999). Under the No Action Alternative, DRAs would still be implemented, but would require separate evaluations under NEPA which would delay drought response times and potentially result in a continuation of current management practices. Current management practices are often poorly suited to periods of drought. Without the prompt implementation of management strategies, the effects of drought could be compounded by inappropriate livestock and wild horse and burro use, given the condition of the rangeland resources.

T. Special Status Species

Affected Environment

BLM manual 6840-Special Status Species Management provides guidance for the designation and conservation of BLM special status species (BLM 2009). "BLM special status species are (1) species listed or proposed for listing under the Endangered Species Act (ESA), and (2) species requiring special management consideration to promote their conservation and reduce the likelihood and need for future listing under the ESA, which are designated as Bureau Sensitive by the State Director(s). All Federal candidate species, proposed species, and delisted species in the 5 years following delisting will be conserved as Bureau sensitive species". Species designated with special status by individual states are incorporated into BLM sensitive species lists. The State of Nevada maintains various lists of rare and protected plant and animal species. The Nevada Administrative Code 503 defines endangered species as "a species or subspecies that is in danger of extinction throughout all or a significant portion of its range." Nevada state threatened species are defined as "a species or subspecies that is likely to become an endangered species in the near future throughout all or a significant portion of its range." Nevada state

sensitive species are those defined as "a species or subspecies is classified as sensitive by the Commission pursuant to NAC 503.104".

BLM manual 6840.06 states: "Bureau sensitive species will be managed consistent with species and habitat management objectives in land use and implementation plans to promote their conservation and to minimize the likelihood and need for listing under the ESA." "Implementation-level planning should consider all site-specific methods and procedures needed to bring species and their habitats to the condition under which management under the Bureau sensitive species policies would no longer be necessary" Furthermore, "In the absence of conservation strategies, incorporate best management practices, standard operating procedures, conservation measures, and design criteria to mitigate specific threats to Bureau sensitive species during the planning of activities and projects. Land Health Standards should be used for managing Bureau sensitive species habitats until range-wide or site-specific management plans or conservation strategies are developed."

The list of BLM special status species that are currently known to or have the potential to occur within the Winnemucca District can be found in Table 9.

Table 9 BLM Special Status Plant and Wildlife Species Potentially Occurring in the WD

Plants			
Common Name	**Scientific Name**	**Common Name**	**Scientific Name**
Margaret rushy milkvetch	*Astragalus convallarius var. margaretiae*	Pueblo Valley peppergrass	*Lepidium montanum* var.*nevadense*
Tonopah milkvetch	*Astragalus pseudiodanthus*	Owyhee prickly phlox	*Leptodactylon glabrum*
Lonesome milkvetch	*Astragalus solitarius*	Succor Creek Parsley	*Lomatium packardiae*
Tiehm milkvetch	*Astragalus tiehmii*	Smooth stickleaf	*Mentzelia mollis*
Osgood Mountain milkvetch	*Astragalus yoder-williamsii*	Oryctes	*Oryctes nevadensis*
Dainty moonwort	*Botrychium crenulatum*	Nevada dune beardtongue	*Penstemon arenarius*
Schoolcraft catseye	*Cryptantha schoolcraftii*	Cordelia beardtongue	*Penstemon floribundus*
Goodrich biscuitroot	*Cymopterus goodrichii*	Lahontan beardtongue	*Penstemon palmeri* var.*marcranthus*
Windloving buckwheat	*Eriogonum anemophilum*	Susanville beardtongue	*Penstemon sudans*
Crosby buckwheat	*Eriogonum crosbyae*	Obscure scorpionflower	*Phacelia inconspicus*
Schoolcraft buckwheat	*Eriogonum microthecum var. schoolcrafti*	Playa phacelia	*Phacelia inundata*
Sand Cholla	*Grusonia pulchella*	Whitebark pine*	*Pinus alvicaulis*
Grimy mousetails	*Ivesia rhypara* var. *rhypara*	Soldier Meadow cinquefoil*	*Potentilla basaltica*
Davis peppergrass	*Lepidium davisii*	Holmgren smelowskia	*Smelowskia holmgrenii*

*Federal candidate species

Insects			
Common Name	**Scientific Name**	**Common Name**	**Scientific Name**
Mattoni's blue	*Euphilotes pallescens mattonii*	Bleached sandhill skipper	*Polites sabuleti sinemaculata*
Rice's blue	*Euphilotes pallescens ricei*	Humboldt sericum scarab	*Serica humboldti*
Great Basin small blue	*Philotiella speciosa septentrionalis*		
Molluscs			
Common Name	**Scientific Name**	**Common Name**	**Scientific Name**
Dixie Valley springsnail	*Pyrgulopsis dixensis*	Northern stepto pyrg	*Pyrgulopsis serrata*
Squat Mud meadows pyrg	*Pyrgulopsis limaria*	Southern Soldier Meadows pyrg	*Pyrgulopsis umbilicata*

Northern Soldier meadow pyrg	*Pyrgulopsis militaris*	Wongs pyrg	*Pyrgulopsis wongi*
Elongate Mud Meadows pyrg	*Pyrgulopsis notidicola*		

Reptiles

There are no known occurrences of special status reptiles within the district at this time.

Birds

Common Name	Scientific Name	Common Name	Scientific Name
Bald eagle	*Haliaeetus leucocephalus*	Pinyon jay	Gymnorhinus cyanocephalus
Black rosy-finch	*Leucosticte atrata*	Northern goshawk	*Accipiter gentilis*
Brewer's sparrow	*Spizella breweri*	Sage thrasher	*Oreoscoptes montanus*
Ferruginous hawk	*Buteo regalis*	Swainson's hawk	*Buteo swainsoni*
Golden eagle	*Aquila chrysaetos*	Western burrowing owl	*Athene cunicularia hypugaea*
Greater sage-grouse	*Centrocercus urophasianus*		
Lewis' woodpecker	*Melanerpes lewis*	Western yellow-billed cuckoo	*Coccyzus americanus*
Loggerhead shrike	*Laniusludovicianus*	Western snowy plover	*Charadrius alexandrines*
Peregrine falcon	*Falco peregrinus*		

Mammals

Common Name	Scientific Name	Common Name	Scientific Name
Big brown bat	*Eptesicus fuscus*	Pallid bat	*Antrozous pallidus*
Bighorn sheep	*Ovis canadensis*	Pika	*Ochotona princeps*
Brazilian free-tailed bat	*Tadarida brasiliensis*	Pygmy rabbit	*Brachylagus idahoensis*
California myotis	*Myotiscalifornicus*	Preble's shrew	*Sorex prebli*
Dark kangaroo mouse	*Micropoipodops megacephalus*	Silver-haired bat	*Lasionycteris noctivagans*
Fringed myotis	*Myotis thysanodes*	Spotted bat	*Euderma maculatum*
Hoary bat	*Lasiurus cinereus*	Townsend's big-eared bat	*Corynorhinus townsendii*
Little brown myotis	*Myots lucifugus*	Western pipistrelle	*Pipistrellus hesperus*
Long-eared myotis	*Myotisevotis*	Western small-footed myotis	*Myotis ciliolabrum*
Long-legged myotis	*Myotis volans*	Yuma Myotis	*Myotis yumanensis*
Pale kangaroo mouse	*Micodipodopspallidus*		

Amphibians

Common Name	Scientific Name
Columbia spotted frog*	*Rana luteiventris*
Northern leopard frog	*Rana pipiens*

*Federal candidate species

Fish

Common Name	Scientific Name
Desert dace*	*Eremichthys acros*
Lahonton cutthroat trout*	*Oncorhyncus clarki henshawi*
Inland Columbia Basin redband trout	*Oncorhyncus mykiss gairdneri*

*Federal candidate species

Some of the more notable species are discussed below and in the Threatened and Endangered Species section (3.3H):

Desert Bighorn Sheep

Desert bighorn historically occupied the central and southern portions of Nevada (NDOW 2002). Hunting the animals was prohibited from 1901 to 1952, and transplanting programs have been successful; between 1968 and 1988 more than 800 desert bighorn were transplanted (McCutchen

1995). Since 1960, bighorn have increased in numbers, but their population levels are still low when compared with the estimates of pre-European numbers and the amount of available unoccupied habitat (McCutchen 1995).

Western Burrowing Owl
Western burrowing owls have been observed in the planning area, but a survey of the area has not been completed. These owls require open terrain, with low vegetation, burrows created by mammals, and an adequate prey base.

Pygmy Rabbit
The pygmy rabbit is the smallest North American rabbit. In the Great Basin, the species is typically restricted to the sagebrush-grass complex. A dietary study of pygmy rabbits showed that they depend on sagebrush year-round, and it supplies 51 percent of their diet in summer and 99 percent in the winter. Pygmy rabbits showed a preference for grasses and, to a lesser extent, forbs, in the summer (Green and Flinders 1980). These data seem to indicate that pygmy rabbits require sagebrush stands with an understory of perennial grasses to meet their seasonal dietary requirements. The pygmy rabbit mates in early spring and summer. No inventories for pygmy rabbits have been completed within the WD, but it appears that the species may be much more widespread than previously thought (Detweiler 2007).

1. Environmental Consequences of the Proposed Action

For this analysis, refer to the Threatened and Endangered Species section (3.3H) for impacts to those BLM sensitive species with federal Candidate designation.

Due to the inherent vulnerability associated with special status species results of impacts would be intensified.

DRAs having the same or similar impacts on the resource have been analyzed together. Those DRAs that could not be categorically grouped are analyzed individually.

Impacts to BLM sensitive fauna associated with the implementation of the DRAs described under the proposed action are the same or similar to those disclosed in the Wildlife section (3.3X). Impacts to implementation of the DRAs to BLM sensitive plants are further discussed below.

Four of the WD BLM sensitive insect species, Mattoni's blue, Rice's blue, Great Basin small blue, and Bleached sandhill skipper rely on vegetation in their lifecycle. Mattoni's blue, Rice's blue, and Great Basin small blue, appear to favor *Eriogonum* and *Oxytheca* species in the polygonaceae (buckwheat family) to lay eggs and feed upon both as larvae and adults. Although not explicitly associated with the *Eriogonum* sensitive species listed above, the removal or degradation of buckwheat species would impact these species' reproductive success. The plant is utilized throughout the year by the insects during their various life stages. Eggs are laid upon the green leaves or flowers which are consumed by the newly hatched larvae (caterpillar). Pupae overwinter on the plant and adults feed on the nectar.

The Bleached sandhill skipper is known from only one location in the WD. Saltgrass (*Distichlis spicata*) probably serves as the larval hostplant and adults have been observed consuming nectar from flowers in the Asteraceae family.

Impacts to BLM sensitive flora associated with the implementation of the following DRAs described under the proposed action are the same or similar to those impacts on vegetation disclosed in the Wildlife section (3.3X).

Temporary Water Hauls and Above Ground Pipelines

Concentrations of livestock near augmented water sources would reduce impacts (consumption and trampling) on rangeland vegetation, which could include BLM sensitive plant species, outside of the footprint of the augmented water source.

Locations and routes taken to augmented water sources would be evaluated for the known or potential existence of BLM sensitive plant species to avert impacts associated with vehicular traffic (trampling, soil compaction) and livestock grazing.

Temporary Fencing

Impacts to BLM sensitive flora associated with the implementation of this DRA described under the proposed action are the same or similar to those impacts on vegetation disclosed in the Wildlife section (3.3X).

Temporary Change in Livestock Kind or Class

Impacts to BLM sensitive flora associated with the implementation of this DRA described under the proposed action are the same or similar to those impacts on vegetation disclosed in the Wildlife section (3.3X), but due to the inherent vulnerability associated with special status species results of the impacts would be intensified.

Temporary Targeted Grazing of Invasive Annual Communities

Impacts to BLM sensitive flora associated with the implementation of this DRA described under the proposed action are the same or similar to those impacts on vegetation disclosed in the Wildlife section (3.3X), but due to the inherent vulnerability associated with special status species results of the impacts would be intensified.

Livestock

Temporary complete or partial closure of allotments, Temporary reduction of AUMs, Temporary changes in season of use and duration, Temporary change in livestock management practices.

Impacts to BLM sensitive flora associated with the implementation of these DRAs described under the proposed action are the same or similar to those impacts on vegetation disclosed in the

Wildlife section (3.3X), but due to the inherent vulnerability associated with special status species results of the impacts would be intensified.

Of primary importance to BLM sensitive plants is the long-term effects of livestock herbivory and site-specific habitat degradation.

Because of the specific and unique environmental requirements of BLM sensitive plants, (i.e. soil type, topography, elevation, precipitation requirements, etc.), they are neither abundant nor wide-spread across the district. Due to this limited potential for sensitive plants to be present they are not an overwhelming concern throughout most of the district. In areas where the plants are present the synergic impacts of livestock grazing and drought could substantially reduce or even eliminate a secular population. Implementation of some of the DRAs could be an additive effect as well. Evaluation for the potential for sensitive plants to occur in an area proposed for a DRA would lessen this impact.

Concentrating livestock grazing pressure in areas where sensitive plant species could exist would increase the likelihood of a sensitive plant being subjected to grazing impacts as discussed in other sections and jeopardize the continued existence of individuals or populations.

Wild Horse and Burros

Within HMA Wild Horse and Burro Relocation, Removal of Wild Horses and Burros

Impacts to BLM sensitive flora associated with the implementation of these DRAs described under the proposed action are the same or similar to those impacts on vegetation disclosed in the Wildlife section (3.3X), but due to the inherent vulnerability associated with special status species results of the impacts would be intensified.

2. Environmental Consequences of the Grazing Closure Alternative

Implementation of this alternative would temporarily reduce or prevent the impacts of livestock grazing on water resources such as streambank destabilization, sedimentation, deposition, dehydration and erosion. This alternative would also provide some degree of protection to vegetative components of the natural habitat that wildlife rely upon either directly or indirectly. Plants stressed under drought conditions are more susceptible to the effects of livestock grazing. Removal of livestock grazing pressures would enhance a plant's ability to recover from drought thus becoming available for use by wildlife and BLM sensitive species during the drought and subsequent seasons.

This alternative would implement DRAs for wild horses and burros in the same way as described under the proposed action alternative. Refer to impacts disclosed under the proposed action alternative with regard to wild horse and burro DRAs.

3. Environmental Consequences of the No Action Alternative

Impacts to BLM sensitive species under this alternative are the same or similar to those discussed in the Wildlife section (3.3X).

U. Vegetation

Affected Environment

The WD includes portions of the Northern Great Basin and Columbia Basin. Within these provinces, precipitation and other climatic factors, availability of water, soils, elevation, and exposure all contribute to the diversity of vegetation. Seven primary vegetation types have been described in the project area: desert sink scrub, saltbush scrub, sagebrush scrub, grasslands, riparian, woodland and mountain shrub.

Desert sink scrub is dominated by greasewood (*Sarcobatus vermiculatus*), with other species such as iodine bush (*Allenrolfea occidentalis*), yellow rabbitbrush (*Chrysothamnus viscidiflorus*), big sagebrush (*Artemisia tridentata*), and shadscale (*Atriplex confertifolia*).

Saltbush scrub occurs in soils that are less salty than those of alkali sinks. Dominant species can include shadscale, hop-sage (*Grayia spinosa*), and mixed saltbush (*Atriplex* spp.). This habitat type may be found in valleys, washes, lower slopes, and moderately drained flats. In the poorly drained playas characteristic of this vegetation type, the water table fluctuates periodically. This results in the development of a salty crust on the surface, as well as extensive wind erosion during dry periods. Plant species that occur in the Salt Desert, such as shadscale and greasewood (*Sarcobatus vermiculatus*), are well adapted to high salt levels and drought conditions. Although there is more biodiversity than what is always apparent to the observer, the general aspect of this vegetation type is one of uniformity, as it is dominated by low, nondescript shrubs that are often spiny and of a greenish-gray hue. Vegetation cover is typically only about 10–15% of the ground surface.

Sagebrush scrub. The species of sagebrush are generally distributed according to elevation, precipitation, slope, and salinity. Kuchler (Kuchler 1970) divided areas supporting sagebrush into two major vegetation types: sagebrush steppe, where sagebrush can co-dominate with native bunchgrasses, and Great Basin sagebrush, where sagebrush can be the sole dominant. These two major types come into contact with each other in the WD, with sagebrush steppe predominant in the north and Great Basin sagebrush predominant in the south.

Grasslands, also called dry meadows, are an understory component of several plant communities, such as sagebrush scrub and riparian. Grasslands are wet for a short period of the year and become increasingly drier as the growing season progresses. Species such as Baltic rush (*Juncus balticus*), grasses, asters (*Aster* spp.), groundsel (*Packera* spp.), onions (*Allium* spp.), and hawksbeard (*Crepis* spp.) are commonly found in this community. Rabbitbrush and sagebrush may be at the meadow's edge.

Riparian Zones The mountain ranges of the Great Basin are dissected by innumerable canyons, which often contain Sagebrush Grassland vegetation at their bottoms. Riparian plant communities occur where perennial streams flow through canyon bottoms. Such communities may be dominated by grassy meadows, shrubs, or trees, depending upon the physical setting, geology, flood regime, and history of human disturbance characteristic of a particular canyon. Narrow stringers of flood-adapted tree and shrub species occur along steep, confined reaches. Stately groves of quaking aspen (*Populus tremuloides*) and narrowleaf cottonwood (*Populus angustifolia*) can be found in deep canyons of some of the mountain ranges within the WD. Common shrubs of the Great Basin riparian zones include water birch (*Betula occidentalis*), wild rose (*Rosa woodsii*) and several willow species (*Salix* spp.) Finally, geomorphic features such as debris fans sometimes create areas of elevated water tables in the riparian zone, giving rise to springs and wet meadows dominated by graminoids (grasses, sedges and rushes).

Forest and woodland types within the WD consist of pinyon-juniper woodland, mountain mahogany woodland and shrubland, limber and whitebark pine forest, and aspen forest and woodland. Juniper and pinyon pine woodlands are not as widespread as in other parts of Nevada. Pinyon pine is expanding in some areas into sagebrush and grassland. Approximately 1,000 acres of former sagebrush are growing up to pinyon pine in the Gamble Basin area. This expansion is likely due to fire suppression and climatic change (BLM 2003a). In the Stillwater Range, nearly all of the pinyon pine stands (29,050 acres) are infested with pinyon dwarf mistletoe (*Arceuthobium divarcatum*). Dwarf mistletoe impacts tree health, resulting in decreased growth, decreased seed production, increased susceptibility to bark beetles or other insects or disease, decreased drought tolerance, and in most cases, mortality of the infected tree. Young trees are particularly susceptible, and mortality for these trees is generally very high. Infected older trees continue to infect any regeneration (Messmer 2008).

Mountain Shrub Many of the mountain ranges within the BRFO lack subalpine forest vegetation. Instead, Pinyon-Juniper Woodland gives way to a diverse Mountain Shrub community at higher elevations and on moister sites. The Mountain Shrub community occurs as a band above the cold tolerance limit of pinyon and juniper, over extensive areas in the WD between 7,500 and 10,000 feet in elevation. Mountain big sagebrush (*Artemisia tridentata* subsp. *vaseyana*) dominates mountain shrub communities together with a diverse mixture of other shrub species, grasses, and flowering herbaceous plants. Many important shrub species in this vegetation type are members of the rose family, including bitterbrush, cliffrose (*Purshia mexicana* var. *stansburiana*), western serviceberry (*Amelanchier alnifolia*), dwarf ninebark (*Physocarpus alternans*), western chokecherry (*Prunus virginiana* var. *demissa),* and wild rose. Interspersed within the montane sagebrush grassland are patches of curlleaf mountain mahogany (*Cercocarpus ledifolius*) along ridge tops and groves of quaking aspen in canyon bottoms and bedrock hollows.

1. Environmental Consequences of the Proposed Action

To survive, perennial plants must accumulate both above ground (shoot growth) and below ground (root growth) biomass through the process of photosynthesis, transpiration, and respiration (Howery 1999). Excessive removal of above ground biomass during the growing season reduces root growth. A healthy root system is paramount in the growth of any range

plant, especially during dry years when competition for water and nutrients is most severe (Bedell and Ganskopp 1980). Proper use of range forage allows plants to survive dry periods, recover quickly, and provide cover to protect the soil and promote water infiltration (Hanselka and White 1986). Rangeland conditions and vegetation types vary throughout the WD. Differences in vegetation communities and the condition of those communities would determine their ability to withstand drought. The Proposed Action defines drought response triggers for each major vegetation community known to occur within the WD. The utilization triggers were developed using the utilization guidelines proved by Holechek et al. (1988) and would be used to activate DRAs to ensure that proper utilization occurs for each vegetation type within the WD.

The degree to which drought impairs the range's potential for future forage production depends on the intensity, frequency and timing of grazing (Howery 1999). The DRAs described in the Proposed Action would implement management strategies intended to limit the impacts of livestock and wild horses and burros on vegetation including special status species during drought. These actions would be implemented in combination or separately once drought response triggers are met.

The concentrated use of preferred areas in the landscape results in uneven distribution of animal impact, and drought compounds the effects of herbivory, providing periods of accelerated deterioration (Teague et al. 2004). Many of the DRAs described within the Proposed Action are designed to improve livestock distribution and prevent the overuse of vegetation during drought. DRAs intended to improve livestock distribution include temporary range improvement projects; change in livestock management practices; and temporary change in kind or class of livestock.

Temporary range improvement projects such as water hauls, above ground pipelines or fences would result in a temporary congregation of livestock and/or wild horses and burros within certain areas (i.e., the immediate area near the improvement) but would improve the overall distribution of livestock and/or wild horses and burros. This would limit the overuse of vegetation by evenly distributing grazing pressure. Livestock and wild horse and burro use around temporary improvement projects would be monitored. Once the aforementioned utilization triggers are met, livestock and the temporary projects would be removed from the area. In circumstances where wild horses and burros are the primary grazers, conditions would be assessed to determine if an adequate amount of forage and water remain to support the animals. The use of temporary water hauls and/or temporary above ground pipelines would only be used when it is determined that adequate forage resources exist to allow for continued grazing of an area in a manner that would not further impact rangeland resources. Temporary fences would facilitate targeted grazing within annual plant communities. Temporary fences could also be used to exclude livestock and wild horses and burros from important areas such as riparian areas, meadows, important areas for wildlife or areas where sensitive plant species are likely to occur.

Changes in livestock management practices such as strategic placement of salt and/or mineral supplements increased herding and concentrating livestock into a single heard can be used to improve livestock distribution. Strategic placement of low moisture blocks is effective in attracting cattle to graze high and rugged rangeland (Bailey et. al 2008a). Low-stress herding is effective in focusing grazing in an area that typically receives little grazing use (Bailey et. al

2008b). Bradford (1998) observed that managing with a single herd strongly affects livestock distribution and grazing patterns. It was found that "bunching" the cattle created a more even utilization pattern and resulted in cattle moving into areas that had not been used before.

A temporary change in kind or class of livestock can provide opportunities to improve livestock distribution and protect vegetation from over utilization. Yearling cattle utilize pastures more uniformly over variable terrain than cows with calves or mixed classes; cows and calves utilize forages nearest the water much more heavily than yearlings (Volesky et al. 1980). Selecting yearlings would improve grazing distribution and limit impacts to riparian areas. Choosing a different kind of livestock would also affect how a range can be utilized. With their large mouths, cattle and horses may not select annual grasses as readily as sheep or goats because livestock prefer plants they can eat quickly and efficiently. Sheep or goats can get a full bite of annual grasses more easily than cattle or horses, especially when annual grass plants are small (Peischel and Henry 2006). Sheep and goats can be herded more effectively which allows for greater control and provides an opportunity to limit impacts to important areas such as riparian areas, meadows, aspen stands, important wildlife habitat etc.

During drought, growth slows and plants should be rested longer (Hanselka and White 1986). A significant impact of drought on rangelands is a severe reduction in herbage production (Bedell and Ganskopp 1980). DRAs that address timing, duration and stocking rate have been developed. These include change in season of use, change in grazing duration, partial reduction in AUMs, partial or complete closure of an allotment(s), and wild horse and burro removal from drought afflicted areas.

Changing the season of use in which livestock are grazed can reduce grazing impacts during drought. Excessive removal of plant material during the growing season reduces root growth and replacement; thereby, reducing a plant's ability to harvest solar energy and soil moisture needed for maintenance and growth (Howery 1999). The specific season of use chosen would be fitted to the situation at hand. In most areas, shifting the season of use to a time that is outside of the critical growth period would allow forage plants to take full advantage of available soil moisture and nutrients. Plants can then be grazed after sufficient growth or dormancy occurs. In areas dominated by cheatgrass, spring grazing and/or fall grazing may be appropriate to take advantage of the annual forage while it is green.

Reductions in grazing duration are often needed during drought to protect rangeland resources from degradation. Grazing durations, as currently permitted, could result in plants being grazed multiple times. Plants that are grazed repeatedly may have little or no opportunity to regrow between successive defoliations and may become stressed (Howery 1999). Reduced grazing durations would provide for an increased amount of rest for plants already stressed by drought and lead to an increase in ground cover and protection from soil erosion.

Targeted grazing of cheatgrass and other non-native annual species could be used to provide forage while providing rest for native species and reduce undesirable plants and hazardous fine fuels. Annual bromes such as cheatgrass can provide a valuable forage resource under drought conditions (Reece et al. 1991). Targeted livestock grazing can help reduce fire hazards by disrupting fine fuel continuity and reducing fuel loads (Peischel and Henry 2006). According to

Reece et al. (1991), moderate defoliation of annual species can enhance the production of perennial grasses by reducing plant competition and minimizing soil moisture depletion.

Partial reduction in AUMs, partial closure of an allotment, and wild horse and burro removal are all intended to match stocking rates to forage supply and water availability. Drought often results in a reduction of forage and water resources. If it is determined that forage and/or water supplies are not sufficient to provide for livestock and/or wild horses and burros, temporary AUM reductions could occur. DRAs intended to improve livestock and/or wild horse and burro distribution are only viable when adequate resources exist within an allotment or HMA. A continuation of current stocking rates would result in overutilization of plants and degradation of rangeland resources. Heavy use of plants during drought results in permanent damage and high death loss of forage plants (Hanselka and White 1986). If necessary a drought gather could occur. Some disturbance to vegetation as a result of a drought gather would occur locally around the gather traps and holding corrals. However, overall improvement and/or maintenance of vegetation are expected to occur due to a decrease in use (matching animal population to forage supply) and improved distribution as a result of fewer animal numbers.

Relocating wild horses and/or burros within HMAs would have similar impacts to hauling water and conducting drought gathers, and would be congruent with the numbers of animals moved. The receiving portion of the HMA would experience an increase in the population, some impacts to vegetation, soils riparian areas and water could be expected due to the additional travel, trampling, trailing or utilization that could occur. The portion of the HMA where animals were moved from would endure benefits similar to those that would be expected following a drought gather to remove all or some of the wild horses and/or burros.

2. Environmental Consequences of the Grazing Closure Alternative

The Grazing Closure Alternative would provide rest for all areas afflicted by drought. Resting these areas would allow vegetation to take full advantage of available soil moisture and nutrients without interruption. Protection of range plants before and during drought years allows for fast recovery following a drought (Howery 1999). The Grazing Closure Alternative would remove livestock grazing from the public lands to eliminate the adverse impacts of grazing during the drought and provide one growing season of rest for plant recovery following the cessation of the drought.

The Grazing Closure Alternative would not provide for the targeted grazing of invasive annual species and would limit the BLM's opportunity to reduce the vigor of invasive species that may compete with native vegetation. Closing drought afflicted areas to livestock grazing under this Alternative would prevent degradation of rangeland resources and protect upland and riparian vegetation communities as well as sensitive plant species during drought. This would have long-term beneficial impacts to vegetation within the WD.
DRAs for wild horses and burros would be implemented as identified in the Proposed Action and would result in similar effects as described above, for the Proposed Action.

3. Environmental Consequences of the No Action Alternative

"It is obvious that when it comes to drought, it is not a question if drought will occur, but rather when it will occur, how long will it last, and are we prepared?" (Howery 1999). Drought or water stress affects virtually every physiological and biochemical process in plants (Hanselka and White 1986). Grazing management practices before, during, and following a drought would influence the ability of native rangeland vegetation to recover (Encinias and Smallidge 2009). Lagged responses toward drought pose a threat to sustainable management of rangelands (Thurow and Taylor 1999). Under the No Action Alternative, DRAs would still be implemented, but would require separate evaluations under NEPA, which would delay drought response times and potentially result in a continuation of current management practices, which are often poorly suited to drought. Livestock and wild horse and burro use would be concentrated around remaining water sources and riparian areas. This would result in an uneven or patchy distribution of grazing pressure with areas of heavy use, leaving other areas far from water unused. As stated earlier, drought reduces the health and production of vegetation. Without the prompt implementation of management strategies, the effects of drought can be compounded by improper livestock and wild horse and burro use. The No Action Alternative would impact vegetation resources within the WD directly affecting the present condition and limiting the ability of vegetation to survive and recover from dry periods in future years. Unsustainable range use can cause an increase in the frequency and consequences of drought (Thurow and Taylor 1999). Hanselka and White (1986) found that weakened root systems affect the ability of plants to pull moisture from the soil and that closely grazed plants would permanently wilt when there is still 6-8 percent moisture in the soil.

V. Wild Horses and Burros

Affected Environment

The Bureau of Land Management protects and manages wild horses and burros under the authority of the Wild Free-Roaming Horses and Burros Act of 1971 (as amended by Congress in 1976, 1978, 1996, and 2004) to ensure that healthy herds thrive on healthy rangelands. The BLM manages these living symbols of the Western spirit as part of its multiple-use mission under the 1976 Federal Land Policy and Management Act. In addition, the BLM must meet or ensure progress is being made toward meeting the Sierra Front-Northwestern Great Basin RAC Standards and Guidelines for Wild Horse and Management.

Wild horse and burro populations are managed within herd management areas (HMAs). Following passage of the Wild Free-Roaming Horses and Burros Act of 1971 (PL 92-195, as amended), thirty-five herd areas (HAs) were originally delineated on the Winnemucca District. Subsequent land management plan decisions identified the removal of wild horses and burros from checkerboard HAs (alternating sections of privately owned lands and BLM lands) unless affected private landowners executed a cooperative agreement providing for their retention and protection. Wild horses and burros were gathered and removed from 15 checkerboard HAs in the early 1990s. HAs are not managed for wild horse or burro populations, but animals that migrate from HMAs are occasionally removed from these areas. Appropriate management levels (AMLs) for wild horses and burros are established through multiple use decisions. AML is the population

range of wild horses and burros to be managed within an HMA. AMLs are established based on "an intensive monitoring program involving studies of grazing utilization, trend in range condition, actual use, and climatic factors" (109 IBLA 120) (Interior Board of Land Appeals, no date). Annual monitoring data are collected to evaluate progress toward meeting management objectives established in multiple use decisions. Wild horses and burros that establish home ranges outside the boundaries of an HMA are removed. Wild horses and burros are removed from private lands at the request of the landowner. The WD manages 20 HMAs (Table 10) with an AML range of 1,974 – 3,233 wild horses and 94-155 wild burros. Table 10 lists HMAs and HAs that may include portions of other BLM District Office lands, but they are administered by the WD and are included in their entirety here.

Table 10 Characteristics of HMAs and HAs HMA or HA

HMA or HA	Total BLM Acres	Population Estimate FY 2010	Appropriate Management Level
Antelope Range HA	131,600	7 H	0
Augusta Mountains HMA	182,900	305 H	185-308 H
Black Rock Range East HMA	93,400	56 H	56-93 H
Black Rock Range West HMA	93,200	56 H	56-93 H
Bloody Runs HA	74,100	0	0
Bluewing Mountains HMA	17,900	48 H & 29 B	22-36 H & 17-28 B
Buffalo Hills HMA	132,400	477 H	188-314 H
Calico Mountains HMA	157,200	200H	200-333 H
East Range HA	451,900	37 H	0
Eugene Mountains HA	86,100	0	0
Fox & Lake Range HMA	177,300	236 H	122-204 H
Granite Range HMA	101,700	155 H	155-258 H
Hot Springs Mountains HA	68,200	0	0
Humboldt HA	431,600	56 H	0
Jackson Mountains HMA	283,000	472 H	130-217 H
Kamma Mountains HMA	57,400	112 H	46-77 H
Krum Hills HA	64,200	0	0
Lava Beds HMA	233,000	213 H & 27 B	89-148 H; 10-16 B
Little Owyhee HMA	460,100	773 H	194-298 H
Lower Paradise Valley HA	44,900	0	0
Mc Gee Mountain HMA	41,100	107 B	25-41 B
Nightingale Mountains HMA	76,000	97 H & 4 B	38-63 H& 0B
North Stillwater HMA	178,900	207 H & 1 B	138-205 H& 0B
Osgood Mountains HA	142,100	0	0
Selenite Range HA	125,300	0 H& 1 B	0 H& 0B
Seven Troughs Range HMA	147,900	227 H & 79 B	94-156 H & 28-46 B
Shawave Mountains HMA	107,100	107 H	44-73 H
Slumbering Hills North HA	46,500	0	0
Snowstorm Mountains HMA	117,100	309 H	90-140 H
Sonoma Range HA	212,600	30	0
Slumbering Hills South HA	30,100	0	0
Tobin Range HMA	195,100	22 H	22-42 H
Trinity Range HA	161,500	7 H	0
Truckee Range HA	171,200	0	0
Warm Springs Canyon HMA	91,700	105 H & 29 B	105-175 H & 14-24 B
TOTALS	5,186,300	4,314H & 248 B	1,974-3,233 H & 94-155 B

1. Environmental Consequences of the Proposed Action

Livestock

The DRAs identified within the Proposed Action, were developed in order to reduce the impacts of authorized uses and activities on natural resources that are at risk of being adversely affected by drought. The DRAs pertaining to livestock management would have minimal direct impacts to wild horses or burros. Actions implemented within HMAs would indirectly affect wild horses and burros. Temporary water hauls, or pipelines would improve distribution of livestock and wild horses and burros as well as reduce impacts to drought affected water sources. Additionally, the DRAs implemented within HMAs would indirectly affect wild horses and burros by reducing competition among wild horses or burros, wildlife and livestock as additional water sources would be available to offset the reduced water supply due to drought. Changes in season of livestock use, grazing duration or livestock management practices would also result in indirect effects to wild horses and burros. The moderation of utilization levels, improvement of distribution and protection of forage resources from concentrated use would ensure the long term productivity and health of the range. The degree to which drought impairs the range's potential for future forage production depends on the intensity, frequency and timing of grazing (Howery 1999). Therefore the aforementioned DRAs would also provide for quicker recovery from drought.

The DRAs also include reductions in livestock AUMs and the partial or complete closure of an allotment(s). Pursuant to 43 CFR §4710.5(a), the authorized officer may close appropriate areas of the public lands inhabited by wild horses or burros if necessary to protect wild horses and burros. These actions implemented either separately or in combination with other DRAs would help ensure that adequate forage and water are available for wild horses, burros and wildlife. Additionally, these DRAs would promote the recovery of rangelands afflicted by drought.

Other actions include temporary fencing, targeted livestock grazing of invasive annual communities and change of kind or class of livestock, which would have minimal indirect effects to wild horses or burros, and would ultimately benefit forage and riparian resources both in the short and long-term.

Wild Horse and Burro

Temporary Water Hauls

In order to augment water sources for wild horses or burros until a drought gather could be completed or until normal precipitation and water availability resume, temporary water hauls could be authorized at select locations within HMAs or at existing (but dry or limited) water sources. Large (500 gallon or larger) water trucks or trailers would be used to replenish waters in tanks, ponds or other available catchments. In most cases, existing roads would be used, and water haul tanks would be placed in disturbed locations following a cultural resources inventory. Where possible, supplemental water troughs would be placed at existing wild horse or burro watering areas to encourage use. All water troughs would be equipped with bird ladders to protect avian species.

Minor soil disturbance would be expected depending upon the number of animals using the water source. No adverse impacts to wild horses or burros would be expected; however, temporary water hauls would help maintain animal health and aid in preventing death due to dehydration. The use of water hauls would continue until natural or developed water becomes available that is adequate to support the existing population, or a drought gather occurs to reduce the existing population to levels that can be sustained with the existing resources.

Within HMA Relocation of Wild Horses and Burros

Relocating wild horses and/or burros within an HMA could result in similar impacts described for helicopter removals, bait or water trapping or hauling water; however wild horses and/or burros would not be removed from the range at this time. The animals may suffer some anxiety being moved to another location, but would soon acclimate to the new area. It is highly likely that the animals would attempt to move back to the area they were moved from. It is also possible that some animals may not acclimate to the new area, or are disoriented in relation to available waters and would not thrive. Follow up monitoring may determine that the relocated animals should be gathered and removed from the range to ensure their welfare.

Bait or Water Trapping

When feasible and appropriate in accordance with the criteria outlined in section 2.0(c)(2) bait and water trapping may be used. In cases where water is the most limiting factor, it may be practical to remove wild horses or burros through water trapping. The use of hay or supplement (bait) could also be used to trap animals targeted for removal due to drought conditions. Impacts of this method of removal are similar to impacts of helicopter gathers and include ground disturbance at the trap location, and minor displacement of wildlife. Traps would be placed on disturbed locations when possible after a cultural inventory has been completed. In the case of water trapping, pens would be placed around developed rather than natural water sources where possible to reduce impacts to existing riparian areas.

Water or bait trapping generally results in the capture of a few animals at a time, and requires lengthy time periods to gather larger numbers. Therefore, gather operations could be ongoing for many weeks or months to remove drought affected animals verses helicopter utilization which would accomplish the same outcome in a matter of days. As a result, animals' debilitation from lack of forage and water would persist for an extended time before being gathered and cared for properly. Additionally some animals may avoid the area or refuse to enter the trap, resulting in a decline in health or possible death due to dehydration.

Injuries to wild horses and burros through bait or water trapping are similar to those described for helicopter removals. Animals would not endure the exertion from being herded several miles to a trap location (by helicopter) but may experience injuries associated with bites and kicks while in the trap, during loading into stock trailers and transportation to BLM preparation facilities. If foals enter the trap with adult animals, they could become injured or killed by adult wild horses or burros fighting. Similarly, if adequate facilities did not exist to separate animals by sex or age, foals and adult animals could be injured or killed during transport in stock trailers.

Bait and water trapping would be accomplished through the gate cut method, and no wild horses or burros would be returned to the range. The effects would be similar to those described for gate cut removals below. Various removal strategies could be employed with the use of bait or water trapping.

Wild Horse and Burro Removal

If it is determined that wild horse and/or burro removal is warranted (i.e., all other feasible DRAs have been exhausted), all livestock within the HMA would be removed prior to the commencement of a gather. Removal of excess and drought affected animals would improve herd health and prevent widespread suffering and death of wild horses and burros. Decreased competition for remaining forage and water resources would reduce stress and promote healthier animals, as the actual population becomes balanced with available forage and water resources.

Further deterioration of drought stressed rangeland and riparian resources would be avoided which would also promote range recovery (and healthy animals) over the long-term. The following discussion outlines the impacts of specific elements of gathers on wild horses and burros.

Helicopter Capture

The BLM has been gathering excess wild horses and/or burros from public lands since 1975 and using helicopter gathers since the late 1970's. Since 2004, BLM Nevada has gathered over 35,000 excess animals. Of these, mortality has averaged only 0.5%, which is very low when handling wild animals. Another 0.6% of the animals captured were humanely euthanized due to pre-existing conditions and in accordance with BLM policy. This data affirms that the use of helicopters and motorized vehicles has proven to be a safe, humane, effective and practical means for the gather and removal of excess wild horses and burros from the range. BLM staff is on-site at all times to observe the gather, monitor animal health, and coordinate the gather activities with the contractor. In their August 2011 BLM Task Force Report, the American Association of Equine Practitioners concluded that the care, handling and management practices utilized by the BLM are appropriate for this population of horses and burros and generally support the safety, health and welfare of the animals.

Over the past 35 years, various impacts to wild horses and/or burros from gathers have been observed. Individual, direct impacts include handling stress associated with the capture, sorting, handling, and transportation of the animals. The intensity of these impacts varies by individual and is indicated by behaviors ranging from nervous agitation to physical distress. Observations made through the completion of gathers show that the majority of the wild horses captured acclimate quickly to the holding corral environment, becoming accustomed to water tanks and hay, as well as human presence. Wild burros generally exhibit less agitation and are calmer albeit resistant to handling. The BLM Wild Horse and Burro Specialists and the gather contractor and crew are very attentive to the needs of all animals captured during gathers, ensuring their health and safety.

Accidental death or the need to humanely euthanize animals as a direct result of gather activities is infrequent and averages less than one half to one percent of the animals gathered (0.5-1.0%). Injuries sustained during gathers could include nicks and scrapes to legs, face, or body from brush or tree limbs while being herded to the gather corrals by the helicopter. Rarely, wild horses or burros could encounter barbed wire fences and could receive wire cuts. These injuries are generally not fatal and are treated with medical spray at the holding corrals until a veterinarian can examine the animal. On some gathers, injures to horses or burros occur more frequently due to animal temperament and/or body condition.

Most injuries to horses and burros are sustained once the animal has been captured and occur within the gather corrals, holding corrals, or during sorting. These injuries result from kicks and bites or from collisions with corral panels or gates, and are less common in burro gathers because burros tend to act less aggressively. Transport and sorting is completed as quickly and safely as possible to reduce the occurrence of fighting and then animals are moved into the large holding pens to settle in with hay and water. Injuries received during transport and sorting consist of superficial wounds of the rump, face, or legs. Occasionally, animals could sustain a spinal injury or a fractured limb which requires humane euthanasia but these injuries are rare. Similar injuries could be sustained if wild horses or burros were captured through bait and/or water trapping, as the animals would still need to be sorted, aged, transported, and otherwise handled following their capture.

During summer gathers, environmental conditions come into play as the temperatures are higher, roads and corrals dusty, and water more limited on the range. During times of drought, water could be greatly limited or nearly non-existent. Animals could have to travel long distances to find water, which may lead to animal dehydration or water stress. The exertion of a gather can exacerbate already debilitated conditions, leading to heat exhaustion or other complications. Wild horses or burros may be located at higher elevations and in areas with dense tree cover during summer months, increasing the difficulty of the gather. The helicopter pilot, regardless of season, allows horses to travel slowly at their own pace. During gathers of drought affected animals, the pace would be slowed to allow weak or debilitated animals to travel to the trap corrals as a group. If necessary, crew members may be instructed to capture the animals by roping and loading the animals into stock trailers for transport in order to reduce the stress on the animals. Mares and small foals are especially vulnerable to drought stress and may become weak; therefore, extra care would be taken to ensure their safe capture and recovery.

Heat stress does not occur often but if it does, death may result. If wild horses or burros are in a weakened state due to a shortage of water or forage, higher mortality could occur. In these cases, the BLM would take extra precautions to ensure the safe capture and post-gather care of these animals. An Animal Plant Health Inspection Service (APHIS) veterinarian or other contract veterinarian would be available to examine animal condition and provide recommendations for care. Electrolytes may be added to the drinking water during summer gathers that involve animals in weakened condition.

Indirect individual impacts are those impacts that occur to individual animals after the initial stress event. These impacts, like direct individual impacts, are known to occur intermittently during gather operations. An example of an indirect individual impact would be a brief skirmish

amongst stallions following sorting and release into the stud pen. Fighting among jack burros during gathers is less common. Traumatic injuries usually do not result from these conflicts. Spontaneous abortion events among mares or Jennies following capture are very rare.

Through the capture and sorting process, wild horses and burros are examined for health, injury and other defects. BLM Euthanasia Policy IM-2009-041 is used as a guide to determine if animals should be euthanized.
It should be noted that drought gathers are not intended to meet long-term management goals (e.g., managing healthy wild horse and burros within the productive capacity of the range), but as a management action to preserve animal health and range condition. It is the intent of BLM to intervene during drought or other emergencies to remove wild horses and burros if necessary, before body condition declines and animals become weak from starvation or dehydration.

Unless emergency conditions exist, the BLM does not gather wild horses by helicopter during the foaling season (i.e., the six weeks before or after the peak of foaling (April and mid-May)), per instruction memorandum (IM) 2010-183. Most foals are born during the aforementioned period; however, it is not uncommon for a very small number of young foals (less than two months old) to be encountered during any month of the year. If foals too young to wean are gathered, they are paired up with the dams. Occasionally foals may be "leppied" or "orphaned" before or during gather activities. These foals would be cared for as appropriate for their age and health condition.

Wild Horses and Burros Remaining (or Released into the HMAs following complete removal)

Following a wild horse or burro drought gather, deterioration of the range associated with wild horses or burros would be reduced and rangelands would have the opportunity to recover from the impacts of drought. Protecting rangeland resources from severe use during drought would improve sustainability and enhance resiliency so that rangelands can support future generations of healthy wild horses and burros. Goals of a drought gather would include: the management of wild horse populations in balance with the available forage and water resources and other rangeland uses, and allowing individual animals to better maintain optimum body weight and overall health during future drought years. This would lessen the potential for individual animals and/or herds to be affected by drought, and avoid or minimize the need for future emergency actions.

Depending upon the gather objectives, some wild horses or burros (whether escaped from capture or intentionally left undisturbed) would remain on the range following the gather. The wild horses or burros that are not captured may be temporarily disturbed and moved to another area during gather operations. Over the last 20 years, it has been proven that, with the exception of changes to herd demographics, direct population-wide impacts are usually temporary in nature and with most; if not all impacts to individual wild horses or burros disappearing within hours to several days after the gather is completed. No observable effects associated with these impacts would be expected within one month of release except for a heightened awareness of human presence.

Primary direct impacts to the wild horse or burro populations related to gather activities include changes to herd population dynamics, age structure and/or sex ratio, and subsequent changes to growth rates and population size over time.

Site-specific data would be used to determine the need for a drought gather. Justification for a drought gather would be thoroughly documented within a site-specific Decision and gather plan. Should it be determined that a drought gather is necessary, HMA-specific gather and removal objectives would be developed based on detailed environmental and animal conditions. This information would be included in the Decision and gather plan issued prior to the gather commencing. Depending on the gather objectives, numerous outcomes would be expected. These are discussed by gather type below.

Gate Cut

Wild horses or burros encountered would be gathered and removed until removal and post-gather population objectives were achieved. Few or no animals would be returned to the range and no population controls would be implemented. The animals may be removed from specific portions of an HMA or Complex where resources are most limiting. Animals remaining on the range are not subjected to additional stress during gate cut removals.

Wild horses or burros that are not gathered could be minimally impacted due to the helicopter activity but would otherwise be unaffected. All impacts would cease once gather operations were completed. Sex ratios and age distributions of the un-gathered population should be comparable to the ratios observed in the gathered animals.

Because no wild horses or burros would be released back to the range, no adjustment to sex ratios or application of fertility control would take place. Wild horses or burros would not be held at the holding corrals for extended lengths of time while waiting to apply fertility control, and horses and burros would not be stressed by additional handling to apply fertility control. Fertility and foaling rates would be unaffected in the un-gathered population with the population increasing at an average rate of 17-27% per year.

Removal Numbers

Because site-specific data would be evaluated prior to conducting a drought gather, removal numbers would be detailed in the site-specific Decision and gather plan. The following scenarios are provided for analysis:

Removal of Small Localized Wild Horse and Burro Populations

When it is determined that a specific group or groups of wild horses or burros need to be removed due to a lack of water and/or forage and other drought response actions have been exhausted those groups identified could be removed. Other wild horses and burros within the other locations within the HMA where adequate forage and water sources remain would not be gathered. For example localized removal could be used when a water source or multiple water sources within a portion of an HMA have dried up while other portions of the HMA remain and

within HMA relocation is not considered to be feasible or appropriate due to horse and/or burro condition or other factors (e.g. location and number of fences pose a high risk of horse injury during relocation, forage and water conditions are only capable of supporting horses occupying other areas within the HMA). Impacts would be limited to the specific group or groups of horses and burros selected for removal. Those animals that are located within areas that have sufficient water and forage resources would not be affected. It is not expected that genetic health would be impacted under this option because only a small, localized portion of the population would be removed.

Removal of Sufficient Numbers of Animals to Achieve the Low Range of AML

Under this strategy, only sufficient numbers of wild horses and/or burros would be removed to achieve the low range of AML for drought affected HMAs. This strategy is consistent with most gathers conducted throughout the District, where excess wild horses are removed to low AML and through the following years the population is allowed to increase to the high AML at which time another gather is scheduled. HMAs in the WD have had gathers completed within the past 10 years. Comprehensive EAs, which analyzed environmental impacts of the gathers, were completed for each gather conducted. If it is determined that a drought gather(s) is needed, site-specific details would be provided in the Decision and gather plan documents for the drought gather(s). Drought gathers would only be conducted after consultation or a reasonable attempt to consult with interested parties.

Removal of Sufficient Animals to Achieve the High AML

This strategy has also been analyzed in numerous gather EAs written by the WD within the past 10 years. If the analysis of environmental and animal conditions trigger the need for a drought gather in a particular HMA, it may be determined that the population need only be reduced to the high AML in order to avoid emergency conditions and sustain the wild horse and burro populations during drought. Further gathers to achieve low AML would be scheduled based on additional monitoring data. Impacts to wild horses or burros would be similar to those under the low AML gather option. Range impacts would be proportional to the residual wild horse and burro population. Impacts to rangeland health could be expected, primarily due to trailing and trampling of riparian areas. The level of impacts realized would vary depending on the health of the rangeland within the HMA(s).

Under this option, the established AML would be exceeded following spring foaling. If drought conditions persisted, rangeland health and post drought recovery could be hindered by overpopulation.

It is not expected that genetic health would be impacted under either the low or high AML options. Most wild horse herds sampled have high genetic heterozygosity, genetic resources are lost slowly over periods of many generations, and wild horses (and burros) are long-lived with long generation intervals (Singer, 2000).

Removal of Animals below the Low AML

Removal of wild horses and/or burros to achieve a population below the low AML would occur when drought severely limits water and forage resources and animals need to be removed to prevent further suffering or death as well as to prevent significant rangeland degradation. HMA specific data and animal health analysis would be used to estimate how many animals could be supported on the range, and where animals should be removed to ensure animal health and resource recovery. This data along with other site-specific data would be included in a site-specific Decision and gather plan.

In order to safeguard genetic variability of the animals remaining on the range, genetic analysis of the horses and/or burros within an HMA would be considered as well as known movement between HMAs. Due to the amount of animals that could be removed under this option, genetic variability could be negatively impacted. However, the immediate welfare of the wild horses, burros and their habitat take precedence over the long-term genetic variability. Hair samples would be collected for genetic analysis, and should future analysis indicate that action is needed to enhance or maintain the genetic variability of the herd; a strategy would be developed to address the specific issues. Strategies may include introducing animals from one HMA into another. Future sampling and evaluation of all pertinent factors would continue.

AML would not be permanently adjusted. The population would be allowed to increase to the high AML before another gather was scheduled, as long as resource conditions and animal health allow.

Complete Removal of All Animals in an HMA

This option would be employed only under extreme circumstances and is, therefore, unlikely. However, it is analyzed as a worst-case scenario and is undesirable. The decision to remove all animals would be made after analysis of the environmental and animal data and only done in order to prevent suffering of animals due to the absence of forage and/or water and reduce negative impacts to rangeland resources. It is possible that a small portion of the animals could be held in a contract facility until conditions recover and then be returned to the range. It may also be possible to gather animals and release them into another HMA that has adequate resources to support additional animals. The consequences of such a removal could be the need to revert the HMA back to a Herd Area. If it is determined that resources are adequate, the HMA could be repopulated in future years with horses or burros transplanted from another HMA.

In the extreme case of a complete removal of animals from an HMA, impacts to the genetic health of the wild horses or burros would be expected. The exact impacts cannot be quantified, as each wild horse or burro herd has specific genetics and the herds are comprised of animals of diverse characteristics and genetic backgrounds. If animals were held in a contract facility and later returned to the HMA, it is expected that the genetic variability may be affected, but substantial impacts would not be likely.

Population Growth Controls (Fertility Control treatments and sex ratio adjustments)

Fertility control or sex ratio adjustments could be applied if conditions warrant the complete removal of all animals within an HMA and those animals are to be returned to the range after drought recovery has occurred. Population controls would not be administered to burros. The following discussion analyzes the impacts of population control methods on wild horses:

Fertility Control

Fertility control would include the application of fertility control drugs to all mares released back to the range. All mares selected for release would be treated with a two-year Porcine Zona Pellucida (PZP) or similar vaccine/fertility control and released back to the range. Immuno-contraceptive (fertility control) treatments would be conducted in accordance with the approved standard operating procedures.

Each released mare would receive a single dose of the two-year PZP contraceptive vaccine. When injected, PZP (antigen) causes the mare's immune system to produce antibodies; these antibodies bind to the mare's eggs and effectively block sperm binding and fertilization (Zoo Montana, 2000). PZP is relatively inexpensive, meets BLM requirements for safety to mares and the environment, and can be easily administered in the field. In addition, among mares, PZP contraception appears to be completely reversible. The vaccine has also proven to have no apparent effect on pregnancies in progress, the health of offspring, or the behavior of treated mares (Turner et. al, 1997). Available data from 20 years of application to wild horses contradicts the claim that PZP application in wild mares causes mares to foal out of season or late in the year (Kirkpatrick and Turner 2003). The PZP vaccine is currently being used on over 75 HMAs for the BLM and its use is appropriate for all free-ranging wild horse herds. The long-term goal is to reduce or eliminate the need for gathers and removals (Kirkpatrick et al. 2010).

The highest success obtained for fertility control has been achieved when applied during the timeframe of November through February. The efficacy for the application of the two-year PZP vaccine based on summer application (August through October) is as follows:

Table 11 Fertility Control Efficacy (Effectiveness)

Year 1	Year 2	Year 3	Year 4
Normal	80%	65%	50%

The PZP treatments would be controlled, handled, and administered by a trained BLM employee. Mares receiving the vaccine would experience slightly increased stress levels associated with handling while being vaccinated and freeze-marked. Serious injection site reactions associated with fertility control treatments are rare in treated mares. Any direct impacts associated with fertility control, such as swelling or local reactions at the injection site, would be minor in nature and of short duration. Most mares recover quickly once released back to the HMA, and none are expected to have long term impact from the fertility control injections. Injuries through fighting and other behaviors may occur within the holding pens prior to release, but rarely result in death.

As the sole approach, contraception would not allow the BLM to maintain populations at AML; however, in conjunction with other techniques (e.g., removals of excess animals and adoption) and through incorporation of other population control techniques (e.g., sex ratio adjustments,

sterilization), it now provides a valuable tool in a larger, adaptive management approach to wild horse management.

Contraception may be a cost effective and humane treatment to employ in horses to prevent increases in populations, or with other techniques, to reduce horse populations (Bartholow 2004). In general, contraception would not remove horses from an HMA's population which would result in some continuing environmental effects by those individuals. Horses are long-lived reaching 20 years of age in the wild and those horses returned to the HMA could continue exerting, throughout their life span, negative effects on the environment as described above, as opposed to the removal of a horse. Contraception, if effective, reduces future reproduction. Limiting future population increases would limit increases in environmental damage from higher densities of wild horses. It could also reduce the effect of wild horse gather activities on the environment (if it limits the numbers of wild horse gathers required). If application of contraception to wild horses requires capturing and handling horses, the risks and costs associated with capture and handling of horses may be roughly equivalent (not counting the cost of adoption). Application of contraception to older animals and returning them to the HMA may reduce risks associated with horses that are difficult to adopt or handle in captivity.

Ransom et al. (2010) found no differences in how PZP-treated and control mares allocated their time between feeding, resting, travel, maintenance, and social behaviors in three populations of wild horses, which is consistent with Powell's (1999) findings in another population. Likewise, body condition of PZP-treated and control mares did not differ between treatment groups in Ransom et al.'s (2010) study. Turner and Kirkpatrick (2002) found that PZP-treated mares had higher body condition than control mares in another population, presumably because energy expenditure was reduced by the absence of pregnancy and lactation.

In two studies involving a total of four wild horse populations, both Nunez et al. (2009) and Ransom et al. (2010) found that PZP-treated mares were involved in reproductive interactions with stallions more often than control mares, which is not surprising given the evidence that PZP-treated females of other mammal species can regularly demonstrate estrus behavior after receiving contraceptives (Shumake and Wilhelm 1995, Heilmann et al. 1998, Curtis et al. 2002). Ransom et al. (2010) found that control mares were herded by stallions more frequently than PZP-treated mares, and Nunez et al. (2009) found that PZP-treated mares exhibited higher infidelity to their band stallion during the non-breeding season than control mares. Madosky et al. (in press) found this infidelity was also evident during the breeding season in the same population that Nunez et al. (2009) studied, resulting in PZP-treated mares changing bands more frequently than control mares. Long-term implications of these changes in social behavior are currently unknown. Kirkpatrick et al. (2010) conclude by stating that "the larger question is, even if subtle alterations in behavior may occur, this is still far better than the alternative" and that the "other victory for horses is that every mare prevented from being removed, by virtue of contraception, is a mare that would only be delaying her reproduction rather than being eliminated permanently from the range. This preserves herd genetics, while gathers and adoption do not." (Kirkpatrick and Turner 2002, 2008; Turner and Kirkpatrick 2002, 2003; Willis et al. 1994.)

Population-wide indirect impacts are more difficult to quantify and would occur over time. A large percentage of inoculated mares would experience reductions in fertility. Recruitment of foals into the population would be reduced over a two-year period. Any multi-year reprieve from foaling would increase overall health and fitness of the mares, as well as the health of the foals born after fertility returns, particularly during times of drought or other environmental stress.

Following resumption of fertility, the proportion of mares that conceive and foal could be increased (rebound effect) due to the increased fitness. Application of fertility control (and/or adjustment of sex ratios to favor stallions) could increase the intervals between future gathers, and reduce disturbance to individual animals as well as to the herd social structure over the foreseeable future when compared to a gather without implementation of either population growth control method. The BLM could return to these areas every 2-3 years (dependent on vaccine formulation used) to re-apply fertility control in order to maintain its effectiveness in controlling population growth rates. By completing follow-up gathers on a regular basis (every 2-3 years) in future years, it is possible that the population control measures may be adequate to maintain the population within the existing AMLs if implemented successfully, with the need to remove few if any wild horses from the range. As a result, few horses would need to be removed that might ultimately be held in long term pastures or entered into the sale program as the adoption demand comes into line with the number of excess wild horses removed from the range.

PZP can safely be repeated in 2 years or as necessary to control the population growth rate. The probability of long-term infertility using PZP is very low, and many mares retreated even after 3 years will return to normal fertility after the second treatment wears off.

Fertility control application would allow the average population size to be maintained at a level consistent with the AML. Reduced population growth rates and smaller population sizes would also allow for improvements to range condition, which would have long-term benefits to wild horse habitat quality and contribute to the achievement and maintenance of a TNEB. This would also improve the recovery of the range from the effects of drought as the population grows more slowly and has fewer impacts on the vegetation, waters and other resources, than would occur without the application of population controls.

Sex Ratio Adjustment

Should population controls be applied to animals released to the range, sex ratio adjustments could be included as a management option in wild horse herds, but not burro herds. Wild horses would be released to increase the post-gather sex ratio to favor stallions in the remaining herds. Stallions would be selected to maintain a diverse age structure, herd characteristics and body type (conformation). Adjustment of sex ratios to favor stallions would be expected to have relatively minor impacts to overall population dynamics. Impacts of additional stallions in the population could include: decreased band size, increased competition for mares, and increased size and number of bachelor bands. These effects would be slight, as population ratios of 60% stallions to 40% mares are not considered extreme departures from natural sex ratios. Ratios above 60% would be expected to increase fighting among studs, which would be a consequence of removing additional mares in order to prevent widespread death and suffering. Conversely, a

selection criterion, which leaves more mares than stallions, would be expected to result in fewer and smaller bachelor bands, increased reproduction on a proportional basis with the herd, and larger band sizes. With more stallions involved in breeding it should result in increased genetic exchange and improvement of genetic health within the herd.

Modification of sex ratios favoring stallions could also reduce growth rates and subsequent population size, as a smaller proportion of the population would consist of mares that are capable of giving birth to foals. As a result, gather frequency could be reduced as well as the number of horses gathered and removed in future gathers.

It is well accepted that wild stallions maintain body condition and muscling better than wild mares when resources are limiting. This is most often observed during gathers where the population is very high in comparison to the AML and forage or water are lacking. In these cases, mares with dependent foals or young mares 3-4 years of age are often very thin with Henneke Body Condition Scores of 2 or 3. In such cases, it may be possible to release additional stallions (rather than thinner mares) that otherwise would have needed to be held in Long Term Pastures, thus leaving a larger population on the range, albeit at a higher proportion of studs. Release of studs could occur at the time of the gather if it is determined that due to limited resources, the more vulnerable mares and foals should be removed from the range, but that resources are adequate to ensure the health of the studs.

Though this could result in sex ratios with higher than 60% studs, the populations would not be so large that competition and fighting among studs would be much higher than normal levels. The sex ratio would eventually even-out over the course of time and could be further corrected in the next gather cycle if necessary. The release of a level of studs above 60% would only occur in extreme cases when it is determined that additional horses (studs) could be left on the range rather than be removed.

Transport, Short Term Holding, and Adoption (or Sale) Preparation

Wild horses or burros removed from the range would be transported from the capture/temporary holding corrals to the designated BLM short-term holding corral facility(s) in straight deck semi-trailers or goose-neck stock trailers.

Vehicles would be inspected by the BLM Contracting Officer's Representative or Project Inspector prior to use to ensure animal safety. Animals would be segregated by age and sex and loaded into separate compartments. A small number of mares or Jennies could be shipped with foals. Transportation of recently captured animals is limited to a maximum of 8 hours. During transport, potential impacts to individual animals can include stress, as well as slipping, falling, kicking, biting, or being stepped on by another animal. Unless wild horses or burros are in extremely poor condition, it is rare for an animal to be seriously injured or to die during transport.

Upon arrival at the short term holding facility, recently captured wild horses and burros would be off-loaded by compartment and placed in holding pens where they are provided quality hay and water. If necessary, specific hay or supplement would be prescribed to help animals recover

from drought stress. Most animals begin to eat and drink immediately and adjust rapidly to their new situation. At the short-term holding facility, a veterinarian would examine each load of horses or burros and provide recommendations to the BLM regarding care, treatment, and if necessary, euthanasia of the recently captured animals. Any animals affected by a chronic or incurable disease, injury, lameness or serious physical defect (such as severe tooth loss or wear, club feet, and other severe congenital abnormalities) would be humanely euthanized using methods acceptable to the AVMA. Wild horses or burros in very thin condition or animals with injuries would be sorted and placed in hospital pens, fed separately and/or treated for their injuries as indicated. Recently captured wild horses, generally mares, in very thin condition may have difficulty transitioning to feed. Some of these animals may be in such poor condition that it is unlikely they would have survived if left on the range. Some mares or Jennies may lose their pregnancies. Every effort would be taken to help the mare make a quiet, low stress transition to captivity and domestic feed to minimize the risk of miscarriage or death.

At short-term corral facilities, once the horses and burros have adjusted to their new environment, they are prepared for adoption or sale. Preparation involves freeze-marking the animals with a unique identification number, drawing a blood sample to test for equine infectious anemia (Coggins test), vaccination against common equine diseases, castration, and de-worming. During the preparation process, potential impacts to wild horses and burros are similar to those that can occur during handling and transportation. Serious injuries and deaths from injuries during the preparation process are rare, but can occur.

At short-term corral facilities, a minimum of 700 square feet is provided per animal. Mortality at short-term holding facilities averages approximately 5% per year (GAO-09-77, 2008, Page 51), and includes animals euthanized due to a pre-existing condition; animals in extremely poor condition; animals that are injured and would not recover; animals which are unable to transition to feed; and animals which are seriously injured or accidentally die during sorting, handling, or preparation.

Adoption or Sale with Limitations, and Long Term Pastures

Adoption applicants are required to have at least a 400 square foot corral with panels that are at least six feet tall for horses over 18 months of age, and 5 feet tall for burros. Applicants are required to provide adequate shelter, feed, and water. The BLM retains title to the horse or burro for one year and the animals and the facilities are inspected to assure the adopter is complying with the BLM's requirements. After one year, the adopter may take title to the horse or burro after an inspection from an official, veterinarian, or other individual approved by the authorized officer to ensure humane care, at which point the horse or burro becomes the property of the adopter. Adoptions are conducted in accordance with 43 CFR §4750.

Potential buyers must fill out an application and be pre-approved before they may buy a wild horse. A sale-eligible wild horse is any animal that is more than 10 years old; or has been offered unsuccessfully for adoption three times. The application also specifies that all buyers are not to re-sell the animal to slaughter buyers or anyone who would sell the animal to a commercial processing plant. Sales of wild horses are conducted in accordance with BLM policy.

Potential impacts to wild horses from transport to adoption, sale or Long Term Pastures (LTPs) (horses only) are similar to those previously described. One difference is that when shipping animals for adoption, sale or LTP, animals may be transported for a maximum of 24 hours. Immediately prior to transportation, and after every 18-24 hours of transportation, animals are offloaded and provided a minimum of 8 hours on-the-ground rest. During the rest period, each animal is provided access to unlimited amounts of clean water and 25 pounds of good quality hay per horse with adequate feed bunk space to allow all animals to eat at one time. Most animals are not shipped more than 18 hours before they are rested. The rest period may be waived in situations where the travel time exceeds the 24-hour limit by just a few hours and the stress of offloading and reloading is likely to be greater than the stress involved in the additional period of uninterrupted travel. Wild horses generally five years of age and older (those for which there is less adoption or sale demand) are transported to LTPs. Establishment of each LTP is subject to a separate environmental analysis and decision making process. Wild horses in LTPs remain available for adoption or sale (11 years of age and older) to individuals interested in acquiring a larger number of animals and who can provide the animals with a good home. The BLM has maintained LTPs in the Midwest for over 20 years.

The LTPs are designed to provide excess wild horses with humane, and in some cases life-long care in a natural setting off the public rangelands. There, wild horses are maintained in grassland pastures large enough to allow free-roaming behavior and with the forage, water, and shelter necessary to sustain them in good condition. About 28,600 wild horses that are in excess of the current adoption or sale demand (due to age or other factors such as economic recession) are currently located on private land pastures in Oklahoma, Kansas, Iowa, and South Dakota. Located in mid or tall grass prairie regions of the United States, these LTPs are highly productive grasslands compared to more arid western rangelands. These pastures comprise about 256,000 acres (an average of about 10-11 acres per animal). Of the animals currently located in LTP, less than one percent is age 0-4 years, 49 percent are age 5-10 years, and about 51 percent are age 11+ years.

Mares and castrated stallions (geldings) are segregated into separate pastures except one facility where geldings and mares coexist. No reproduction occurs in the LTPs, but some foals are born to mares that were pregnant when they were removed from the range and placed onto the LTP. These foals are gathered and weaned when they reach about 8-10 months of age and are then shipped to short-term facilities where they are made available for adoption. Handling of wild horses at the LTPs is minimized to the extent possible although regular on-the-ground observation and weekly counts of the wild horses to ascertain their numbers, well-being, and safety are conducted. A very small percentage of the animals could be humanely euthanized if they are in very thin condition and are not expected to improve to a Henneke Body Condition Score of 3 or greater due to age or other factors. Natural mortality of wild horses in LTP averages approximately 8% per year, but can be higher or lower depending on the average age of the horses pastured there (GAO-09-77, Page 52). The savings to the American taxpayer which results from contracting for LTP averages about $4.45 per horse per day as compared with maintaining the animals in short-term holding facilities.

Euthanasia and Sale without Limitation

While humane euthanasia and sale without limitation of healthy horses for which there is no adoption demand is required under the WFRHBA, Congress prohibited the use of appropriated funds for this purpose between 1987 and 2004 and again in 2010-12.

2. Environmental Consequences of the Grazing Closure Alternative

Similar to the Proposed Action, the Grazing Closure Alternative would have indirect impacts to wild horses or burros that would consist of reduced numbers of grazing animals on the range through the drought period and drought recovery. The impacts would be a degree of increased availability and quality of forage and water dependent upon the specific vegetation and water present throughout the HMA(s) and the inherent overlap of livestock and wild horses or burros of that particular HMA. In any case, the absence of all livestock within drought affected areas would ensure maximum recovery of vegetation and riparian areas especially in HMAs that are at or below the established AML or where wild horse and burro distribution is good as a result of adequate and dispersed available water. In areas where wild horse or burro populations exceed AML or are concentrated, the beneficial impacts to the range from grazing animals would be lessened, yet drought recovery would be enhanced.

Direct impacts to wild horses and burros would be the same as those described for the proposed action due to the fact that DRAs for wild horses and burros would be implemented as identified in the Proposed Action.

3. Environmental Consequences of the No Action Alternative

The No Action Alternative would require the preparation of separate EAs, which would delay drought response times and potentially result in a continuation of current management practices, which are often poorly suited to drought.

Implementation of livestock and wild horse and burro drought management actions would be delayed which could result in deterioration of animal health and body condition and degradation of rangeland health as water and/or vegetation resources dwindle under continued use by livestock and wild horses or burros.

Wild horse and burro habitat could be affected through concentrated use by livestock and wild horses or burros. Drought affected forage and riparian resources would be more likely to be degraded by overuse or improper timing of use. Trailing, trampling, leading to bare ground and erosion of soils would increase, as would degradation to riparian areas and utilization of rangeland plants. Excessive utilization of plants and pawing them from the ground would cause plant death, preventing recovery of plant health once drought ceases. Irreparable damage may occur.

Competition for the available water and forage between wild horses, and native wildlife would continue and further increase. Wild horses and burros are a long-lived species with documented survival rates exceeding 92%, with little impact from predation and disease occurring. Experience has shown that once the vegetation and water resources are at critically low levels,

deterioration of animal health can happen very quickly, with young foals and mares or Jennies affected most severely. Without implementation of drought management actions, it is likely that many of these animals would die from starvation and/or dehydration. The resultant population could be heavily skewed towards the stronger stallions which could lead to social disruption in the HMAs.

Recovery from drought could be delayed, and could require many years before pre-drought production is achieved. In the short and long-term, wild horses and burros would have reduced quality and quantity of habitat, which could affect distribution of use within the HMAs, concentration of use and have impacts to animal health as resources are less plentiful.

By managing the public lands in this way, the vegetation and water resources would be severely impacted with little to no potential for recovery. This degree of rangeland degradation could lead to management of wild horses or burros at greatly reduced levels in the future. As a result, the No Action Alternative would adversely impact the health and wellbeing of wild horses or burros in drought afflicted HMAs and would inhibit the recovery of drought stressed habitat important to the future management of these herds. A TNEB would not be maintained or restored under the No Action Alternative.

As populations increase beyond the capacity of the habitat, bands of horses or burros could leave the boundaries of the HMAs in search of forage and water, thereby increasing impacts to rangeland resources outside the HMA boundaries as well (i.e., in areas not designated for their use).

An indirect impact of the No Action Alternative would include animal and/or human deaths due to the increased vehicle collisions as wild horses and/or burros cross roadways in specific areas searching for food and water.

The BLM realizes that some members of the public advocate "letting nature take its course", however, allowing horses to die of dehydration and starvation would be inhumane treatment and clearly indicates that an overpopulation of horses exists in the HMA, and is not consistent with the WFRHBA. Additionally, promulgated Federal Regulations at Title 43 CFR 4700.0-6 (a) state "*Wild horses shall be managed as self- sustaining populations of healthy animals in balance with other uses and the productive capacity of their habitat"* (emphasis added).

W. Wilderness Study Areas

Affected Environment

There are 14 WSAs within the WD administrative boundary, totaling approximately 592,592 acres (Table 12). The conditions of the WSAs have remained largely the same since they were designated in 1980. The WDO manages WSAs in other districts, and other districts manage WSAs in the WD. The Disaster Peak and Pueblo Mountain WSAs are partially in Oregon, and Poodle Mountain is partly within the BLM Eagle Lake District Office jurisdiction. Augusta Mountain is partly within both the Carson City and Battle Mountain District Office jurisdictions.

Table 12 Wilderness Study Areas within the WD

WSA Name	Total Acreage
Alder Creek	5,142
Augusta Mountains (portion)	89,372
Blue Lakes	20,508
China Mountain	10,358
Disaster Peak	13,200
Fox Range	75,404
Lahontan Cutthroat Trout Instant Study Area	12,316
Mount Limbo	23,752
North Fork of the Little Humboldt River	69,683
Pole Creek	12,969
Poodle Mountain (portion)	142,050
Pueblo Mountains (portion)	72,690
Selenite Mountains	32,041
Tobin Range	13,107
Total	**592,592**

1. Environmental Consequences of the Proposed Action

Impacts from the Proposed Action would be similar to those identified in the Wilderness section (3.3K).

2. Environmental Consequences of the Grazing Closure Alternative

Impacts from the Grazing Closure Alternative would be similar to those identified in the Wilderness section (3.3K)

3. Environmental Consequences of the No Action Alternative

Impacts from the Grazing Closure Alternative would be similar to those identified in the Wilderness section (3.3K). Additionally, WSAs must meet certain criteria in order to be studied further for a determination of suitability as wilderness. Criteria include an area which generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; has outstanding opportunities for solitude or a primitive and unconfined type of recreation; has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value (Section 2(c) of the Wilderness Act of 1964). The No Action Alternative would not allow for timely changes in livestock grazing management to adjust to drought conditions. Over time, this could impair the same qualities that the WSAs originally met in order to receive further study regarding their suitability as wilderness. During drought conditions, livestock, wild horses, and

burros would congregate in areas that receive a higher abundance of moisture, especially riparian areas. Riparian areas would be degraded more rapidly than upland areas. This degradation could include, but is not limited to, vegetation trampling, introduction and expansion of invasive weed populations, soil compaction, erosion, and water contamination.

X. Wildlife

Affected Environment

The planning area falls within the greater Great Basin ecosystem. The assortment of topography, vegetation, and climate occurring in the planning area provides habitats for a variety of wildlife species. The presence of any species may be seasonal or year-round based on individual species requirements. Fish and wildlife found within this area are representative of those species found within Great Basin ecosystems, including sagebrush scrub, saltbush scrub, riparian and wetlands, and woodland habitats.

Wildlife Habitat
Wildlife habitat needs vary substantially by species; however, it is generally true that healthy and sustainable wildlife populations can be supported where there is a diverse mix of multi-canopied plant communities to supply structure, forage, cover, and other specific habitat requirements.

Sagebrush steppe/sagebrush includes a number of upland vegetation communities with a shrubland aspect and a variable understory of grass and forbs. Examples of generally short shrub species include varieties of big sagebrush (*Artemisia tridentata*), low sagebrush (*A. arbuscula*), and rabbitbrush (*Chrysothamnus* spp.). Mountain mahogany (*Cercocarpus ledifolius*), snowberry (*Symphoricarpos oreophilus*), and antelope bitterbrush (*Purshia tridentata*) are examples of taller steppe species collectively referred to as mountain shrub in this document. The shrubby plants within sagebrush scrub communities are important to most small and large wildlife because they supply food (directly or indirectly), nesting cover, and concealment. The thermal relief provided by shrub cover helps wildlife to survive the rigors of summer heat and winter cold. The presence of a sagebrush overstory is strongly associated with wildlife community diversity. An understory of grasses and forbs also provide food and cover for wildlife. Habitats providing a predominately native mixture of grasses and forbs meet the needs of a wide range of species.

Sagebrush habitats are a dominant type within the planning area, so the condition of this important western shrub community greatly influences the health and populations of numerous wildlife species in the WD. Populations of sagebrush obligate species such as Greater sage-grouse and pygmy rabbit are in decline as a result of deterioration and loss of sagebrush habitat. Many sagebrush communities have been altered from their natural state by invasions of weedy species, historic management, and fires.

Salt desert vegetation communities support a wide range of wildlife species with substantial overlap with the sagebrush communities. Because salt desert habitats are substantially drier, the abundance of wildlife and diversity is lower. Notable salt desert wildlife species include kit fox

(*Vulpes macrotis*) and antelope ground squirrel (*Ammospermophilus leucurus*). Reptiles are well represented in this type because of the lower elevations and warmer conditions.

Riparian areas consist of plant communities associated with springs, wet meadows, streams, and rivers. The structure, food, and water provided in riparian areas make them the single most diverse and productive habitat for wildlife. Where site potential allows, multi-canopy riparian areas with trees, shrubs, grasses, forbs, sedges, and rushes are exceptionally valuable as habitat for a wide array of wildlife species, including neotropical migrant birds. Riparian areas dominated by herbaceous communities and with low potential for multi-canopy structure are nevertheless important as water and succulent food sources for wildlife. Riparian habitats or wetlands in nonfunctioning or functional-at-risk condition due to erosion, lowered water table, or degraded vegetation composition or structure, provide decreased wildlife habitat values. Because of the continuous flow and constant temperature of water flow, spring areas frequently remain permanently green, providing forage and water for wildlife throughout the year.

Where the site potential exists, wetlands associated with reservoirs or vegetated playas commonly provide valuable nesting and brood-rearing habitat for waterfowl and shorebirds. Common vegetation associated with these types of wetlands includes inland saltgrass (*Distichlis spicata stricta*), Baltic rush (*Juncus balticus*), spikerush (*Eleocharis* sp.), alkali bulrush (*Scirpus robustus*), and cattail (*Typha angustifolia*).

Woodlands composed of stands of Utah juniper (*Juniperus osteosperma*) vary greatly in their value as habitat depending on site-specific factors, such as height, stocking density, age of trees, and understory composition. Scattered Utah juniper may be found in other parts of the planning area at midlevel elevations.

Junipers provide cavities and dense foliage for nesting birds and features used by roosting bats. Juniper berries are a source of food for many passerines and rodents. Many animals benefit from the thermal cover provided by junipers. Dead juniper trees and snags are important for wildlife cover and food and even help recycle nutrients back to the soil.

Aspen-mahogany woodlands occur at higher elevations. Cavity-dependent species of forest-dwelling birds and mammals require snags for their reproduction. The size, age classes, and stocking levels of trees influence their values as wildlife habitat. Dead and downed material supply structure for a variety of purposes and plays an important role in the overall ecology of the forest and its wildlife, such as providing recycled nutrients.

Rock complexes in mountainous areas are used as roosting and nesting sites for a variety of raptors and songbirds. These rocks also provide important cover for large mammals, such as bighorn sheep, mountain lions, and bobcats, and for small mammals, such as ground squirrels, wood rats, rabbits, pikas, and marmots.

Wildlife living in the Great Basin are an integral part of varied habitats and ecosystems. It is the responsibility of the BLM to manage the habitat for the sustainability for all wildlife objectively and, (special status species and a few species with special habitat considerations aside), without judgment as to the "value" of that species. Therefore, for the purposes of this analysis, typical

wildlife species found in the WD will be grouped together by taxa for discussion. Species mentioned in the following discussion and tables are not all inclusive, but representative of those found in various habitats of the District.

In ecological terms, a food chain is a succession of organisms (*consumers*) that eat each other and in turn are themselves consumed. A trophic level is the position an animal occupies (primary-herbivore, secondary-predator, tertiary/quarternary-carvivore/apex predator), in the food chain. Regardless of the trophic level, an organism's survival is intrinsically dependent upon primary *producers*, most notably plants. A range with healthy native plant communities almost always produces forage of higher productivity and potential for increased animal performance than does a low condition range (Bedell and Ganskopp). Any action taken to preserve the integrity of native vegetation's ability to grow and reproduce will impact the value of habitat to wildlife.

Insects

The presence or absence of specific aquatic insects can give an indication of the health of a stream system. For example, caddisfly larvae survive in cool, clean, well oxygenated water whereas mosquito larvae can thrive in stagnant pools of poorly oxygenated water. Aquatic insect larvae or adult morphs provide food to fish, crustaceans, and other invertebrates as well as terrestrial insectivores.

Terrestrial insects are probably the most numerous of the primary consumers of plants, both in the larval or adult form. Although many insects are generalists, numerous species require specific plants during all or portions of their lifecyle. Loss of vegetation due to drought and overgrazing impacts insect populations resulting in a decreased food source for insectivores and omnivores (secondary consumers) which decreases the prey base for subsequently higher trophic levels.

The insect species that occupy the Great Basin are too numerous and diverse to list in this document. Discussion of special status insects can be found in section 3.3T, BLM Special Status Species of this document.

<u>Fish, Amphibians, and Molluscs</u>

As with insects, the characteristics of a water body, in large part determines what species of fish, amphibians and molluscs inhabit it. Habitat suitability factors such as water temperature, clarity, flow-rate, oxygen level, streambank and aquatic vegetation, determine what species the water body can support. Any variation among these factors can change the dynamics of the ecosystem and make the water inhabitable by those animals typically associated with it.

Because of the unique environment characteristic of thermal springs, animal species found in spring waters have often evolved with and are endemic to a single, specific spring. Thermal spring environments and their inhabitants are particularly vulnerable to the impacts of livestock grazing.

The WD environment is not conducive to supporting many native fish species. Most "sport" fish found within streams and reservoirs in the project area were and continue to be introduced into the systems for recreational purposes.

Table 13 lists some of the native and introduced fish species found in the WD. Table 14 lists amphibians found within the WD and Table 9 in section 3.3T of this document lists some of the molluscs.

Table 13 Native and Introduced Fish in the WD

Common Name	Scientific Name	Common Name	Scientific Name
Black bullhead	*I. melas*	Lahontan speckled dace	*Rhinichthys robustus*
Black crappie	*Pomoxis nigromaculatus*	Largemouth bass	*Micropterus salmoides*
Bluegill	*L. macrochirus*	Rainbow trout	*Oncorhynchus mykiss*
Brook trout	*Salvelinus confluentus*	Red-ear sunfish	*L. microlophus*
Brown bullhead	*Ictalurus nebulous*	Sacramento perch	*Archoplites interruptus*
Brown trout	*Salmo trutta*	Smallmouth bass	*M. dolomieui*
Channel catfish	*I. punctatus*	Speckled dace	*Rhinichthys osculus*
Common carp	*Cyprinus carpio*	Walleye	*Stizostedion vitreum*
Green sunfish	*Lepomis cynellus*	White catfish	*Ictalurus catus*
Lahontan mountain sucker	*Catostomus platyrhynchus*	White crappie	*Pomoxis annularis*
Lahontan redside dace	*Rhinichthys egregius*	Yellow perch	*Perca flavescens*

Table 14 Amphibians found within the WD

Common Name	Scientific Name
Boreal toad	Bufo boreas boreas
Bullfrog	Ran catesbeiana
Columbia spotted frog	Rana luteventris
Grat Basin spadefoot toad	Scaphiopus intermontanus
Northern leopard frog	Rana pipiens
Pacific treefrog	Hyla regilla
Spotted frog	Rana pretiosa

Reptiles

Reptiles are typically more abundant in the drier, lower elevations of the District although some species can be found throughout. Reptiles play an important role in balancing the Great Basin ecosystems, both as predators and prey. Table 15 lists some of the more common reptiles found in the WD.

Table 15 Common Reptiles of the WD

Common Name	Scientific Name	Common Name	Scientific Name
California king snake	*Lampropelitis getulus californiae*	Northern side-blotched lizard	*Uta stansburiana stansburiana*
Desert night snake	*Hypsiglena torquata deserticola*	Pygmy short-horned lizard	*Phrynosoma douglassi*
Great Basin collared lizard	*Crotaphytus bicinctores*	Red racer	*Masticophis flaggellum piceus*
Great Basin fence lizard	*Sceloporus occidentatlis biseriatus*	Rubber boa	*Charina bottae*
Great Basin gopher snake	*Pituophis melanoleucaus deserticola*	Striped whipsnake	*Masticophis taeniatus*
Great Basin rattlesnake	*Crotalus viridis lutosus*	Wandering garter snake	*Thamnophis elegans vagrans*
Great Basin skink	*Eumeces skiltonianus utahensis*	Western long-nosed snake	*Rhinocheilus lecontei lecontei*
Great Basin whiptail	*Cnemidophorus trigris tigris*	Western patch-nose snake	*Salvadora hexalepis*
Western ground snake	*Sonora semiannulata*	Western skink	*Eumeces skiltonianus*
Long-nosed leopard lizard	*Gambelia wislizenii*	Western yellow-bellied racer	*Coluber constrictor mormon*
Desert short-horned lizard	*Phrynosoma platyrhinos*	Yellow-backed spiny lizard	*Sceloporus magister uniformis*
Northern sagebrush lizard	*Sceloporus graciosus*	Zebra-tailed lizard	*Callisouris draconides*

Birds

Numerous species of migratory birds are found throughout the project area. Migratory birds are discussed in the Migratory Birds section of this EA. Table 16 lists some birds (some of which are also migratory) generally categorized as waterfowl, gallinaceous birds, and shorebirds. Some of these birds are year-round residents while others utilize components of the habitat seasonally.

Table 16 Common Birds of the WD

Common Name	Scientific Name	Commnon Name	Scientific Name
American avocet	*Recurvirostra americana*	Long-billed curlew	*Numenius americanus*
American bittern	*Botaurus lentiginosus*	Mallard	*Anas platyrhynchos*
American coot	*Fulica americana*	Mountain quail	*Oreortyx pictus*
American white pelican	*Pelecanus erythrorhynchos*	Northern pintail	*Anas acuta*
Belted kingfisher	*Ceryle alcyon*	Northern shoveler	*Anas clypeata*
Black-crowned night heron	*Nycticorax nycticorax*	Pied-billed grebe	*Podilymbus podiceps*
California quail	*Callipepla californicus*	Ruddy duck	*Oxyura jamaicensis*
Canada goose	*Branta canadensis*	Sandhill crane	*Grus canadensis*
Chukar	*Alectoris gracea*	Snowy egret	*Egretta thula*
Cinnamon teal	*Anas cyanoptera*	Sora	*Porzana carolina*
Common Merganser	*Mergus merganser*	Spotted sandpiper	*Acutis macularia*
Common snipe	*Gallinago gallinago*	Virginia rail	*Rallus limicola*

Common Name	Scientific Name	Commnon Name	Scientific Name
Gadwall	*Anas strepera*	Clark's grebe	*Aechmophorus clarkii*
Great blue heron	*Ardea herodias*	Willet	*Catoptrophorus semipalmatus*
Hungarian partridge	*Perdix perdix*	Wilson's phalarope	*Phalaropus tricolor*

Mammals

The size of mammals within the WD range from the very, very small (as is the Preble's shrew), to the massive elk. Trophic levels range from the insects as the primary consumers to the cougar as an apex predator. All mammals have a niche within this ecosystem and the importance of each should not be discounted.

The majority of mammals in the WD are in the rodentia order. These animals are the often overlooked ominvores that shore up the foundation of a viable, sustainable desert ecosystem. Not only do they provide a substantial prey base for larger carnivores, they also provide habitat by creating burrows. Burrowing activities also exposes soil more amendable to establishing vegetation and the cached seeds of granivores serve as a seedbank.

Not only are mammals important in the maintenance of the ecosystem, several species such as Bighorn sheep (*Ovis canadensis*), Mule deer (*Odocoileus hemionus*), Pronghorn (*Antilocarpa americana*), and elk (*Cervus canadensis*) are game animals (even though *Ovis canadensis* is also a BLM sensitive species). Table 17 provides a representative list of mammals found within the WD.

Table 17 Mammals within the WD

Common Name	Scientific Name	Common Name	Scientific Name
Badger	*Taxidea taxus*	Long-tailed vole	*Microtus longicaudus*
Beaver	*Castor canadensis*	Long-tailed weasel	*Mustela fenata*
Bighorn sheep	*Ovis canadensis*	Merriman's shrew	*Sorex merriami*
Black-tailed jack rabbit	*Lepus Californicus*	Mink	*Mustela vison*
Bobcat	*Felis rufus*	Mountain cottontail	*Sylvilagus nuttallii*
Broad-footed mole	*Scapanus latimanus*	Mule deer	*Odocoileus hemionus*
Bushy-tailed woodrat	*Neotoma cinerea*	Muskrat	*Ondatra zibethicus*
Canyon Mouse	*Peromyscus crinitus*	Northern grasshopper mouse	*Onychomys leucogaster*
Cougar	*Felis concolor*	Northern pocket gopher	*Thomomys talpoides*
Coyote	*Canis latrans*	Ord's kangaroo rat	*Dipodomys ordii*
Deer mouse	*Peromyscus maniculatus*	Porcupine	*Erethizon dorsatum*
Desert cottontail	*Sylvilagus auduboni*	Pronghorn	*Antilocarpa americana*
Desert woodrat	*Neotoma lepida*	Sagebrush vole	*Lagurus curtatus*
Elk	*Cervus canadensis*	Stripped skunk	*Mephitis mephitis*
Golden-mantled ground squirrel	*Spermophilus lateralis*	Townsend's ground squirrel	*Spermophilus townsendii*
Great basin kangaroo	*Dipodomys microps*	Townsend's pocket gopher	*Thomomys townsendii*

Common Name	Scientific Name	Common Name	Scientific Name
rat			
Great Basin pocket mouse	*Perognathus parvus*	Vagrant shrew	*Sorex vagrans*
Kit fox	*Vulpes macrotis*	Western harvest mouse	*Reithrodontomys megalotis*
Least chipmunk	*Tamias minimus*	White-tailed antelope squirrel	*Ammospermophilus leucurus*
Little pocket mouse	*Perognathus longimembris*	Yellow-bellied marmot	*Marmota flaviventris*
Long-tailed pocket mouse	*Perognathus fromosus*	Yellow-pine chipmunk	*Tamias amoenus*

1. Environmental Consequences of the Proposed Action

Although the specific impacts of the Proposed Action vary depending on the wildlife species and its habitat requirements, the Drought Response Actions (DRAs) are designed to provide resources for viable wildlife populations to persist over the long-term. The underlying goal of the actions is to promote sound conservation practices to protect soil, water, and native vegetation for future use by livestock, wildlife, and wild horses and burros.

Livestock

Temporary Complete or Partial Closure of Allotments

Research has shown that reducing stocking rates during a drought is an important management tool for preventing overgrazing and maintaining wildlife habitats. Vegetation and water resources can be severely degraded by the synergic effects of overgrazing and drought.

Prohibiting livestock grazing in an area would temporarily negate the impacts of alteration of plant community composition, temporary or permanent removal of vegetation (which provides food and cover), trampling of vegetation, soil compaction and associated consequences (i.e. plant survival and reproduction, erosion, desertification), displacement of wildlife, competition for water and food sources, increased potential disease transmission, fence installation and other impacts associated with livestock use of an area as discussed in sub-sections of this section. Regardless of climatic conditions, ungrazed plants are better able to establish, sustain themselves, or reproduce than grazed plants thereby providing better wildlife habitat.

Implementation of temporary complete allotment closure would not allow grazing of communities within invasive annual species which compete with native vegetation.

The above discussion of impacts would be the same in the closed sections of partially closed allotments. Sections of allotments not closed would be subjected to the same impacts (as applicable to natural or man-made features within the grazed area) as those described in subsections Temporary fencing, Temporary change in Livestock kind or class, Temporary Water Hauls and Temporary above Ground Pipelines.

Temporary Partial Reduction of Animal Unit Months

A reduction in AUMs would result in more available water and vegetative resources for the sustenance and reproductive success of wildlife during the drought (short-term impact).

Plants that are grazed repeatedly while growing may have little to no opportunity to grow new leaf material between successive defoliations thus diminishing the probability of the plant's survival (Howery, 1999). A reduction in AUMs is expected to decrease grazing pressure on individual plants. Decreased grazing pressure would increase vegetation's ability to sustain and reproduce in subsequent seasons (of drought or normal precipitation) benefiting wildlife habitat in the long-term.

A reduction in AUMs is expected to lessen the impacts of livestock grazing on riparian, wet meadow, and aspen stand habitat as discussed in that subsection below.

Temporary Changes in Season of Use

A perennial grass(s) that is grazed during its growth period could stop growth altogether. If soil moisture was declining rapidly at the same time, the grazed plant would not have the opportunity to recover (Bedell and Ganskopp, 1980), thus depleting native grass vegetation crucial to quality wildlife habitat in the short and long-term.

Permitting plants the maximum opportunity for growth should significantly help them maintain vigor even under very dry soil conditions (Bedell and Ganskopp, 1980). Native plants allowed to reach maturity would impact wildlife habitat by replenishing the seedbank thus allowing for the establishment of plants in the years following drought cessation.

Elimination of livestock grazing during the vegetation critical growing periods could provide increased areas of food and cover resources for animals lambing, fawning, or nesting when the seasons overlap.

Temporary Reduced Grazing Duration

Impacts of implementing this DRA could be the same or similar to (as applicable with respect to natural and man-made features of the area) those discussed in sub sections: Temporary partial closure of allotments, Temporary reduction of AUMs, Temporary changes in season of use, and Temporary change in livestock management practices, depending upon the timing and duration of implementation.

Temporary Change in Livestock Management Practices

Impacts of implementing this DRA could be the same or similar to (as applicable with respect to natural and man-made features of the area) those discussed in sub sections: Temporary partial

closure of allotments, Temporary reduction of AUMs, Temporary changes in season of use, and Temporary reduced grazing duration.

Temporary fencing

Ecologically functioning riparian areas, springs, aspen stands and seasonally wet meadows provide vitally important habitat for Nevada's wildlife and fish. Aquatic wildlife are totally dependent upon an ample supply of quality water sources for survival and reproduction.

Livestock tend to congregate and linger near water sources, oftentimes impacting vegetation and wildlife communities. During drought, these effects can be amplified. Using temporary fences to restrict livestock access to these areas during a drought is an effective management tool to prevent degradation and potentially improve habitat. Several studies have shown that fencing riparian zones may in fact be a rapid method of habitat improvement important for wildlife and fish (Schulz and Leininger 1991; Giuliano and Homyack 2004).

Vegetation and vegetative debris are important components in stream bank stability which is crucial to a properly functioning riparian system. Streambanks denuded of vegetation from grazing and trampling are unstable and are susceptible to erosion. The resultant sedimentation and deposition reduce the quality and quantity of water available to aquatic wildlife (fish, invertebrates, macroinvertebrates, amphibians) as well as terrestrial species. Aquatic and streambank vegetation provides concealment refugee for fry and fingerlings. Vegetation also helps moderate water temperatures and oxygen content which is essential to fisheries vitality. Quantity and quality of water also impacts the population and development of aquatic insects which provide a food sources for fish, amphibians, waterfowl and some terrestrial animals such as birds and bats. Eroded streambanks alter stream channel characteristics which lead to continued degradation and diminished functionality. Restricting livestock access to these areas will help sustain the integrity of the vegetation and streambanks.

Moist ground and pools formed by springs provide succulent, nutritious vegetation beneficial to many animals. Pools from thermal springs provide a water source to wildlife throughout the seasons and are especially important during the winter months and times of drought. Springsnail species associated with thermal springs are particularly vulnerable to the impacts of trampling and defoliation of spring ecosystems. Because dispersal of springsnails from one spring system to another is essentially infeasible, species of springsnails are often endemic to specific springs. Degradation of a spring system could cause the extinction of a species.

Erosion is often not as readily evident in springs or wet meadow systems. Soil compaction and removal of vegetation by consumption or trampling which result in dehydration of the meadow, are the more apparent impacts, the result of which is the degradation or voiding of the functionality of the water system. Restricting access to these areas will help sustain the integrity of the vegetation and spring/meadow ecosystem. Springsnail populations would not sustain mortality due to being crushed by livestock.

Aspen stands are most commonly associated with streams, but due to their vegetative cloning form of reproduction, aspens can and typically do expand well beyond streambanks. Root

systems of aspen stands are very effective in stabilizing streambanks and hillsides. Vegetative understory in aspen stands is often dense and diverse providing food and concealment for both predator and prey. Aspen forests also provide thermal cover for birds, and large and small mammals throughout the year. Dead or dying trees provide nest cavities for birds and mammals and attract insects which are fed upon by various bird species. Shading effects from aspen trees also help moderate stream water temperature which is important to fish and other aquatic wildlife.

Grazing in aspen stands damage the trees' root system thereby creating an opportunity for harmful fungi or bacteria to be introduced. Due to the intertwined network of the cloned aspen root system, one damaged root can impact the health of an entire stand. Mortality without regeneration could result.

Grazing also results in erosion and/or soil compaction which alters the soil conditions favorable for the emergence of remets. Smaller trees and shoots are broken or weakened by trampling.

Installation of fencing can limit access to water for large wild ungulates such as mule deer, bighorn sheep, and elk. Appropriate fencing that allows passage of wild ungulates, but obstructs that of livestock would lessen this impact.

Mesh size and height of fencing necessary to prevent sheep from entering riparian areas would be prohibitive to wild ungulates and large mammals (i.e. fox, badger, bobcat, etc.), as well. Fencing can provide safe perches and foraging vantage points for birds. Heavy bodied, slower flying birds, lacking in quick maneuverability and gains in altitude (such as waterfowl and gallinaceous birds) are particularly vulnerable to fatal avian/fence collisions. Installation of flight diverters on fences crossing open water sources (stream corridors, ponds) could lessen this impact.

Temporary Targeted Grazing of Invasive Annual Communities

A restored habitat of native vegetation can support livestock and wildlife in a more compatible manner than a landscape comprised of invasive or agricultural plants. The impact of successful implementation of this DRA would potentially reduce the presence of invasive annual plant species and promote the re-establishment of native vegetation. Diversity created by an ecosystem comprised of native plants can support the array of wildlife that inhabits the sagebrush steppe.

Implementation of this DRA would require intense grazing monitoring to ensure livestock do not convert to eating the more palatable native vegetation once it begins emerging. If not properly implemented, the AUMs, timing and duration of use by livestock in annual invasive areas could impact native emerging plants by consumption, trampling, root destruction, soil compaction, and introduction of other non-native plant seed, thus limiting the potential of this DRA objective to be met. The impact of continued and increased quantity of annual grasses and a continued decline of native vegetation beneficial to wildlife would result from the unsuccessful implementation of this DRA.

Numerous migratory birds utilize dense stands of any vegetation for cover and nesting. Because timing of nesting often coincides with the applicable grazing regimen, eggs and chicks of ground-nesting birds are particularly susceptible to destruction by grazing although non-ground nests are susceptible as well. A short-term decrease in successful avian reproduction could be expected.

Temporary Change in Livestock Kind or Class

The ecological impacts of grazing are dependent in part upon the ecosystem, plant community, conditions of the site, and the livestock species (USFWS, 1994). Grazing affects the species composition of a plant community through herbivores selecting or avoiding specific plants, and through differential tolerance of plants to grazing. Cattle, sheep, and goats differ in their foraging habits not only in the manner in which they graze, but also in their selection or avoidance of specific plants or plant parts (USFWS 1994, PA DCNR). In general, cattle tend to eat taller, longer-leaved grasses and forbs and have a tendency to move from plant to plant before consuming one plant entirely. In contrast to cattle, sheep tend to favor shorter grasses and forbs and will often graze plants to the point of non-recovery before moving to another area. Goats tend to eat a greater variety of plants than sheep including woody browse. Therefore, consecutive grazing of an area by different livestock species does have the potential to eliminate the majority of plants on the site, thus decreasing plant diversity.

Plant diversity, density, structure (height and canopy), and productivity, are all components in plant community composition. Collectively, these components largely determine wildlife habitat suitability. Reduction or elimination of any of these components alters the habitat and the number of wildlife species and individuals it can support.

Impacts include the temporary or permanent removal of and/or trampling of vegetation that would otherwise be used by wildlife for food or cover (including nesting cover), soil compaction resulting in root destruction or inhibited new growth, displacement of wildlife and increased potential of disease transmission to wildlife from domestic animals.

Sheep and goat grazing can be used as tool to remove noxious plants. Sheep and goats can tolerate the consumption of noxious plants such as leafy spurge (*Euphorbia esula*) and Russian knapweed (*Acroptilon repens*). Sheep can also consume spotted knapweed (*Centaurea maculosa*) and other noxious plants. Removal of these plants could allow the emergence of less aggressive native species used by wildlife, but could also increase the presence of competitive invasive or noxious plants. Leafy spurge seeds remain viable until nine days after consumption and animals should not be transferred to un-infested areas until adequate time has passed. Additionally, goats or sheep may not find noxious or invasive plants as palatable as native plants and consumption of native plants would result in an increased infestation of undesirable plants. Noxious and invasive plants are of little or no value to wildlife.
For protection of riparian or other natural water features in the area where this DRA would be implemented, appropriate fencing would need to be installed. Mesh size and height of fencing necessary to prevent sheep from entering riparian areas would be prohibitive to wild ungulates and large mammals (i.e. fox, badger, bobcat, etc.), as well.

Temporary Water Hauls and Above Ground Pipelines

The availability of augmented water sources would impact mobile species that can move relatively long-distances to access water sources (e.g., birds, large mammals). Conversely, augmented water sources would be less accessible to animals with restricted mobility (e.g., many reptiles and small mammals). Water augmentation would not directly benefit animals that subsist solely on metabolic water or those that do not drink from open water sources.

During drought, livestock often concentrate in and around riparian areas which can lead to degraded water quality and quantity and reduced vegetative cover. Water augmentation would divert livestock and wild horses and burros from natural water sources thus reducing competition for water with wildlife.

Vegetation and vegetative debris are important components in stream bank stability which is crucial to a properly functioning riparian system. Streambanks denuded of vegetation tend to be unstable and are susceptible to erosion. The resultant sedimentation and deposition reduce the quality and quantity of water available to aquatic wildlife (fish, invertebrates, amphibians) as well as terrestrial species. In springs or wet meadow systems, soil compaction, dehydration, erosion and removal of vegetation by consumption or trampling result in the degradation or voiding of the functionality of the water system. Diverting use from these areas to augmented water sources could alleviate some of the impacts associated with livestock use.

Obtaining supplemental water from free water sources such as streams, springs, and ponds would not only exacerbate the drought effects on terrestrial animals, but would imperil aquatic animals and ecosystems as well.

Concentrations of livestock, near augmented water sources would reduce impacts (consumption and trampling) on rangeland vegetation outside of the footprint of the augmented water source. As a result, wildlife that requires understory vegetation as a habitat component would benefit from reduced grazing impacts range-wide. Within the footprint of the augmented water source, trampling, consumption, and removal of vegetation from grazing could have long-term and short-term impacts on the availability of vegetation as a food source and/or source of cover for wildlife.

Wildlife are known to avoid areas near water developments that are heavily used by livestock (Leeuw et al. 2001), and these areas are thought to increase predation risk, interspecific competition, and provide avenues of disease transmission. To effectively implement the DRA, installation of multiple temporary water structures may be required to provide water for livestock, wild horses and burros and wildlife.

The presence of temporarily installed above-ground pipelines used to supply water to troughs would not impact wildlife.

Some additional impacts from the implementation of this DRA are the same or similar to those in subsection, Temporary fencing.

Wild Horses and Burros

Reduction of wild horse and/or burro populations during a drought would aid in protecting rangeland habitats from overuse. Impacts would be the same or similar to those associated with livestock use as discussed above. Implementing a gather would reduce the competition for vegetative and water resource components of wildlife habitat. Impacts to range-wide habitat conditions would be lessened, making those resources more available for wildlife use.

Temporary Water Hauls

Augmented water sources are most likely to benefit mobile species that can move relatively long-distances to access water sources (e.g., birds, large mammals). Conversely, augmented water sources would be less accessible to animals with restricted mobility (e.g., many reptiles and small mammals). Water augmentation would not directly benefit animals that subsist solely on metabolic water or those that do not drink from open water sources.

During drought, wild horses and burros often concentrate in and around riparian areas which can lead to degraded water quality and quantity and reduced vegetative cover. Water augmentation would divert wild horses and burros from natural water sources thus reducing competition for water with wildlife.

Vegetation and vegetative debris are important components in stream bank stability which is crucial to a properly functioning riparian system. Streambanks denuded of vegetation tend to be unstable and are susceptible to erosion. The resultant sedimentation and deposition reduce the quality and quantity of water available to aquatic wildlife (fish, invertebrates, amphibians) as well as terrestrial species. Erosion is not often as readily evident in springs or wet meadow systems. Soil compaction and removal of vegetation by consumption or trampling are the more apparent impacts, the result of which is the degradation or voiding of the functionality of the spring/wet meadow system. Diverting use from these areas to augmented water sources could alleviate some of the impacts associated with wild horse and burro use.

Concentrations of wild horses and burros near augmented water sources would reduce impacts (consumption and trampling) on rangeland vegetation outside of the footprint of the augmented water source. As a result, wildlife that requires understory vegetation as a habitat component would benefit from reduced grazing impacts range-wide. Within the footprint of the augmented water source, trampling, consumption, and removal of vegetation by wild horses and burros could have long-term and short-term impacts on the availability of vegetation as a food source and/or source of cover for wildlife.

Wild horses are known to out-compete some wildlife species for natural water sources by aggressively driving them away. The same behavior would be expected at augmented water sources. To effectively implement this DRA, installation of multiple temporary water sources may be required.

Within HMA Wild Horse and Burro Relocation

Within HMA wild horse and burro relocations would have the same impacts to wildlife as discussed in the above Livestock section, (subsections Temporary complete closure of an allotment and Temporary fencing), in the area the horses and burros are removed from. However, the drought induced impacts to wildlife habitat and wildlife may be intensified in the release site area resulting in increased competition for already limited resources and a greater rate of wildlife mortality would result.

Free ranging wild horses and burros would not be confined to the relocation area. Wild horses and burros would migrate from the translocation area once inadequacy or depletion of resources has occurred. Degradation of the habitat in the translocation area would only compound the impacts of limited wildlife resources over a broader area of the HMA.

Wild Horse and Burro Removal

Wild horse and burro gather activities could temporarily displace wildlife.

Prior to selection, the proposed trap site area would be surveyed for nesting birds if gathers were proposed during the migratory bird nesting season.

Reduction of wild horse and/or burro populations during a drought would aid in protecting rangeland habitats from overuse and reduce drought-induced stressors (i.e. survival, reproduction) on vegetation wildlife rely upon.

Removing wild horses and burros from the rangeland would have some of the same impacts to wildlife as discussed in the above Livestock section, (subsections: Temporary complete closure of an allotment and Temporary fencing), making those resources more available for wildlife use during the drought.

Removal of wild horses and burros would temporarily eliminate the competition for limited vegetation and water resources among horses and burros and wildlife. These resources would still be impacted by wildlife usage, but not to the synergic degree it would be when horses and burros are present.

2. Environmental Consequences of the Grazing Closure Alternative

Implementation of this alternative would temporarily reduce or prevent the impacts of livestock grazing on water resources such as streambank destabilization, sedimentation, deposition, dehydration and erosion. This alternative would also provide some degree of protection to vegetative components of the natural habitat that wildlife rely upon either directly or indirectly. Plants stressed under drought conditions are more susceptible to the effects of grazing. Removal of livestock grazing pressures would enhance a plant's ability to recover from drought thus becoming available for use by wildlife during the drought and subsequent seasons.

Additional impacts of this alternative are the same or similar to those discussed in the Livestock subsection Temporary complete closure of allotment discussed above.

This alternative would implement DRAs for wild horses and burros in the same way as described under the proposed action alternative. Refer to impacts disclosed under the proposed action alternative with regard to wild horse and burro DRAs.

3. Environmental Consequences of the No Action Alternative

Consequences of the No Action Alternative would be the same as the detrimental impacts disclosed in the Proposed Action which were presented to emphasize and explain impacts to wildlife in the event the Proposed Action was not implemented.

Selecting the No Action Alternative would fully subject wildlife and wildlife habitat to the impacts of livestock and wild horse and burro use on limited natural resources during drought: that being the exacerbated competition for forage and water and the continued degradation of natural habitat by the reduction or elimination of native vegetation.

Competition for limited resources among wildlife, wild horse and burros and livestock would lead to wildlife water depravation, malnourishment, and starvation. Wildlife mortality and the subsequent population declines would be expected to continue not only because of immediate resource limitations caused by drought, but also due to the compromised state of malnourished animals entering into the winter season.

The long-term recovery of wildlife habitat would be prolonged or uncertain under this alternative. Recovery of rangelands that are grazed during drought can be a slow process during which time wildlife survival would be jeopardized, reproduction would be less successful, mortality would increase, and populations would decline. Thus, the long-term viability of wildlife populations would be compromised.

IV. CUMULATIVE EFFECTS

The Council on Environmental Quality (CEQ) regulations implementing NEPA defines cumulative impacts as: "The impact on the environment which results from incremental impact of the action when added to other past, present or 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). For the purposes of this EA, cumulative impacts are the sum of all past and present actions, the Proposed Action and reasonably foreseeable future actions (RFFAs) resulting from public land uses. The purpose of the cumulative analysis in this EA is to evaluate the significance of the Proposed Action's contributions to cumulative impacts.

As required under NEPA and the regulations implementing NEPA, cumulative impacts have been addressed for each resource brought forward for analysis. The extent of impacts to each resource would vary based on geographical and biological limits of that resource. Additionally, the length of time for cumulative effects analysis would vary according to the duration of impacts from the Proposed Action on the particular resource. The Cumulative Effects Study Area (CESA) for the Proposed Action is the entire WD and administered allotments.

4.0 Past, Present and Reasonably Foreseeable Future Actions

The Past, Present and Reasonably Foreseeable Future Actions (RFFAs) applicable to the assessment area are identified as the following:

Table 18: Past, Present and Reasonably Foreseeable Future Actions

Project Name or Description	Status (X)		
	Past	Present	Future
Rangeland Management	X	X	X
Wild horse and Burro Management	X	X	X
Mineral Resource Management	X	X	X
Recreation	X	X	X
Wildfire/Fuels Management	X	X	X
Invasive and noxious weed treatments	X	X	X
Woodland Products	X	X	X

Any future proposed projects within the assessment area would be evaluated under NEPA following site-specific planning.

4.1 Effect of Past, Present and Reasonably Foreseeable Future Actions

A. Air Quality

Cumulative Effects of the Proposed Action

Past, present and RFFAs cumulatively affecting air quality on the WD have been identified as smoke, ash and debris from wildland fires/prescribed burns, fugitive dust from mining activities and (OHV) use of unimproved roads, combustion engine emissions, wind erosion of disturbed areas and herbicide applications.

Under the Proposed Action, DRAs would be implemented to maintain vegetation within the WD to minimize the potential for accelerated erosion events. DRAs such as temporary water hauls could result in the short-term increase of wind born particulate matter and vehicle emissions during the hauling of water. Any airborne particulate matter caused by the implementation of DRAs coupled with past, present and RFFAs would be negligible and are not expected to cumulatively impact air quality.

The DRAs described in the Proposed Action are designed to protect vegetation and stabilize soils and would decrease wind born particulate matter in the long-term. Therefore, it is expected that the cumulative effects of the Proposed Action, would be beneficial and not significant in regards to air quality.

Cumulative Effects of the Grazing Closure Alternative

The cumulative effects of the Grazing Closure Alternative are similar to those of the Proposed Action.

Cumulative Effects of the No Action Alternative

Marshal (1973) found that wind velocity, and its potential to detach and transport dry soil, exponentially increases near the ground as vegetation's sheltering effect is reduced. The Society for Range Management Task Group in Concepts and Terminology (1995) concluded that erosion was a function of protective attributes of vegetation (e.g., cover, biomass, density of plants). The No Action Alternative would increase response time and reduce the effectiveness of management during a drought. In many instances, current livestock and wild horse and burro management would continue with no modifications. This would lead to an overall decline in rangeland health associated with a reduction in plant cover and increased soil erosion. Accelerated soil erosion rates would increase the amount of airborne particulate matter, which could reduce air quality causing public safety issues such as poor visibility or respiratory problems. This coupled with past, present and RFFAs such as smoke, ash and debris from wildland fires/prescribed burns and fugitive dust from mining activities and (OHV) use of unimproved roads would have adverse cumulative impacts on air quality.

B. Areas of Critical Environmental Concern

Cumulative Effects of the Proposed Action

The ACECs have been historically managed to protect the special species and resources for which they were established. This management is expected to continue. Wildfires have threatened the ACECS and are expected to increase in frequency in the future with drier conditions and increased presence of non-native cheatgrass. Development of roads or structures is not anticipated due to the protected status of the ACECs. The Proposed Action would help mitigate the effects of drier conditions and increase of invasive species within the ACECs.

Cumulative Effects of the Grazing Closure Alternative

The ACECs have been historically managed to protect the special species and resources for which they were established. This management is expected to continue. Wildfires have threatened the ACECS and are expected to increase in frequency in the future with drier conditions and increased presence of non-native cheatgrass. Development of roads or structures is not anticipated due to the protected status of the ACECs. The Grazing Closure Alternative would help mitigate the effects of drier conditions and increase of invasive species within the ACECs.

Cumulative Effects of the No Action Alternative

The ACECs have been historically managed to protect the special species and resources for which they were established. This management is expected to continue. Wildfires have threatened the ACECS and are expected to increase in frequency in the future with drier conditions and increased presence of non-native cheatgrass. Development of roads or structures is not anticipated due to the protected status of the ACECs. The No Action Alternative would

accelerate and magnify the effects of drier conditions and increase of invasive species within the ACECs.

C. Cultural Resources

Cumulative Effects of the Proposed Action

Past, present and RFFAs cumulatively affecting cultural resources on the WD have been identified as wildland and prescribed fires, recreation/OHV use, general ground disturbing activities and the illegal desecration of evaluated and unevaluated sites. When compared with the previously identified cumulative impacts, the Proposed Action is not expected to contribute to cumulative loss of cultural resources. This is because the DRAs identified in the proposed action are intended to maintain vegetation health and limit soil erosion. Furthermore, any of the DRAs that have the potential to be ground disturbing (e.g., temporary water hauls, temporary fences and above ground pipelines) would be inventoried for cultural resources prior to implementation. It is possible that the cumulative and incremental effects of the Proposed Action may even be beneficial and not significant in respect to cultural and historical resources.

Cumulative Effects of the Grazing Closure Alternative

The cumulative effects of the Grazing Closure Alternative reflect those of the Proposed Action.

Cumulative Effects of the No Action Alternative

The No Action Alternative would require the preparation of separate EAs, which would delay drought response times and result in a continuation of current management practices, which are often poorly suited to drought. Drought reduces the health and production of vegetation. Without the prompt implementation of management strategies, the effects of drought can be compounded by improper livestock and wild horse and burro use. This may lead to a further reduction in plant cover and increased soil erosion. An increase in soil erosion would provide the potential for the degradation of important cultural resources. Therefore, the No Action Alternative coupled with past, present and RFFAs known to affect cultural resources would have adverse cumulative impacts on cultural and historical resources.

D. Noxious Weeds/Invasive Non-native Species

Cumulative Effects of the Proposed Action

Noxious weeds and/or invasive non-native species are spread by wind, water, animals and people. The potential for these species to invade an area and become established increases with ground disturbance and reduced vigor of native plants. In the short-term, the Proposed Action would provide for targeted grazing of non-native species. In the long-term the Proposed Action

would limit adverse impacts to native vegetation and reduce the potential for soil erosion, thus limiting the opportunity for noxious weeds and/or invasive non-native species to become established. It is expected that the cumulative and incremental effects of the Proposed Action would be beneficial and not significant in regards to noxious weeds and invasive non-native species.

Cumulative Effects of the Grazing Closure Alternative

The cumulative effects of the Grazing Closure Alternative reflect those of the Proposed Action. However, the Grazing Closure Alternative does not provide an opportunity for targeted grazing of non-native species.

Cumulative Effects of the No Action Alternative

Under the No Action Alternative, current livestock and wild horse and burro management would continue during drought and would likely lead to the degradation of upland and riparian health. Reduced plant vigor, soil cover and increased erosion are linked to reduced upland and riparian health. This would increase the potential for invasion by noxious weeds and non-native species and lead to a long-term increase in noxious weeds and non-native species.

E. Native American Religious Concerns and Environmental Justice

Cumulative Effects of the Proposed Action

Past, present and RFFAs cumulatively affecting cultural resources on the WD have been identified as wildland and prescribed fires, recreation/OHV use, general ground disturbing activities and the illegal desecration of evaluated and unevaluated sites. When compared with the previously identified cumulative impacts, the Proposed Action is not expected to contribute to cumulative loss of cultural resources. This because the DRAs identified in the proposed action are intended to maintain vegetation health and limiting soil erosion. Furthermore, any of the DRAs that have the potential to be ground disturbing (e.g., temporary water hauls, electric fences and above ground pipelines) would be inventoried for cultural resources prior to implementation. The placements of such temporary projects are flexible and would avoid any known cultural resources or NRHP eligible TCPs. Any temporary fences constructed would be designed in a manner that allows access at all current access points (e.g., trails, roads, etc.). The cumulative loss of cultural resources would be minimized since the BLM would take into account any potential effects prior to the installation of temporary range improvements.

It is expected that the cumulative and incremental effects of the Proposed Action would be beneficial overall in respect to Native American Religious Concerns.

Cumulative Effects of the Grazing Closure Alternative

The cumulative effects of the Grazing Closure Alternative reflect those of the Proposed Action.

Cumulative Effects of the No Action Alternative

The No Action Alternative would require the preparation of separate NEPA evaluations, which would delay drought response times and result in a continuation of current management practices, which are often poorly suited to drought. Drought reduces the health and production of vegetation. Without the prompt implementation of management strategies, the effects of drought can be compounded by improper livestock and wild horse and burro use. This may lead to a further reduction in plant cover and increased soil erosion. An increase in soil erosion would provide the potential for the degradation of important cultural resources. Edible and medicinal plants may be reduced or eliminated from traditional cultural sites if overgrazing occurs during drought. Riparian areas may experience heavy use by livestock and/or wild horses and burros as upland vegetation dries out and becomes less palatable and water resources become scarce. The delayed implementation of DRAs under the No Action Alternative coupled with past, present and RFFAs known to affect cultural resources would have impacts on Native American religious concerns.

F. Water Quality

Effects from Past, Present, and Reasonably Foreseeable Future Actions

Past and present impacts to water quality from rangeland management are generally a broad scale impact on water quality, both from the introduction of sediments related to hoof action and erosion as well as the introduction of nutrients and bacteria from urine and feces. Nutrient and bacteriological effects are generally short lived (<1 year) as nutrients are taken up into the biological cycle and bacteria are reduced or eliminated due to drying or freezing. In many cases, though, these effects are reinitiated annually. Sediment loading effects can be short lived, ceasing as soon as livestock use is removed, or long lasting when soil or vegetation alteration leads to longer term erosional processes. Wild horse and burro management generally leads to the same type of effects as livestock use, however WH&Bs are not herded or removed from the landscape according to grazing schedules. So, while the effects are limited to HMAs, the effects are generally more persistent. The intensity of the effect depends on the density or number of horses, which the BLM attempts to maintain at manageable numbers. When the BLM conducts gathers of excess WH&Bs, impacts on water quality will be reduced temporarily until populations reach former numbers. Past and present effects on surface water quality from minerals management are varied. In many cases, new surface water sources are created (leach ponds, pit lakes, etc.), however most of these sources are managed to be inaccessible to livestock and are not expected to create any effects that would be cumulative with effects from the proposed action or alternatives. Other impacts to surface water quality from past and present minerals management are related to dewatering of surface water sources as well as potentially harmful runoff from mine sites (either from acid forming minerals or from compounds used during the mineral extraction process). When surface water sources are dewatered, one of two things may happen. Partial dewatering can lead to concentration of sediments, nutrients, and bacteria which would reduce water quality. Complete dewatering would cause livestock and wildlife to utilize other water sources, which would concentrate utilization effects on those other sources. Both of these scenarios are rare and likely have a negligible impact on surface water quality as a whole across the district. Past and present effects from recreation are related to vehicle use and camping activities. Both can lead to the introduction of nutrients and pollutants (trash, spilled automotive

fluids, etc.) as well as short and long term sediment loading related to destabilization of stream bank and meadow soils. Past and present effects on water quality from wildfire and fuels management are generally neutral. Suppression of fire can prevent the effects of nutrient (soot/ ash) and sediment loading from loss of vegetation; however this practice can lead to a buildup of fuels which can lead to more severe subsequent fires. The resiliency of riparian habitats and their adaptation to fire cycles, however, generally leads to rapid rehabilitation from these effects. Fire suppression activities can have direct impacts to water quality through the introduction of sediments related to bulldozing and other sediment disrupting activities as well as introduction of nutrients from retardant application. Both of these effects are short term and are infrequent because BLM policy attempts to limit the amount of this activity that occurs in streams and riparian areas. Past and present effects to surface water quality from invasive and noxious weed treatment are mostly related to the use of chemicals, however the loss of vegetation can lead to temporary or long term destabilization of soils causing sediment loading in surface waters. In general, chemical application practices for herbicides include restrictions that reduce or eliminate the introduction of the substance to water sources. It is unlikely, though, that these practices are completely effective in all circumstances with changes in weather (wind, rain, etc.) potentially transporting chemicals to unintended water sources. Historically, willows were considered a nuisance species and were removed from many streams. While this is no longer a common practice, the impacts from these actions are still felt. Many streams have reestablished their willow communities. The ones that have not continue to suffer from erosion caused by the lack of critical soil stabilizing root structures. This leads to sediment loading of surface waters during high flows.

Many of the activities discussed as "past or present" are expected to continue to occur into the future at either current or increased rates. It is assumed that all impacts to surface water sources will be identical in type; however the scale/ number of occurrences and severity would continue to increase without increased management, restrictions, or mitigations.

Cumulative Effects of the Proposed Action

Because the Proposed Action is intended to reduce impacts to natural resources, specifically riparian areas in some cases, during drought by allowing continued grazing with modifications or by closing grazing, the proposed action will have a countervailing effect to any past, present, or reasonably foreseeable future action which have or would reduce surface water quality and would have a compounding effect on any action that is intended to improve surface water quality. The degree to which the Proposed Action would be countervailing or compounding to these effects would depend on which DRAs are implemented, to what degree, at what timing, and in what combination.

Cumulative Effects of the Grazing Closure Alternative

Because the Grazing Closure Alternative is intended to reduce impacts to natural resources by completely restricting livestock grazing during drought, the Grazing Closure Alternative will have a countervailing effect to any past, present, or reasonably foreseeable future action which have or would reduce surface water quality and would have a compounding effect on any action that is intended to improve surface water quality. The degree to which the Proposed Action would be countervailing or compounding to these effects would be greater and more

instantaneous than that of the proposed action. This is because there would be no attempt at utilizing DRAs which depend on specific conditions, livestock tendencies, or permittees' ability to comply. Instead, grazing pressure, whether it is a primary or secondary degradation factor, would be removed at the first observation of drought triggers.

Cumulative Effects of the No Action Alternative

Under the No Action Alternative there could be a significant decrease of surface water quality. In cases where vegetation utilization leads to insufficient root systems, livestock and WH&B use of riparian areas would result in increased erosion causing sediment loading in surface waters. Limited water sources during drought would also cause more concentrated use of available water which would lead to increased nutrient and bacteriological loading.

Actions could be taken under the No Action Alternative to reduce, mitigate, or eliminate these impacts; however the actions would be individually assessed under NEPA and would likely take longer to implement. Because of this, the countervailing effects of those actions would occur to a lower degree compared to those that would occur under either of the action alternatives.

G. Wetland and Riparian Zones

Effects from Past, Present, and Reasonably Foreseeable Future Actions

Past and present rangeland management has generally been viewed to have a large scale negative impact to riparian habitats. At one time unmanaged grazing led to broad scale overutilization of riparian areas. Overutilization of vegetation led to weakened root systems which, in conjunction with other stressors such as climate variability and wildfire, have led to head cuts, incision/ gullying, loss of riparian soil, and the drying out of previously wet meadows. More recent regulation of livestock grazing has begun to decrease or eliminate the pressure put on riparian areas from this use, but many areas are too far removed from pre-livestock conditions to fully rehabilitate. Rangeland management has provided for water improvements, many of which are able to aid in greater distribution and uniform utilization. Old habits and cost issues have decreased the effectiveness of recent rangeland management in promoting broad-scale habitat improvement in some places. Past and Present WH&B management on BLM lands within the WD has led to similar utilization issues as those caused by livestock. When WH&B herds become too numerous or are subjected to poor forage or water availability, they have caused severe harm to riparian areas through over utilization of vegetation as well as alteration (compacting, digging, etc.) to soils. Past and present mineral resource management, in general, has little impact to riparian areas. Both geothermal and mining activities can harm or destroy riparian habitat through siting of facilities, but the total impacts are localized and usually small. The dewatering that occurs at some mines or the excess water obtained at geothermal plants is applied directly to the surface in some cases which can actually create riparian habitat if it occurs frequently enough or for long enough duration. In rare cases, mining or geothermal activities can lead to dewatering of local surface water sources which previously sustained riparian habitat. Past and present impacts to riparian areas from recreation are generally related to vehicles. Crossing streams/ meadows and camping on riparian surfaces leads to soil compaction, damage to vegetation, and destabilization of stream banks. These effects are very localized and may be

very short term or persistent depending on the frequency of use. Past and present wildfire/ fuels management has generally had a neutral effect on riparian areas. Fire suppression helps preserve riparian communities in some cases; however the buildup of fuels can lead to more severe fires at later times. Riparian areas are relatively resilient and have adapted to fire cycles in this region. Fire suppression activities can directly impact riparian areas when they occur directly in the riparian area (use of trucks, creating dozer lines, etc.); however most of these activities are restricted to some degree in riparian areas to protect the habitat. Fuels management practices sometimes lead to the removal of portions of riparian woody communities, but this usually does not have a significant impact on the function of the vegetative community as a whole. Past and present invasive and noxious weed treatments have had beneficial and adverse effects on riparian habitats. At one time, willows were considered to be a nuisance species and were removed from communities. In these cases, the loss of the critical, erosion resistant root structures of willows was lost and led to erosion and loss of soils and water retention capacity. Many of these areas have since recovered the willow community, some have not. More recent weed management has focused on removal of non-native species which can out-compete more functional native species. While this has generally been the goal, when non-native species are treated with chemicals, native species can be inadvertently impacted.

Many of the activities discussed as "past or present" are expected to continue to occur into the future at either current or increased rates. It is assumed that all impacts to riparian areas will be identical in type; however the scale/ number of occurrences and severity would continue to increase without increased management, restrictions, or mitigations.

Cumulative Effects of the Proposed Action

Because the Proposed Action is intended to reduce impacts to natural resources, specifically riparian areas in some cases, during drought by allowing continued grazing with modifications or by closing grazing, the proposed action will have a countervailing effect to any past, present, or reasonably foreseeable future action which have or would reduce the functionality of riparian habitat (with the exception of instances of permanent loss of riparian habitat) and would have a compounding effect on any action that is intended to improve riparian functionality. The degree to which the Proposed Action would be countervailing or compounding to these effects would depend on which DRAs are implemented, to what degree, at what timing, and in what combination.

Cumulative Effects of the Grazing Closure Alternative

Because the Grazing Closure Alternative is intended to reduce impacts to natural resources by completely restricting livestock grazing during drought, the Grazing Closure Alternative will have a countervailing effect to any past, present, or reasonably foreseeable future action which have or would reduce the functionality of riparian habitat (with the exception of instances of permanent loss of riparian habitat) and would have a compounding effect on any action that is intended to improve riparian functionality. The degree to which the Proposed Action would be

countervailing or compounding to these effects would be greater and more instantaneous than that of the proposed action. This is because there would be no attempt at utilizing DRAs which depend on specific conditions, livestock tendencies, or permittees' ability to comply. Instead, grazing pressure, whether it is a primary or secondary degradation factor, would be removed at the first observation of drought triggers.

Cumulative Effects of the No Action Alternative

Under the No Action Alternative there could be a significant loss of riparian vegetation. In cases where vegetation utilization leads to insufficient root systems, livestock and WH&B use of riparian areas would result in increased erosion and sedimentation.

The reduction in riparian vegetation as a result of grazing would increase the impacts of storm run-off. Channels could become entrenched, and flood plains become hydrologically disconnected from stream and groundwater flow resulting in the loss of riparian vegetation and the formation of dry terraces.

Based on climate models, the severity and frequency of droughts in the southwestern United States is expected to increase. Predicted climate change may result in the acceleration of the degradation of the riparian ecosystem.

Actions could be taken under the No Action Alternative to reduce, mitigate, or eliminate these impacts; however the actions would be individually assessed under NEPA and would likely take longer to implement. Because of this, the countervailing effects of those actions would occur to a lower degree compared to those that would occur under either of the action alternatives.

H. Wilderness, Wilderness Study Areas, and Lands with Wilderness Characteristics

These units are managed to maintain their natural conditions in accordance with the Wilderness Act, BLM Manual 6340 Management of Designated Wilderness, and BLM Manual 6330 Management of Wilderness Study Areas. Under this guidance, there has been little change in past management and no future management actions are anticipated. Grazing by livestock is expected to continue at historic levels. Excess wild horse and burros are expected be gathered at a similar frequency and numbers to the past. Wildfires occur seasonally and are expected to continue. Because of the unique management situation of Wilderness and Wilderness Study Areas, no Cumulative Impacts beyond impacts discussed in Chapter 3 are anticipated.

I. Lands and Realty

Cumulative Effects of the Proposed Action

There are standard operating procedures for each of the identified past, present and RFFAs to reduce or prevent impacts to land use authorizations. Therefore, the incremental impacts of the Proposed Action would not result in a measurable cumulative impact.

Cumulative Effects of the Grazing Closure Alternative

The cumulative effects of the Grazing Closure Alternative reflect those of the Proposed Action.

Cumulative Effects of the No Action Alternative

The No Action Alternative would increase response time and reduce the effectiveness of management during a drought. In many instances, current livestock and wild horse and burro management would continue with no modifications. This would lead to an overall decline in rangeland health associated with a reduction in plant cover and increased susceptibility to soil erosion. Noxious weeds and non-native invasive species are more likely to invade areas that are in poor condition. Noxious weeds increase the costs for maintenance and soil erosion could damage access to sites or the sites themselves. Increased erosion and density of noxious weeds associated with the prolonged degradation of rangeland health that would occur with the No Action Alternative would have a negative effect on Land Use Authorizations.

J. National Conservation Area

Cumulative Effects of the Proposed Action

Past, present and RFFAs cumulatively affecting cultural resources in the NCA as distinct from the rest of the Winnemucca District have been identified as disturbance to emigrant trail traces and the viewsheds of the trails. When compared with the previously identified cumulative impacts, the Proposed Action is not expected to contribute to cumulative impacts to this resource. This is because the DRAs identified in the proposed action are intended to maintain vegetation health and to limit soil erosion. Furthermore, any of the DRAs that have the potential to be ground disturbing (e.g., temporary water hauls, temporary fences and above ground pipelines) as well as use of transportation routes would be evaluated for the presence of cultural resources prior to implementation. It is possible that the cumulative and incremental effects of the Proposed Action may even be beneficial and not significant in respect to cultural and historical resources.

Cumulative Effects of the Grazing Closure Alternative

The cumulative effects of the Grazing Closure Alternative reflect those of the Proposed Action.

Cumulative Effects of the No Action Alternative

The No Action Alternative would require the preparation of separate EAs, which would delay drought response times and result in a continuation of current management practices, which are often poorly suited to drought. Drought reduces the health and production of vegetation. Without the prompt implementation of management strategies, the effects of drought can be compounded by improper livestock and wild horse and burro use. This may lead to a further reduction in plant cover and increased soil erosion. An increase in soil erosion would provide the potential for the degradation of important cultural resources. Therefore, the No Action

Alternative coupled with past, present and RFFAs known to affect cultural resources would have adverse cumulative impacts on cultural and historical resources.

K. Paleontological Resources

Cumulative Effects of the Proposed Action

Past, present and RFFAs cumulatively affecting cultural resources on the WD have been identified as wildland and prescribed fires, recreation/OHV use, general ground disturbing activities and the collection of fossils beyond the free use or specifically permitted amounts. When compared with the previously identified cumulative impacts, the Proposed Action is not expected to contribute to cumulative loss of cultural resources. This is because the DRAs identified in the proposed action are intended to maintain vegetation health and limiting soil erosion. Furthermore, any of the DRAs that have the potential to be ground disturbing (e.g., temporary water hauls, temporary fences and above ground pipelines) would be inventoried for cultural resources prior to implementation. It is possible that the cumulative and incremental effects of the Proposed Action may even be beneficial and not significant in respect paleontological resources.

Cumulative Effects of the Grazing Closure Alternative

The cumulative effects of the Grazing Closure Alternative reflect those of the Proposed Action.

Cumulative Effects of the No Action Alternative

The No Action Alternative would require the preparation of separate EAs, which would delay drought response times and result in a continuation of current management practices, which are often poorly suited to drought. Drought reduces the health and production of vegetation. Without the prompt implementation of management strategies, the effects of drought can be compounded by improper livestock and wild horse and burro use. This may lead to a further reduction in plant cover and increased soil erosion. An increase in soil erosion may further expose important paleontological resources to undesirable weathering as well as increased sanctioned and unsanctioned collecting. Therefore, the No Action Alternative coupled with past, present and RFFAs known to affect cultural resources would have adverse cumulative impacts on paleontological resources.

L. Rangeland Management

Cumulative Effects of the Proposed Action

Past, present, and RFFAs have the potential to impact livestock grazing activities, at least temporarily. It is expected that the Proposed Action could contribute to the cumulative impacts of past actions that have resulted in improved rangeland health conditions such as; rangeland health evaluations, wildland fires, habitat treatment activities, and past weed treatments. Temporary displacement of livestock as a result of actions that could occur under the Proposed Action along with past, present and RFFAs also contributes to the direct cumulative impacts to

grazing management. The Proposed Action would require an increase in grazing management practices on allotments occurring within drought afflicted areas of the WD. Depending on the DRAs selected, grazing management would be modified. This would lead to increased inputs from permittees. The cumulative effects of these inputs have been analyzed within the Social and Economic Values section of this document.

The degree to which drought impairs the range's potential for future forage production depends on the intensity, frequency and timing of grazing (Howery 1999). Lagged responses toward drought pose a threat to sustainable management of rangelands (Thurow and Taylor 1999). The proposed action would provide for the maintenance of vegetation and continuation of opportunities for grazing when past, present and RFFAs could provide additional disturbances (e.g., mineral exploration/extraction, disturbance from wildland and prescribed fire, road maintenance, etc.) across the public lands. These actions result in an increase in disturbed lands, increasing the risk of degradation of vegetative resources. Cumulatively, the indirect impact of the Proposed Action, when coupled with these particular past, present and RFFAs would improve resources available for livestock grazing management due to a reduction in the net-loss of vegetative resources.

Cumulative Effects of the Grazing Closure Alternative

In the short-term, the Grazing Closure Alternative would remove livestock from public lands and eliminate grazing management. The cumulative effects of the reduced opportunity for grazing have been analyzed within the Social and Economic Values section of this document.

In the long-term, the Grazing Closure Alternative would have similar impacts as the Proposed Action. The removal of grazing would maintain vegetative cover and reduce the potential for soil erosion and noxious weed invasion. This would provide for the sustainable management of the rangelands and provide future opportunities for grazing.

Cumulative Effects of the No Action Alternative

The No Action Alternative would increase response time and reduce the effectiveness of management during a drought. In many instances, current livestock and wild horse and burro management would continue with no modifications. This would lead to an overall decline in rangeland health associated with a reduction in plant cover and increased susceptibility to soil erosion. The No Action Alternative would directly impact rangeland health, indirectly impacting grazing management practices and levels of livestock production over the long term.

M. Recreation

Cumulative Effects of the Proposed Action

In the past, recreation within the WD has been dispersed and primitive in nature, and presently remains that way. Under the Proposed Action, reasonably foreseeable future actions include impacts on wild horse viewing, and riparian areas that are utilized for recreational purposes. In recent years, there has been an increased interest in wild horses and wild horse viewing within

the WD. Under the proposed action, gathers would be implemented in order to minimize the impacts that drought conditions would have on wild horses that are on the range. Wild horse viewers would observe horses that are in better viewing condition than if no action is taken, due to fewer horses utilizing scarce resources under drought conditions. Due to these actions, wild horse viewers would continue to come to the WD for their wild horse viewing needs. This would impact communities within the WD that rely partly on wild horse viewers as a source of income.

While limited, the WD does contain riparian resources that are frequently used for recreational purposes. Impacts under the Proposed Action include minimizing the degradation of riparian resources used for recreational purposes. If livestock management actions and wild horse and burro gathers are implemented, riparian resources wouldn't be impacted as heavily as if no action was taken. If drought conditions persisted, this would cause livestock, wild horses, and burros to seek out any remaining water sources in order to survive. This could result in large congregations of animals in riparian areas that are utilized for recreation, causing degradation to the riparian resources. Degradation could include, but is not limited to, vegetation trampling, soil compaction, erosion, and water contamination. These impacts would be minimized under the proposed action. Visitors would continue to utilize riparian resources within the WD for recreational purposes. This would have an economic impact on communities within the WD that rely partly on recreational visitors as a source of income.

Cumulative Effects of the Grazing Closure Alternative

Past and current actions within the WD include allowing for livestock grazing in areas which coincide with recreation activities. Reasonably foreseeable future actions under the Grazing Closure Alternative include a temporary impact to rangeland and riparian resources that are utilized for recreation purposes. Livestock would not cause impacts such as, vegetation trampling, soil compaction, erosion, and water contamination. These measures would protect rangeland and riparian resources within the WD, and allow them to remain suitable areas for recreation. This would have an economic impact on communities within the WD that rely partly on recreational visitors as a source of income.

Cumulative Effects of the No Action Alternative

In the past, recreation within the WD has been dispersed and primitive in nature, and presently remains that way. Impacts under the No Action Alternative include reduced wild horse viewing, and a degradation of riparian areas used by recreationists. In recent years, there has been an increased interest in wild horses and wild horse viewing within the WD. If no action is taken and rangeland and riparian resources deteriorate under drought conditions, this would affect the health of wild horses that are on the range. Wild horse viewers could see horses in malnourished conditions, and could view horses that are near death or have died due to these conditions. This would have an impact on wild horse viewing within the WD. This impact could cause wild horse viewers to search for other wild horse viewing opportunities outside of the WD. This

would result in an economic impact on communities within the WD that rely partly on wild horse viewers as a source of income.

While limited, the WD does contain riparian resources that are frequently used for recreational purposes. Reasonably foreseeable future actions under the No Action Alternative would include a degradation of the riparian resources within the WD. Under the No Action Alternative, changes in livestock management and wild horse and burro gathers would be delayed. If drought conditions persisted, this would cause livestock, wild horses, and burros to seek out any remaining water sources in order to survive. This could result in large congregations of animals in riparian areas that are utilized for recreation, causing degradation to the riparian resource. Degradation could include, but are not limited to, vegetation trampling, soil compaction, erosion, and water contamination. These impacts could cause recreation users to search for other recreation areas outside of the WD. This would result in an economic impact on communities within the WD that rely partly on recreational visitors as a source of income.

N. Social and Economic Values

Cumulative Effects of the Proposed Action

In the short-term, the Proposed Action could adversely impact ranchers who hold BLM grazing permits due to costs incurred to implement DRAs. However, in the long-term, ranchers would benefit from improved rangeland health conditions. Wildlife, wild horses and burros would also benefit from the increased production rates of forage and habitat improvement.

The Proposed Action does not induce substantial growth or concentration of population; displace a large number of people; cause a substantial reduction in employment; reduce wage and salary earnings; cause a substantial net increase in county expenditures; or create a substantial demand for public services. In the volatile economy of the foreseeable future, it is expected that the cumulative and incremental socioeconomic effects of the Proposed Action, would be beneficial and not significant.

Cumulative Effects of the Grazing Closure Alternative

In the short-term, the Grazing Closure Alternative could adversely impact ranchers who hold BLM grazing permits due to costs incurred to provide alternate livestock forage. However, in the long-term, ranchers could benefit from improved rangeland health conditions. Wildlife, wild horses and burros would also benefit from the increased production rates of forage and habitat improvement.

This alternative does not induce substantial growth or concentration of population; displace a large number of people; cause a substantial reduction in employment; reduce wage and salary earnings; cause a substantial net increase in county expenditures; or create a substantial demand for public services. In the volatile economy of the foreseeable future, it is expected that the cumulative and incremental socioeconomic effects of the Grazing Closure Alternative, would be beneficial and not significant.

Cumulative Effects of the No Action Alternative

The No Action Alternative would require the preparation of separate EAs, which would delay drought response times and potentially result in a continuation of management practices that are employed during times of normal precipitation. Current management practices may be poorly suited to drought. Under the No Action Alternative, therefore, current management of livestock and wild horses and burros could temporarily continue during drought due to delays in approval and implementation of DRAs and could potentially lead to the degradation of upland and riparian health. If DRAs were not promptly implemented during prolonged drought conditions, cumulative degradation of rangeland health could occur, resulting in grazing allotments failing to meet rangeland S&Gs in the future. If individual DRA EAs were not approved and adopted, BLM could cancel portions of or entire permits on allotments that fail to meet S&Gs, which may adversely impact affected permittees. Additionally, declining conditions of the rangelands may be coupled with declining conditions of livestock, wild horses and burros and wildlife. During periods of prolonged drought, profits of ranchers would decline. This may or may not lead to existing ranches becoming economically unviable. The BLM assumes that if existing ranches fail, some other corporation or individual may step in to purchase the base property and grazing privileges. It is not possible to foresee which base properties, if any, may change out of livestock production and into some other form of business. If base properties do remain active for livestock production, the industry as a whole would continue to exist but under different ownership and likely with reduced income.

O. Soils

Cumulative Effects of the Proposed Action

Past, present and RFFAs such as historic grazing management, range improvement construction, mining exploration/extraction, wild horse and burro use, OHV use, and wildland and prescribed fires have impacted soils, at least temporarily, in the form of soil compaction, loss of soil-site stability and changes in physical and/or biological processes. These impacts, which may be in the form of compaction, erosion, loss of soil structure, or a combination of the three, are dependent upon the size and nature of the actions that have or may occur across the landscape. Other activities that have resulted in improved rangeland health have been implemented to improve soil site stability such as changes in grazing management, removal of excess wild horses and burros, mining exploration/extraction reclamation, emergency stabilization and rehabilitation activities and authorization of various range improvement projects.

There is broad agreement that improper grazing can negatively impact various rangeland ecosystem functions and degrade ecosystem services (Belsky et al. 1999; Briske et al. 2008; Tate et al. 2004). This is especially true during drought, when plant production and vigor is reduced and plants become increasingly vulnerable to grazing. The quality of the soil determines the nature of plant ecosystems and the capacity of land to support animal life, vegetation and society (Brady and Weil 2002). Soil erosion decreases the capacity of the soil to provide these services. The erosion hazard during drought is increased when prolonged grazing pressure further reduces plant cover (Thurow and Taylor 1999).

The livestock and wild horse and burro management strategies described in the Proposed Action would provide for the maintenance of soil cover. The Proposed Action would also limit the impact to riparian areas where improper management can lead to increased erosion in a short amount of time. It is expected that the cumulative and incremental effects of the Proposed Action would be beneficial and not significant in respect to soils.

Cumulative Effects of the Grazing Closure Alternative

The cumulative effects of the Grazing Closure Alternative reflect those of the Proposed Action.

Cumulative Effects of the No Action Alternative

Increases in wind and water erosion are positively correlated to reduced plant cover. Marshal (1973) found that wind velocity, and its potential to detach and transport dry soil, exponentially increases near the ground as vegetation's sheltering effect is reduced. The Society for Range Management Task Group in Concepts and Terminology (1995) concluded that erosion was a function of protective attributes of vegetation (e.g., cover, biomass, density of plants). The No Action Alternative would increase response time and reduce the effectiveness of management during a drought. In many instances, current livestock and wild horse and burro management would continue with no modifications. This would lead to an overall decline in rangeland health associated with a reduction in plant cover and increased susceptibility to soil erosion. Therefore, it is expected that the No Action Alternative would have a negative effect on soils within the WD.

P. Vegetation

Cumulative Effects of the Proposed Action

Past, present and RFFAs brought forward in Table 18 have resulted in potential direct and indirect impacts to vegetative resources. Most actions that occur have resulted in the improvement of vegetative communities as a whole. Activities such as rehabilitation/restoration projects, noxious/invasive weed treatments, changes in grazing management, and removal of wild horses and burros have had direct impacts to vegetative communities by improving vegetative health (vigor, density, and production). Activities such as the implementation of range improvement projects are designed to improve vegetative conditions by modifying livestock distribution patterns within an area. Improved livestock distribution patterns limit grazing pressures on vegetative resources within a given area therefore allowing for an increased vigor, density, and productive response. Where impacts have resulted in a loss of vegetation (e.g., mining, wildland and prescribed fires, geothermal exploration, OHV use) mitigation efforts are typically incorporated in order to limit a net loss across the landscape.

During drought, it is imperative that proper grazing management occurs. The Proposed Action is designed to reduce the impacts of livestock and wild horse and burro use on vegetation during drought.

To survive, perennial plants must accumulate both above ground (shoot growth) and below ground (root growth) biomass through the process of photosynthesis, transpiration, and respiration (Howery 1999). Excessive removal of above ground biomass during the growing season reduces root growth. A healthy root system is paramount in the growth of any range plant, especially during dry years when competition for water and nutrients is most severe (Bedell and Ganskopp 1980). Proper use of range forage allows plants to survive dry periods, recover quickly, and provide cover to protect the soil and promote water infiltration (Hanselka and White 1986). The DRAs described in the Proposed Action are intended to ensure that adequate residual plant material is left to protect the soil and provide for sustainable plant production. Maintenance of native plants is crucial for the continuation of healthy and diverse plant communities, therefore, it is expected that the cumulative and incremental effects of the Proposed Action would be beneficial in respect to vegetation.

Cumulative Effects of the Grazing Closure Alternative

The cumulative effects of the Grazing Closure Alternative are similar to those of the Proposed Action. However, the Grazing Closure Alternative does not provide an opportunity for targeted grazing of non-native species, which could be used to enhance the production of perennial grasses by reducing plant competition and minimizing soil moisture depletion.

Cumulative Effects of the No Action Alternative

The degree to which drought impairs the range's potential for future plant production depends on the intensity, frequency, and timing of grazing (Howery 1999). Thurow and Taylor (1999) found that unsustainable range use leads to erosion, crusting and degraded vegetation. This causes an increase in the frequency and consequences of drought. Excessive removal of above ground biomass during the growing season reduces root growth. A healthy root system is paramount in the growth of any range plant, especially during dry years when competition for water and nutrients is most severe (Bedell and Ganskopp 1980). As plants are overgrazed their root system is reduced which in turn limits their ability to capture and use soil moisture.

The No Action Alternative would require the preparation of separate EAs, which would delay drought response times and potentially result in a continuation of current management practices, which are often poorly suited to drought. Therefore, it is expected that the No Action Alternative would have negative cumulative impacts on vegetation. Overuse of vegetation during drought would directly impact the health of vegetation and reduce the ability of vegetative communities to use soil nutrients and water even during times of average precipitation.

Q. Wild Horses and Burros

Cumulative Effects of the Proposed Action

Since 1975, the WD has been conducting periodic gathers to remove excess wild horses and burros. Through this time, populations of individual HMAs have fluctuated. Emergency drought or wildfire gathers have also been conducted on several HMAs.

Past activities, which may have affected wild horses and burros, include livestock grazing through the impacts on vegetation condition and availability, as well as water quality and quantity, and drought. Wild horse and burro use/overpopulation and gathers to remove excess animals are likely to have the largest impact on the quality of habitat used by wild horses and burros and thus on the health and long term success of animals on the range. Other actions have included mining and mineral exploration, wildfire suppression and rehabilitation, range improvement projects including water developments and vegetation treatments, geothermal development, oil and gas exploration, power line development, recreational activities and fence construction.

Currently, the population of the 20 HMAs administered by the WD is approximately 5,058 wild horses and 276 burros. Several HMAs maintain populations in excess of AML, and maintenance gathers are being proposed for 2013 to remove excess animals. Permitted livestock use is the primary use that occurs within the associated allotments in addition to the use by wild horses and burros and wildlife. Geothermal exploration and development is taking place in several HMAs, as well as ongoing mineral exploration and mining. Vegetation and fuels treatments are currently being analyzed and implemented.

Rangeland Health Evaluations (RHE) are currently being completed in several HMAs. Once data is collected and analyzed, Standards for Rangeland Health will be evaluated and if necessary, changes to livestock and wild horses or burro use would be recommended and implemented through decisions, following consultation with the interested public.

Future activities which could occur include adjustments to livestock grazing numbers or season of use, water developments, spring enclosures, solar, geothermal and mine development, and mineral or geothermal exploration activities. The future may also involve further adjustments (increases or decreases) to AMLs and development of Herd Management Area Plans (HMAPs). Other activities, such as future gathers to maintain AML, implementation of fertility control and/or modification of sex ratios within the HMAs could occur. Should future genetic analysis indicate concerns with genetic viability, specific treatment protocols would be developed to address these concerns such as potential augmentation of wild horses or burros from other similar HMAs.

The BLM would continue to conduct monitoring to assess progress towards meeting the Sierra Front Northeastern Great Basin RAC Standards and Guidelines, Rangeland Health Standards and RMP objectives. Wild horses and burros would continue to be a component of the public lands, managed within a multiple use concept.

While there is no anticipation that amendments to the Wild Free-Roaming Horses and Burros Act would change the way wild horses would be managed on the public lands, the Act has been amended three times since 1971. Therefore, there is potential for amendment as a reasonably foreseeable future action.

Cumulative beneficial effects from the Proposed Action are expected, and would include improvement of the rangeland vegetation and riparian areas, which in turn positively impact

wildlife, wild horse populations, and livestock as forage and water availability and quality is protected from the effects of drought.

The combination of the past, present, and reasonably foreseeable future actions, along with the Proposed Action, should provide the best opportunity to maintain stable wild horse and burro populations, healthier rangelands and animals, and avoid future emergency situations.

The Proposed Action would contribute to isolated areas of disturbed vegetation through the gather activities. Due to the small size or short duration of the disturbance, cumulative impacts associated with the Proposed Action, when compared to the overall CESA, are expected to be negligible especially when identified mitigation measures are implemented.

The Proposed Action is expected to result in indirect impacts that would contribute to improved rangeland health. In the long term, the DRAs in addition to foreseeable actions (such as changes to livestock management systems) would lead to improved habitat for wild horse, burros and wildlife. The actions identified for Livestock and Wild Horses and Burros, whether implemented alone or in combination would promote recovery of native vegetation affected by drought as well as reduce or eliminate additional degradation to vegetation and riparian areas.

With implementation of the Proposed Action, excessive use by wild horses or burros would be minimized or avoided. Key forage species would improve in health, abundance and robustness, and would be more likely to set seed and reproduce, which in turn would contribute to their increase within the plant community. As future wild horse or burro decisions are implemented and future gathers conducted to remove excess animals and maintain AML, these impacts are expected to continue and result in overall improvements to the forage availability for livestock, wild horses and burros and wildlife. Habitat would be protected from further losses of important key forage species, which would increase in frequency, vigor and production. Improved habitat condition would lead to improved equine body condition, healthier foals, and ensure herd sustainability through drought years.

No additional impacts would be expected from relocating wild horses and/or burros within HMAs beyond those identified for the other Drought Response Actions. Over the course of time, animals would be expected to re-distribute throughout the HMA, and long term distribution patterns would not be affected.

Cumulative Effects of the Grazing Closure Alternative

Cumulative impacts of this alternative in combination with all other past, present and future actions would consist of enhanced rangeland health in the long term as recovery from drought ensues in the absence of livestock grazing. Effects to wild horses and burros would be a degree of improved quantity and quality of forage and water in the short term and potentially in the long term if recovery from drought and subsequent impacts to rangeland health is notable. Future impacts from overpopulation of wild horses or burros, changes to livestock management or actions that cause changes to animal distribution on the range (including future or continued

drought) could negate impacts from this alternative in the long term. There are however, no adverse impacts to wild horses or burros anticipated from this alternative.

Cumulative Effects of the No Action Alternative

The No Action Alternative would not result in any long-term cumulative benefits to any rangeland user. The No Action Alternative would allow continued degradation of vegetation by wild horses or burros within drought affected rangeland, which would cause continued loss of key perennial forage species replaced by less palatable and nutritious native and non-native plants.

In HMAs which support inadequate resources in relation to the population of animals, emergency conditions for wild horses and burros could result. No other past, present or reasonably foreseeable actions would offset the potentially irreparable damage to the range. Lack of appropriate management action at this time could result in future decisions to reduce AML or eliminate portions of HMAs from long term management due to lack of resources.

Without an emergency gather to remove the stressed animals, a large portion of the population could die. Animal health, particularly wild horses and burros would be affected for many years as the range begins to recover from drought under the pressure of a population of animals that is out of balance with the resources.

Deterioration of uplands and riparian areas would not ensure healthy habitat for future generations of wild horses, burros or wildlife. Chronic and long term degradation of rangeland resources could result in irreparable damage to the arid habitat and could result in the need to permanently remove all wild horses and burros from the range in certain HMAs, cumulatively resulting in reduced AML or discontinuing long term management of wild horses or burros due to lack of suitable habitat. In the long term, the No Action Alternative would result in reductions or elimination of livestock grazing due to degraded range conditions, and a severe reduction or extirpation of native wildlife in most seriously affected areas.

R. Wildlife, Special Status Species, Migratory Birds and Threatened and Endangered

Cumulative Effects of the Proposed Action

Past, present, and RFFAs brought forward in Table 18 have resulted in and would continue to result in impacts to wildlife habitat and wildlife. For the purpose of this section of the analysis and because the basic principles of the impacts are the same or similar, the impacts to general wildlife, BLM special status species (including plants), Threatened, Endangered, and Candidate Species, and migratory birds are collectively discussed. As previously state, due to the inherent vulnerability associated with T, E, &C and BLM special status species, results of impacts could be intensified.

The past human activities related to mining, geothermal development, OHV trails and to a lesser degree fence construction and permitted grazing have altered the natural environment

dramatically by degrading, decreasing, fragmenting, or eliminating natural wildlife habitat (food, water, cover, space, and arrangement). Various degrees of resource consumption by these activities (primarily water use and vegetation removal, but also space) have increased the competition for these resources with wildlife. Woodcutting (firewood) and Christmas tree harvesting is limited to certain ranges within the district therefore impacts of those activities (loss of cover and cavities, food, soil stability) are cumulative to those areas, but not district wide.

Wildfires, started from natural or human causes are devastating to the Great Basin ecosystem. Because of the slow recovery process and overwhelming presence of invasive annual grasses, wildfire rehabilitation, invasive and noxious weed treatments and habitat and vegetation improvement treatments have had mixed success in restoring and maintaining native vegetation.

The removal of wild horses and burros has reduced competition with wildlife for natural resources.

The impacts to wildlife and wildlife habitat by the RFFAs will be the same as those associated with past activities listed in Table 18. The extent of the cumulative effects of those impacts will be dependent upon the size, duration, and nature of the action.

Although the specific impacts of the Proposed Action vary depending on the wildlife species and its habitat requirements, the Drought Response Actions (DRAs) are designed to lessen the impacts of drought and allow for the protection of resources required for viable wildlife populations to persist over the long-term. The underlying goal of the actions is to promote sound conservation practices to protect soil, water, and native vegetation for future use by livestock, wildlife, and wild horses and burros.

Any action taken to preserve the integrity of native vegetation and enhance its ability to grow and reproduce will impact the value of rangeland habitat to wildlife. Protection of riparian areas and other natural water sources are as imperative to maintain the diversity of wildlife found here. The impacts of the pro-active approach of the Proposed Action could lessen the detrimental outcome of habitat loss due to future human activity.

Cumulative Effects of the Grazing Closure Alternative

For the purpose of this section of the analysis and because the basic principles of the impacts are the same or similar, the impacts to general wildlife, BLM special status species (including plants), Threatened, Endangered, and Candidate Species, and migratory birds are collectively discussed. As previously state, due to the inherent vulnerability associated with T, E, &C and BLM special status species, results of impacts could be intensified.

Any action taken to preserve the integrity of native vegetation and enhance its ability to grow and reproduce will impact the value of rangeland habitat to wildlife. This alternative would allow the rangeland and riparian/water sources within the allotment a temporary reprieve from the impacts of decreased plant vigor, vegetation removal or trampling, soil compaction, erosion,

water depletion and streambank destabilization resulting from livestock grazing, thus allowing native plants a better opportunity of re-emergence. The extent of the cumulative effects of those impacts will be dependent upon the size of the allotment and duration of the closure, as well as the number of allotments closed throughout the district.

Cumulative Effects of the No Action Alternative

For the purpose of this section of the analysis and because the basic principles of the impacts are the same or similar, the impacts to general wildlife, BLM special status species (including plants), Threatened, Endangered, and Candidate Species, and migratory birds are collectively discussed. As previously state, due to the inherent vulnerability associated with T, E, &C and BLM special status species, results of impacts could be intensified.

Under the No Action Alternative, current livestock and wild horses and burros management would not change during drought and would compound the impacts of habitat alteration and destruction due to livestock grazing. Over the short-term, impacts to wildlife include declines in physiological condition leading to depressed reproductive output and increased mortality. Persistent drought conditions would result in the cumulative degradation and potentially irreparable damage to rangeland health and lead to significant declines in wildlife populations due to direct mortality (starvation, increased predation) or decreased reproductive success. Local extinctions, and reduced connectivity between extant populations resulting in reduced genetic variability (thus further compromising the viability of a population), would also occur. Impacts would be significant for species that depend on surface water and/or riparian areas for portions of their life history. Due to the inherent vulnerability associated with T, E, &C and BLM special status species, detrimental impacts could lead to elevating the status of a species or extinction.

VI. CONSULTATION, COORDINATION, AND LIST OF PREPARERS

5.1 Consultation

Native American Consultation
Consultation letters were sent out to the following tribes on December 26, 2012: the Battle Mountain Band, the Fallon Paiute-Shoshone Tribe, Fort McDermitt Paiute-Shoshone Tribe, the Lovelock Paiute Tribe, the Pyramid Lake Paiute Tribe, the Reno-Sparks Indian Colony, and the Summit Lake Paiute Tribe.

5.2 Coordination

US Fish and Wildlife Service

5.3 List of Preparers

Bureau of Land Management, Winnemucca District:

Mark Hall	Native American Concerns/Cultural
Rob Bunkall	Maps
Jason Spence	Rangeland Management
Julie XXX	Social and Economic Values
Kristine Struck	ACECs/Wilderness/Wilderness Study Areas
Greg Lynch	Wildlife/Threatened and Endangered Species/Special Status Species
Melanie Mirati	Wild Horse and Burro
Nancy Spencer-Morris	Wildlife/Threatened and Endangered Species/Special Status Species
John McCann	Air Quality/Water Quality/Wetland and Riparian Zones
Rob Burton	Soils
Eric Baxter	Vegetation
Derek Messmer	Vegetation
Calvin Jennings	Cultural Resources/Paleontological Resources
Debbie Dunham	Lands and Realty
Joey Carmosino	Recreation
Lynn Ricci	Planning and Environmental Coordinator
Kathy Attaman	National Conservation Area

Bureau of Land Management, Nevada State Office:

Alan Shepherd	Nevada Wild Horse and Burro Program Lead

5.4 Public Outreach

Scoping was conducted during January of 2013. A letter regarding the BLMs proposal was sent to nearly 400 potentially affected interests including individuals and organizations. The letter was also provided on the Winnemucca District web page.

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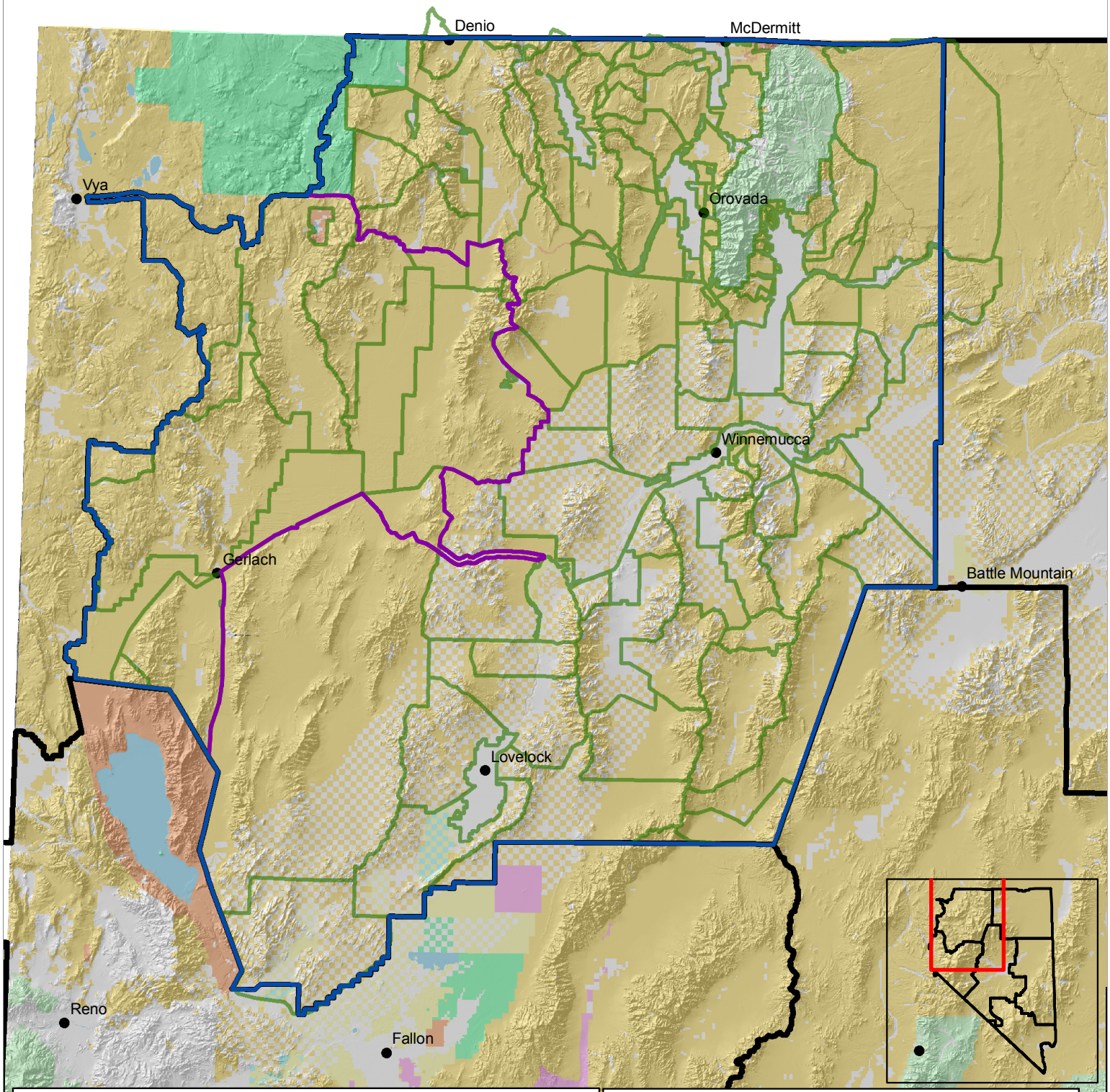
Maps – Winnemucca District

Winnemucca District Allotments
Map 1



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Miles

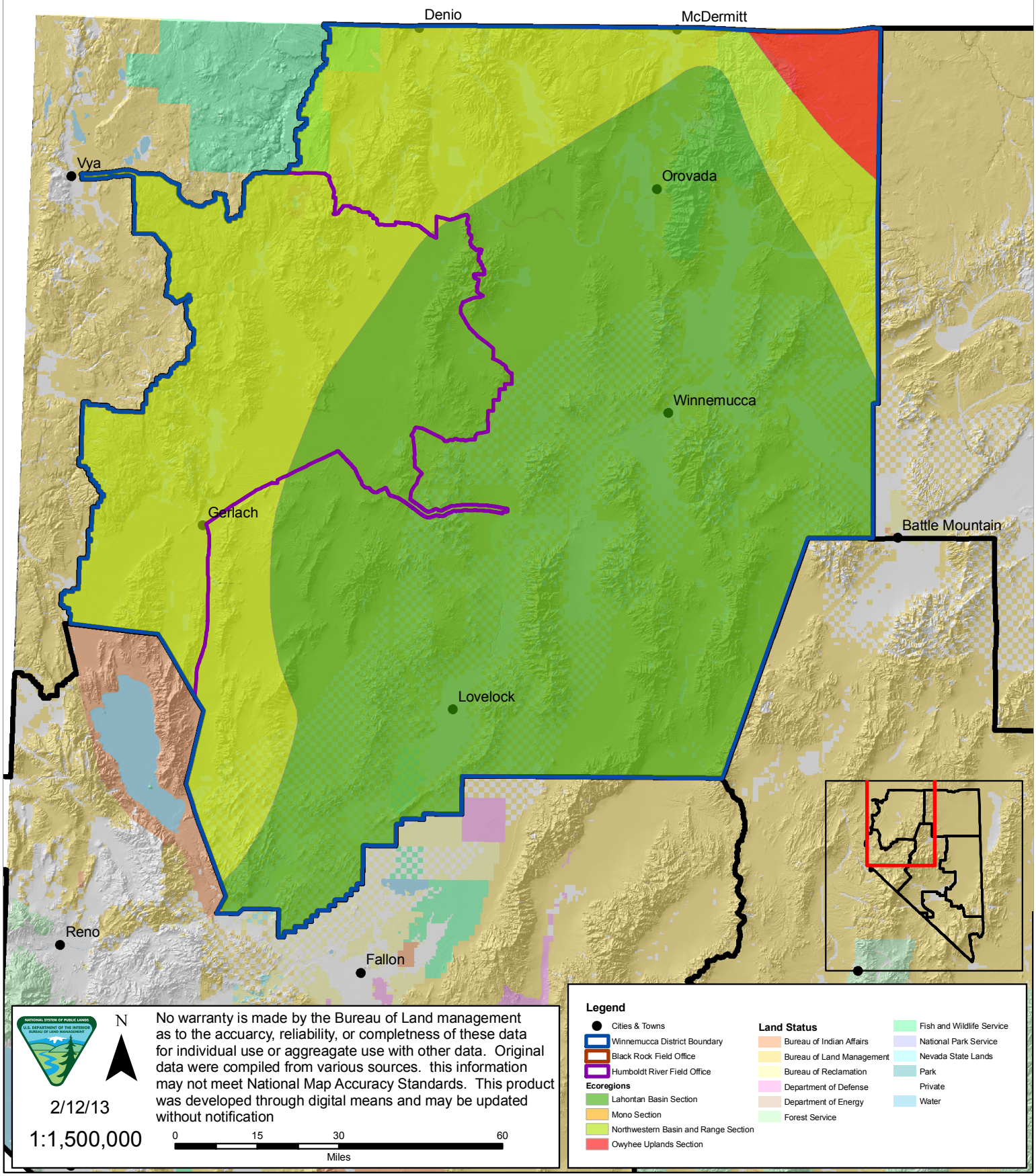
Legend

- Cities & Towns
- Winnemucca District Boundary
- Black Rock Field Office
- Humboldt River Field Office
- Winnemucca Allotments

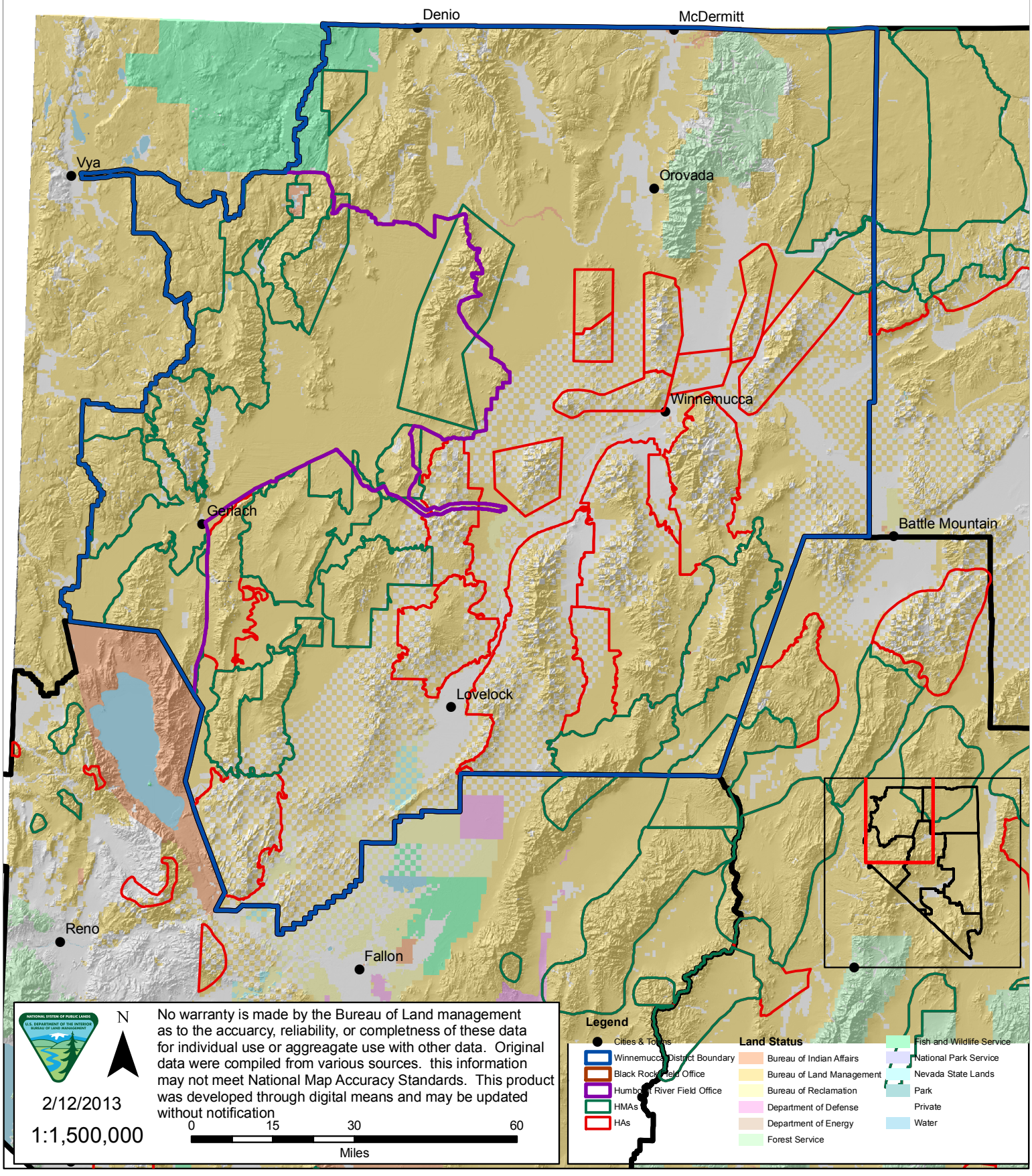
Land Status

- Bureau of Indian Affairs
- Bureau of Land Management
- Bureau of Reclamation
- Department of Defense
- Department of Energy
- Forest Service
- Fish and Wildlife Service
- National Park Service
- Nevada State Lands
- Park
- Private
- Water

Winnemucca District Ecoregions
Map 2



Winnemucca District Herd Managment Areas
Map 3



Appendix 1 – Winnemucca District Drought Detection and Monitoring Plan

BUREAU OF LAND MANAGEMENT

Winnemucca District

Drought Detection and Monitoring Plan

February 2013

This monitoring plan contains a description of drought indicators and response triggers that would be used to facilitate the detection and monitoring of drought conditions. This document also provides a description of the monitoring methods that would be used to determine if drought response triggers have been met.

Table of Contents

Winnemucca District
Drought Detection and Monitoring Plan

I. Introduction

Drought, a normal part of the climate for virtually all regions of the United States, is of particular concern in the west where an interruption of the region's already limited water supplies for extended periods of time can produce devastating impacts (Wilhite 1997). Drought has been defined by the Society for Range Management as, "(1) A prolonged chronic shortage of water, as compared to the norm, often associated with high temperatures and winds during spring, summer, and fall. (2) A period without precipitation during which the soil water content is reduced to such an extent that plants suffer from lack of water." (Bedell 1998).

The Winnemucca District (WD) is located within the Central and Northern Basin and Range ecoregions defined by the Western Ecology Division of the United States Environmental Protection Agency. Drought is considered to be a recurring event within both ecoregions. The early detection and rapid response to drought is needed to minimize degradation to affected resources. The purpose of this monitoring plan is to describe the drought indicators and response triggers that will be used to facilitate the detection and monitoring of drought conditions and determine if the activation of drought response actions (refer to the Winnemucca District Drought Response Plan EA Proposed Action) is needed. This document also provides a description of the monitoring methods that will be used to determine if the drought response triggers have been met.

II. Goals

The early detection of drought is necessary for effective management during drought. The following list outlines the goals of the Winnemucca District Drought Detection and Monitoring Plan:

Goal 1: Provide for the early detection of drought conditions.

Goal 2: Identify and minimize degradation to affected resources on lands affected by drought.

Goal 3: Define Drought Response Triggers (DRT) that would be used to distinguish site specific drought levels and activate drought response actions (refer to the Drought Response Plan).

Goal 4: Monitor the condition of plants and water resources.

Goal 5: Monitor weather, plants and water conditions and identify when drought conditions have ceased.

III. Drought Indicators

Drought indicators are observations signaling the start or continuation of a drought. The following discussion identifies the indicators that the WD would use to determine the onset and/or continuation of a drought.

To determine if there is a chronic shortage of water, as compared to the norm, the U.S. Drought Monitor (http://droughtmonitor.unl.edu/)[2] would be consulted to identify drought afflicted areas. Site visits to the drought afflicted areas would be used to evaluate the current condition of water resources and determine if water shortages exist.

To determine if vegetation is suffering from the lack of water, the U.S. Drought Monitor and the Vegetation Drought Response Index (VegDRI) (http://vegdri.unl.edu/)[1] would be consulted to determine drought afflicted areas and vegetation condition as it pertains to drought stress. Site visits to drought afflicted areas would be used to evaluate the current condition and production of key species as described in the associated Ecological Site Descriptions (ESDs) for the area. In instances where key species referenced in the ESD are absent, alternative key species would be identified using site-specific and/or past monitoring data. Evaluations would be used to determine if plants are exhibiting signs of drought stress and if vegetation shortages exist. Signs of drought stress include, but are not limited to reduced shoot and leaf growth, reduction in seed head development, induced senescence (i.e., premature aging) and plant mortality.

The U.S. Drought Monitor can be accessed at http://droughtmonitor.unl.edu/. The Vegetation Drought Response Index can be accessed at http://vegdri.unl.edu/Home.aspx.

IV. Drought Monitoring

4.0. Drought Response Triggers

When it is determined that drought conditions exist, site visits to drought afflicted areas will occur where drought monitoring would be completed for both upland and riparian areas. Drought Response Triggers (Triggers) will be used to determine site specific drought affects and activate drought response actions. Triggers are thresholds associated with vegetation and water resources that indicate the need for response. Triggers would be used separately or in combination to activate Drought Response Actions. The following is a list of the triggers:

A. Water

This DRT is based on the presence or absence of available water. Field visits would be conducted in drought afflicted areas to determine if there are adequate water sources (natural and/or developed) to provide for the management and/or distribution of fisheries, wildlife, wild

[2] In the event the U.S. Drought Monitor or the Vegetation Drought Response Index is abandoned or another more accurate service becomes available, the BLM will consult with the most widely recognized source of relevant data.

horses and burros and livestock while maintaining riparian area functionality and the health of upland areas surrounding developed water sources (e.g.,, wells, pipelines, guzzlers, etc.). Water would be classified as available or unavailable. Available is defined as an amount of water sufficient to provide a safe and reliable source of water for fisheries, wildlife, wild horses and burros and livestock while maintaining resource values. Resource values associated with riparian areas include riparian vegetation, bank stability, wildlife habitat and water quantity and quality. Resource values associated with upland areas include vegetation, nutrient cycling, soil site stability, hydrologic function and wildlife habitat.

Unavailable is defined as an absence of water or quantity/quality of water that is insufficient to provide a safe and reliable source of water for fisheries, wildlife, wild horses and burros and livestock while maintaining resource values.

Field observations and professional judgment would be used to determine availability. Criteria such as reduced quantity/quality of water, noticeable accumulation of animal waste and unsafe conditions due to mud or unstable banks would be used.

B. Vegetation

To survive, perennial plants must accumulate both above ground (shoot growth) and below ground (root growth) biomass through the process of photosynthesis, transpiration, and respiration (Howery 1999). A lack of available soil moisture usually reduces the length of the growing season. A shorter growing season directly impacts above and below ground production and ultimately vegetation quantity. The degree to which drought impairs the range's potential for future production depends on the intensity, frequency, and timing of grazing (Howery 1999). Drought afflicted rangelands are unable to support pre-drought stocking levels. Overutilization during drought can negatively impact plant health and impair the ability (in the future) to meet, or make significant progress towards fulfillment of the standards and guidelines for rangeland health.

The following DRTs associated with vegetation are intended to ensure proper utilization levels of upland and riparian key species, as described in the associated ESD. In instances where key species referenced in the ESD are absent, alternative key species would be identified using site-specific and/or past monitoring data. Appropriate utilization levels provide adequate residual matter for the maintenance of plant health especially during a drought. These DRTs have been organized into three categories; utilization and stubble height by vegetation community, livestock distribution and plant production/drought stress.

1. Utilization and Stubble Height

Utilization triggers were developed using the guidelines proved by Holechek et al. (1988). The guidelines provide a range of use associated with rangeland condition. The lower utilization levels will be the trigger which is consistent with the levels suggested for ranges in poor condition. These were chosen due to the reduced vigor and production of plants resulting from drought. The following utilization levels would function as drought response triggers within each respective vegetation community and would trigger the implementation of DRAs. Stubble

height triggers were developed to ensure adequate residual matter remains to maintain riparian plant communities. Generally, stubble heights of 4 to 6 inches provide effective stream bank protection, prevent sedimentation that is out of balance with the water and sediment being applied, and maintain or improve plant communities (USDI 1999-2001). Key species would be identified using the ESD for a specific area. In instances where key species referenced in the ESD are absent, alternative key species would be identified using site-specific and/or past monitoring data.

- **Salt Desert Shrub**
  - 25 % utilization of key species.
- **Sagebrush Grassland**
  - 30% utilization of key species.
- **Pinyon-Juniper Woodland**
  - 30% utilization of key species.
- **Mountain Shrub**
  - 30% Utilization of key species.
- **Riparian Zones**
  - 6 inch stubble height of key riparian species.
  - 20% utilization of key woody species.

2. Livestock\ Wild Horse and Burro Distribution

A pattern of use or distribution of livestock and/or wild horses and burros resulting in a concentration of animals, which contributes to grazing in excess of the aforementioned utilization levels and/or stubble heights, would trigger DRAs to improve animal distribution and minimize rangeland degradation.

3. Plant Production/Drought Stress

The following plant production and/or drought stress indicators would trigger DRAs:

- Drought induced senescence or reduced production of key upland and/or riparian species which results in an insufficient quantity/quality of vegetation for wildlife, wild horses and burros and/or livestock;
- Drought induced senescence of key riparian herbaceous species which results in insufficient plant growth/height to provide for stubble heights equal to or greater than six inches within riparian areas; and
- Noticeable signs of drought stress which impede the ability of key species to complete their life cycle (e.g., drought induced senescence, reduced seed head development, etc.).

4.1 Monitoring Methods

The sections below provide summaries of (1) the protocol for each trigger to be monitored, including general techniques and key information to be collected and (2) the authors and organizations that developed the protocol. All monitoring data will be recorded on the appropriate monitoring forms and summarized.

A. Water

A BLM monitoring protocol does not currently exist to quantify the availability of water for wildlife, wild horses and burros and livestock. Therefore, field observations and professional judgment will be used to determine if an adequate amount of water is available. Water will be rated using the criteria described in section 4.0 (A) of this document.

B. Utilization and Stubble Height

The key species method will be used to determine utilization levels. This method is adapted to areas where perennial grasses, forbs and/or browse plants are the key species. A key species is determined for the monitoring location based on the vegetation community defined in the Ecological Site Description correlated to the location. In instances where key species referenced in the ESD are absent key species will be identified using site specific and/or past monitoring data.

A transect bearing and distance between observation points is selected. Utilization levels are based on an ocular estimate of the amount of forage removed by weight on individual key species and observations are recorded in one of seven utilization classes rather than as a precise amount. Different examiners are more likely to estimate utilization in the same classes than to estimate the same utilization percentages (USDA and USDI 1996). Utilization estimations are improved through a calibration process prior to the collection of utilization data. Sampling techniques include; walking the pre-determined transect, stopping at the pre-determined interval and estimating and recording the percent utilization of the key species nearest the toe.

The stubble height method will be used to determine stubble heights within riparian areas and areas identified for targeted grazing. Stubble height standards and measurements have been used primarily in riparian areas; however, this method may also be used for upland sites. The concept of this method is to measure stubble height, or height (in centimeters or inches) of herbage left un-grazed at any given time. This method, because of its simple application, is becoming a well-accepted method for expressing rangeland use (USDA and USDI 1996). A key species is determined for the monitoring location based on the vegetation community defined in the Ecological Site Description correlated to the location. In instances where key species referenced in the ESD are absent key species will be identified using site specific and/or past monitoring data. A transect bearing and distance between observation points is selected. Sampling techniques include; walking the pre-determined transect, stopping at the pre-determined interval and measuring and recording the stubble height of the key species nearest to the toe.

A complete description of these methods, as well as a copy of the appropriate monitoring forms can be found in the Utilization Studies and Residual Measurements Interagency Technical Reference 1996.

C. Livestock\Wild Horse and Burro Distribution

The Landscape Appearance Method will be used to determine the distribution of livestock across allotments determined to be affected by drought. This method is adapted to areas where perennial grasses, forbs, and/or browse plants are present and to situations where utilization data must be obtained over large areas using only a few examiners. The method uses an ocular estimate of forage utilization based on the general appearance of the rangeland (USDA and USDI 1996). Utilization levels are determined by comparing observations with written descriptions of each class. A transect bearing and distance between observation points is selected. Sampling techniques include; moving along the pre-determined transect, stopping at the pre-determined interval and estimating and recording the utilization class at each observation point.

A complete description of this method, as well as a copy of the appropriate monitoring form can be found in the Utilization Studies and Residual Measurements Interagency Technical Reference 1996.

Wild horse and burro distribution will be evaluated using inventory flights and on the ground observations including trailing, horse and burro scat (droppings) and horse and burro location observations. Location observations will include numbers, behavior, body condition and sighted location.

D. Plant Production and Drought Stress

Visual appraisal of production will be used to determine the amount of forage currently available for wildlife, wild horses and burros and livestock. Visual appraisal of production is an efficient means to check whether forage supply and demand are in balance (Allison 2001). Areas determined to be affected by drought will be visited and a visual appraisal of production will be completed. Areas visited will receive one of the following production scores as defined in Allison (2001):

Production Scores		
1.	Extreme Drought	No growth occurred this year.
2.	Below-Average Production	Production appears less than most years.
3.	Average Production	Production is comparable to most years.
4.	Above-Average Production	Production is greater than most years.
5.	Extremely Wet Year	Excellent growing season. Range production is at maximum potential.

Current year's production will be compared to production data collected in past years. When production data is not available "average production" will be determined for the monitoring location through professional judgment, consultation with local permittees, and based on the normal production as defined in the Ecological Site Description correlated to the location. A complete description of this method can be found in the Level II monitoring section of Allison, C.D., Baker, T.T., Boren, J.C., Wright, B.D., and Fernald, A. 2001. Monitoring Rangelands in New Mexico: Range, Riparian, Erosion, Water Quality and Wildlife. Range Improvement Task Force, Agricultural Experimental Station, Cooperative Extension Service, New Mexico State University, College of Agricultural Experiment Station, Cooperative Extension Service, New Mexico State University, College of Agricultural and Home Economics,

Report 53. 60 pp. Also as referenced in the short term monitoring section of Volume 1 of the Monitoring Manual for Grassland, Shrubland and Savanah Ecosystems by Herrick et al. (2005). Drought stress will be monitored using VegDRI with site visits occurring to ground truth VegDRI reports. VegDRI is a hybrid drought monitoring and mapping tool that integrates satellite observations of vegetation status and climate data with information on land cover, soil characteristics, and other environmental factors. VegDRI reveals vegetation conditions as plants respond to solar energy, soil moisture, and other limiting factors (USGS 2010). Site visits will be used to inspect plants for signs of drought stress. Signs of drought stress include reduced shoot and leaf growth, reduction in seed head development, induced senescence and plant death. A BLM monitoring protocol does not currently exist to quantify signs of drought stress. Therefore field observations and professional judgment will be used to determine and record signs of drought stress.

V. Data Management

Field worksheets, maps and drought monitoring summaries will be stored in the short term/ long term monitoring files for the respective allotment and/or HMA. GPS points of monitoring locations will be uploaded into GIS. All GIS information will be kept to Winnemucca District and Nevada State Office standards and will be incorporated into the GIS data base.

VI. Management Actions as a Result of Drought Detection and Monitoring

Triggers either separate or in combination, will activate drought response actions as described in the Winnemucca District Drought Response Plan EA Proposed Action. All actions would be implemented through the issuance of full force and affect decisions pursuant to 43 CFR §4110.3-3(b), and would be implemented within all appropriate laws, regulations and policies.

Full force and effect decision would be supported by site specific monitoring data collected as outlined within this plan and recorded. Justification for Wild Horse and/or Burro Drought Gathers would be thoroughly documented within a site specific Drought Gather Plan (see Appendix 2 of the EA for a Drought Gather Plan Outline).

Literature Cited

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Appendix 2 – Winnemucca District Sample Drought Gather Plan

Sample Drought Gather Plan

The following is a sample of a Draft Drought Gather Plan to outline the components that would be included should a drought gather of wild horses or burros be necessary.

Name of HMA or Complex

1. Introduction

This section would provide an introduction as to how the need for a drought gather had become necessary. An overview of climate/precipitation/animal health concerns/forage or water limitations would be provided. An overview of the planned wild horse or burro removal would also be introduced.

2. Background

This section would include the recent history of the area, summary of monitoring activities, wild horse or burro population levels and AML, and gather history. A table of the HMA(s) involved, AML, and the current population would be presented. Any past wild horse or gather EAs which are relevant would be listed/referenced.

3. Drought Wild Horse or Burro Gather Rationale

This section would provide detailed information that led to the determination that a drought gather was necessary. The HMA specific information would be provided including but not limited to:

3.1. Climate

A summary of the specific drought conditions of the area, precipitation, Drought Response Index etc.

3.2. Drought Response Triggers and Monitoring results

As detailed in the Drought Detection and Monitoring Plan, Drought Response Triggers and the results of monitoring would be summarized. Available and unavailable water, forage condition and availability, assessment by Key Area or summary with detailed information attached, riparian condition and any resource impacts by wild horses or burros, utilization levels, actual use, and animal distribution.

3.3. Animal Health and Characteristics

Summary of specific genetic information (if available), wild horse or burro characteristics, inventory and population data. Current observations of animal health and expected results of a gather delay.

3.4 Status of Livestock

Overview of actual use, status of livestock, modifications to livestock, removal of livestock, or closure to livestock as a result of drought.

3.5. Drought Response Actions To Date
Summary of activities undertaken such as water hauling or other efforts to avoid the need to gather.

3.6. Other information pertinent to the need for a gather

3.7. Summary: Determination of Excess and Rationale for Drought Gather
This section would summarize the rationale for a wild horse or burro drought gather and the determination of excess based upon the data and information presented in Sections 3.1-3.6.

4.0. Drought Gather Plan

This section would detail the plan for the gather

- Planned gather method – bait/water trap, helicopter or both
- Timeframe for gather
- Locations of gather. If water/bait trapping, where would the trap(s) be set up
- Safety precautions and mitigation measures to ensure mare and foal health
- Nevada Safe Gather Intent Criteria
- If water/bait trapping, logistics for transportation, feed, water,
- Veterinarian
- Gather objectives: number of animals to be captured, removed, released
- Locations where animal removal would be targeted
- Number of animals to remain in the HMA after the gather
- Monitoring follow up -- range and animal health
- In the case of a complete removal, plans to return animals and triggers for when that would occur

5.0. Attachments

The following is a list of attachments that would be included in a site-specific gather plan:

- Map
- Animal Condition, Water and Upland Monitoring detail and photos
- Drought Response Index and Precipitation Summary
- Public Observation Plan
- Bait/Water Trap Diagram