Impacts to soils with implementation of the Proposed Action would include disturbance around temporary trap sites and at holding and processing facilities. Impacts would be caused by vehicle traffic and the hoof action of penned horses, and would be locally severe in the immediate vicinity of the corrals or holding facilities. Generally, these activity sites would be small in size, at less than one half acre for each site. Soil compaction, localized wind erosion, and destruction of biological soil crusts where present, would occur at the trap sites. Since most trap sites and holding facilities are re-used during subsequent wild horse gather operations, impacts from the gather activities would remain site-specific and isolated in nature. In addition, most trap sites or holding facilities are selected to enable easy access by transportation vehicles and logistical support equipment and would generally be adjacent to or on roads, pullouts, water haul sites, or other flat spots that were previously disturbed, thereby minimizing new disturbance. Vehicles used in the horse gather would also cause soil compaction and increased erosion in a small area. By adhering to the SOPs, adverse impacts to soils would be minimized.

***Alternative* B**– Impacts would be the same as in the proposed action. Removal of excess wild horses would be beneficial to soils, but soil resources may not get as much recovery as in the proposed action when the wild horse population reaches and then exceeds the high end of AML more quickly than would occur under the proposed action.

No Action Alternative – With the no action alternative, the wild horse population in the Silver King HMA would continue to grow. Increased horse use throughout the HMA would continue to adversely impact soils health, especially around riparian resources. As native plant health deteriorates and plants are lost, soil erosion would increase. Continued heavy wild horse use, especially around water sources, would cause further compaction, reduced infiltration, increased runoff and erosion, and loss of biological soil crusts. Compaction caused impacts would be greatest on moist soils and soils with few surface coarse fragments. The greatest disturbance impacts to crusts would occur when the soils are dry and on highly calcareous sites. The shallow soils typical of this region cannot tolerate much loss without losing productivity and thus the ability to be re-vegetated with native plants. Invasive, non-native plant species would increase and invade new areas following increased soil disturbance and reduced native plant vigor and abundance. Wild horses likely transport weed propagules, and this transport would increase as horse numbers increase. This would lead to both a shift in plant composition towards weedy species. With the no action alternative, the severe localized trampling associated with trap sites would not occur, but this alternative would not make progress towards achieving and maintaining a thriving natural ecological balance.

5.0 Cumulative Impacts

The National Environmental Policy Act (NEPA) regulations define cumulative impacts as impacts on the environment that result from the incremental impact of the Proposed Action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such actions (40 CFR 1508.7). Cumulative impacts can result from

individually minor but collectively significant actions taking place over a period of time.

The area of cumulative impact analysis is the Silver King HMA (See map appendix I).

Past, Present, and Reasonably Foreseeable Actions

The Past, Present, and Reasonably Foreseeable Future Actions applicable to the assessment area are identified as the following:
Table 6.

Project -- Name or Description	Status (x)		
	Past	Present	Future
Issuance of multiple use decisions and grazing permits for ranching operations through the allotment evaluation process and the reassessment of the associated allotments.	**x**	**x**	x
Livestock grazing	**x**	**x**	x
Wild Horse and Burro Gathers	**x**	**x**	x
Mineral Exploration / Geothermal Exploration/Abandoned mine land reclamation	**x**	**x**	x
Recreation	**x**	**x**	x
Spring development/spring source protection (fencing water sources)	**x**	**x**	x
Wildlife guzzler construction	**x**	**x**	x
Invasive weed inventory/treatments	**x**	**x**	x
Wild Horse and Burro issues, issuance of Multiple use decisions AML adjustments and planning	**x**	**x**	x
Southern Nevada Water Authority Pipeline			x
Wind Energy Production projects			x
South West Intertie Project			x

Any future proposed projects within the Silver King HMA would be analyzed in an appropriate environmental document following site specific planning. Future project planning would also include public involvement.

Past Actions

Past actions include establishment of wild horse Herd Management Areas, establishment of AML for wild horses, wild horse gathers, mineral extraction, oil and gas exploration, livestock grazing and recreational activities throughout the area. Some of these activities have increased infestations of invasive plants, noxious weeds, and pests and their associated treatments.

Present Actions

Today the Silver King HMA has an estimated population of 505 adult wild horses. Resource damage is occurring in portions of the HMA and areas adjacent to the HMA due to excess

animals. Approximately 191 wild horses routine move outside the HMA boundaries; of thesen approximately 50 wild horses are permanently residing outside the HMA these horses between the Eagle and Silver King HMAs. Those wild horses pose a potential safety concern because of their proximity to Hwy 93. Current BLM policy is to conduct removals targeting portions of the wild horse population based upon age, and allows for the correction of any sex ratio imbalances that may occur. Further, the BLM's policy is to conduct gathers in order to facilitate a four-year gather cycle. Over the past decades, program goals have expanded beyond analyzing data and setting the population levels necessary to achieve a "*thriving natural ecological balance*" (by setting appropriate management level (AML)) for individual herds, to activities designed to achieve and maintain healthy, viable, vigorous, and stable populations. (See appendix I)

Current mandates prohibit the destruction of healthy animals that are removed or deemed to be excess. Only sick, lame, or dangerous animals can be euthanized, and destruction is no longer used as a population control method. A recent amendment to the Wild Free-Roaming Horses and Burro Act allows the sale of excess wild horses that are over 10 years in age or have been offered unsuccessfully for adoption three times. BLM is adding additional long-term holding grassland pastures in the Midwest to care for excess wild horses for which there is no adoption or sale demand.

The BLM is continuing to modify livestock grazing permits to ensure rangeland health and is undertaking vegetation treatments to improve watershed health by promoting healthy vegetative communities. Monitoring of vegetative resources, vegetative treatments, rangeland health, and watershed health continues. Currently within the Silver King HMA sheep and cattle grazing occurs on a yearly basis under grazing management systems designed to meet or make significant progress in meeting rangeland health standards.

The focus of wild horse management has also expanded to place more emphasis on achieving rangeland health as measured through the RAC Standards. Mojave-Southern Great Basin Resource Advisory Councils (RAC) developed standards and guidelines for rangeland health that have been the current basis for managing wild horse and livestock grazing within the Ely District. Adjustments in numbers, season of use, grazing season, and allowable use are based on evaluating progress toward reaching the standards.

Reasonably Foreseeable Future Actions

In the future, the BLM would manage wild horses within HMAs that have suitable habitat for a population range, while maintaining genetic diversity, age structure, and sex ratios. The Ely BLM District completed the *Ely Proposed Resource Management Plan/Final Environmental Impact Statement* (RMP/EIS, 2007) in November 2007 which analyzed AMLs expressed as a range and addressed wild horse management on a programmatic basis. Future wild horse management would focus on an integrated ecosystem approach with the basic unit of analysis being the watershed. The BLM would continue to conduct monitoring to assess progress toward meeting rangeland health standards. Wild horses would continue to be a component of the public lands, managed within a multiple use concept.

While there is no anticipation for amendments to the Wild and Free-Roaming Horses and Burros Act that would change the way wild horses could 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, though the specifics of any such amendments is unknown.

As the BLM achieves AML on public lands through removal of excess wild horses, gathers should become more predictable due to facility space. This should increase stability of gather schedules. Fertility control should also become more readily available as a management tool, with treatments that last between gather cycles, reducing the need to remove as many wild horses, and possibly extending the time between gathers.

The public lands within the HMA contain a variety of resources and support a variety of uses. Any alternative course of wild horse management has the opportunity to affect and be affected by other authorized activities ongoing in and adjacent to the area. Future activities which would be expected to contribute to the cumulative impacts of implementing the Proposed Action include: future wild horse gathers, continuing livestock grazing in the allotments within the area, development of range improvements, continued development of mineral extraction, oil and gas exploration, new or continuing infestations of invasive plants, noxious weeds, and pests and their associated treatments, and continued native wildlife populations and recreational activities historically associated with them.

Impacts

Cumulative effects expected when incrementally adding either the Proposed Action or Alternative B to the Cumulative Effect Study Area (CESA) would include continued improvement in riparian vegetation conditions, which would in turn benefit current livestock management, native wildlife, water resources and wild horses populations as forage (habitat) quantity and quality improves. Benefits from reduced wild horse populations would include fewer animals competing for limited water quantity and at limited perennial water sources. Cumulatively there should be more stable wild horse populations, healthier rangelands, healthier wild horses, and fewer multiple use conflicts within the cumulative area over the short and long-term. Gathering and removing excess wild horses from the Silver King HMA, and treating gathered wild horses that are released back into the HMA, would also likely benefit resources in the adjoining areas. As the wild horse population returns to AML, wild horses would not need to travel outside of the HMA in search of additional forage, water and space due to overpopulation.

Cumulatively over the next 10-15 year period, continuing to manage wild horses within the established AML range would result in improved vegetation condition (i.e. forage availability and quantity), which in turn would result in improved vegetation density, cover, vigor, seed production, seedling establishment and forage production over current conditions. Managing wild horse populations within the established AML would allow the primary forage plant species to return more rapidly and allow for improvements to riparian habitat, even though some vegetation conditions may never be able to return to their potential. Maintaining AML over a

sustained period of time throughout the CESA would allow for the collection of scientific data to evaluate current AML levels and to identify whether any changes to ALM are warranted.

Cumulatively over the next 10-15 years, fewer gathers should result and less frequent disturbance to individual wild horses and the herd's social structure would occur. Individual and herd health would be maintained.

By removing excess wild horses, BLM will be able to gather a higher percentage of the total wild population in future gathers for fertility control and sex ratio adjustments in an effort to slow population growth and to reduce the need to remove excess wild horses from the range, and number of excess wild horses that must be removed. However, the gather and release of wild horses back into the HMA may lead to the decreased ability to gather horses in the future as released horses learn to evade the helicopter by taking cover or temporarily moving outside the HMA until gather activities cease.

No Action Alternative:
Under the No Action alternative, the wild horse population in the Silver King HMA could exceed 1,046 head in about four years. Increased movement of horses outside the boundaries of the Silver King HMA can be expected as wild horses move in search for sufficient resources and habitat for survival due to overpopulation of their habitat, thus impacting larger areas of public lands within the CESA. Heavy utilization of available forage and insufficient water would be expected. Allowing the wild horse population to continue to grow beyond the current population numbers would be likely to result in a population crash during the next decade. Wild horses, wildlife and livestock would not have sufficient forage or water and would experience suffering and possible death. Ecological communities and habitat resources would not be sustainable. Rangeland health would degrade, possibly below biological thresholds, making recovery unlikely if not impossible as cheatgrass and other invasive non native species could dominate the understory degrading ecological conditions and leading to irreversible conversion and loss of native vegetative communities.

Emergency removals could be expected in order to prevent individual animals from suffering or death as a result of insufficient forage and water. These emergency removals could occur in the summer season if the area experiences normal or below normal precipitation and insufficient water resources are available for the wild horse population, or in the winter if harsh winter conditions result in limited forage availability. During emergency conditions, competition for available forage and water resources is heightened and generally impacts the older and youngest horses as well as lactating mares first. These groups would experience significant weight loss and diminished health, which could result in prolonged suffering and their eventual death. If emergency actions are not taken (prior to or in response to these events), the overall population could be affected by severely skewed sex ratios towards stallions (generally the strongest and healthiest portion of the population) and a significantly altered age structure. In addition, habitat resources would be over-utilized and progress toward rangeland health standards would not be met.

Cumulative impacts be continued degradation of rangeland resources due to the failure to manage wild horses in balance with available water and forage. Over-utilization of vegetation and other habitat resources would occur as wild horse populations continued to increase. Wild horse populations would be expected to eventually crash at some ecological threshold; however wild horse, livestock, and wildlife would all experience suffering and possible death of individual animals as rangeland resources continued to degrade. Attainment of RMP objectives and Standards for Rangeland Health and Wild Horse and Burro Populations would not be achieved.
Under the No Action Alternative, AML would not be achieved or sustained throughout the CESA and therefore the collection and analysis of scientific data necessary to evaluate AML levels, in relationship to rangeland health standards and whether a thriving natural ecological balance is being met or achieved, could not be undertaken.
Impacts to the human environment across the CESA would be compounded should the current population of horses be allowed to remain and expand.

The combination of the past, present, and reasonably foreseeable future actions, along with the proposed action and Alternative B, should result in more stable wild horse populations, healthier rangelands, healthier wild horses, and fewer multiple-use conflicts within the Silver King HMA.

6.0 Mitigation Measures and Suggested Monitoring

Proven measures to mitigate impacts of the gather on wild horses and on rangeland resources, along with monitoring are incorporated into the proposed action through standard operating procedures, which have been developed over time. These SOPs (Appendix II, III and IV) represent the "best methods" for reducing impacts associated with gathering, handling, and transporting wild horses and for collecting herd data. Hair samples to establish a genetic baseline for the Silver King HMA wild horses will be collected; additional samples will be collected during future gathers (in 10-15 years) to determine trend. Should monitoring indicate genetic diversity is not being adequately maintained, 2-10 mares and/or studs from HMAs in similar environments would be added every generation (every 8-10 years) to avoid inbreeding depression/maintain acceptable genetic diversity. Ongoing resource monitoring, including climate (weather), and forage utilization, population inventory, and distribution data will continue to be collected.

7.0 Consultation and Coordination

Public hearings are held annually on a state-wide basis regarding the use of motorized vehicles, including helicopters and fixed-wing aircraft, in the management of wild horses (or burros). During these meetings, the public is given the opportunity to present new information and to voice any concerns regarding the use of the motorized vehicles.