**Bald Mountain HMA**

**HMA Overview**

The Bald Mountain HMA is located 40 miles south east of Battle Mountain, Nevada in Lander County. The HMA consists of 139,879 acres and is 14 miles wide by 20 miles long. The HMA encompasses the northern end of the Toiyabe Range.

The southern boundary of the Carico Lake Allotment serves as the southern boundary of the HMA, which borders the Callaghan HMA to the south. The HMA is also in close proximity to the Rocky Hills HMA to the east, and South Shoshone HMA to the west.

The original Herd Area (HA) boundaries are limited to areas of the public lands identified as being habitat utilized by wild horses and/or burros at the time of the passage of the Wild Free-Roaming Horse and Burro Act of 1971. The Bald Mountain HMA boundaries are nearly identical to the original Herd Area boundaries.

The AML range is 129-215 wild horses. A large portion of the population congregates along the eastern edge of the Toiyabe range bordering the western edge of Grass Valley in the vicinity of Hot Springs Point and the boundary with the Callaghan HMA. Although many springs are located within the HMA, wild horse distribution has been concentrated in certain areas.

The elevation ranges from 8500 feet at the top of Bald Mountain down to 5500 feet in the valleys that surround the mountain range. Numerous canyons and creeks dissect the mountains.

It is suspected that a great deal of movement occurs among the horses from this HMA and the South Shoshone and Callaghan HMAs. The horses in this area are relatively large horses exhibiting various color characteristics such as gray, roan, sorrel, and pinto.

**Herd Considerations**

**Appropriate Management Level (AML)**

An AML range of 129-215 was established for this HMA through the FMUD for the Carico Lake Allotment, issued by the MLFO September 30, 2005 following completion of the Carico Lake Allotment Evaluation and Rangeland Health Assessment and EA #NV062-EA05-61. .

**Wild Horse Gather History**

### Wild Horse Gathers

Prior to 2009, only one documented gather had been conducted by the BLM within the Bald Mountain HMA Between July 1981 and January 1982, a total of 364 wild horses were removed from the HMA through a wild horse gather contract.

The most recent gather was accomplished in January 2009 in conjunction with the Callaghan and Rocky Hills HMA gathers.

A stretch of warm weather had caused much of the snow to melt, resulting in muddy roads (not impassable, but messy).

Because the horses were difficult to locate and appeared to have scattered widely within the HMA, a helicopter flight was scheduled. On January 19, 120 horses were observed within the HMA. The gather continued for the next several days to gather everything but an estimated 31 horses. Fertility control was administered to 49 mares. On January 21 and 22, 49 mares and 49 studs were released back to the HMA. Fertility control has not been administered to this HMA in the past, and the last gather conducted by the BLM was in 1981.

Animal condition throughout the HMA was variable. Horses gathered on the east side of the HMA (where concentrations were highest and resources most limited) were in the poorest condition similar to the condition of the Callaghan HMA horses. Most horses were estimated to be in Body Condition Score 4 or under. Few horses (mostly studs) were considered to be in good condition or well muscled. Most mares showed accentuated backbone and ribs. All age groups were represented within the horses captured, and no specific age group in better or worse condition than any other.

Within the central portion of the HMA, approximately 40-50% of the horses were thin, with estimated BCS 3.5-4.0.; the remaining animals were healthy, well muscled and BCS 4.5-5.0. Most foals were large and healthy. Contrary to the Callaghan HMA gather, old (25-30 year old) horses were gathered from Bald Mountain HMA. About half were in thin but acceptable body condition, and half were thin. Most had good teeth for their age. Several of the poorer horses were selected for release back to the range to avoid stress of handling/shipping. 44 of the 609 horses captured (7.2%) were 15 years of age or older. WinEquus population modeling indicated that 58 horses (9.5% of the population) would be captured that were 15 years of age or older.

Selection for horses to release back to the range focused on horses 4 years of age and older. One of the priorities for release horses selected was health. Poor, thin or less thrifty horses were not selected for release. Since this was the first gather since 1981, little knowledge existed about the historical traits of the herd. Many large draft (Belgian) influenced grey horses were gathered from the central portion of the HMA. Other traits included many frosted type horses with splashed white faces, roaning on the chest and flanks, and high white stockings. Several paint horses were captured which result from the close proximity to Callaghan HMA.

**Wild Horse Distribution**

Wild horse locations as observed during census and distribution flights since 1974 indicate significant fluctuations of wild horse distribution across both the Callaghan and Bald Mountain HMAs, which is likely a result of snow depth and other seasonal factors, water and forage availability, possible illegal activity and harassment of wild horses, and overall population size and density. Through interpretation of census and distribution flight data, some generalizations in distribution patterns can be made. These patterns are based on existing populations at the time the flights were conducted, and may not represent distribution following achievement of an appropriate management level (AML).

Throughout the history of the Bald Mountain HMA, some patterns in wild horse distribution have been noted. Regardless of time of year or environmental conditions, many of the census flights and field observations reveal concentrations of wild horses in three different areas of the HMA. The primary concentration occurs on the far eastern side of the HMA in the vicinity of Bald Mountain, Copper Canyon, Hot Springs Point and Dry Creek Wash. The second location where concentration occurs is at the boundary fence with Grass Valley Allotment in the vicinity of Dead Ox Canyon. Throughout census and other HMA files, “banding” of the wild horses from the Callaghan and Bald Mountain HMAs has been documented in this location. The concentration of wild horses in the south east portion of the HMA has been documented as early as 1978. The third area of wild horse concentration is in the vicinity of the Red Mountain Springs.

The occurrence of clusters of wild horses in these areas appears to be most pronounced in the winter months, and observed during census flights were conducted in January, or March. This was notable during 1998 and 2001 census flights conducted in March, when 58-71% of the wild horses observed within the HMA were located on the east side of the HMA between Dry Canyon Wash and Bald Mountain in the vicinity of Hot Springs Point and Copper Canyon. During the March 2005 census, over 78% of the wild horses were located in these areas. Additionally, field observations have documented large numbers of wild horses in the vicinity of Dry Canyon, Copper Canyon, Ox Corral Canyon, Blue Mountain Spring, and Dead Ox Spring. This trend was also reflected in census flights during the 1980-1990’s.

In general, during winter months, wild horses will remain in lower elevations when snow cover prevents occupancy of higher elevations. However, wild horses have been observed utilizing south facing, snow free slopes as high as 8000’ elevation.

During summer and fall census flights, wild horses were more uniformly distributed into the higher elevations and wild horses were considered well scattered throughout the entire HMA. Precipitation levels through the year, and from year to year have likely influenced wild horse movement and distribution; however, patterns in the census maps are not apparent.

Although precipitation patterns and drought have likely influenced herd distribution, patterns are not apparent from analysis of the census and distribution maps. It is possible that population fluctuations in the Bald Mountain HMA have influenced the population in the South Shoshone HMA, as fences do not separate the two HMAs.

**Wild Horse Movement Patterns**

Neither the Bald Mountain nor South Shoshone HMAs are fenced, and wild horse movement is unrestricted between the two HMAs. Because the boundaries are not fenced, wild horses are not prevented from moving outside of HMA boundaries. Historically, the majority of wild horses have been located within the HMA boundaries. Some wild horses move outside of the Bald Mountain HMA to the north and east.

Slight interchange likely occurs between the Rocky Hills HMA and the Bald Mountain HMA. Some Rocky Hills HMA wild horses gathered in 1999 and observed in the field since then exhibit pinto markings, which is consistent with the Callaghan HMA and to a lesser extent Bald Mountain HMA. Census data does not indicate that more than a few individuals per generation may be moving between the areas.

The Bald Mountain and Callaghan HMAs share a common boundary, and although it is fenced, wild horses move back and forth between the HMAs. The degree of movement, (i.e. the number of animals that may move from one area into the other), is unknown, however fluctuations in inventory numbers over the years suggests that it could be substantial. Prior to construction of the Dead Ox Canyon allotment boundary fence in 1976 (the current boundary between the two HMAs), movement north and south along the Toiyabe Range was unrestricted. Historically and currently, mixing of wild horses near the boundary fence has been documented during census flights. Wild horses move through breaks in the fence or through open gates. These movement patterns account for fluctuations in the Bald Mountain HMA population size following gathers that have taken place on Callaghan and Rocky Hills HMAs.

Gathers conducted in the Callaghan HMA in 1987, 1997 and 2002 have resulted in the removal of nearly 2,400 wild horses. Data from census flights indicates that populations numbers in the Bald Mountain HMA dropped in years following Callaghan HMA gathers, and it is believed that these horses temporarily or permanently emigrated into the Callaghan HMA when competition for resources was reduced, resulting in this type of compensatory distribution change.

Analysis of gather and inventory data since 1997 shows that The Bald Mountain HMA has averaged only 5.2% increase annually. The adjoining Callaghan HMA has averaged 43.5% annual increase since 2002 when the last gather was completed. The inventory data from Bald Mountain HMA indicates that the population is 200-300 wild horses below what it would be if the population had increased at the MLFO average of 17.5% since 2001. The data also indicates that the Callaghan HMA population in 2008 was 400 wild horses in excess of what it would be with an average annual increase of 17.5% since the last gather in 2002. This comparison shows that the number of wild horses that have moved from Bald Mountain HMA to Callaghan HMA over the years is likely substantial. For these reasons, the areas will be managed as a Complex in the future for purposes of inventory and gathers.

**Population Growth Rates**

Wild horse HMAs administered by the MLFO increase at an average of 17.5% each year. This figure takes into account mortality and foals born each year, but does not account for ingress or egress between HMAs. Foaling rates indicate the percent of the population comprised of foals less than a year of age at the time of the flight. In contrast, average annual rates of herd increase take into account growth of the herd through reproduction, as well as mortality. Variation from year to year is also the result of environmental influences such as drought or severe winters or particularly high moisture years and mild winters. It is also suspected that population growth rates increase in the years following a gather as animals are subject to improved habitat conditions and reduced competition for forage, water, and space.

The three HMAs in the Callaghan Complex pose unique circumstances in comparison to other HMAs administered by the MLFO. The Callaghan and Bald Mountain HMAs are contiguous, and although the boundary between them is fenced, movement does occur. These two HMAs have not been gathered together in the past. Callaghan HMA has been gathered numerous times since the mid 1980’s. These gathers have reduced the population in the Callaghan HMA and have apparently resulted in compensatory changes in the Bald Mountain HMA population size.

Foaling rates observed during summer and fall census flights since 1974 reveal a range of 10-21% foals each year, and an average of 17% foals over the history of post-foaling census flights. Field office records from the early 1980’s suggests an average rate of increase for the Bald Mountain HMA of 16%. Analysis of the census data between 1974 and 2005 suggests that during some periods of the history of the Bald Mountain HMA, herd increase may have averaged as little as 12.5%.

Analysis of the Bald Mountain HMA census data since 1974 revealed significant fluctuation of population size through time, and an annual rate of increase lower than the district average. Several reasons for this may exist. The only gather to take place in the Bald Mountain HMA was completed in 1981, when 364 wild horses were removed from an estimated population of 686.

Extensive illegal shooting of wild horses in northern Nevada occurred between 1987-1989, and no less than 266 carcasses were documented within the Bald Mountain HMA. Record snowfall in 1993, and below average precipitation during the early 1990’s may have also increased mortality rates within the herd.

What has likely been the most significant influence to the Bald Mountain HMA population size is the gathers and removals of wild horses that have taken place in the Callaghan HMA. Gathers conducted in the Callaghan HMA in 1987, 1997 and 2002 have resulted in the removal of over 2,400 wild horses. Data from census flights indicates that populations numbers in the Bald Mountain HMA dropped in years following Callaghan HMA gathers, and it is believed that these horses temporarily or permanently emigrated into the Callaghan HMA when competition was reduced, resulting in this compensatory distribution fluctuation.

Despite the observed health of the herd, the 2005 census figures for the Bald Mountain HMA were lower than the current estimates based on the previous census completed in March 2001. Between 1998 and 2001, the Bald Mountain HMA population increased by 79 animals which approximates a 13% annual rate of increase. Between 2001 and 2005 flights, the Bald Mountain HMA increased by 8 horses according to the census results, and is currently 150-200 wild horses short of estimated. The primary reason for this is likely the large gather that occurred in the Callaghan HMA in 2002. The Callaghan HMA population was 150-200 wild horses larger than estimated according to the 2002 gather data and the 2005 census data.

During the May 2007 inventory flight, 17% of the animals observed were foals. The foaling season would not have been complete until later in June, so the foals born that year could have easily reached 18-19% of the population or higher. What has likely been the most significant influence to the Bald Mountain HMA population size is the gathers and removals of wild horses that have taken place in the Callaghan HMA.

**Wild Horse Background/Herd History**

Historical information indicates that the Bald Mountain HMA herd may have been influenced by a large gray imported English Thoroughbred released by the owners of the Grass Valley Ranch in the 1960’s. The owner had a permit to graze horses on public land. The horses were known to be distributed across the Toiyabe Range north to Bald Mountain, as the Carico Lake/Grass Valley Allotment fence in that portion of the allotment was not constructed until 1976. When the HMA was gathered in 1981, the gather contractor noted that the grey horse was still present, estimated to be over thirty years of age, and was unable to trap the horse. During the 1974 inventory, grey and white horses were noted as well as black, sorrel, and bay. Today, white and grey horses are still observed in the HMA. Paint (pinto) horses are also observed in the HMA, and assumed to be a result of mixing with the Callaghan HMA to the south.

In 1980, dead wild horses were found in the Bald Mountain HMA and other nearby HMAs, which were determined to have been shot. In November 1980, 20 were located in Ox Corral Canyon, and in December, an additional 13 dead wild horses were located in the Bald Mountain HMA north of Corral Canyon. Between 1987-1989 over 500 wild horse carcasses were documented in Lander County. Investigators and veterinarians determined that the majority of animals had died from gun shot wounds. No less than 266 carcasses were discovered in Bald Mountain HMA, and 7 in South Shoshone HMA. Other HMAs involved included Augusta, Callaghan, and New Pass/Ravenswood.

Though several individuals were indicted for wild horse deaths in Lander and other Nevada counties, the cases were eventually dismissed due to insufficient evidence. Nonetheless, a significant number of wild horses were killed, which influenced the population sizes during that time. Today, groupings of wild horse skeletal remains are still discovered in both South Shoshone and Bald Mountain HMAs. As recently as winter 2000, 12 wild horse skeletons were located in close proximity of one another north of Corral Canyon in the Bald Mountain HMA. The grouping of the skeletons of apparently younger animals caused reason for suspicion; however, the carcasses were too decomposed to determine the cause of death. There have also been at least two anonymous reports received between 1990-1999 of small fixed wing aircraft pushing or herding wild horses. In one case, gunshots were heard, but follow-up investigation produced no findings of illegal activity.

**Wild Horse Management Objectives**

* **Key Species:** All key perennial species as identified in the Key Management Area Objectives for those key areas located within the HMAs
* In addition to those allotment specific short and long term objectives identified for each key area, the following management and monitoring objectives apply to the HMA:
  + Improve the forage component of wild horse habitat. Emphasize improving habitat as indicated by achieving desired plant community objectives within the HMA.
  + Manage the Bald Mountain and South Shoshone HMAs as a Complex with the Callaghan HMA for the purposes of census, evaluation and gathers to account for the inherent movement between the areas.
  + Manage the Bald Mountain and South Shoshone HMA population levels as a population range where the upper limit of the range is the level where the optimum number of wild horses can exist without causing resource degradation. The lower limit of the range would be based on the level to remain following a gather to allow for a normal gather cycle of 3-4 years.
  + Rangeland monitoring within the HMAs would be accomplished with the goal of obtaining data specific to areas utilized by wild horses that would be used to modify AML and propose future management actions.
  + Manage the Bald Mountain and South Shoshone HMAs populations to preserve and enhance physical and biological characteristics that are of historical significance to the herd, which would include conformation, coloring and size.
* Maintain sex ratios and age structures, which will allow for the continued physical, reproductive and genetic health of the Bald Mountain and South Shoshone HMAs.
* Preserve and maintain a healthy and viable wild horse population that will survive and be successful within the HMAs during poor years when elements of the habitat are limiting due to severe winter conditions, drought, or other uncontrollable and unforeseeable environmental influences to the herd.
* Preserve the characteristic wild free-roaming behavior of wild horses within the Bald Mountain and South Shoshone HMAs by limiting management actions that would prohibit wild horse access to portions of the HMAs or restrict historical patterns of use.
  + - Where fences are needed within HMAs to meet other resources objectives, fences will be planned so as to not restrict movement patterns of wild horses. An example would be the construction of carefully planned drift fences, which allow wild horses to maintain historic patterns of use within the HMA. Fences built within the HMA will include posts with white tops to provide visual warning and prevent injury and death to wild horses.

**Habitat Considerations**

**Rangeland Vegetation Resources**

Elevations within the Bald Mountain HMA range from 5,150 feet in Carico Lake Valley, to 8,541 at the top of Bald Mountain. Vegetation types are distributed according to topography, elevation, and precipitation. Lower elevations receive as little as 4-8 inches of precipitation annually and support salt desert shrub vegetation such as basin wildrye, black greasewood, saltbush, rubber rabbitbrush, shadscale, saltgrass and bottlebrush squirreltail.

Foothills and low mountains within the Callaghan Complex support bottlebrush squirreltail, Indian ricegrass, shadscale, bluebunch wheatgrass, Thurber needlegrass and Wyoming big sagebrush.

The upper elevational zones on moderately steep locations (mountains) receive 10-30 inches of annual precipitation. These plant communities include Idaho fescue, Thurber needlegrass, black sagebrush, Indian ricegrass, bluebunch wheatgrass, mountain big sagebrush, single-leaf pinyon pine, and Utah juniper.

The condition of the rangeland vegetation throughout the Complex varies considerably, and has been negatively impacted by current and historic levels of wild horses and past use by livestock. Throughout the Bald Mountain HMA, many of the Resource Advisory Council (RAC) Standards for Rangeland Health are not being met. Wild horse populations have been determined as contributing to standards not being met in many cases. Throughout the Bald Mountain HMA, wild horse populations have been concentrated in specific areas, leading to increased use of the vegetation resources.

The vegetation resources within the Complex as a whole are dictated by geologic and climatologic factors within the Great Basin, which determine what type of plant communities can be sustained. Climate is characterized by warm, dry summers and cold winters. Mean average temperatures range from 45 to 48 degrees F. The area receives an annual average 70-75% of maximum possible sunshine and pan evaporation averages 48 to 50 inches per year.

Many of the valley bottoms within the Complex receive just 5-8 inches of annual precipitation, and support some of the lowest forage production. Low, poorly drained elevations and lower alluvial fans support salt tolerant vegetation and salt desert shrub communities interspersed with Wyoming big sagebrush plant communities. These sites are typically not highly productive and will support less than 450 lbs/acre of vegetation in a normal year, with only 25% of that comprised of grasses. Because of the low elevation, these sites have often been heavily utilized in winter months.

Mid elevations and alluvial fans support 8-14 inches of annual precipitation, but vary widely across the Complex due to aspect, soils, and general steepness of the terrain. Wyoming big sage, low sage and black sage communities are common throughout the lower and middle elevations of the Complex consisting of rolling hills, alluvial fans, and benches. These sites are generally more productive, and located on well-drained and deeper soils. Wyoming big sage sites should produce 600 lbs/acre of annual vegetation in normal years, with 55% comprised of deep rooted perennial key grasses such as Indian ricegrass, Thurber’s Needlegrass and bluebunch wheatgrass. These sites should also support a diverse forb component important to many species of wildlife.

Cheatgrass, an annual non-native species, is prevalent in the vegetative communities located within 5,000-7,000 feet elevation. Pinyon-Juniper woodlands are also common at mid elevations. These communities vary in the amount of understory grasses that are available due to the density of the trees and the soil composition. In general, wild horses do not prefer thickly timbered areas, but may frequently use open Pinyon-Juniper and individual trees for shade in summer or shelter in winter. Because of the position on the landscape, these middle elevations are sometimes used throughout the year by wildlife, livestock, and wild horses. Lower elevations provide important winter habitat where snow depth does not deter use.

The highest elevation mountainous areas vary greatly across all three HMAs. These areas may receive more than 14 inches of precipitation annually. In many cases, the higher elevations provide important summer habitat for wild horses, and support higher production of forage and water than lower elevations. The highest elevations vary widely in species composition and vegetation production potential. Large expanses of the Complex consist of mountain ridges and steeper slopes, cut by perennial or ephemeral drainages. Annual, above ground vegetation production in normal years varies from 250 lbs/acre for mountain ridges to a potential of 1,700 lbs/acre on loamy slopes receiving more than 14 inches of precipitation annually.

The headwaters of many important streams originate as springs in the higher elevations. These areas may support quaking aspen or willow vegetation, which is important wildlife habitat. Other common vegetation types include mountain big sagebrush, low sagebrush, black sagebrush, curl leaf mountain mahogany, and meadows. Important wildlife browse species such as snowberry and serviceberry are also present in various amounts. Understory grass composition varies and in addition to grass species cited above, may include mountain brome, productive needlegrasses, bluegrasses and fescues.

Within the Callaghan Complex, most low and mid-elevation salt desert shrub and Wyoming big sage sites are in poor ecological condition and lack the proper perennial key species in the understory. In some cases, perennial grasses are missing completely from the understory and have been replaced by cheatgrass or invasive species such as halogeton and mustard. Production of forage species is well below the potential for these sites. In some cases, perennial grasses comprise 1-5% of the plant community and produce 5-10 lbs/acre. Historic over use by both livestock and wild horses has contributed to the degradation of these areas, as they have been important low elevation winter grazing areas. Because low elevation sites are key winter habitat for wild horses, they are one of the primary limiting factors to the Callaghan and Bald Mountain HMAs.

Livestock and wild horse use for the majority of the upper elevations is determined through monitoring of riparian and wetland areas. However, monitoring of the mid and upper elevations has determined that key perennial grasses are limited or are present at levels below the potential. These areas do not support desired plant communities. Fortunately, many of these areas receive the moderate to high precipitation, which increases the potential for improvement in the future with proper management. Many of the higher elevations are utilized primarily by wild horses and by sheep that are trailed through the mountainous areas.

MLFO staff have documented heavy and severe utilization by wild horses within the Callaghan and Bald Mountain HMAs. This has included not only grass species, but also heavy use of riparian vegetation and mountain browse species such as serviceberry, mountain mahogany, Mormon-tea, and snowberry, and has affected regeneration of these plant communities. Key forage species are present in mid and high elevation plant communities, and have the potential for future improvement with proper use. However, wild horses are currently utilizing these areas heavily and impacting the vegetation through utilization and trampling.

Many of the lower elevations support diminished populations of key perennial grasses in the understory; however, the key species are still present in these communities providing a source for future improvements. These sites are primarily salt desert shrub and black sagebrush sites. Wyoming big sagebrush is one of the common vegetation types in the middle elevations, dissected by communities of Pinyon Juniper and by perennial and ephemeral drainages. These areas reflect mixed ecological condition depending upon distance to water, which has influenced use by wild horses and cattle.

Monitoring throughout the Complex has shown that wild horses are contributing to downward trend of the native vegetation in the uplands and riparian areas, affecting habitat that is important to wildlife such as mule deer, Pronghorn and sage grouse, as well as permitted sheep and cattle. Within the Carico Lake Allotments wild horses have been identified as causal factors or significant causal factors for not meeting the Resource Advisory Council (RAC) Standards for Rangeland Health. In the case of most of these determinations, the failure to meet standards was due to historic as well as current wild horse use.

The precipitation patterns for central Nevada near the Callaghan Complex meet the definition for drought 4 years out of every 10. Within the past 13 years, the weather station nearest the Complex reported precipitation that met the definition of drought 46% of the years, or 1 out of every 2.16 years. From 2002-2007 (since the last Callaghan HMA gather), the average precipitation received has been 85% of the 36-year period of record average. Because of the inherent low precipitation levels received in the Great Basin and the frequency of drought occurrence, vegetation recovery from past grazing abuse or wildfire can be very slow. Improvement can be further impeded and can even be precluded should these areas continue to receive continuous over use by wild horses.

**Riparian-Wetland Resources and Water Quality**

Riparian-wetland areas adjacent to surface waters are the most productive and important ecosystems found on public lands. These areas play an integral role in restoring and maintaining the chemical, physical, and biological integrity of the nation’s water resources. They stabilize water supplies, and buffer effects of floods and droughts. Functioning riparian-wetland areas provide many values, including recreation, fish and wildlife, water supply, cultural, historic and economic.

Riparian Condition Assessments were completed and baseline water quality data collected on many of the streams, springs, and meadow complexes within the Carico Lake Allotment between 1999 and 2004. The majority of sites were found to be in poor or extremely poor physical condition as identified in the riparian function assessment. Over 90% of the springs were rated Functional at Risk – downward trend or Non-Functional. Over 55% of the 13 miles of stream assessed were also rated Functional at Risk – downward trend or Non-Functional. These areas were characterized by the presence of significant hoof trampling, hummocking, feces, bank slumping/undercutting, and over-utilization of riparian and herbaceous vegetation. It was established that cattle and to a lesser extent, wild horses were the main causative agents.

Consistently high single fecal coliform and turbidity values were found for many of the springs and streams within the Bald Mountain and South Shoshone HMAs. At all sampling locations, which exhibited higher concentrations of fecal coliform bacteria, turbidity, and temperature; it was observed and documented that these sites were being regularly utilized by cattle and to a much lesser extent, wild horses.

Bald Mountain HMA records indicate that wild horses have concentrated near Hot Springs Point causing deterioration of the resources. Records from the 1980’s state that wild horses primarily use water at the hot springs in the summer months. Little use by wild horses has been documented at Summit Spring. Wild horses have heavily depended upon Sheep Corral Spring, and have utilized Dead Ox Canyon Spring, Red Mountain Springs, and Dry Canyon Spring. Riparian Proper Functioning Condition Assessment specifically identified wild horse use and hoof action as contributing to negative impacts and poor ratings on Wenban Spring Complexes, Copper Canyon (north), and Dead Ox East Spring.

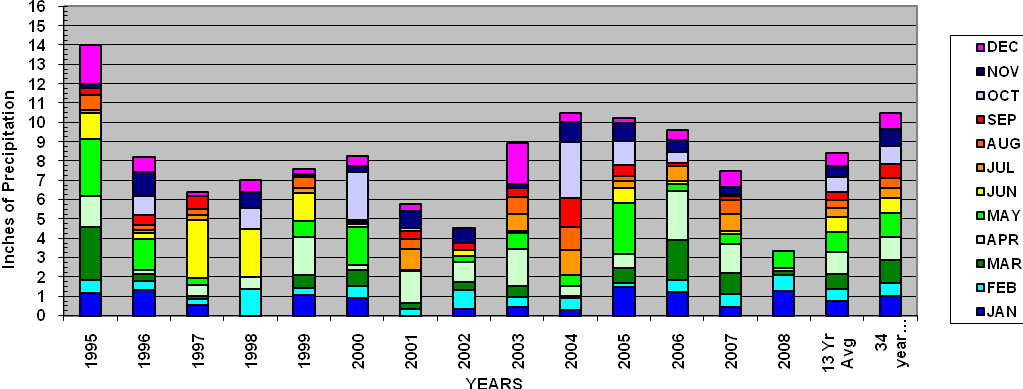
Direct field observation of feces and hoof prints are a primarily means of differentiating animal use. Livestock and wild horse utilization of riparian and wetland areas for food, water and shelter have collectively affected the functioning condition. Riparian areas in the Bald Mountain HMA has been heavily to severely affected by wild horses through trampling, compaction and utilization of riparian vegetation. Wild horse use has contributed to bank shearing, cutting, hummocking, loss of riparian vegetation, compaction, and soil erosion.

In most cases, wild horses visit water sources briefly. The exception may include large open springs or meadow complexes. High wild horse population and density of animals in relation to limited water sources results in degradation of riparian and wetland habitat. Wild horses utilized lotic and lentic sites differently because of inherent social behaviors. Wild horses tend to move quickly away from lotic sites to avoid dangerous encounters with other horses or predators. Lentic sites have a valley landform that is wider and more capable of viewing further distances. These sites deteriorate faster with long duration and concentrated use. Wild horses impact riparian and wetland sites through hoof action which causes compaction, bank shear, erosion, and hummocking, resulting in drainage of subsurface water, channelization and shrinkage (and loss) of the riparian zone. Through utilization of riparian vegetation, wild horses cause downward trends in riparian health. In addition to potential physical impacts to riparian areas, dominant studs can physically exclude other wildlife and livestock species.

**Monitoring and Climate Information**

Precipitation data were compiled for the Beowawe, University of Nevada Ranch Weather Station, which is located near the Callaghan Complex. Precipitation data was available through May 2008, and was compiled for analysis. These precipitation levels only reflect those received at the collection point, and does not reflect variation across the Complex. Conditions at specific locations could deviate substantially from these presented here. This data demonstrates the extreme variability in precipitation received from year to year and month to month.

**Beowawe, Univ. of Nevada Ranch USDA Weather Monitoring Station – Precipitation Data**



**Precipitation received by month – Beowawe, U of N Ranch**

| **YEAR** | **JAN** | **FEB** | **MAR** | **APR** | **MAY** | **JUN** | **JUL** | **AUG** | **SEP** | **OCT** | **NOV** | **DEC** | **Total** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **1995** | 1.13 | 0.70 | 2.71 | 1.62 | 2.97 | 1.32 | 0.17 | 0.75 | 0.37 | 0.00 | 0.21 | 2.05 | 14.00 |
| **1996** | 1.30 | 0.47 | 0.36 | 0.19 | 1.64 | 0.28 | 0.15 | 0.30 | 0.48 | 1.02 | 1.24 | 0.77 | 8.20 |
| **1997** | 0.52 | 0.34 | 0.14 | 0.54 | 0.37 | 3.03 | 0.24 | 0.31 | 0.69 | 0.00 | 0.00 | 0.20 | 6.38 |
| **1998** | 0.00 | 1.38 | 0.00 | 0.60 | 0.00 | 2.47 | 0.00 | 0.00 | 0.00 | 1.09 | 0.82 | 0.64 | 7.00 |
| **1999** | 1.05 | 0.34 | 0.69 | 1.97 | 0.85 | 1.42 | 0.24 | 0.60 | 0.05 | 0.02 | 0.07 | 0.29 | 7.59 |
| **2000** | 0.90 | 0.62 | 0.83 | 0.27 | 1.94 | 0.16 | 0.05 | 0.12 | 0.04 | 2.49 | 0.28 | 0.55 | 8.25 |
| **2001** | 0.06 | 0.24 | 0.35 | 1.63 | 0.05 | 0.00 | 1.12 | 0.47 | 0.46 | 0.13 | 0.86 | 0.37 | 5.74 |
| **2002** | 0.30 | 0.99 | 0.44 | 1.04 | 0.32 | 0.28 | 0.03 | 0.00 | 0.33 | 0.02 | 0.75 | 0.00 | 4.50 |
| **2003** | 0.43 | 0.49 | 0.58 | 1.91 | 0.83 | 0.10 | 0.90 | 0.86 | 0.48 | 0.02 | 0.20 | 2.11 | 8.91 |
| **2004** | 0.27 | 0.64 | 0.07 | 0.53 | 0.56 | 0.03 | 1.28 | 1.18 | 1.51 | 2.89 | 1.05 | 0.44 | 10.45 |
| **2005** | 1.44 | 0.22 | 0.77 | 0.76 | 2.63 | 0.78 | 0.35 | 0.25 | 0.59 | 1.24 | 0.91 | 0.29 | 10.23 |
| **2006** | 1.22 | 0.60 | 2.07 | 2.54 | 0.38 | 0.13 | 0.76 | 0.00 | 0.18 | 0.56 | 0.65 | 0.51 | 9.60 |
| **2007** | 0.43 | 0.65 | 1.1 | 1.48 | 0.56 | 0.15 | 0.86 | 0.72 | 0.22 | 0.1 | 0.37 | 0.84 | 7.48 |
| **2008** | 1.27 | 0.8 | 0.2 | 0.17 | 0.87 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2.07 |
| **13 Yr Avg** | **0.74** | **0.61** | **0.78** | **1.16** | **1.01** | **0.78** | **0.47** | **0.43** | **0.42** | **0.74** | **0.57** | **0.70** | **8.33** |
| **36 Year Avg** | **0.97** | **0.71** | **1.19** | **1.17** | **1.26** | **0.74** | **0.54** | **0.54** | **0.73** | **0.90** | **0.90** | **0.80** | **10.45** |

The Beowawe U of N Ranch weather station is at 5,740 ft. elevation. The period of record from this weather station was from September 1972 to January 1, 2008, with data available through May 2008. The average annual precipitation received at this weather station was 10.47” through the period of record according to the Western Regional Climate Center website ([wrcc@dri.edu](mailto:wrcc@dri.edu)). This weather station also reports that the average total snowfall per year is 28.4 inches, with snow data reported from October through May.

Drought is a common occurrence in Nevada and the Great Basin, occurring as frequently as 6 out of every 10 years. Drought is defined by the Society for Range Management as “…prolonged dry weather when precipitation is less than 75% of the average amount” (SRM 1989).

The precipitation data from this weather station indicates that seven of the past 13 years (54%) have met the definition of drought. In 2008, data from January through May reflects 62% of the period of record average. Spring moisture is most critical to plant growth, followed by late summer or fall, which allows some re-growth and carbohydrate storage prior to winter. Drought conditions during the period of March through June can substantially reduce annual production of forage, as well as have detrimental effects to vegetation health, especially under heavy or repeated grazing. March through May 2008 – precipitation was far below the average, reflecting just 34% of the average. Despite this low recorded precipitation, the spring was frequented by numerous rain storms which provided timely moisture within the Complex.

With the exception of 2005, and 2006, all years since 2002 (the most recent Callaghan HMA gather and when Rocky Hills wild horses were released) reflected precipitation levels far below the period of record average for the period of March through June. The following table displays the results for both the critical spring growth period (March-June) and for the entire year as a whole.

**Beowawe Weather Station -- Spring and Annual Precipitation**

|  |  |  |  |
| --- | --- | --- | --- |
| **Year** | **March-June Precipitation (inches)** | **March-June**  **% of 36 Year Average** | **12 Month % of 36 Year Average** |
| 2008 | 1.24 | 34% | 62% |
| 2007 | 3.29 | 75% | 72% |
| 2006 | 5.12 | 117% | 92% |
| 2005 | 4.94 | 113% | 98% |
| 2004 | 1.19 | 27% | 100% |
| 2003 | 3.42 | 78% | 85% |
| 2002 | 2.08 | 48% | 43% |

Interestingly, in 2004, July through November precipitation was far above average levels, with the data reflecting 117-321% in July through November despite below average levels during spring.

Since 2002, precipitation has averaged 8.87 inches annually corresponding to 85% of the period of record average. Of these 7 years, (2002-2008), 3 years met the definition of drought.