

Condition Assessment of Selected  
Nevada Wildhorse Herds and  
Herd Areas

an assessment requested  
by the Bureau of Land Management

Professional opinions  
submitted by

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## I. Purpose:

The purpose of this report is to provide the Bureau of Land Management with an outside/independent assessment of selected Nevada wild horse herds and herd management areas. This assessment deals with the nutritional status of the horses as well as forage availability and ecological well being of the range area on which these horses and other grazers depend. This report is provided in response to a solicitation by the Bureau of Land Management.

## II. Situation:

The Animal Protection Institute (API) has filed appeals which protest several planned wild horse round-ups in Nevada. At issue is the Bureau's attempt to manage wild horses. In order to manage these animals the Bureau developed desired herd population levels which were thought to be consistent with the grazing capacity of the land and the forage demands of the other grazers using these same lands. The desired horse herd population levels, which have become known as appropriate management levels (AML), were developed through the Bureau's land use planning process (LUP). This planning process draws on appropriate biological and social information and provides for public input. The LUP is the planning process used to generate management plans for all of the Bureau's natural resources responsibilities.

API has challenged the Bureau's method of establishing the Appropriate Management Levels. They contend that the Land Use



Plans are not sufficiently specific, Environmental Assessments (EAs) for gathering plans are not adequate, and the Herd Management Plans (HMPs) must be completed prior to gathering. In a separate appeal, Craig Downer contends that some gathers affect the viability of herd populations.

### III. Assessment Methods:

The information in this report represents the collective professional judgement of the authors who, acting as a team, conducted an extensive field tour of selected wild horse management areas. Team members included an animal nutritionist, two range scientists and a horsewoman (see Appendix 7 for team member resumes'). The data base for this report was provided by visual observations of wild horses; forage utilization, abundance and quality on wild horse ranges; and apparent ecological status of horse ranges as well as briefings by Bureau wild horse specialists. Wild horse ranges (Herd Management Areas) inspected by the team include: Buffalo Hills, Buck and Bald, Butte, Maverick-Medicine, New Pass-Ravenswood, Desatoya, Monte Cristo, Granite and Clover Mountain. The field tours of these areas were conducted between October 24 and November 5, 1988.

Timing of the field observations that provide the basis of this report is significant. Observations on horse body condition and on remaining forage availability are particularly pertinent at the end of the plant growing season and immediately prior to the onset of winter. Body fat reserves and the remaining



standing forage during this season represents the sole food reserves on which horses and other grazers must winter.

Important forages available to grazing horses were recorded for each of the HMAs (Appendix Table 3). Published information from similar plant communities in Nevada, Oregon and Wyoming (Appendix Tables 4 and 5) was used to provide an assessment of nutrient quality of forages known to be utilized by horses during the winter season. According to the National Research Council (1978), horses require a minimum of 8.5% crude protein for maintenance (Appendix Table 2). Growing animals or animals which are walking long distances (>3 miles) to water will have higher requirements. Also, environmental stress (winter conditions) will elevate nutritional requirements. Urness and McCulloch (1973) have developed general categories for rating digestibility values. These categories are excellent (>50%), good (40-50%), fair (30-40%) and poor (<30%) and provide an estimate of energy derived by the grazing animal foraging on various plant species.

Skeletal cover sex and age are appropriate parameters to assess body condition of horses on the range. The following condition descriptions were used to classify the wild horses observed during this assessment.

#### EXCELLENT TO GOOD

Bands in excellent to good condition would include both sexes, adults and foals, carrying an abundance of



flesh over the entire body, however, with special emphasis over the top line. This indicates they have had access to sufficient water and nutrition to prepare them for the more rigorous demands of maintaining body heat and weight during winter. It would also indicate that they are not expending an inordinate amount of energy traveling between feed and water which allows them to convert their intake to weight rather than its being utilized for travel.

#### FAIR

Bands in fair condition would be those where the stallions may be in the above described condition, however, the mares are showing stress of lactation and likely another pregnancy by carrying less flesh over the top line. This indicates a deficiency in nutrition or water, or may be brought about by excessive travel. The result is a lack of weight appropriate to deal with the additional stress of winter and cold weather. Often these horses will carry more belly than horses in better condition which would indicate a lower quality of feed that isn't efficiently converting to flesh. Foals would also not be as well fleshed out as those in the above category.



POOR

Bands in poor condition would include stallions, mares and foals with the poorest condition evidenced in the mares and foals. These horses may or may not be showing extended bellies. Some will be gaunt and all will be angular over the hips with withers more than normally prominent. Adequate flesh will be absent from the neck, top line (spine) and many of these horses will appear to have a shelf over the rib cage due to inadequate cover.

Horses in this category have suffered severe deprivation of feed or water or both, or may simply be worn down from extensive travel between supplies of feed and water. Their feet may show abnormal wear, often resulting in deep bruising of the frog and lameness. Lameness will be particularly noticeable in the foals.

AGED HORSES

Bands in all three categories of condition may include aged horses consistent with the condition of the rest of the population, or in a greater state of decline than younger more vigorous animals. Due to the consequences of age and possible infirmities, aged horses should not be a primary indicator of band condition.



#### IV. Findings:

Resource conditions of the wild horse areas inspected are presented subject to the caveat that reasonable and perceptive management takes remedial action before a disaster develops. Obvious forage shortages, habitat damage and poor animal condition should not be necessary precursors to management action.

#### Buffalo Hills HMA

The Buffalo Hills HMA is largely low sagebrush rocky scablands with interminglings of big sagebrush and western juniper sites. Predominant forage plants utilized by wild horses and livestock are Sandberg bluegrass, squirreltail grass and at lower elevations cheatgrass, winterfat and shadescale (Appendix Table 3). These grasses during the winter season will contain 3-6% crude protein with forage digestibilities ranging from 30-50%. The limited amount of winterfat will maintain a higher crude protein (8-9%) and similar digestibility to grasses. This would indicate that winter season crude protein levels will be below those required for horse maintenance while energy level will be adequate.

Apparent ecological condition of the Buffalo Hills HMA is fair to good. The area currently sustains approximately 7000 AUMs of wild horse use on a year long basis, 4000 AUMs of livestock and a large number of deer and antelope. Livestock grazing occurs during the summer for two consecutive years out of



four with 1988 being the second year. The Buffalo Hills HMA is also located in a region of the state that has sustained two consecutive years of severe drought. Current forage use is heavy and scant cured forage remains to carry the horses through the coming winter. Additionally there was no fall green-up of grasses which would have provided an important increase in the nutritional quality and quantity of forage available to horses (10-20% crude protein and 50-70% digestibility).

Current wild horse populations are about twice the desired management level (Appendix Table 1). The management level represents the number of horses that survived in the area after the severe winters of the early 1980s. Current body condition of observed horses was fair with mares showing signs of "draw down" on the top line.

Overall the Buffalo Hills HMA is in trouble. Winter die-off of wild horses is probable. Perhaps API should be required to bond against the cost of winter feeding or rescue of these horses if they wish to continue enjoining the horse round-up. API contends that a round-up on the rocky terrain would result in sore footed horses. However, the BLM proposal to round-up when the ground would be snow covered would alleviate this problem. The horses are more likely to become sore-footed because of the distance they have to travel between water and feed in this drought stricken area (Fig. 1).





Figure 1. Scarcity of water and forage apparent in Buffalo Hills HMA.



### Granite HMA

Granite Mountain HMA is primarily a big sagebrush-bunchgrass range. Principal forage species include Sandberg bluegrass, squirreltail grass, needlegrass, bluebunch wheatgrass, ryegrass, and cheatgrass (Appendix Table 3). These grasses should provide 3-6% crude protein and adequate energy levels. A limited amount of winterfat and shadscale is available at lower elevations. Apparent ecological condition of much of this HMA is good. The area is currently grazed by at least 563 horses (Appendix Table 1) yearlong (6756 AUMs) and by about 1562 AUMs of cattle use in the late summer on alternate years. Vegetation growth in the Granite Mountain evidenced less drought impacts than the Buffalo Hills, possibly due to the higher elevation.

Current forage utilization in the Granite HMA was moderate. Sufficient forage reserves remain to assure successful overwintering of the wild horse herds. While horse numbers currently exceed management levels (563 head vs 176 head), there appears to be little or no problem with adequate forage supplies. This likely results from the very conservative livestock forage allocation in this area. Whatever the reason, current horse body condition is good and remaining forage supplies appear adequate for the forthcoming winter.

### Maverick-Medicine HMA

The Maverick-Medicine HMA consists mostly of moderate elevation Utah juniper rangeland surrounded by black sagebrush at



lower elevations. The horses winter on winterfat (8-9 crude protein, fair to good energy level) flats when the snow covers forage at higher elevations. Predominant forage plants for wild horses and livestock include Sandberg bluegrass, squirreltail and cheatgrass. These grasses should provide crude protein levels ranging from 3-6% with fair to good energy levels. No fall green-up was observed on the area. There has been no livestock use on the west side during the past two years, but there has been heavy use at the lower elevations on the east side. The BLM presently has little or no control of the Indian cattle use on the east side.

The apparent ecological condition is fair to good, with heavy juniper and rabbitbrush infestation on the fair sites. Considerable standing forage is available on the west side of the area with good stands of Basin wildrye grass virtually ungrazed around springs that are used by horses for watering (Fig. 2). The 1987 inventory of horses on the area, at least 443, is more than double that AML of 195 to 244. Although there is sufficient feed to winter the horses this year, there will likely be forage shortage when the domestic livestock permit on the west side is again activated. The area has good water distribution.

No horses were observed during the field tour of this HMA, but recent signs of horse use around the springs was noted. Observations of agency field staff rated horse condition as good.





Figure 2. Abundant forage in the vicinity of springs currently used by wild horses for watering. Maverick-Medicine HMA.



### Butte HMA

The Butte HMA is composed of mountain sagebrush-grassland and pinyon-juniper woodlands at the higher elevations and open valley bottoms vegetated by wyoming big sagebrush and winterfat stands. Major forage plants are winterfat, needlegrass, Sandberg bluegrass, squirreltail, rye grass, and wheatgrass. These forages should provide 3-8% crude protein and fair to good energy levels. Winter season horse diets should be near maintenance levels because of availability of shrubs. Apparent ecological condition is mostly satisfactory to good, with considerable standing forage. The area has good water distribution.

Domestic livestock grazing consists of cattle use on the lower range and sheep use on the upper range. The AML for the area is 60 horses. The 1987 inventory showed at least 202 horses using the area. Body condition of observed wild horses was good. Although current grazing use appears moderate there is a potential for forage shortages if the horse numbers continue to increase. The HMA is an important deer range with heavy use.

### Buck and Bald HMA

The Buck and Bald HMA is a large area encompassing two mountain ranges, (Butte Mountains and Buck and Bald Mountains) along with Long Valley and the eastern part of Newark Valley. The valley vegetation is predominantly shadscale and winterfat. The mountain vegetation consists of big sagebrush-grasslands,



black sagebrush communities and pinyon-juniper woodlands with a sagebrush-grass understory.

The Buck and Bald HMA, as of the 1987 census, supports at least 1081 wild horses. The AML was established at 700 head and the annual horse increase has not been removed since 1985. This HMA also supports a large amount of livestock grazing. At the time the AML for horses was established (thru CRMP), reductions in the livestock use were successfully negotiated.

The lower elevation sagebrush vegetation and pinyon-juniper woodland of this HMA are in poor to fair apparent ecological condition due to widespread pinyon-juniper encroachment. This increase of unpalatable woody plants occur at the demise of desirable understory forage plants. Pinyon-juniper encroachment is the direct result of lack of periodic fires.

The shadscale and winterfat areas are in apparently good ecological condition. There is considerable standing forage of both palatable shrubs and grasses in Long Valley. However, there is very little remaining grass forage and over 60% current use on the winterfat in the Newark Valley portion of this HMA (Fig 3). The bulk of wild horse observations were also confined to the Newark Valley portion of the HMA. In the other portions of the Buck and Bald HMA winter forage reserves certainly appeared adequate if not abundant and the nutritional characteristic of the forage plants should provide a satisfactory maintenance ration for over wintering horses and other grazers (Appendix Tables 2, 3, 4, and 5).





Figure 3. Ungrazed winterfat stands in Long Valley (upper photo) compared with more heavily grazed winterfat stands in eastern Newark Valley (lower photo). The grazing use in Newark Valley was from wild horses.



Observed horse body condition in this HMA was good, even for horses found in the more heavily grazed Newark Valley portion. It was the degree of current horse grazing use and the lack of remaining forage reserves on the east side of Newark Valley that suggests the need to reduce horse numbers.

#### New Pass - Ravenswood HMA

The New Pass-Ravenswood HMA consists of a portion of the Shoshone and Ravenswood Ranges, Antelope Valley and portions of Edwards Creek and Reese River Valleys. The higher mountain slopes were vegetated by mountain big sagebrush-bunchgrass; the lower slopes supported dense stands of pinyon-juniper and wyoming big sagebrush; and the valley bottoms were shadscale, winterfat and cheatgrass. The HMA currently supports at least 1200 wild horses (Appendix Table 1) and substantial amounts of livestock grazing. AML for wild horses is 812 head and horses were last gathered in 1986.

Apparent ecological condition of the vegetation in this HMA is mostly fair. There are excessive proportions of pinyon-juniper or sagebrush when compared to the amount of desirable understory plant species. The species of forage plants generally common on this HMA should provide adequately for the nutritional needs of horses and other grazers (Appendix Tables 2, 3, 4, and 5) provided forage shortages do not occur.

The current intensity of the combined grazing use by horses and livestock in this HMA appears to be a matter for some



concern. Summer range areas and riparian zones were heavily grazed. Winter ranges were already showing signs of substantial grazing, mostly by horses as the bulk of the livestock had not yet arrived on winter range. The few water sources on winter range showed signs of heavy horse use (Fig. 4). While considerable ungrazed winter forage was yet evident and observed horse body condition was good in the New Pass-Ravenswood HMA, there were early signs of a generally overstocked range. This area is probably in need of management attention before major problems develop.

#### Desatoya HMA

The Desatoya HMA is vegetated largely by mountain big sagebrush at the higher elevations, dense pinyon-juniper on the lower mountain slopes, black sagebrush on the alluvial fans and winterfat/shadscale in the valleys. The winter range is dominated by cheatgrass, needlegrass, Sandberg bluegrass, squirreltail and winterfat. These forage plants should provide adequately for the nutritional needs of wild horses and other grazers (Appendix Tables 2, 3, 4, and 5) when sufficiently abundant. Apparent ecological condition of the vegetation varied from fair to good for the winterfat/shadscale communities, excellent in the blacksage type and poor in the pinyon/juniper zone. The problem in the pinyon/juniper relates to tree encroachment at the expense of shrub-grass understory plants and results from lack of burning.



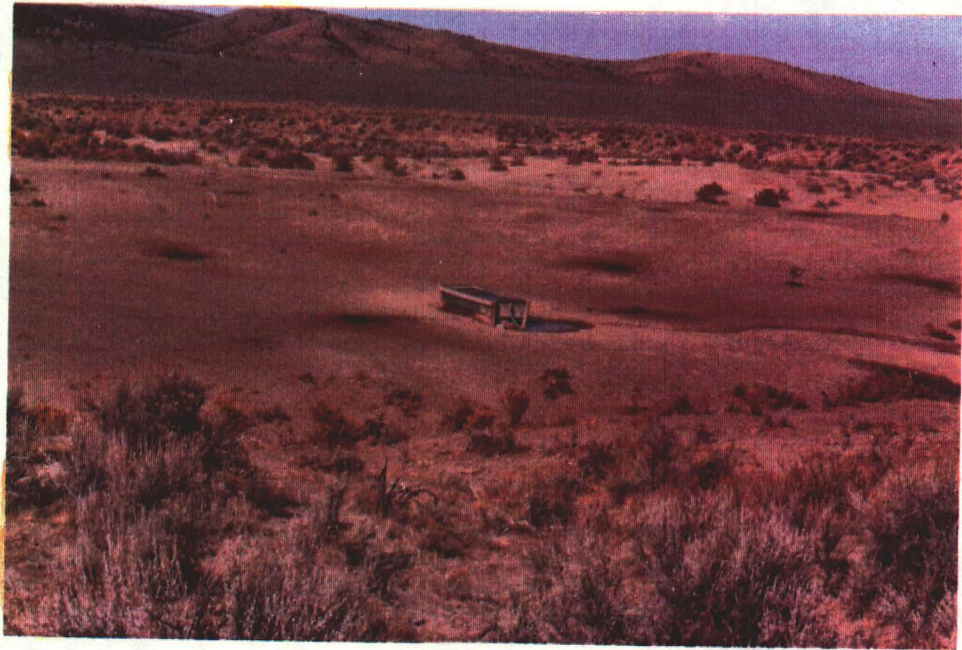


Figure 4. Heavy horse use around Little Antelope Springs in the Ravenswood HMA. Note numerous stud piles.



Current wild horse populations in the Desatoya were censused at 688 head. There are portions of this HMA which appear to be virtually horse-free while other places show signs of heavy horse concentrations. Specifically, horses were abundant on the Smith Creek and Porter Canyon/Corral Springs area. From Corral Springs north past the mouth of Porter Canyon to the fence near Highway 50, horse use was heavy to excessive. Trampled watering areas, a proliferation of dusty horse trails and the ever present stud piles characterize this landscape. Winterfat and grasses in this region already show heavy grazing use. Observed horse body condition was fair with mares showing sign of "draw down" along the top line. In this area of wild horse concentration there was little or no observable signs of current-year livestock use.

While portions of the Desatoya HMA do not appear to support much wild horse use, other portions show signs of horse overstocking. Specifically the Smith Creek-Porter Canyon area appears to be overstocked with wild horses.

#### Monte Cristo

Rolling hills covered with dense pinyon juniper, limestone outcropping ridges vegetated by little leaf mahogany and broad valley bottoms of winterfat, shadscale and blacksage characterize the Monte Cristo HMA. Ecological condition of these plant communities is generally good except for the pinyon-juniper encroachment problem. This area currently supports over 200 horses or about double the management levels.



Current forage utilization in the Monte Cristo is moderate to light. Much winter forage remains ungrazed at this time, suggesting that adequate winter feed exists to successfully overwinter this horse herd. Major grasses are needlegrass, squirreltail, cheatgrass, Sandberg bluegrass, wheatgrass and Indian ricegrass. Some fall green-up on cheatgrass and bluegrass was observed which will enhance nutrient quality available to winter grazing animals. These species should provide 3-6% crude protein and fair to good energy levels. Winterfat, ephedra and little leaf mahogany are the major shrubs in the area which provide 7-9% crude protein and fair to good energy levels.

Although no horses were observed during the tour of Monte Cristo, horse condition likely is at least satisfactory. Current feed supplies suggest that there is no eminent disaster awaiting the horses or the other grazers in this HMA.

#### Clover Mountains HMA

The Clover Mountains are largely pinyon-juniper-grassland with interminglings of big sagebrush-grass areas at the higher elevations. The winter site in the Tule Desert is predominantly a blackbrush-galleta grass-threawn community. Galleta grass, needlegrass, bluegrass, squirreltail, Indian ricegrass, cheatgrass and wheatgrass are the major grasses available to horses. These grasses should provide 3-6% crude protein and fair to good energy levels. The major shrub available on the winter range is blackbrush. Use of this shrub species by horses has



not been documented. Apparent ecological condition of this area is good. The winter range occupies a small area and all large grazers tend to utilize it during the winter. It is recommended that this area be monitored for possible over utilization. Current forage use is light to moderate throughout the area. There was some fall green-up of cheatgrass, bluegrass and wheatgrass. Water is available throughout the area and use around water sites observed was light to moderate.

#### V. Discussion:

##### Management of Populations of Large Grazers

Prior to European settlement of the western United States, populations of several species of large grazing animals roamed the western range. The natural increase of these grazers was constantly being limited by predation, including aboriginal hunting and by attrition from winter die-off due to starvation. While the population levels of grazers may well have fluctuated, it is obvious that the natural annual increase of grazing animals on pristine ranges was inevitably held in check.

The necessity of population control on grazing animals is as real today as in times past. Today large populations of native grazers, such as deer and antelope, compete for food, water, and space on our western rangelands along with herds of domestic grazers such as livestock and wild horses. The well-being of each of these grazer populations is dependent upon some form of population check on all grazers. It is eminently reasonable and



ecologically necessary that we do not allow the unrestricted increase of these populations. The natural increase of wildlife species is annually harvested. The young animals from our herds of livestock are gathered each year and removed from the range. So it must be with the wild horse. The wild horse has no effective natural predator except man, and our failure to maintain population control on wild horses not only jeopardizes the well-being of wildlife and livestock but the horses as well. It is an ethical obligation of man that we maintain population checks on the various grazers so that a reasonable balance with the capacity of the land is maintained. To this purpose, it is important that the natural increase of horses along with other grazers be periodically gathered from the range.

Prior to 1971 the natural increase of free roaming horses on the western range was periodically checked by ranchers and mustangers. With passage of the Wild Horse and Burro Act the sole responsibility for managing free roaming horses in a thriving ecological balance was vested in the Bureau of Land Management as part of its boarder purpose of managing the public rangelands. To this purpose the Bureau, through its land use planning process, established management levels for horse populations as well as stocking rates for livestock and management levels for major wildlife species. These population levels for large grazers were based on best estimates of the grazing capacities of the land as determined from professional judgement and public input. The appropriateness of these



management levels can only be judged by holding grazer populations at or near these management levels through several years and various weather cycles. The vagaries of drought and severe winters are the ultimate test of the correctness of herd management levels.

Reasonable and perceptive management avoids disaster. Remedial action should be taken before there is a feed shortage, subsequent range damage, and winter die-offs. Furthermore, failure to maintain wild horses at agreed upon herd levels, while wildlife and livestock are annually held in check, contributes to public disillusionment with the Bureau's management program and leads to blatant disregard for the laws and rules governing our natural resources. Would the opponents of the planned wild horse round-ups maintain a similar posture if it were the livestock that were annually increasing unchecked on the range?

#### VI. Conclusions:

Periodic removal of the annual increase of large grazer populations such as wild horses is a reasonable and necessary part of rangeland management. The failure to take such management action leads directly to overgrazing and animal die-offs. Several of the HMA's included in this report showed obvious biologic indicators of the need for wild horse population reductions. Specifically the Buffalo Hills, New Pass-Ravenswood and portions of the Buck and Bald and the Desatoya HMA's are in trouble biologically. Wild horse herds as well as the other



grazing animals that live in these areas are facing some degree of forage shortage during the coming winter. Appropriate management action in these areas has already been too long delayed.

Prudent management of natural systems is not a matter of reacting to disasters, but rather preventing them. The Bureau, through its land use planning process, has established stocking rates or population levels for all large grazers using the public range. Implementation of these levels and monitoring their effects constitutes reasonable grazing management: "state of the art." If monitoring indicates that these population levels are incorrect (excessive or conservative), the means for adjustments are in place as part of the Bureau's planning and management procedures.

The API appeals are, in our opinion, without a biological basis and appear intended to perpetuate rather than solve the wild horse problem. These legal challenges appear to be driven by political and self-serving motivations and are an attempt to by-pass the established management procedures of the responsible agency.



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APPENDIX TABLE 1. Allotment Management Level (AML) and Current Horse Census Numbers for Selected Horse Management Areas in Nevada.

Horse Management Area	AML	Current Census	Last Gathered
Buffalo Hills	272	644 (1988)	1986
Buck and Bald	700	1081 (1987)	1985
Butte	60	202 (1987)	1986
Clover Mountain	55	84 (1988)	Never
Desatoya	688	217 (1988)	Never
Granite Range	176	563 (1988)	Never
Maverick Medicine	195-244	443 (1987)	1986
Monte Cristo	96	200 (1987)	1985
Newpass-Ravenwood	812	1227 (1988)	1986
Nellis Range <sup>a</sup>	2000	4185 (1988)	

<sup>a</sup>This site was not visited, however the extremely large number of horses occupying this area may warrant site inspection to access animal and range conditions. Comments from local observers strongly suggest that there are major problems in this area.



APPENDIX TABLE 2. Nutrient Requirements of Horses Expressed on 100 Percent Dry Matter Basis.

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	Crude Protein (%)	Digestible Energy (meal/lb)
Mature horse maintenance	8.5	1.0
Mares, last 90 days of gestation	11.0	1.1
Mares, first 90 days of lactation	14.0	1.3
Foal (first 3 month)	18.0	1.5
Weaning (first 6 months )	16.0	1.4
Yearling (12 Months)	13.5	1.3
Long Yearling (18 months)	11.0	1.2

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APPENDIX TABLE 3. Major Horse Forage Species Observed on Selected Horse Management Areas in Nevada.

FORAGE	Horse Herd Management Areas								
	Buck and Bald	Buffalo Hills	Butte	Clover Mtn.	Desatoya	Granite Range	Maverick Medicine	Monte Cristo	New Pass-Ravenwood
<b>GRASSES:</b>									
Cheatgrass	x	x	x	x	x	x	x	x	x
Needlegrass	x	x	x	x	x	x	x	x	x
Sandberg Bluegrass	x	x	x	x	x	x	x	x	x
Wheatgrass	x	x	x	x	x	x	x	x	x
Squirreltail	x	x	x	x	x	x	x	x	x
Indian ricegrass	x	x	x	x	x	x	x	x	x
Brome									x
Galleta				x					
Threeawn				x					
Wildrye						x	x		
<b>SHRUBS:</b>									
Winterfat	x	x	x	x	x	x	x	x	x
Shadescale	x	x	x	x		x		x	x
Lowsage		x					x	x	
Blacksage			x						
Budsage			x				x		
Blackbrush				x					
Serviceberry		x		x		x			
Bitterbrush		x		x		x			
Mahogany			x					x	



APPENDIX TABLE 4. Botanical Composition of Horse Diets Consumed During the Winter Season in Nevada, Oregon, and Wyoming.

	NEVADA <sup>a</sup>	Percent OREGON <sup>b</sup>	WYOMING <sup>c</sup>
Grasses	46.8	98.5	60
Shrubs	53.1	1.5	39
Forbs	<.1	--	1
GRASSES:			
Needlegrass	17.6	Major	31.0
Squirreltail	1.2	Major	--
Sandberg Bluegrass	2.6	--	19.0
Wheatgrass	12.1	Major	4.0
Cheatgrass	t	--	--
Indian ricegrass	4.7	--	5
Foxtail barley	7.0	--	--
Fescue	--	Major	--
SHRUBS:			
Winterfat	52.5	--	16.0
Ephedra	<1.0	--	--

<sup>a</sup>Krysl, L. J. et al (1987 unpublished data).

<sup>b</sup>Vavra, M. and F. Sneva (1978).

<sup>c</sup>Krysl, L. J. et al (1984a)



APPENDIX TABLE 5. Nutritional composition of Major Horse Forage Consumed During the Winter Season in Nevada and Wyoming.

FORAGE	Percent			
	NEVADA <sup>a</sup>		WYOMING <sup>b</sup>	
	Crude Protein	Digestibility	Crude Protein	Digestibility
<b>Grasses:</b>				
Needlegrass	3.6	43.3	5.6	43
Squirreltail	-	-	5.5	46
Sandberg Bluegrass	4.2	49.4	3.7	40
Wheatgrass	3.0	44.5	3.9	39
Cheatgrass	3.5	50.1	-	-
Indian ricegrass	4.6	47.5	4.0	42
<b>SHRUBS:</b>				
Winterfat	8.9	50.6	8.1	42
Ephedra	7.3	42.0	-	-

<sup>a</sup>Krysl, L. J. et al (1987, unpublished data).

<sup>b</sup>Krysl, L. J. et al (1984b)



APPENDIX TABLE 6. Horses Observed and Condition on Selected Herd Management Areas (HMA) in Nevada

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HMA	Number Observed	Animal Condition <sup>a</sup>
Buck and Bald	78	fair - good
Buffalo Hills	7	poor - good
Butte	11	good
Clover Mountain	-	good - excellent <sup>b</sup>
Desatoya	100+	good
Granite Range	60	excellent
Maverick Medicine	-	good - excellent <sup>b</sup>
Monte Cristo	-	-
Newpass-Ravenwood	119	fair - good

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<sup>a</sup>poor - fair - good - excellent

<sup>b</sup>observations of local field staff interviewed.



Appendix 7.      Resume's of Authors



RESUME'

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M.S. Range Management, University of Idaho, 1967;  
B.S. Forestry, University of Idaho, 1964;  
Certificate, Farm and Range Appraisals.

Experience

Thirteen years teaching the following courses at University of Nevada and University of Idaho: Principles of Range Management, Range Plants, Range Agrostology, Range Improvements, Quantitative Vegetation analysis, Resources Field Trip, Range Management Planning and Advanced Grazing Management.

Eighteen years conducting research in pinyon-juniper ecology, livestock food habits in the Mojave Desert, mule deer-livestock relationships, methods of measuring range forage production and condition and trend, shrub biomass, and evaluating vegetation changes since settlement times.

Served on numerous advisory groups and technical committees for the Bureau of Land Management, Forest Service, and Fish and Wildlife Service working on coordinated resource management planning resources conflict resolution.

Range management consultant for several private consulting firms working on environmental assessments of grazing practices, mining proposals, and powerline corridors. Designed grazing management systems and grazing monitoring programs.

Eight yeasrs managing grazing and cropland permits and leases for the Idaho Department of Public Lands.



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Education

BA University of Washington in Public  
Policy and Planning

Experience

1955-74 Operated a horse breeding  
program of about 100 mares annually

1961-66 Co-owner and operator of a  
large horse ranch in California.  
Handled 8500 head of broke and wild  
horses.

1970 Trained competition riding judges  
for North America Trail Riding  
Conference.

Fifteen years conducting clinics and  
seminars on horse behavior, horse  
stress management, Wild Horse and  
Burro capture.

Conducted BLM education seminars on Wild  
Horse and Burro capture and  
adoption. The audience was the  
general horse owning public and the  
horse industry leadership. Goal  
was to gain horse industry  
acceptance of the Wild Horse and  
Burro adoption program.

Produced 6 slide series for the Bureau  
of Land Management on Wild Horse  
and Burro capture, adoption, and  
training.

Conducted stress tests for BLM on  
various Wild Horse and Burro  
restraint and handling methods.

Author of 3 books and numerous articles  
on horses.

Photographer.



# LESLIE JOE KRYSL

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## PERSONAL DATA

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### Office

Department of Animal Science  
University of Nevada-Reno  
Reno, NV 89557  
(702) 784-1624

### Residence

3290 Plumas #223  
Reno, NV 89509  
(702) 826-9576

Date and Place of Birth: March 7, 1955; Topeka, KS

Marital Status: Married

Children: Two

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## ACADEMIC BACKGROUND

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<u>Date</u>	<u>Degree</u>	<u>Institution</u>	<u>Subject Area</u>
1977	B.S.	Texas Tech University	Wildlife Science
1979	M.S.	Texas Tech University	Range Science
1986	Ph.D.	New Mexico State University	Animal Science

**Dissertation Title:** Influence of nitrogen fertilization on botanical and chemical composition, intake and digesta kinetics of steers grazing blue grama rangeland.

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## PROFESSIONAL ADVANCEMENT

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<u>Date</u>	<u>Rank</u>	<u>Institution</u>
1986-Present	Assistant Professor	University of Nevada-Reno
1982-1986	Research Assistant	New Mexico State University
1980-1982	Research Associate	University of Wyoming
1979-1980	Research Associate	Texas Tech University
1977-1979	Research Assistant	Texas Tech University

## RESEARCH INTERESTS:

Investigation of the grazing ruminant-rangeland interface in order to increase production efficiency. Examination of the grazing ruminant from a basic (intake, digesta kinetic, microbial protein synthesis, forage degradation, hormonal profiles) as well as an animal performance (applications to producers) standpoint.