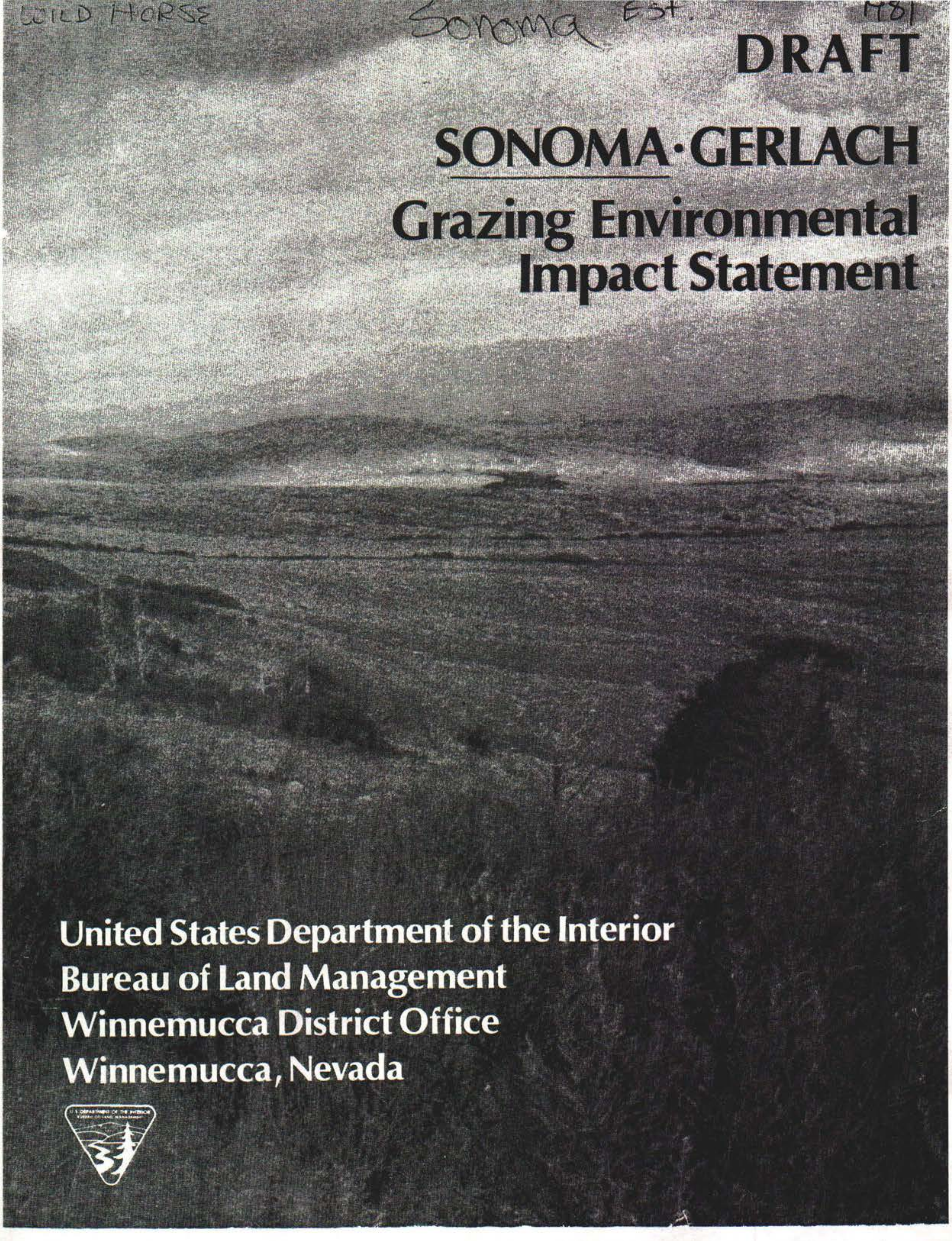
WILD HORSE Sonoma Est. 1981

DRAFT

SONOMA·GERLACH

Grazing Environmental Impact Statement



United States Department of the Interior
Bureau of Land Management
Winnemucca District Office
Winnemucca, Nevada

Save this document for future reference, as an abbreviated final environmental statement may be filed.

DRAFT

ENVIRONMENTAL IMPACT STATEMENT

PROPOSED DOMESTIC LIVESTOCK GRAZING MANAGEMENT PROGRAM

for the

SONOMA-GERLACH RESOURCE AREA

Nevada

Prepared by

DEPARTMENT OF THE INTERIOR

BUREAU OF LAND MANAGEMENT

WINNEMUCCA DISTRICT

State Director

Nevada State Office

The Bureau of Land Management proposes to implement a livestock grazing management program for the Sonoma-Gerlach Resource Area of the Winnemucca District in north-central Nevada. This program proposes to allocate available vegetation to livestock, big game, and wild horses and burros; determine the levels of livestock grazing management; identify needed livestock support facilities; outline a general implementation schedule and list the standard procedures for operation. Four alternatives are considered along with the proposed action. They are: No Livestock Grazing, No Action, Maximizing Livestock, and Maximizing Wild Horses and Burros. A discussion of the affected environment is briefly summarized and the environmental consequences occurring from the proposed action and each alternative are documented in the EIS.

For Further Information Write Frank Shields, District Manager,
705 E. 4th Street, Winnemucca, Nevada 89445
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Date by which comments are due:

SUMMARY

ALTERNATIVES INCLUDING THE PROPOSED ACTION

The Winnemucca District of the Bureau of Land Management (BLM) proposes to implement a livestock grazing management program in the Sonoma-Gerlach Resource Area. The Sonoma-Gerlach Grazing Environmental Impact Statement (EIS) covers approximately 4.5 million acres of BLM-administered public lands in the Sonoma-Gerlach Resource Area. Approximately 1.5 million acres of private, state and other lands are scattered throughout these public lands. In addition, the Summit Lake and Pyramid Lake Indian reservations are located within or adjacent to the resource area.

Five alternatives including the proposed action are being analyzed in the EIS: No Action, No Livestock Grazing, Maximizing Livestock Grazing, Maximizing Wild Horses and Burros, and the Proposed Action.

The various components to be analyzed for the alternatives, including the proposed action, which is the Bureau's preferred alternative, are: (1) Vegetation Allocation Program (Summary Figure 1), (2) Levels of Grazing Management, (3) General Implementation Schedule, (4) Livestock Support Facilities, and (5) Standard Operating Procedures.

Chapter 1 addresses the alternatives, including the proposed action. The present condition of the affected resource area is discussed in Chapter 2. Analyses of the alternatives including the proposed action, along with a discussion of avoidable and unavoidable impacts and means to lessen the effects of the more severe impacts are presented in Chapter 3. The Appendices contain methodologies and back up data.

The year 1982 will serve as the decision for action point followed by a seven year period to implement range improvements and land treatments (1989). A two year time period, designated short term, which would be 1991, has been allowed for land treatments to become fully effective. The long-term date (2024) is 35 years after implementation (1989). Summary Figure 2 further identifies these dates.

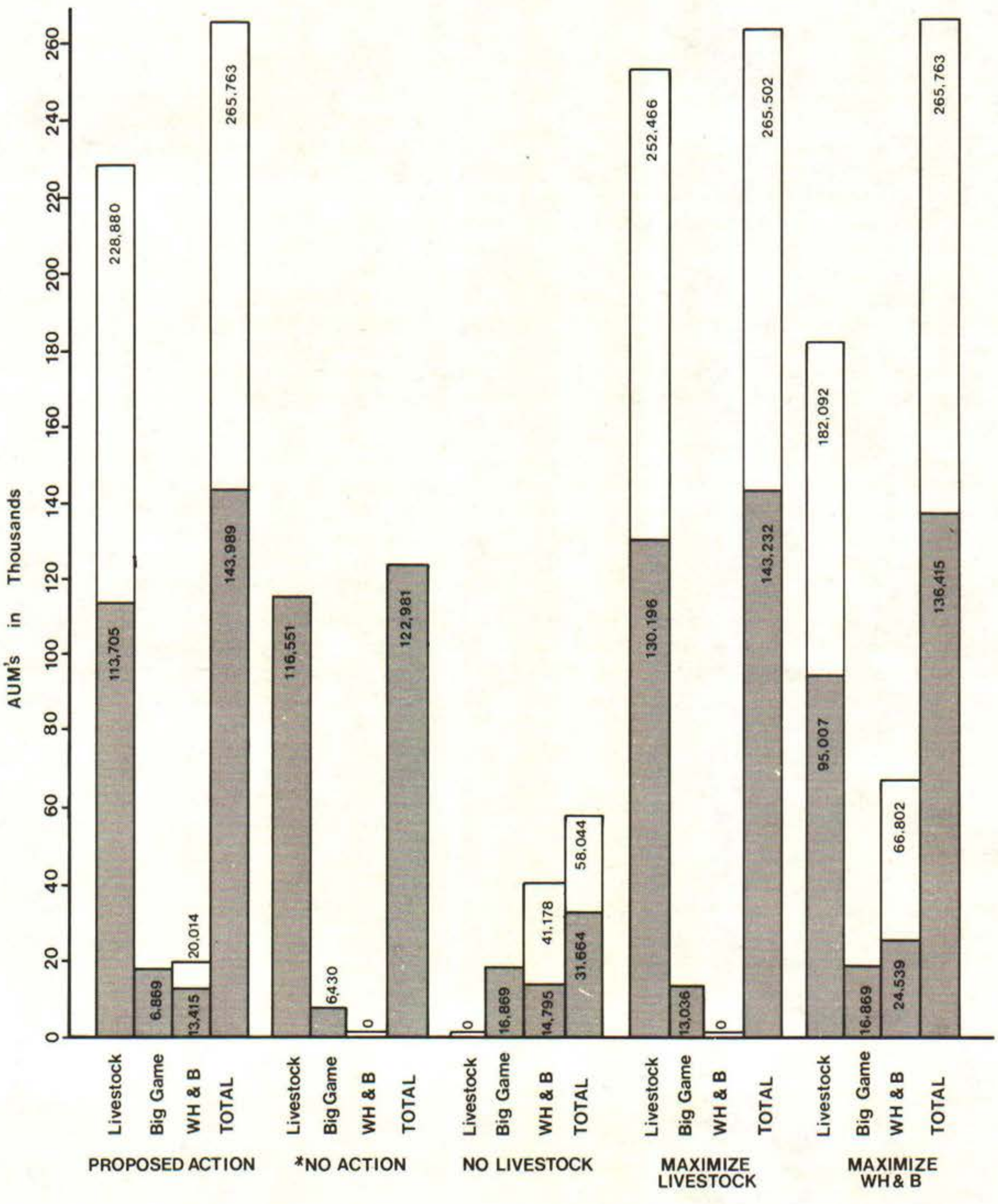
AREAS OF CONTROVERSY

In order to determine areas of concern with the proposed grazing management program in the Sonoma-Gerlach Resource Area, various interest groups, local and state governments, other federal agencies and numerous individuals were contacted. The allocation of vegetation emerged as a main area of controversy. Of greatest concern was the allocation of vegetation to wildlife and wild horses and burros which was previously allocated to livestock. Another area which drew considerable interest was the total elimination of livestock grazing in the three proposed wild horse and burro herd management areas. The effects on ranch operations resulting from the proposed changes in periods-of-use and the implementation of Allotment Management Plans (AMPs) also generated considerable interest.

Many of these issues will be resolved at the MFP III stage and/or during the implementation stage at which time all interested groups and individuals will be offered the opportunity to join with the Bureau in resolving these and other issues through Coordinated Resource Management and Planning.

The following summary table (Summary Table 1) covers only significant impacts to each resource, broken down by proposed action and alternative. Summary Table 2 shows the development of the Proposed Action through the MFP (planning) process and Summary Tables 3, 4, and 5 outline the vegetation allocations, management levels, and support facilities, respectively, proposed under the various alternatives.

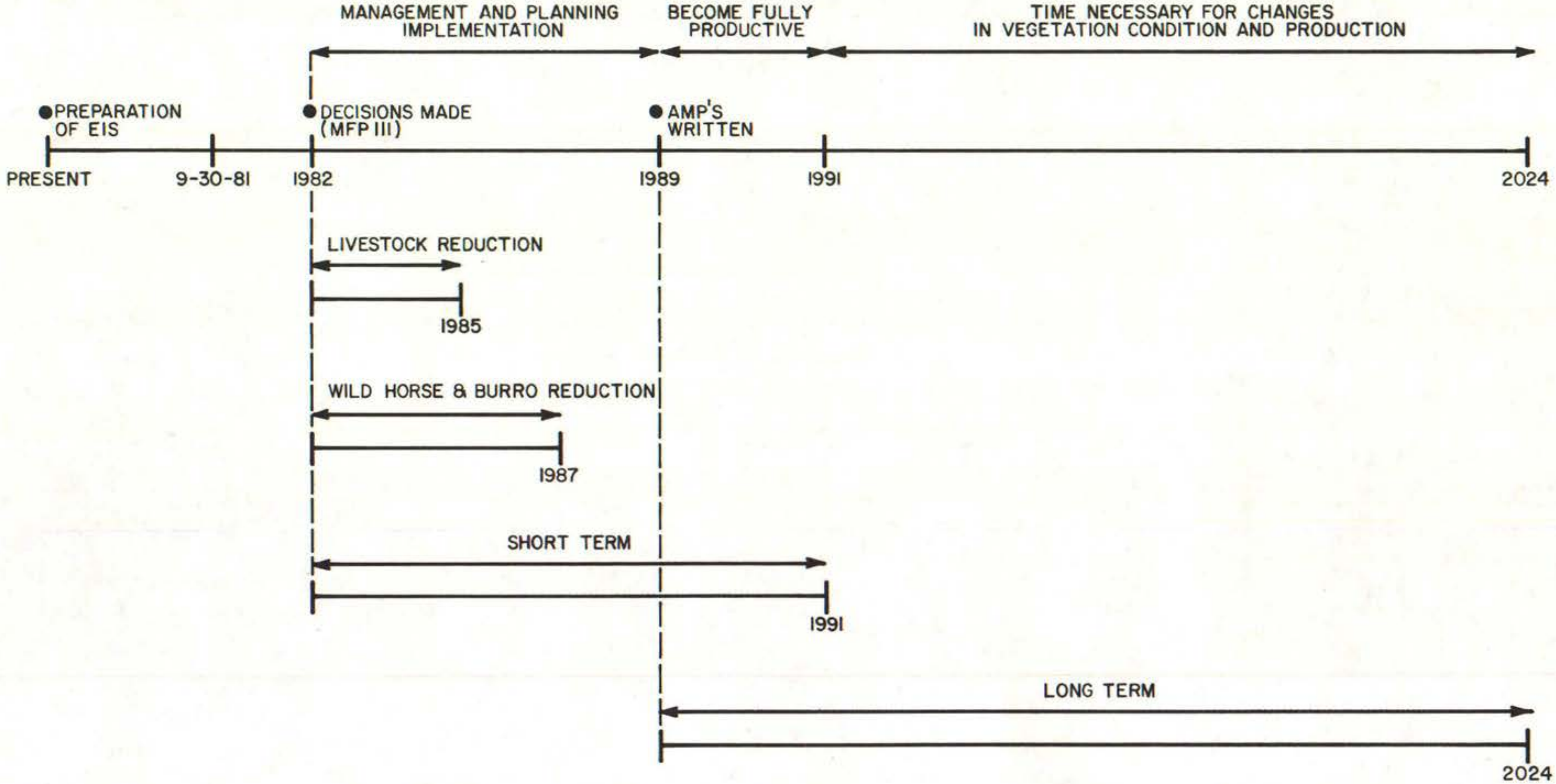
ALLOCATION OF VEGETATION BY ALTERNATIVE



Summary Figure 1 Allocation of vegetation in AUMs under each alternative. In all cases, AUMs for estimated future allocation equal or exceed initial allocations. Shaded areas correspond to initial allocations (1982); white areas correspond to any additional AUMs expected by year 2024.

*No action alternative is also the existing situation.

SUMMARY FIGURE 2
TIME FRAMES
PROPOSED ACTION AND ALTERNATIVES



SOURCE: U.S.D.I., B.L.M., SONOMA-GERLACH E.I.S.

SUMMARY TABLE 1 - Continued
SUMMARY COMPARISON OF SIGNIFICANT IMPACTS

Proposed Action	No Livestock Grazing	No Action	Maximizing Livestock Grazing Use	Maximizing Wild Horses and Burros
		WATER RESOURCES		
Short and Long-Term Adverse Impacts: 9 streams would exceed turbidity criteria. 3 streams would exceed temperature criteria. 4 streams would exceed coliform bacteria criteria.	Short and Long-Term Beneficial Impacts: 9 streams would not exceed turbidity criteria. 3 streams would not exceed temperature criteria. 4 streams would not exceed coliform bacteria criteria.	Same as proposed action. Same as proposed action. Same as proposed action.	Same as proposed action. Same as proposed action. Same as proposed action.	Same as proposed action. Same as proposed action. Same as proposed action.
		VEGETATION		
Short-Term Beneficial Impacts: Vegetation production projected to increase 82,020 AUMs (57 percent); however, eliminating land treatments within WSAs results in 77,011 AUMs (54 percent).	None	None	Short-Term Beneficial Impacts: Vegetation production projected to increase 85,550 AUMs (60 percent); however, eliminating land treatments within WSAs results in 78,332 AUMs (55 percent).	Short-Term Beneficial Impacts: Vegetation production projected to increase 82,020 AUMs (57 percent); however, eliminating land treatments within WSAs results in 77,011 (54 percent).
Short-Term Adverse Impacts: Loss of remaining ecological climax on 244,864 acres (6 percent) from rangeland seedings; however, eliminating rangeland seedings within WSAs results in 226,358 (5 percent).	None	None	Short-Term Adverse Impacts: Loss of regaining ecological climax on 259,956 acres (6 percent) from rangeland seedings; however, eliminating rangeland seedings within WSAs results in 228,840 acres (5 percent).	Short-Term Adverse Impacts: Loss of regaining ecological climax on 244,864 acres (6 percent) from rangeland seedings; however, eliminating rangeland seedings within WSAs results in 226,358 acres (5 percent).
Long-Term Beneficial Impacts: Ecological condition and trend projected to improve 10 and 63 percent, respectively. Vegetation production projected to increase 122,535 AUMs (85 percent); however, eliminating land treatments within WSAs results in 117,526 AUMs (82 percent). Aspen communities (non-riparian) projected to improve, but not significantly.	Long-Term Beneficial Impacts: Ecological condition and trend projected to improve 10 and 56 percent, respectively. Vegetation production projected to increase 39,987 AUMs (28 percent). Riparian and aspen communities projected to approach original (climax) plant communities.	None	Long-Term Beneficial Impacts: Ecological condition and trend projected to improve 11 and 64 percent respectively. Vegetation production projected to increase 121,270 AUMs (85 percent); however, eliminating land treatments within WSAs results in 113,052 AUMs (79 percent). Aspen communities (non-riparian) projected to improve, but not significantly.	Long-Term Beneficial Impacts: Ecological condition projected to improve 4 percent, but not significantly. Ecological trend projected to improve 55 percent. Vegetation production projected to increase 122,535 AUMs (85 percent); however, eliminating land treatments within WSAs results in 117,526 AUMs (82 percent). Riparian and aspen communities projected to improve in herd management areas, but not significantly. Also, aspen communities (non-riparian) projected to improve in allotments managed with AMPs, but not significantly.
Long-Term Adverse Impacts: Riparian communities projected to degrade, but not significantly.	None	Long-Term Adverse Impacts: Ecological condition and trend projected to degrade 13 and seven percent, respectively. Vegetation production projected to decrease 29,194 AUMs (20 percent). Riparian and aspen communities and projected to degrade in aspect, condition and trend and/or lose capabilities to regain original (climax) plant communities.	Long-Term Adverse Impacts: Riparian communities projected to degrade, but not significantly.	Long-Term Adverse Impacts: Riparian communities projected to degrade where livestock grazing continues, but not significantly. Aspen communities projected to degrade in allotments not managed with AMPs that have livestock grazing, but not significantly.
		LIVESTOCK GRAZING		
Initial (1982) Beneficial Impacts: The livestock allocation of 113,705 AUMs would increase livestock AUMs over the average livestock licensed use in nine allotments.	None	None	Initial (1982) Beneficial Impacts: The livestock allocation of 130,196 AUMs would increase livestock AUMs over the average livestock use in 11 allotments. This also represents a 12 percent increase in livestock AUMs for the resource area.	Initial (1982) Beneficial Impacts: The livestock allocation of 95,007 AUMs would increase livestock AUMs over the average livestock licensed use in seven allotments.
Initial Adverse Impacts: The livestock allocation would reduce livestock AUMs from the average livestock licensed use in 25 allotments. Implementation of the proposed periods-of-use would impact livestock grazing in all allotments.	Initial Through Long-Term Adverse Impacts: No allocation of the vegetation resource to livestock use would result in a detriment to livestock grazing in all allotments. Also, based on permittees dependence on the public rangeland, 40 permittee's livestock operations would be adversely impacted.	None	Initial Adverse Impacts: The livestock allocation would reduce livestock AUMs from the average livestock licensed use in 23 allotments. Implementation of the proposed periods-of-use would impact livestock grazing in all allotments throughout the short-term.	Initial Adverse Impacts: The livestock allocation would reduce livestock AUMs from the average livestock licensed use in 25 allotments. This also represents an 18 percent decrease in livestock AUMs for the resource area. Implementation of the proposed periods-of-use would impact livestock grazing in all allotments throughout the short-term.
Short-Term (1991) Beneficial Impacts: The livestock adjustments to an estimated 192,247 AUMs would result in an increase in livestock AUMs over the average livestock licensed use in 20 allotments. This also represents a 65 percent increase in livestock AUMs for the resource area.	None	None	Short-Term (1991) Beneficial Impacts: The livestock adjustments to an estimated 216,746 AUMs would result in an increase in livestock AUMs over the average livestock licensed use in 23 allotments. This also represents an 86 percent increase in livestock AUMs for the resource area.	Same as Initial Beneficial Impacts.
Short-Term Adverse Impacts: The livestock adjustments would reduce livestock AUMs from the average livestock use in 13 allotments. Proposed periods-of-use would result in four allotments being adversely impacted throughout the long-term.	Same as Initial Adverse Impacts	None	Short-Term Adverse Impacts: The livestock adjustments would reduce livestock AUMs from the average livestock licensed use in 11 allotments.	Same as Initial Adverse Impacts.
Long-Term (2024) Beneficial Impacts: The livestock adjustments to an estimated 228,880 AUMs would result in an increase in livestock AUMs over the average livestock licensed use in 28 allotments. This also represents a 95 percent increase in livestock AUMs for the resource area. Livestock production would benefit from an increase in calf and lamb crops weaned of five and seven percent, respectively. Livestock production would also benefit from an increase in calf weaning weights of 13 pounds.	None	None	Long-Term (2024) Beneficial Impacts: The livestock adjustments to an estimated 251,466 AUMs would result in an increase in livestock AUMs over the average livestock licensed use in 31 allotments. This also represents a 116 percent increase in livestock AUMs for the resource area. Livestock production would benefit from an increase in calf and lamb crops weaned of five and seven percent, respectively. Livestock production would also benefit from an increase in calf weaning weights of 13 pounds.	Long-Term (2024) Beneficial Impacts: The livestock adjustments to an estimated 182,092 AUMs would result in an increase in livestock AUMs over the average livestock licensed use in 21 allotments. This also represents a 56 percent increase in livestock AUMs for the resource area. Livestock production would benefit from an increase in calf and lamb crops weaned of five and seven percent, respectively. Livestock production would also benefit from an increase in calf weaning weights of 13 pounds.

SUMMARY TABLE 1 - Continued
SUMMARY COMPARISON OF SIGNIFICANT IMPACTS

SUMMARY TABLE 1 - Continued
SUMMARY COMPARISON OF SIGNIFICANT IMPACTS

Proposed Action	No Livestock Grazing	No Action	Maximizing Livestock Grazing Use	Maximizing Wild Horses and Burros
Long-Term Adverse Impacts: The livestock adjustments would reduce livestock AUMs from the average livestock licensed use in seven allotments.	Same as Initial Adverse Impacts	Long-Term Adverse Impacts: Livestock production would decline due to a loss in calf and lamb crops weaned, and also, a decline in calf and lamb weaning weights.	Long-Term Adverse Impacts: The livestock adjustments would reduce livestock AUMs from the average livestock licensed use in five allotments.	Long-Term Adverse Impacts: The livestock adjustments would reduce livestock AUMs from the average livestock licensed use in 13 allotments.
		WILDLIFE		
Beneficial Impacts: Reasonable number of deer attained or maintained in all but three allotments; antelope would attain reasonable numbers in all but three allotments. Habitat would be provided for 845 sheep. Sage grouse would increase 30 percent. Big game habitat conditions improve.	Beneficial Impacts: Reasonable numbers of all big game species attained in all allotments; sage grouse increase 50 percent; big game, riparian habitat improve in condition.	None	Beneficial Impacts: Mule deer attain, maintain reasonable numbers in 23 allotments, big game habitat improves. Sage grouse increase 20 percent.	Beneficial Impacts: Impacts to wildlife same as proposed action.
Adverse Impacts: Reasonable numbers of deer, antelope not attained in three allotments each; riparian habitat declines in condition.	None	Adverse Impacts: No big game species attains or maintains reasonable numbers in any allotment; sage grouse decline 50 percent; all habitats decline in condition. Significantly adverse impact to mule deer reduced by 1,540.	Adverse Impacts: Mule deer fail to attain, maintain reasonable numbers in 13 allotments, antelope fail to attain reasonable numbers in any allotment, bighorn sheep fail to attain reasonable numbers in Buffalo Hills Allotment, other reintroductions cancelled. Riparian habitat declines in condition.	Same as proposed action.
		AQUATIC HABITAT		
Adverse Impacts: Nine streams would remain in fair or poor condition.	Adverse Impacts: None	Adverse Impacts: Same as proposed action.	Adverse Impacts: Same as proposed action.	Adverse Impacts: Eight streams would remain in poor or fair conditon.
Beneficial Impacts: One stream would remain in good to excellent condition.	Beneficial Impacts: Ten streams would improve to or remain in good to excellent condition.	Beneficial Impacts: Same as proposed action.	Beneficial Impacts: Same as proposed action.	Beneficial Impacts: Two streams would improve to or remain in good to excellent condition.
		WILD HORSE AND BURRO		
Beneficial Impacts: Improved health and condition of remaining animals. Improved health and condition of removed animals.	Same as proposed action.	Beneficial Impacts: Wild horse and burro removals less than 50 percent of present population.	Beneficial Impacts: Improved health and condition of removed animals.	Beneficial Impacts: Improved health and condition of removed and remaining animals. Increase over existing numbers in the long term.
Adverse Impacts: Reduction of animals greater than 50 percent of present numbers. Reduction in Herd Use Areas from present. Death loss due to capture operations of eight percent.	Same as proposed action.	Adverse Impacts: Reduced health and condition of remaining animals. Death loss due to capture operations of eight percent.	Adverse Impacts: Total removal of wild horses and burros and elimination of all Herd Use Areas. Death loss due to capture operations of eight percent.	Adverse Impacts: Reduction greater than 50 percent in the initial allocation. Reduction of Herd Use Areas below present numbers. Death loss of eight percent due to capture operations.
		VISUAL RESOURCES		
Adverse Impacts: Potential impacts from land treatments on 15,490 Acres of VRM Class II and 18,004 acres of VRM Class III.	None	None	Adverse Impacts: Potential impacts from land treatments on 560 acres of VRM Class II and 1,910 acres of VRM Class III.	Same as proposed action.
		CULTURAL RESOURCES		
Adverse Impacts: Trampling damage from livestock, wild horses and burros which would result in breakage, displacement, rubbing and mixing of cultural strata.	Adverse Impacts: Wild horse and burro trampling damage which would result in breakage, displacement, rubbing, and mixing of cultural strata.	Same as proposed action.	Same as proposed action.	Same as proposed action.
Construction of livestock support facilities would adversely affect 97 known cultural resource sites.			Construction of livestock support facilities would adversely affect 105 known cultural resource sites.	Construction of livestock support facilities would adversely affect 125 known cultural resource sites.
Grazing-related erosion would occur.	Grazing-related erosion would occur.	Grazing-related erosion would occur.	Grazing-related erosion would occur.	Grazing-related erosion would occur.
None	Beneficial Impacts: Elimination of livestock trampling.	None	None	None
		RECREATION		
Adverse Impacts: Wildlife numbers would increase but would not meet hunting demand.	Same as proposed action.	Adverse Impacts: Wildlife numbers would decrease and would not meet hunting demand.	Same as proposed action.	Same as proposed action.
Stream fishing availability would not meet demand.		Same as proposed action.		

SUMMARY TABLE 1 - Continued
SUMMARY COMPARISON OF SIGNIFICANT IMPACTS

SUMMARY TABLE 1 - Continued
SUMMARY COMPARISON OF SIGNIFICANT IMPACTS

Proposed Action	No Livestock Grazing	No Action	Maximizing Livestock Grazing Use	Maximizing Wild Horses and Burros
		SOCIAL CONDITIONS		
Ranching Community				
Initial Adverse Impacts AUM reductions and changes in periods-of-use may cause many ranchers to go out of business, relocate, become employees of agribusinesses or take non-agricultural jobs. Non-monetary values associated with ranching may be lost, quality of life reduced, and anxieties about future increased. Those who stay in ranching could experience decreased property values, increased difficulties in obtaining loans, reduced income, and decreased quality of life. Acceleration of ranch consolidation could occur threatening traditional rural community.	Initial Adverse Impacts Similar to proposed action but more ranchers would be likely to go out of business.	Initial Through Long-Term Adverse Impacts No additional range improvement, and continuing problems with wild horses. Decline in livestock production in long term could result in adverse social impacts similar to initial impacts of proposed action but occurring at a more gradual rate.	Initial Adverse Impacts Similar to proposed action but less adverse due to fewer and less drastic AUM reductions.	Initial Adverse Impacts Similar to proposed action though slightly less adverse.
Short-Term Beneficial Impacts Some ranchers or ranch heirs (particularly in small class) who stay in business could experience slightly improved quality of life due to economic gains.	None	None	Short-Term Beneficial Impacts Similar to proposed action.	Short-Term Beneficial Impacts Similar to proposed action.
Long-Term Beneficial Impacts Members of all ranch classes who stay in business could experience improved herd condition, economic gains, enhanced quality of life, improved property values and improved loan eligibility.	None	None	Long-Term Beneficial Impacts Similar to proposed action but benefits greater.	Long-Term Beneficial Impacts Similar to proposed action.
Regional				
Initial Through Short-Term Adverse Impacts Loss of ranchers or rancher business would result in social, cultural, and economic losses to EIS area residents. Community cohesion and context and quality of life individuals could be impacted. Increased antagonism toward BLM and federal government.	Initial Through Short-Term Adverse Impacts Same as initial and short-term impacts of proposed action but more adverse due to greater losses or ranchers and rancher business.	None	Initial Through Short-Term Adverse Impacts Similar to proposed action.	Initial Through Short-Term Adverse Impacts Similar to proposed action.
Long-Term Beneficial Impacts Increased quality of life for individuals benefiting from rancher business.	None	None	Long-Term Beneficial Impacts Similar to proposed action.	Long-Term Beneficial Impacts Similar to proposed action.
Long-Term Adverse Impacts Social and cultural losses and impacts to community context and cohesion would persist if there is continued absence of family-run ranches from area.	Long-Term Adverse Impacts Same as short-term	Long-Term Adverse Impacts Impacts similar to proposed action initial through short term impacts may occur but at more gradual rate.	Long-Term Adverse Impacts Same as proposed action	Long-Term Adverse Impacts Same as proposed action
State and National				
Wild Horse Protection Groups				
Beneficial Impacts Perceptual benefits from fence removals, water developments and priority removal from checkerboard lands, and improved health of animals.	Beneficial Impacts Perceptual impacts from horses remaining in natural environment, fence removals, and improved health of animals.	Beneficial Impacts Perceptual impacts from horses remaining in natural environment.	Beneficial Impacts None	Beneficial Impacts Same as proposed action except more animals would remain in natural environment and animal numbers would increase in long term. Most acceptable alternative to group members.
Adverse Impacts Perceptual impacts due to confinement of animals to HMAs and reductions in animals considered excessive by group members.	Adverse Impacts Perceptual impacts due to reductions in animals considered excessive by group members.	Adverse Impacts Perceptual impacts to many members from reduced health and vigor of animals.	Adverse Impacts Perceptual impacts from complete removal of wild horses and burros. Loss of viewing opportunities and what members feel to be important part of national heritage.	Adverse Impacts Initial reductions considered to be greater than necessary.
Conservation, Wildlife Recreation Groups				
Beneficial Impacts Improved quality of perceptual, recreational, and educational opportunities due to improvements in range conditions, non-riparian, big game habitat, slight increases in sage grouse and antelope populations, bighorn sheep introductions and fence removals.	Beneficial Impacts Improved quality of perceptual, recreational, and educational opportunities due improvements in range condition, big game, riparian, and aquatic habitats, water quality, and increases in sage grouse and big game numbers.	Beneficial Impacts None	Beneficial Impacts Similar to proposed action except for decreases in antelope and bighorn sheep.	Beneficial Impacts Similar to proposed action.
Adverse Impacts Decreased quality of perceptual, recreational, and educational experiences on public lands due to deterioration of water quality and riparian zones and slight decreases in mule deer numbers as well as deteriorated condition of aquatic habitat.	Adverse Impacts Most group members favor multiple use of public lands and would not advocate this alternative.	Adverse Impacts Decrease quality of experiences on public lands due to deteriorated range condition, aquatic and wildlife habitats, and wildlife numbers.	Adverse Impacts Decreased quality of experiences on public lands due to deterioration of water quality, decreases in mule deer, antelope and bighorn sheep and deterioration of riparian and aquatic habitat.	Adverse Impacts Similar to proposed action

SUMMARY TABLE 1 - Continued
SUMMARY COMPARISON OF SIGNIFICANT IMPACTS

SUMMARY TABLE 1 - Continued

SUMMARY OF SIGNIFICANT ECONOMIC IMPACTS 1/
SONOMA-GERLACH RESOURCE AREA

Alternatives	INITIAL IMPACTS						SHORT TERM IMPACTS						LONG TERM IMPACTS					
	Individual Level		Sectoral Level		Areawide Level		Individual Level		Sectoral Level		Areawide Level		Individual Level		Sectoral Level		Areawide Level	
	Income	Employment 2/	Income	Employment	Income	Employment	Income	Employment	Income	Employment	Income	Employment	Income	Employment	Income	Employment	Income	Employment
PROPOSED ACTION																		
Ranch Sector	-1,127,000	- 32	-1,127,000	- 32	-1,127,000	- 32	-1,031,000	- 21	-1,031,000	- 23	-1,031,000	- 23	+ 425,000	+ 31	+ 425,000	+ 31	+ 425,000	+ 31
Construction Sector	+ 118,000	+ 8					+ 118,000	+ 8										
Government Sector	+ 105,000	+ 7					+ 105,000	+ 7										
Trade and Service Sector							+ 5,000	+ 1					+ 5,000	+ 1				
Rancher Wealth 3/	-1,937,000						+1,990,000						+3,822,000					
EIS Area Economy 4/	-2,083,000	- 38	-2,083,000	- 38	-2,083,000	- 38	-1,875,000	- 20	-1,875,000	- 20	-1,875,000	- 20	+ 899,000	+ 57	+ 899,000	+ 57	+ 899,000	+ 57
NO LIVESTOCK GRAZING 5/																		
Ranch Sector	-2,206,000	- 85	-2,206,000	- 85	-2,206,000	- 85	-2,206,000	- 85	-2,206,000	- 85	-2,206,000	- 85	-2,206,000	- 85	-2,206,000	- 85	-2,206,000	- 85
Construction Sector	+ 18,000	+ 0					+ 18,000	+ 0										
Government Sector	- 90,000	- 6					- 90,000	- 6										
Trade and Services Sector							+ 9,000	+ 1					+ 9,000	+ 1				
Rancher Wealth 3/	-7,622,000						-7,622,000						-7,622,000					
EIS Area Tax Revenue	- 40,000	- 1					- 40,000	- 1					- 40,000	- 1				
EIS Area Economy	-4,750,000	-164	-4,750,000	-164	-4,750,000	-164	-4,741,000	-164	-4,741,000	-164	-4,741,000	-164	-4,628,000	-164	-4,628,000	-164	-4,628,000	-164
NO ACTION																		
Trade and Services Sector							- 5,000	- 1					- 18,000	- 3				
	NO OTHER SIGNIFICANT ECONOMIC IMPACTS WOULD BE EXPECTED FROM THIS ALTERNATIVE																	
MAXIMIZE LIVESTOCK																		
Ranch Sector	-1,112,000	- 31	-1,112,000	- 31	-1,112,000	- 31	-1,011,000	- 21			-1,011,000	- 21	+ 408,000	+ 32	+ 408,000	+ 32		
Construction Sector	+ 126,000	+ 7					+ 126,000	+ 9										
Government Sector	+ 105,000	+ 7					+ 105,000	+ 7										
Trade and Services			NOT SIGNIFICANT															
Rancher Wealth 3/	-1,113,000						+3,215,000						+4,951,000					
EIS Area Economy	-2,038,000		-2,038,000	- 35	-2,038,000	- 35	-1,825,000	- 17	-1,825,000	- 17	-1,825,000	- 17	+ 859,000	+ 57	+ 859,000	+ 57	+ 859,000	+ 57
MAXIMIZE WILD HORSES & BURROS																		
Ranch Sector	-1,147,000	- 32	-1,147,000	- 32	-1,147,000	- 32							+ 316,000	+ 21	+ 316,000	+ 21		
Construction Sector	+ 68,000	+ 4																
Government Sector	+ 105,000	+ 7																
Trades and Services Sector													+ 5,000	+ 1				
Rancher Wealth 3/	-2,872,000												+1,482,000					
EIS Area Economy	-2,183,000	- 46	-2,183,000	- 46	-2,183,000	- 46							+ 670,000	+ 39	+ 670,000	+ 39	+ 670,000	+ 39

1/ Significant adverse economic impacts are denoted by a minus (-) sign, while significant beneifical impacts are denoted by a plus (+).
2/ Employment was calculated on the basis of Full Time Equivalent, with a 2,000 hour work year constituting one FTE.
3/ The Impact to Rancher Wealth should not be interpreted as an actual income impact.
4/ Pershing and Humboldt county data was summed in order to accurately portray the EIS area economy.
5/ Short and long term impacts of the No Grazing alternative are similar to the initial impacts.

Source: U.S. Department of the Interior, Bureau of Land Management, Winnemucca District, Sonoma-Gerlach EIS Team, 1980.

SUMMARY TABLE 1 - Continued
SUMMARY OF SIGNIFICANT ECONOMIC IMPACTS 1/
SONOMA-GERLACH RESOURCE AREA

SUMMARY TABLE 2
DEVELOPMENT OF THE PROPOSED ACTION THROUGH THE MANAGEMENT FRAMEWORK PLAN (MFP)

MFP STEP I RECOMMENDATIONS	CONFLICTS	MFP STEP II RECOMMENDATIONS	RATIONALE	TRADE OFFS
Allocate all suitable livestock forage within the resource area to livestock.	Lands Retain public lands around Gerlach and Empire for future municipal expansion.	Accept the recommendation for Gerlach and Empire.	The lands near Gerlach and Empire are the most logical in which to assume that future community expansion would occur.	26 AUMs would not be available for livestock.
	Forestry & Wildlife Consider aspen and mahogany as "critical" management species and designate as Areas of Critical Environmental Concern (ACEC)	Modify recommendation as follows: in design, implementation, or revision of grazing management systems, horse management areas, or horse use areas, consider aspen and mahogany as "critical" management species.	Coordinated planning efforts on an area should develop realistic objectives for these critical management species.	Insignificant.
	Wild Horse & Burro Designate 4 herd management areas and 11 herd use areas for management of wild horses.	Modify recommendation as follows: designate 3 herd management areas.	Restriction of wild horses & burros to HMA would permit effective, intensive livestock management on non-HMAs.	4,445 horses (53,340 AUMs) would be removed from the resource area.
	Wildlife Provide forage for reasonable number of big game by adjusting livestock allocation.	Accept.	Balancing available forage among all grazing animals would help reverse the unsatisfactory ecological range condition.	13,140 AUMs would be allocated to big game out of a total 140,260 AUMs.
	Wildlife Reserve a majority of available forage in Granite Range for a wildlife management area (WMA) or as Area of Critical Environmental Concern (ACEC).	Accept as ACEC.	This area is the most important wildlife habitat in the resource area.	Insignificant.
	Wildlife (Aquatic) Designate following areas as ACECs - Mahogany Creek & its watershed, & Soldier Meadows Warm Springs.	Accept.	These areas should be afforded the special management attention that ACEC classification/ designation would require.	Insignificant.
	Watershed Protect the plants from surface disturbance or adverse management actions.	Accept.	It is Bureau policy to protect, conserve, & manage Federal & State T/E plants.	Trade off insignificant.
Establish periods-of-use for each allotment & base management on the physiological requirements of key species.	Same as above for Wild Horse & Burro & Wildlife (Aquatic)	Accept.	The establishment of a period-of-use based upon the physiological requirements of key management species would help to reverse the declining range conditions & would lead to a sustained yield vegetation resource.	Elimination of year-round

Source: U.S. Department of the Interior, Bureau of Land Management, Winnemucca District, Sonoma-Gerlach Management Framework Plan 1980.

SUMMARY TABLE 3
PROPOSED VEGETATION ALLOCATION PROGRAM (AUMs)

Type of Action	Proposed Initial Allocation (1982) Livestock	Big Game	Wild Horses and Burros	Total	Proposed Short-Term Adjustments (1991) Livestock	Big Game	Wild Horses and Burros	Total	Proposed Long-Term Adjustments (2024) Livestock	Big Game	Wild Horses and Burros	Total
Proposed Action	113,705	16,869	13,415	143,989	192,247	16,869	16,625	225,741	228,880	16,869	20,014	265,763
No Action	116,551 a/	6,430	0	122,981	116,551 a/	6,430	0	122,981	116,551 a/	6,430	0	122,981
Livestock Grazing	0	16,869	14,795	31,664	0	16,869	14,795	31,664	0	16,869	41,175	58,044
Maximizing Livestock Use	130,[illegible]96	13,036	0	143,232	216,746	13,036	0	229,782	251,466	13,036	0	264,502
Maximizing Wild Horse and Burro	[illegible]5,007	16,869	14,795	126,671	95,007	16,869	14,795	126,671	182,092	16,869	66,802	265,763

a/ Livestock use for the No Action alternative is based on the last three to five year average livestock licensed use. This excludes 1,644 AUMs of documented three year average trespass use.

Source: Sonoma-Gerlach EIS Team 1980.

SUMMARY TABLE 4
PROPOSED LEVELS OF GRAZING MANAGEMENT

Type of Action	Intensive Management a/ Allotments	Acres	Non-Intensive Management b/ Allotments	Acres	Update Current Allotment Management Plan c/ Allotments	Acres	No Livestock Grazing d/ Allotments	Acres
Proposed Action	26	3,[illegible]34,580	3	165,301	8	541,568	1	18,393
No Action	8	541,568	30	3,718,274	0	0	0	0
No Livestock Grazing	0	0	38	4,259,842	0	0	0	0
Maximizing Livestock Use	30	3,718,274	0	0	8	541,568	0	0
Maximizing Wild Horse and Burro	24	3,327,301	3	165,301	8	541,568	3	225,672

a/ Those allotments that would have a specified grazing system under an Allotment Management Plan (AMP).
b/ Those allotments that would not have an Allotment Management Plan.
c/ Those allotments that would have an updating of the current Allotment Management Plan.
d/ Those allotments where there would be no livestock grazing allowed.

Source: Sonoma-Gerlach EIS Team 1980.

SUMMARY TABLE 5
PROPOSED LIVESTOCK SUPPORT FACILITIES

	Proposed Facilities							Land Treatments (Acres)			
Type of Action	Wells	Pipelines (Miles)	Springs	Troughs	Fences (Miles)	Fence Removal (Miles)	Cattleguards	Sagebrush Control	Seed and/or Reseed	Sagebrush Control Then Seed	Estimated Cost (Dollars)
Proposed Action	42.0	15.5	8.0	102.0	399.0	0	18.0	0	14,752	230,112	$16,058,680
No Action	0	0	0	0	0	0	0	0	0	0	0
No Livestock Grazing	0	0	0	0	0	275.1	0	0	0	0	$ 990,360
Maximizing Livestock Use	44.0	15.5	8.0	106.0	411.0	0	19.0	21,290	16,172	243,784	$17,320,390
Maximizing Wild Horse and Burro	42.0	15.5	8.0	102.0	692.0	31.9	18.0	0	14,752	230,112	$17,129,430

Source: Sonoma-Gerlach EIS 1980.

SUMMARY TABLE 6
RELATIONSHIP BETWEEN THE GENERAL OBJECTIVES AND THE ALTERNATIVES a
SONOMA-GERLACH RESOURCE AREA

General Objectives	Proposed Action	No Livestock Grazing	No Action	Maximizing Livestock Grazing	Maximizing Wild Horse and Burro
(1) Improve habitat and rangeland conditions for livestock, wildlife, and wild horses and burros by allocation of available vegetation within the productive capacity of the vegetation resource.	Meets objective	Meets objective	Does not meet objective	Meets objective	Meets objective
(2) Enhance the vegetation resource by establishment of proper periods-of-use by livestock, by allotment, to meet te physiological needs of key management species.	Meets objective	Meets objective	Does not meet objective	Meets objective	Meets objective
(3) Reduce soil erosion and enhance watershed values by increasing ground cover and litter.	Meets objective	Meets objective	Does not meet objective	Meets objective	Meets objective
(4) Improve te health and productivity of wild horse herds by managing wild horse numbers and by improving forage condition.	Meets objective	Meets objective	Does not meet objective	Meets objective	Meets objective
(5) Enhance recreation values by increasing wildlife numbers through improved habitat condition.	All wildlife meet objective	All wildlife meet objective	All wildlife do not meet objective	All wildlife meet objective	All wildlife meet objective
(6) Improve the condition of the riparian and stream habitat.	Does not meet objective	Meets objective	Does not meet objective	Does not meet objective	Does not meet objective

a/ The general objectives are found at the beginning of Chapter 1.

Source: U.S. Department of the Interior, Bureau of Land Management, Winnemucca District, Sonoma-Gerlach Environmental Impact Statement Team 1980.

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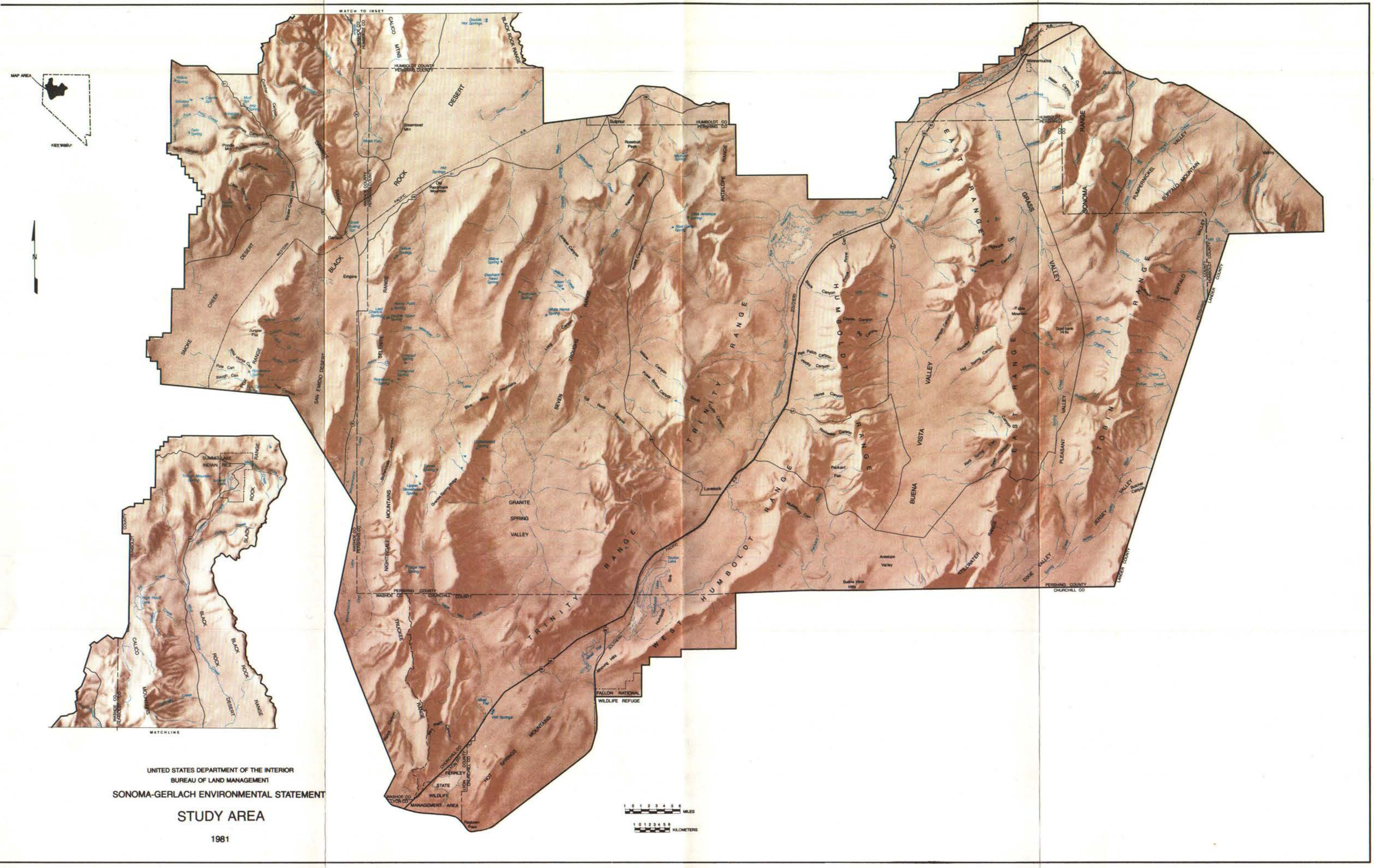


UNITED STATES DEPARTMENT OF THE INTERIOR

BUREAU OF LAND MANAGEMENT

SONOMA-GERLACH ENVIRONMENTAL STATEMENT

STUDY AREA

1981

CHAPTER 1

ALTERNATIVES
INCLUDING THE PROPOSED ACTION

CHAPTER 1

ALTERNATIVES INCLUDING THE PROPOSED ACTION

PURPOSE AND NEED FOR ACTION

The purpose of the Sonoma-Gerlach Grazing Environmental Impact Statement (EIS) is to analyze the potentially significant environmental impacts of implementing a grazing management program in the Sonoma-Gerlach Resource Area. This EIS is being prepared in compliance with Section 102(2) of the National Environmental Policy Act (NEPA) of 1969. It will follow recent direction as outlined in the Council on Environmental Quality's (NEPA) Regulations of November 29, 1978.

As a result of court actions, the Federal Land Policy and Management Act of 1976, and the diverse uses and influences on the vegetation resources, the Land Use Plan, which consists of the Unit Resource Analysis - Management Framework Plan (URA-MFP), was revised for the Sonoma-Gerlach Resource Area in 1979. From the revision, coordinated land use recommendations were made for all resource uses.

The multiple use objectives of MFP II are to improve habitat and rangeland conditions for livestock, wildlife, and wild horses and burros; enhance the vegetation resource; reduce soil erosion and enhance watershed values; improve the health and productivity of wild horse and burro herds; improve recreation values; and improve the condition of riparian and stream habitat.

The land use planning effort, from which the alternatives are derived, is responsive to the requirements of the Federal Land Policy and Management Act of 1976 including the policy goals that, "the national interest will be best realized if the public lands and their resources are periodically and systematically inventoried and their present and future use is projected through a land use planning process...", and "that the public lands be managed in a manner which recognizes the Nation's need for domestic sources of minerals, food, timber, and fiber from the public lands...".

The alternatives, in addition to the proposed action, that will be addressed in this document are: No Action, No Livestock Grazing, Maximizing Livestock Grazing, and Maximizing Wild Horses and Burros. Recognizing that the implementation of any of the alternatives except No Action constitutes a major federal action that could have a significant effect on the human environment, the Bureau is therefore required to prepare this EIS.

COORDINATED RESOURCE MANAGEMENT AND PLANNING

Coordinated Resource Management and Planning (CRMP) is an approach for working with the Bureau's "publics" primarily before on-the-ground implementation of an activity plan. All of these public users, interest groups, agencies, and affected individuals are given an opportunity to work together to develop plans of action within the Bureau's planning decisions, laws and regulations. The result is a commitment of federal, state, and local agencies, interest groups, and individuals to a multiple use coordinated plan, to be used to implement decisions.

The Bureau's planning system, from whence the Land Use Plan evolves, is the umbrella under which Coordinated Resource Management and Planning functions. The BLM has three levels of planning: (1) the general Land Use Plan or Management Framework Plan (MFP)--which allocates uses and resources on the land; (2) activity level planning - Allotment Management Plans, Wildlife Habitat Management Plans, Recreation Management Plans, etc.-- which identifies specific on-the-ground changes, improvements and projects; and (3) project level plans which provide survey, design and contract specifications for specific projects, e.g., spring developments, fences, seedings, chainings, etc. The Coordinated Resource Management and Planning process will have its maximum effect following the MFP and occurring prior to or as part of activity level planning. Coordinated Resource Management and Planning can provide a strategy for implementing decisions and will serve as an extension of public involvement in the implementation stage. Coordinated Resource Management and Planning should be viewed as a positive approach to implementing decisions, and not as an arena to try to reverse decisions made through the Land Use Planning process (MFP).

In the case of a grazing EIS, Coordinated Resource Management and Planning becomes very important at the implementation stage which follows Land Use Decisions. The purpose of an EIS is to discuss environmental impacts of the alternatives including the proposed action. The EIS informs the decision maker of ways to avoid or minimize adverse impacts or of ways to enhance the human environment. It is not a decision document but an informational aid to the decision maker in making Land Use Decisions. The implementation stage follows the decisions and it is at this point for the Sonoma-Gerlach area that the various publics, especially local individuals and groups, have the opportunity to become involved in Coordinated Resource Management and Planning. This includes not only range users, but non-consumptive users and interest groups as well.

In the Sonoma-Gerlach grazing EIS, the proposed action and alternatives discuss future management actions to be implemented. One of these actions is the allocation of vegetation to livestock, wildlife, wild horses and burros. The basis of the allocation of vegetation was the recompilation of the 1947 and 1960s range surveys, which in the case of the Sonoma-Gerlach Resource Area is the best information available at this time. In addition to the recompiled survey, management techniques and systems, including monitoring and evaluation, will be applied to tailor implementation of on-the-ground resource management on an allotment basis. As management concepts are applied through the normal progression of events including implementation, the outcome will be based on the combination of management considerations, which may be derived through coordinated planning.

In order to achieve these objectives, the following considerations will be applied in the implementation process:

1. Coordinated Resource Management and Planning (CRMP) concepts will be considered in all cases prior to initiating livestock, wildlife, wild horse and burro adjustments during or prior to development of activity plans, establishment of monitoring studies and subsequent evaluations.

2. Rangeland suitability is a factor that will be subject to review and/or modification (based on refinement of specific data applicable to that allotment) during the process of coordination/consultation for the development and implementation of Allotment Management Plans (AMPs), etc.

3. Range improvement projects identified in activity planning may replace the estimated number and location analyzed in the EIS. (For example, before arriving at a plan of operations and possible livestock use adjustments, actual detailed analysis of specific allotments through coordination/consultation would consider such things as range improvement projects, management systems, class of stock, period-of-use, etc.).

4. BLM's intent is to incorporate, prior to implementation, any reliable new data and information which may become available from BLM, land users or the general public.

PROPOSED ACTION

VEGETATION ALLOCATION PROGRAM

The Winnemucca District of the Bureau of Land Management proposes to allocate available vegetation on a multiple use basis to livestock, big game, wild horses, and burros in the Sonoma-Gerlach Resource Area. The proposed allocation is based on information obtained from the 1979 recompilation of the 1947 and 1960s range surveys and recommendations made in the Sonoma-Gerlach Management Framework Plan (MFP) Step II, and is the Bureau's preferred alternative.

For analysis purposes, the short term would be 9 years (7 years for final implementation of management systems and 2 years thereafter for minimum required rest of land treatments) and the long term would be 35 years beginning in 1989 after implementation of management systems and would end in 2024 (Summary Figure 2).

Vegetation would be allocated to livestock by allotment or combination of allotments, to optimum numbers of wild horses and burros on three herd management areas, and to reasonable numbers of big game (as cooperatively determined by the Nevada Department of Wildlife (NDOW) and the BLM) by seasonal use areas per allotment or combination of allotments (see Appendix A for methodology). Big game reasonable numbers include proposed bighorn sheep and antelope reintroductions.

All vegetation allocations would be based on Animal Unit Months (AUMs) which is the amount of vegetation necessary for the subsistence of one cow or its equivalent (i.e., four deer, five antelope, five bighorn sheep, five domestic sheep or one horse) for one month.

The 1982 initial allocation would be 113,705 AUMs to livestock, 13,415 AUMs to wild horses and burros, and 16,869 AUMs to big game animals. This compares with an existing use of 116,551 AUMs for livestock (based upon the average licensed use for the last three to five years), 66,012 AUMs for wild horses and burros, and 13,026 AUMs for big game (Table 1-1).

The short-term (1991) estimated future production is based upon the probability of additional vegetation becoming available through range improvements such as water developments and land treatments. The estimated allocation in year 1991 would be 192,247 AUMs for livestock, 16,625 AUMs for wild horses and burros, and 16,869 AUMs for big game (Table 1-2). This is an increase of 78,542 livestock AUMs over the initial allocation and 3,210 AUMs increase for wild horses and

Allotment	Land Ownership Status		Present Demand			
					Reasonable Numbers e	
	Public Land (acres) a/	Other Land (acres) b/	Authorized Livestock Use c/	Wild Horse & Burro Use d/	Mule Deer	Antelope
Intensive Management with AMPs						
Blue Wing	976,928	164,973	24,160	20,556	701	49
Seven Troughs	302,371	62,398	9,163	4,344	495	26
(Total)	(1,279,299)	(227,371)	(33,323)	(24,900)	(1,196)	(75)
Buffalo Hills	394,516	30,607	11,920	4,152	6,294	1,106
Calico	36,490	126	2,584	348	46	44
(Total)	(431,006)	(30,733)	(14,504)	(4,500)	(6,340)	(1,150)
Clear Creek	55,455	10,707	3,111	492	176	0
Dolly Hayden	77,904	48,824	3,709	2,856	68	0
(Total)	(133,359)	(59,531)	(6,820)	(3,348)	(244)	(0)
Desert Queen	123,161	178,218	3,355	708	0	0
Harmony	6,803	1,779	348	180	95	0
Melody	3,762	0	1,020	0	0	0
Thomas Creek	11,264	15,706	629	192	90	0
(Total)	(21,829)	(17,485)	(1,997)	(372)	(185)	(0)
Humboldt House	23,837	22,665	727	60	67	0
Humboldt Sink	68,985	122,023	1,427	0	2	0
Klondike	50,321	28,916	2,205	1,848	57	0
Prince Royal	10,425	10,417	153	0	47	0
Star Peak	84,091	86,187	3,722	3,624	434	0
(Total)	(144,837)	(125,520)	(6,080)	(5,472)	(538)	(0)
Licking	4,569	4,847	153	0	45	0
North Buffalo	51,573	37,106	3,294	0	15	0
(Total)	(56,142)	(41,953)	(3,447)	(0)	(60)	(0)
Majuba	100,581	46,862	1,100	1,680	57	92
Pleasant Valley	174,543	9,160	10,392	1,944	354	0
Pole Canyon	13,877	0	540	192	15	7
Rodeo Creek	193,402	5,373	6,631	1,092	177	137
(Total)	(207,279)	(5,373)	(7,171)	(1,284)	(192)	(144)
Pumpernickel	124,934	21,475	9,440	192	222	0
Rawhide	122,631	31,033	2,721	1,704	84	0
Rochester	173,679	79,263	3,964	2,052	45	0
(Total)	(296,310)	(110,296)	(6,685)	(3,756)	(129)	(0)
Soldier Meadows	327,739	10,518	16,070	5,244	786	429
White Horse	20,739	16,204	1,970	2,460	35	0
Revision and/or Update of Existing AMPs						
Coal Canyon-Poker	97,265	75,600	3,144	2,652	97	1
Coyote	34,270	3,075	3,051	0	35	411
Goldbanks	37,460	2,145	2,051	948	92	0
Leadville	54,572	1,989	2,567	840	179	67
Rock Creek	23,365	16,614	2,192	408	134	0
Sonoma	20,178	16,978	1,510	264	141	0
(Total)	(43,543)	(33,592)	(3,702)	(672)	(275)	(0)
Rye Patch	40,123	24,230	1,981	816	61	0
South Buffalo	234,335	9,537	9,157	168	381	0
Nonintensive Management						
Cottonwood Canyon	12,470	0	60	24	18	0
Jersey Valley	66,517	640	1,581	960	48	0
Ragged Top	86,314	74,833	155	2,184	72	0
No Livestock Grazing						
Diamond S	18,393	14,735	1,158	828	129	0
TOTAL	4,259,842	1,285,763	153,115	66,012	11,799	2,369

a/ Public land represents Bureau of Land Management administered public land.

b/ Other land includes unfenced private land, State, County, Indian, and other public land under reclamation withdrawal.

c/ Authorized livestock use includes active use plus regular nonuse.

d/ Wild horse and burro use was estimated from 1977 inventory figures using an 11 percent yearly increase.

e/ Reasonable numbers as derived cooperatively between the Nevada Department of Wildlife and the Winnemucca District, Bureau of Land Management.

f/ This is the 3-year average actual licensed livestock use. Soldier Meadows Allotment is an exception to the 3-year average. Because of various legal and administrative factors, this allotment had either no use or comparatively little use during the 3-year period. The use in the 1980-81 grazing season of 16,067 AUMs would be an indicator of future licensed use.

g/ These allotments have a 5-year average actual licensed livestock use.

TABLE 1-1
PROPOSED ACTION - PRESENT DEMAND, EXISTING USE, PERIOD-OF-USE,
AND PROPOSED INITIAL ALLOCATION (AUMs) BY ALLOTMENT, YEAR 1982
SONOMA-GERLACH RESOURCE AREA

/	Existing Use						Proposed Initial Allocation - Year 1982 j/					
				Big Game h/					Big Game			
Bighorn Sheep	Average Livestock Licensed Use f/	Documented Trespass Last 3-yr. Average k/	Wild Horse & Burro d/	Mule Deer	Antelope	Total Vegetation Allocated i/	Livestock	Wild Horse & Burro	Mule Deer	Antelope	Bighorn Sheep	Proposed Period-of-use
106	22,068	156	20,556	865	0	19,827	13,521	5,450	701	49	106	6/1-2/28
0	6,183	49	4,344	611	1	4,024	3,503	0	495	26	0	6/1-2/28
(106)	(28,251)	(205)	(24,900)	(1,476)	(1)	(23,836)	(17,024)	(5,450)	(1,196)	(75)	(106)	(6/1-2/28)
1,142	9,586	248	4,152	6,280	630	23,320	7,363	7,415	6,294	1,106	1,142	6/1-2/28
86	2,574	0	348	44	22	1,741	1,565	0	46	44	86	6/1-2/28
(1,228)	(12,160)	(248)	(4,500)	(6,234)	(652)	(25,061)	(8,928)	(7,415)	(6,340)	(1,150)	(1,228)	(6/1-2/28)
20	3,062	68	492	50	0	2,478	2,282	0	176	0	20	6/1-2/28
18	3,302	156	2,856	84	0	3,953	3,867	0	68	0	18	6/1-2/28
(38)	(6,364)	(224)	(3,348)	(134)	(0)	(6,431)	(6,149)	(0)	(244)	(0)	(38)	(6/1-2/28)
0	2,834	362	708	0	0	730	730	0	0	0	0	7/1-2/28
7	347	7	180	27	0	258	156	0	95	0	7	7/1-10/30
0	290	0	0	0	0	616	616	0	0	0	0	5/1-9/30
35	631	0	192	25	0	463	338	0	90	0	35	6/1-9/30
(42)	(1,268)	(7)	(372)	(52)	(0)	(1,337)	(1,110)	(0)	(185)	(0)	(42)	(5/1-10/30)
23	577	0	60	83	0	523	433	0	67	0	23	6/1-9/30 & 10/1-2/28
3	1,377	0	0	3	0	302	297	0	2	0	3	6/1-2/28
10	2,115	45	1,848	70	0	1,480	1,413	0	57	0	10	6/15-2/28
13	153 g/	0	0	58	0	210	150	0	47	0	13	6/1-2/28
82	3,225 g/	38	3,624	536	0	2,788	2,272	0	434	0	82	6/1-2/28
(105)	(5,493)	(83)	(5,472)	(664)	(0)	(4,478)	(3,835)	(0)	(538)	(0)	(105)	(6/1-2/28)
0	152 g/	0	0	13	0	88	43	0	45	0	0	7/15-9/30
0	963 g/	0	0	4	0	1,640	1,625	0	15	0	0	6/1-2/28
(0)	(1,115)	(0)	(0)	(17)	(0)	(1,728)	(1,668)	(0)	(60)	(0)	(0)	(6/1-2/28)
0	503	0	1,680	70	21	3.324	3.175	0	57	92	0	6/1-2/28
97	8,553 g/	0	1,944	438	0	8,760	8,309	0	354	0	97	6/1-2/28
37	540	0	192	14	4	232	173	0	15	7	37	6/15-9/30
150	6,014	479	1,092	175	68	5,648	5,184	0	177	137	150	6/1-2/28
(187)	(6,554)	(479)	(1,284)	(189)	(72)	(5,880)	(5,357)	(0)	(192)	(144)	(187)	(6/1-2/28)
38	4,957 g/	0	192	106	0	6,160	5,900	0	222	0	38	6/1-2/28
46	2,417	0	1,704	104	0	2,493	2,363	0	84	0	46	6/1-2/28
15	1,959 g/	0	2,052	56	0	2,429	2,369	0	45	0	15	6/1-2/28
(61)	(4,376)	(0)	(3,756)	(160)	(0)	(4,922)	(4,732)	(0)	(129)	(0)	(61)	(6/1-2/28)
264	3,423	0	5,244	747	216	25,335	23,856	0	786	429	264	6/1-2/28
7	1,970	19	2,460	43	0	1,073	1,031	0	35	0	7	5/1-11/30 & 6/1-11/30
31	2,345	0	2,652	120	0	2,909	2,780	0	97	1	31	5/1-2/28
7	2,682	0	0	35	234	3,299	2,846	0	35	411	7	5/1-12/1
18	2,040	0	948	114	0	1,546	1,436	0	92	0	18	5/1-2/28
176	2,566	0	840	178	38	2,629	2,207	0	179	67	176	5/1-11/30
43	2,192	0	408	38	0	1,776	1,599	0	134	0	43	6/15-11/30
29	1,510	0	264	39	0	863	693	0	141	0	29	7/1-10/30
(72)	(3,702)	(0)	(672)	(77)	(0)	(2,639)	(2,292)	(0)	(275)	(0)	(72)	(6/15-11/30)
24	1,744	0	816	81	0	1,468	1,378	0	66	0	24	5/1-2/28
135	8,839	0	168	471	0	7,640	7,124	0	381	0	135	5/1-2/28
0	60	0	24	22	0	166	148	0	18	0	0	6/15-10/1
1	989 g/	0	960	59	0	600	551	0	48	0	1	10/1-2/28
0	784	0	2,184	89	0	481	409	0	72	0	0	12/1-2/28
38	1,025	17	828	36	0	717	0	550	129	0	38	3/1-2/28
2,701	116,551	1,644	66,012	11,788	1,248	143,989	113,705	13,415	11,799	2,369	2,701	

h/ Existing big game numbers were provided by Nevada Department of Wildlife on a planning unit basis. The procedure outlined in Appendix A, Section 2 was used to apportion existing numbers by allotment. In addition, Buffalo Hills Allotment has 14 AUMs bighorn sheep existing use.

i/ Allocated vegetation as determined by the 1979 recompilation of the 1947 and 1960s range surveys.

j/ The proposed initial allocation categorizes the estimated total vegetation production (1979 recompiled range survey) by each use.

k/ Documented trespass as recorded in the Winnemucca District records and averaged over 3-year period (3/1/77 to 2/29/80). This constitutes unauthorized livestock use on public lands and/or lands under the Bureau's management control.

Source: U.S. Department of the Interior, Bureau of Land Management, Sonoma-Gerlach Unit Resource Analyses, Management Framework Plan (MFP) Steps I and II, Winnemucca District Office files, 1979 recompiled range survey.

TABLE 1-2

PROPOSED ACTION - ESTIMATED FUTURE PRODUCTION AND USE, YEAR 1991 AND 2024 (AUMs)

		Estimated Future Production Through Range Improvements - Year 1991			Estimated Use - Year 1991					Estimated Future Production Through Management - Year 2024		
Allotment	Available Vegetation a/ 1982	Water b/ Developments	Land b/ Treatments	Available Vegetation	Livestock	Wild Horse & Burro	Mule Deer	Antelope	Bighorn Sheep	Suitable Vegetation a/	Improvement Through Grazing Systems c/	Improvement Through Reduction in Grazing Intensity d/
Intensive Management with AMPs												
Blue Wing	19,751	6,158	35,752	61,661	53,157	7,648	701	49	106	61,659	961	4,035
Seven Troughs	3,932	521	929	5,382	4,861	0	495	26	0	5,345	194	817
(Total)	(23,683)	(6,679)	(36,681)	(67,043)	(58,018)	(7,648)	(1,196)	(75)	(106)	(67,004)	(1,155)	(4,852)
Buffalo Hills	23,320	0	4,545	27,865	11,908	7,415	6,294	1,106	1,142	27,764	1,107	4,650
Calico	1,741	0	0	1,741	1,565	0	46	44	86	1,741	85	358
(Total)	(25,061)	(0)	(4,545)	(29,606)	(13,473)	(7,415)	(6,340)	(1,150)	(1,228)	(29,505)	(1,192)	(5,008)
Clear Creek	2,478	330	2,840	5,648	5,452	0	176	0	20	5,639	120	505
Dolly Hayden	3,953	215	819	4,987	4,901	0	68	0	18	4,987	196	0
(Total)	(6,431)	(545)	(3,659)	(10,635)	(10,353)	(0)	(244)	(0)	(38)	(10,626)	(316)	(505)
Desert Queen	730	883	0	1,613	1,613	0	0	0	0	1,613	36	153
Harmony	258	0	851	1,109	1,007	0	95	0	7	1,109	11	48
Melody	616	0	623	1,239	1,239	0	0	0	0	1,239	30	129
Thomas Creek	463	0	0	463	338	0	90	0	35	463	20	84
(Total)	(1,337)	(0)	(1,474)	(2,811)	(2,584)	(0)	(185)	(0)	(42)	(3,378)	(61)	(261)
Humboldt House	523	0	0	523	433	0	67	0	23	433	21	90
Humboldt Sink	302	0	0	302	297	0	2	0	3	302	14	62
Klondike	1,480	18	0	1,498	1,431	0	57	0	10	1,498	72	305
Prince Royal	210	0	759	969	909	0	47	0	13	909	7	31
Star Peak	2,788	0	1,978	4,766	4,250	0	434	0	82	4,764	131	551
(Total)	(4,478)	(18)	(2,737)	(7,233)	(6,590)	(0)	(538)	(0)	(105)	(7,171)	(210)	(887)
Licking	88	0	0	88	43	0	45	0	0	52	2	10
North Buffalo	1,640	1,219	1,302	4,161	4,146	0	15	0	0	4,161	82	344
(Total)	(1,728)	(1,219)	(1,302)	(4,249)	(4,189)	(0)	(60)	(0)	(0)	(4,213)	(84)	(354)
Majuba	3,321	379	2,294	5,994	5,845	0	57	92	0	5,991	166	0
Pleasant Valley	8,729	224	0	8,953	8,502	0	354	0	97	8,953	429	1,803
Pole Canyon	200	196	0	396	337	0	15	7	37	396	10	42
Rodeo Creek	5,648	380	676	6,704	6,240	0	177	137	150	6,704	276	1,163
(Total)	(5,848)	(576)	(676)	(7,100)	(6,577)	(0)	(192)	(144)	(187)	(7,100)	(286)	(1,205)
Pumpernickel	6,136	199	0	6,335	6,075	0	222	0	38	6,307	299	1,256
Rawhide	2,493	0	0	2,493	2,363	0	84	0	46	2,487	122	514
Rochester	2,429	393	0	2,822	2,762	0	45	0	15	2,782	119	500
(Total)	(4,922)	(393)	(0)	(5,315)	(5,125)	(0)	(129)	(0)	(61)	(5,269)	(241)	(1,014)
Soldier Meadows	25,335	0	2,436	27,771	26,292	0	786	429	264	27,771	1,262	0
White Horse	1,073	0	345	1,418	1,376	0	35	0	7	1,418	53	223
Revision and/or Update of Existing AMPs												
Coal Canyon-Poker	2,907	495	1,401	4,803	4,674	0	97	1	31	4,803	0	602
Coyote	3,299	0	1,233	4,532	4,079	0	35	411	7	4,531	0	692
Goldbanks	1,538	241	1,744	3,523	3,413	0	92	0	18	3,523	0	317
Leadville	2,629	0	1,725	4,354	3,932	0	179	67	176	4,342	0	543
Rock Creek	1,776	0	697	2,473	2,296	0	134	0	43	2,473	0	366
Sonoma	863	0	1,631	2,494	2,324	0	141	0	29	2,494	0	165
(Total)	(2,639)	(0)	(2,328)	(4,967)	(4,620)	(0)	(275)	(0)	(72)	(4,967)	(0)	(531)
Rye Patch	1,468	0	1,748	3,216	3,126	0	66	0	24	3,216	0	297
South Buffalo	7,640	185	2,272	10,097	9,581	0	381	0	135	10,097	0	1,572
Non-intensive Management												
Cottonwood Canyon	166	34	0	200	182	0	18	0	0	200	0	0
Jersey Valley	600	69	0	669	620	0	48	0	1	642	0	115
Ragged Top	481	269	0	750	678	0	72	0	0	712	0	0
No Livestock Grazing												
Diamond S	717	0	1,012	1,729	0	1,562	129	0	38	1,728	0	141
Total f/	143,721	12,408	69,612	225,741	192,247	16,625	11,799	2,369	2,701	225,248	5,825	22,483

a/ Suitable vegetation as determined using vegetation suitable to livestock plus vegetation used by big game in areas unsuitable to livestock by the 1979 recompilation of the 1947 and 1960 range surveys for big game, livestock, and wild horses and burros.

b/ Estimated future vegetation production that would become available through the development of water and through land treatments, such as sagebrush control, prescribed burning, and seedings.

c/ The methodology for estimating increases in available vegetation through the implementation or revision of grazing management systems is listed in Appendix A.

d/ An improvement in the available vegetation would result through reductions in intensity of livestock, wild horse and burro use. The methodology for determining estimated increases is listed in Appendix A.

e/ Certain areas which did not meet minimum production criteria, i.e., 32 acres p management, livestock reductions, and reductions of wild horse and burro populat livestock grazing.

f/ Consult Appendix J, to balance totalled figures

Source: U.S. Department of the Interior, Bureau of Land Management, Sonoma-G Plan Steps I and II, 1980, and Winnemucca District Office files.

		Estimated Use - Year 2024				
ovement Through anagement e/	Available Vegetation	Livestock	Wild Horse & Burro	Mule Deer	Antelope	Bighorn Sheep
1,140	67,795	58,039	8,900	701	49	106
4,690	11,046	10,525	0	495	26	0
(5,830)	(78,841)	(68,564)	(8,900)	(1,196)	(75)	(106)
816	34,337	16,383	9,412	6,294	1,106	1,142
0	2,184	2,008	0	46	44	86
(816)	(36,521)	(18,391)	(9,412)	(6,340)	(1,150)	(1,228)
120	6,384	6,188	0	176	0	20
6	5,189	5,103	0	68	0	18
(126)	(11,573)	(11,291)	(0)	(244)	(0)	(38)
751	2,553	2,553	0	0	0	0
8	1,176	1,074	0	95	0	7
0	1,398	1,398	0	0	0	0
0	567	442	0	90	0	35
(8)	(3,141)	(2,914)	(0)	(185)	(0)	(42)
183	727	637	0	67	0	23
69	447	442	0	2	0	3
122	1,997	1,930	0	57	0	10
146	1,093	1,033	0	47	0	13
32	5,478	4,962	0	434	0	82
(300)	(8,568)	(7,925)	(0)	(538)	(0)	(105)
66	130	85	0	45	0	0
0	4,587	4,572	0	15	0	0
(66)	(4,717)	(4,657)	(0)	(60)	(0)	(0)
140	6,297	6,148	0	57	92	0
130	11,315	10,864	0	354	0	97
0	448	389	0	15	7	37
20	8,163	7,699	0	177	137	150
(20)	(8,611)	(8,088)	(0)	(192)	(144)	(187)
42	7,904	7,644	0	222	0	38
34	3,157	3,027	0	84	0	46
1,044	4,445	4,385	0	45	0	15
(1,078)	(7,062)	(7,412)	(0)	(129)	(0)	(61)
0	29,033	27,554	0	786	429	264
0	1,694	1,652	0	35	0	7
268	5,673	5,544	0	97	1	31
2	5,225	4,772	0	35	411	7
0	3,840	3,730	0	92	0	18
41	4,926	4,504	0	179	67	176
0	2,839	2,662	0	134	0	43
47	2,706	2,536	0	141	0	29
(47)	(5,545)	(5,198)	(0)	(275)	(0)	(72)
0	3,513	3,423	0	66	0	24
377	12,046	11,530	0	381	0	135
0	200	182	0	18	0	0
883	1,640	1,591	0	48	0	1
1,030	1,742	1,670	0	72	0	0
0	1,869	0	1,702	129	0	38
12,207	265,763	228,880	20,014	11,799	2,369	2,701

er AUM, would improve through intensive livestock grazing
ons. These areas have the potential to become suitable for

rlach Unit Resource Analyses, 1979, Management Framework burros. Big game allocations would remain constant throughout the long term.

The long-term (2024) estimated future production is based upon the additional vegetation becoming available through grazing management systems (Allotment Management Plans (AMPs)), reductions in grazing intensity of livestock, wild horses and burros to the estimated carrying capacity (available vegetation) of the area and/or the complete removal of livestock, wild horses, and burros in specified allotments. The estimated allocation in year 2024 would be 228,880 AUMs for livestock, 20,014 AUMs for wild horses and burros and 16,869 AUMs use for big game animals (Table 1-2). These are increases in AUMs over the initial allocation of 115,175 for livestock and 6,599 for wild horses and burros.

LEVELS OF GRAZING MANAGEMENT

MANAGEMENT INTENSITY

The proposed levels of grazing management by allotment for the proposed action are shown in Table 1-3. Levels of grazing management would be: (a) intensive management with implementation of AMPs, (b) non-intensive management with no AMPs, and (c) no livestock grazing. There are 16 allotments or combinations of existing allotments proposed for intensive management with implementation of AMPs. There are an additional seven allotments or combinations of existing allotments already in intensive management proposed for review and revision of the current AMP, if necessary. There are three allotments proposed for non-intensive management with no AMPs implemented. One allotment is proposed to have no livestock grazing with implementation of a Herd Management Area.

PERIODS-OF-USE

In establishing grazing management programs, allotment by allotment, special consideration would be given to providing for the physiological needs of key plant species during the critical spring growing period. Until such grazing management plans are established and implemented, however, periods-of-use would be established on each allotment. These proposed periods-of-use are shown in Table 1-1, and would continue to be used in the non-intensive management (non-AMP) allotments.

GRAZE AND REST TREATMENTS

A grazing treatment describes the amount of grazing and periods-of-use for a unit (usually a pasture) of an allotment or an entire allotment in one or more years. Grazing treatments are the building blocks of the grazing system, and are designed to improve rangeland condition by manipulating livestock grazing to accomplish objectives of management. The deferment of grazing or complete rest from grazing during the critical growth period of key management species would allow these species to maintain and/or increase their density, composition, vigor, production, and reproduction. The critical growth periods of the key management species in the Sonoma-Gerlach Resource Area are shown in Table 1-4. Key management species are shown for each allotment in Appendix B. The following rest treatments (singly or in various combinations) would be combined with scheduled graze treatments to form grazing systems in AMPs that would be used in the Sonoma-Gerlach Resource Area.

Rest Treatments:

Treatment 1: Defer livestock grazing from early spring to late spring (approximately March 15 to June 15). This treatment allows key management grass species to rest from grazing during the critical growth period, and gives the plants an opportunity to make and store necessary food to sustain and/or increase vigor.

Treatment 2: Defer livestock grazing from late winter of the first year to midsummer of the following year--providing 16 months' rest from grazing (approximately March 15 until July 15 of the following year). This treatment allows all key management species (perennial grasses, forbs and shrubs and trees) rest during the critical growth period. This would provide two consecutive years' rest during the growing season to make and store necessary food reserves, produce seeds and allow establishment of seedlings. In addition, this would allow accumulation of plant litter on the soil surface to reduce soil erosion and increase soil fertility.

Treatment 3: Following vegetation manipulation projects and/or natural acts (fires, floods), provide rest from livestock grazing for a minimum of two consecutive years (24 months). This treatment must include a minimum of two consecutive years' growing season rest. This treatment provides the protection necessary for establishment or recovery of key management species following wildfire, prescribed burning, mechanical and/or chemical treatment of vegetation and seedings.

Treatment 4: Rest from livestock grazing from early summer to fall (approximately June 16 to Sep-

TABLE 1-3
LEVELS OF GRAZING MANAGEMENT BY ALLOTMENT FOR ALTERNATIVES
INCLUDING THE PROPOSED ACTION
SONOMA-GERLACH RESOURCE AREA

	Alternatives				
Allotment	Proposed Action	No Livestock Grazing	No Action	Maximizing Livestock	Maximizing Wild Horses And Burros
Blue Wing	AMP	Non-AMP	Non-AMP	AMP	AMP
Buffalo Hills	AMP	Non-AMP	Non-AMP	AMP	AMP
Calico	AMP	Non-AMP	Non-AMP	AMP	AMP
Clear Creek	AMP	Non-AMP	Non-AMP	AMP	AMP
Coal Canyon-Poker	Update	Non-AMP	AMP	Update	Update
Cottonwood Canyon	Non-AMP	Non-AMP	Non-AMP	AMP	Non-AMP
Coyote	Update	Non-AMP	AMP	Update	Update
Desert Queen	AMP	Non-AMP	Non-AMP	AMP	AMP
Diamond S	No	Non-AMP	Non-AMP	AMP	No
Dolly Hayden	AMP	Non-AMP	Non-AMP	AMP	AMP
Goldbanks	Update	Non-AMP	AMP	Update	Update
Harmony	AMP	Non-AMP	Non-AMP	AMP	AMP
Humboldt House	AMP	Non-AMP	Non-AMP	AMP	AMP
Humboldt Sink	AMP	Non-AMP	Non-AMP	AMP	AMP
Jersey Valley	Non-AMP	Non-AMP	Non-AMP	AMP	Non-AMP
Klondike	AMP	Non-AMP	Non-AMP	AMP	AMP
Leadville	Update	Non-AMP	AMP	Update	Update
Licking	AMP	Non-AMP	Non-AMP	AMP	AMP
Majuba	AMP	Non-AMP	Non-AMP	AMP	AMP
Melody	AMP	Non-AMP	Non-AMP	AMP	AMP
North Buffalo	AMP	Non-AMP	Non-AMP	AMP	AMP
Pleasant Valley	AMP	Non-AMP	Non-AMP	AMP	AMP
Pole Canyon	AMP	Non-AMP	Non-AMP	AMP	No
Prince Royal	AMP	Non-AMP	Non-AMP	AMP	AMP
Pumpernickel	AMP	Non-AMP	Non-AMP	AMP	AMP
Ragged Top	Non-AMP	Non-AMP	Non-AMP	AMP	Non-AMP
Rawhide	AMP	Non-AMP	Non-AMP	AMP	AMP
Rochester	AMP	Non-AMP	Non-AMP	AMP	AMP
Rock Creek	Update	Non-AMP	AMP	Update	Update
Rodeo Creek	AMP	Non-AMP	Non-AMP	AMP	No
Rye Patch	Update	Non-AMP	AMP	Update	Update
Seven Troughs	AMP	Non-AMP	Non-AMP	AMP	AMP
Soldier Meadows	AMP	Non-AMP	Non-AMP	AMP	AMP
Sonoma	Update	Non-AMP	AMP	Update	Update
South Buffalo	Update	Non-AMP	AMP	Update	Update
Star Peak	AMP	Non-AMP	Non-AMP	AMP	AMP
Thomas Creek	AMP	Non-AMP	Non-AMP	AMP	AMP
White Horse	AMP	Non-AMP	Non-AMP	AMP	AMP

AMP = Intensive management (implement Allotment Management Plan).
Non-AMP = Non-intensive management (no Allotment Management Plan).
Update = Update current Allotment Management Plan.
No = No livestock grazing (implement Herd Management Area).

Source: U.S. Department of Interior, Bureau of Land Management, Winnemucca District, Sonoma-Gerlach Management Framework Plan, 1980, and Sonoma-Gerlach EIS Team

TABLE 1-4
KEY VEGETATION FACTORS
SONOMA-GERLACH RESOURCE AREA

Key Management Species a/	Critical Growth Period b/	Allowable Utilization Levels c/ (percent)
Grasses		
Nevada bluegrass (Poa nevadensis)	5/15-6/15	50
basin wildrye (Elymus cinereus)	5/1-7/30	50
crested wheatgrass (Agropyron cristatum)	5/1-6/30	50
bluebunch wheatgrass (Agropyron spicatum)	5/1-7/15	50
Thurber needlegrass (Stipa thurburiana)	5/1-7/15	40
needle-and-thread (Stipa comata)	5/1-7/15	50
bottlebrush squirreltail (Sitanion hystrix)	5/1-6/30	40
Idaho fescue (Festuca idahoensis)	5/15-7/31	40
Indian ricegrass (Oryzopsis hymenoides)	4/15-7/15	50
Webber ricegrass (Oryzopsis webberi)	5/15-7/30	50
Forbs		
tapertip hawksbeard (Crepis acuminata)	4/15-6/30	50
globemallow (Sphaeralcea spp.)	4/15-6/30	15
arrowleaf balsamroot (Balsamorhiza sagittata)	5/15-6/30	30
Hooker balsamroot (Balsamorhiza hookeri)	5/15-6/30	5
Shrubs		
winterfat (Ceratoides lanata)	3/1-9/30	50
bitterbrush (Purshia tridentata)	5/1-7/15	50
Saskatoon serviceberry (Amalanchier alnifolia)	5/1-7/15	40
quaking aspen (Populus tremuloides)	N/A	40
curlleaf mountain mahogany (Cercocarpus ledifolius)	5/1-9/15	50
Mormon-tea (Ephedra nevadensis)	4/20-7/30	30
snowberry (Symphoricarpos spp.)	5/1-8/15	40
bud sagebrush (Artemisia spinescens)	3/1-5/30	30
spiny hopsage (Grayia spinosa)	3/15-5/30	20
willow (Salix spp.)	N/A	30

a/ These are the current key management species in the Sonoma-Gerlach Resource Area.

b/ Critical growth periods are based on 1976-1979 phenological studies for Nevada, Ecology 30(3):298-305; Agronomy Journal Vol. 56, No. 1: 80-82; Farm and Home Science, March 1964, page 6; and Journal of Range Management 24(6):414-418 and 418-425.

c/ Taken from Winnemucca District Proper Use Factor Tables (available in the Winnemucca District Office). Maximum for the species. These are average allowable levels under continuous use, and under intensive grazing management these levels may be exceeded.

Source: Winnemucca District Office Allotment Files and District personnel.

tember 30). This treatment would provide later-developing key management species an opportunity to make use of remaining soil moisture to complete some vegetative growth to store food reserves, produce reproductive parts, and/or produce seeds for dispersal to meet physiological requirements.

Graze Treatments:

Treatment 5: Graze livestock from early spring to late spring (approximately March 15 to June 15). In this treatment the pasture would be grazed from the time of range readiness to the designated end of grazing (June 15). This would provide new green forage for livestock during the time when it is most nutritious for livestock and may promote the highest weight gain per day for livestock. This treatment would provide for the maximum use of forage by livestock.

Treatment 6: Livestock grazing from early summer to late fall (approximately June 16 to October 30). This treatment would provide the same benefits as noted in Treatment 1, and would also allow livestock to make partial use of nutritious green growth for increases in weight.

Treatment 7: Livestock grazing from midsummer to late fall (approximately July 16 to November 15). This treatment would provide growing season rest for key management species to improve their vigor, make and store food reserves for future growth and maintenance, and produce mature seed. The grazing of livestock after seedripe: (1) tramples and shatters the seed onto the soil surface; (2) disturbs the soil surface so the seed is covered (plants the seed); (3) adds additional litter to the soil for soil improvement and erosion reduction; and (4) provides forage for livestock.

Treatment 8: Livestock grazing restricted to the fall and winter use period, starting approximately October 1 until the start of twig growth of key management shrub species, approximately February 28. This treatment would provide fall and winter use for livestock while allowing rest during the growing season to improve vigor, seed production, seed trampling and seedling establishment. This would benefit all key management species by increasing their composition and density within the vegetation communities.

GRAZING SYSTEMS

Grazing systems are sequences of grazing and rest treatments designed to meet physiological requirements of key management species, thus accomplishing AMP objectives. Grazing systems could be designed through coordinated resource management and planning--with selection of a particular system dependent on the kind and condition of vegetation, the physiography of the range, the kind of animals, and the management objectives of all interest groups. Some objectives that would be considered are: (1)restoring vigor of key management species, (2) allowing plants to produce seed and establish seedlings, (3) attaining uniform livestock distribution, (4) increasing animal production by providing a sustained yield of perennial forage plants, and (5) those general objectives specified in the purpose and need for action (Chapter 1). These objectives would increase composition, density and diversity of perennial vegetation. The aforementioned grazing treatments would be used singly or in combination to derive the proper system for each allotment. The complexity of the grazing system would depend on the management intensity designated in the proposed action (Table 1-3) based upon the desired resource objectives. Allotments designated for intensive management would require more complex grazing systems to accomplish improved resource conditions, as compared to non-intensive management allotments where less management would attain desired resource objectives. In addition, if the above mentioned objectives for riparian habitat (Chapter 1) cannot be accomplished through intensive grazing systems (AMPs) then these riparian areas would be fenced to provide necessary habitat improvement.

The Sonoma-Gerlach Resource Area is typified by marginally producing desert rangeland. To meet objectives of improved rangeland resources the grazing systems chosen would need to fulfill the physiological requirements of key management species. Descriptions of preferred grazing systems for this particular rangeland are described as follows.

Rotational Grazing Systems

Rotation grazing, or alternate grazing, involves subdividing the range into units and grazing one range unit, then another, in regular succession. This results in greater uniformity in plant utilization and the periods of rest provide for the physiological requirements of the plants.

Rest-Rotation Grazing Systems

Rest rotation grazing systematically (by the grazing formula cycle) provides a period (or 'treatment') of rest for at least one continuous growing season for each pasture included in the allotment. Normally the number of pastures is equal to the number of separate treatments employed in the particular grazing system. Each treatment consists of a scheduled, but different, period of grazing and/or resting during the grazing year. These treatments are rotated annually from one pasture to another to vary the periods-of-use and thereby provide for the physiological needs of the vegetation. The key management species would be allowed an opportunity to gain vigor, increase density, produce seed and establish seedlings.

Deferred Rotational Grazing Systems

Deferred rotation grazing consists of two or more treatments at least one of which systematically provides rest from grazing during the critical growing period for vegetation in each pasture included in the allotment. It is distinguished from rest-rotation by the absence of rest for at least one continuous growing season. However, like rest-rotation, the treatments are rotated each year from one pasture to another. This system provides rest so that the key management species in the allotment may increase stored root reserves during the critical growth period and thus gain in vigor.

Deferred Grazing Systems

Deferred grazing means the delay of the beginning of grazing until a particular occurrence or date has been met. This usually constitutes deferment of grazing until key management species have accomplished particular goals such as: peak of flowering, seedripe or dormancy. The deferred grazing allows the key management species to meet established goals for the allotment, thus benefiting that species.

UTILIZATION LEVELS

Utilization refers to the percentage of the annual production of forage that has been consumed and/or destroyed by animals throughout a grazing period or grazing season under continued use and management. Utilization may refer either to a single species or to the vegetation as a whole.

The allowable utilization levels of key management species recommended for the Sonoma-Gerlach Resource Area are shown in Table 1-4. These are average allowable levels under continuous use; however, modifications of these levels could be allowed as a result of intensive grazing or management through coordinated AMPs. These utilization levels, with periodic rest, would allow the key management species to increase in vigor and productivity.

LIVESTOCK SUPPORT FACILITIES

The development of livestock support facilities would be required in order to facilitate intensive grazing management, to make available AUMs previously not allocated because of the physical lack of water, and to improve livestock vegetation condition and trend. These facilities consist of fences, wells, springs, troughs, pipelines, and cattleguards (see Appendix C, Section 1).

Land treatments, such as seedings, reseedings and sagebrush control followed by seeding are proposed in the resource area. The number of treatments as well as the number of livestock support facilities are shown in Table 1-5. Land treatments are based on MFP Step II recommendations while livestock support facility numbers and locations were estimated to provide a base for analysis purposes. The approximate locations of these land treatments and support facilities are shown on the Livestock Support Facilities Map. The land treatment method, acres treated, anticipated AUM increases and cost breakdowns by allotment are shown in Appendix C, Section 2.

The proposed action has not identified any areas for sagebrush control to release understory vegetation. However, sagebrush must be eliminated in some treatments to provide for seedings. The method of sagebrush control for seedings would be either by mechanical (e.g., discing, chaining) or chemical (e.g., spraying) treatments depending primarily on site location, soils, vegetation density, and/or surrounding wildlife habitat.

All land treatments and livestock support facilities will be constructed, maintained, and/or implemented within the Standard Operating Procedures incorporated in this chapter.

GENERAL IMPLEMENTATION SCHEDULE

Filing of the Sonoma-Gerlach final EIS is scheduled for September 30, 1981. Levels of grazing use in the proposed action would be based on BLM's best available information which is suitable vegetation as determined by the 1979 recompilation of the 1947 and 1960s range surveys and recommendations made in the Sonoma-Gerlach Management Framework Plan (MFP) Step II. It should be understood that the range survey recompilation is only an indicator of the existing situation and that management decisions (MFP Step III) and administrative actions would be tailored to on-the-ground resource management. The following management factors would be included in the decision-making process:

TABLE 1-5
LIVESTOCK SUPPORT FACILITIES FOR THE PROPOSED ACTION a/
SONOMA-GERLACH RESOURCE AREA

Facilities	Units	Cost/Unit c/	Total Cost
Wells b/	42.0 each	$5,100 each d/	$ 214,200
Springs	8.0 each	2,250 each	18,000
Pipelines	15.5 mile	2,600 mile	40,300
Troughs	102.0 each	500 each	51,000
Fences	399.0 mile	3,600 mile	1,436,400
Cattleguards	18.0 each	2,750 each	49,500
Subtotal			$ 1,809,400
Land Treatments			
Seed and/or Reseed	14,752 acres	$30/acre	442,560
Sagebrush Control and Seed	230,112 acres	$60/acre	$13,806,720
Subtotal			$14,249,280
Grand Total			$16,058,680

a/ Approximate locations are shown on the Livestock Support Facilities Map (see Appendix C, Sections 1,2 for a list of proposed livestock support facilities by allotment).

b/ Well site investigations have not yet been conducted, and it is assumed for analysis purposes that ground water is available.

c/ Costs per unit were developed by the Division of Operations, Winnemucca District, and the Division of Technical Services, Nevada State Office, Bureau of Land Management, 1980, and the U.S. Forest Service, Winnemucca, Nevada (personal communication with Mr. Bob Tonioli), 1979. These costs were developed at 1980 prices and do not include future maintenance and replacement cost.

d/ Wells differ in depth; therefore, this reflects average unit cost.

Source: U.S. Department of the Interior, Bureau of Land Management, Sonoma-Gerlach Management Framework Plan Step II, Winnemuccan Step II, Winnemucca District Office files; Division of Technical Services, Nevada State Office, Reno, Bureau of Land Management; and the U.S. Forest Service, Department of Agriculture (personal communication with Mr. Bob Tonioli), compiled, 1979-1980.

1. Coordinated Resource Management and Planning: the concepts of CRMP would be applied in all cases prior to initiating use adjustments and developing AMPs.

2. Monitoring studies and evaluation.

3. Range Improvement projects identified in AMPs would replace what are now only estimates.

4. Possible flexibility in application of suitability criteria: The suitability criteria may not be applicable in all areas. Therefore, prior to developing AMPs and making livestock adjustments, the application of suitability would be verified. Where the resource manager determines through field examination, allotment condition and trend studies, etc., that the basic reasons for applying the criteria do not in fact exist, modifications would be made and documented to provide a record and rationale for such modifications. An example of such a modification is where a large monoculture exists which does not meet the 25 pounds of useable perennial forage standards. If during field verification and consultation with the user it is determined that the area can be grazed without damaging adjacent rangeland, then the purpose for applying the criteria no longer exists and should not be applied.

5. Incorporation later of new data and information made available by users and general public prior to implementation.

Adjustments to grazing use would be made in accordance with the District Manager's final decisions based on the above management factors. The adjustments in livestock use would be implemented over a three year period in accordance with current regulations (Title 43 Code of Federal Regulations (CFR) 4110.3-2 (c)).

Detailed livestock grazing plans (AMPs) would be developed for each allotment or combination of allotments scheduled for intensive management and/or non-intensive management with an AMP (see Table 1-6). However, until AMPs are implemented, livestock grazing on these allotments would be in accordance with the periods-of-use listed in Appendix B and/or Table 1-1. Allotments scheduled for non-intensive management with no AMPs would continue to be authorized for livestock use up to estimated carrying capacity and proposed periods-of-use in Appendix B.

Implementation of AMPs in those allotments scheduled for intensive management and/or non-intensive with AMPs would be in accordance with Table 1-6. It is assumed that all AMPs would be implemented within seven years. The AMPs for these allotments would be completely written by 1989 and completely functional by 1991. The criteria used in determining the order of priority of AMP implementation are based on the following: (1) condition of the soil and vegetation resources and the rate of deterioration; (2) impact of the severity of AUM reductions; (3) potential of the area for improvement and the anticipated rate of recovery; (4) the presence of threatened and/or endangered species; and (5) the presence of areas of critical environmental concern (ACEC).

The proposed action recommends the removal of approximately 4,400 wild horses and burros from the Sonoma-Gerlach Resource Area. There are limiting factors that prevent immediate gathering of approximately 4,400 wild horses and burros (e.g., foaling season, weather conditions and/or foal age). Complete elimination of wild horses and burros from an area is difficult as the last wild horses and/or burros are the most difficult to gather. It is estimated that seven years would be needed to completely remove all wild horses and burros from the specified areas. See Table 1-7 for the schedule of wild horse and/or burro removal by allotment. Table 1-12 shows the wild horses and burros to be removed from the checkerboard land pattern use areas. Wild horses and/or burros would be totally removed from the Antelope Range, Augusta Mountains, Black Rock (West), Blue Wing Mountains, Calico Mountains, East Range, Fox and Lake Range, Granite Range, Humboldts, Kamma Mountains, Nightingale Mountains, Selenite Range, Seven Troughs, Shawave Mountains, Sonoma Range (with the exception of the Diamond S Allotment which would become the Button Point HMA), Stillwater Range, Trinity Range, Truckee Range, Tobin Range, and Warm Springs Canyon herd use areas (reference Wild Horse and Burro Use Area Map). Approximately 930 wild horses and/or burros per year would have to be removed over a seven year period to complete the removal (assuming an 11 percent yearly increase in wild horse and burro numbers). Wild horses and burros would be managed in the Button Point, Lava Beds, and Buffalo Hills herd management areas.

NO ACTION ALTERNATIVE

Under the no action alternative, the present grazing management program would continue unchanged. For analysis purposes, it is assumed that future use (year 2024) would be the same as at present.

TABLE 1-6
GENERAL IMPLEMENTATION SCHEDULE
FOR THE PROPOSED ACTION a/

Allotment Name	Priority b/	Implementation Year c/
Intensive AMP d/		
Soldier Meadow-Paiute	1	1982
Humboldt House	1	1982
Buffalo Hills-Calico	2	1983
White Horse	2	1983
Desert Queen	2	1983
Humboldt Sink	3	1984
Majuba	3	1984
North Buffalo-Licking-Copper Canyon	3	1984
Blue Wing-Seven Troughs	4	1985
Melody-Thomas Creek-Harmony	4	1985
Pumpernickel	5	1986
Rawhide-Rochester	5	1986
Prince Royal-Star Peak-Klondike	6	1987
Rodeo Creek-Pole Canyon	6	1987
Pleasant Valley	7	1988
Clear Creek-Dolly Hayden	7	1988
AMP Revision e/		
Coal Canyon-Poker	1	1982
South Buffalo	2	1983
Gold Banks	3	1984
Rock Creek-Sonoma	4	1985
Leadville	5	1986
Coyote	6	1987
Rye Patch	7	1988

a/ All allotments, with the exception of Diamond S, would have periods-of-use, proper stocking rates, and kind of livestock established in 1982. For three allotments (Jersey Valley, Cottonwood Canyon, and Ragged Top) this is all that would be done; AMPs are not required to obtain desired vegetative changes. Diamond S is excluded because it is proposed as a Horse Management Area, with no livestock grazing. All other allotments would have AMPs established or revised.
b/ Allotments having No. 1 priority would have AMPs implemented or revised in 1982, those with priority 2 in 1983, priority 3 in 1984, and so on.
c/ For analysis purposes, it is assumed that all AMPs would be implemented within seven years.

TABLE 1-7
REMOVAL OF WILD HORSES AND BURROS
FOR THE PROPOSED ACTION
SONOMA-GERLACH RESOURCE AREA

Allotment	Estimated Number Wild Horses/Burros for Removal	Priority for Removal a/
Intensive Management with AMPs		
Blue Wing	394/39	1
Seven Troughs	63/1	1
(Total)	(457/40)	
Buffalo Hills	0	0
Calico	29	1
(Total)	(29)	
Pleasant Valley	9	1
Pole Canyon	16	1
Rodeo Creek	91	1
(Total)	(107)	
Pumpernickel	4	1
Rawhide	1	1
Rochester	18	1
(Total)	(19)	
Soldier Meadows	419/18	2
Revision and/or Update of Existing AMPs		
Goldbanks	4	1
		1
Leadville	70	1
South Buffalo	14	1
Non-Intensive Management		
Cottonwood Canyon	2	1
Jersey Valley	80	2
No Livestock Grazing		
Diamond S	23	1
Total	1,237/58	

a/ Priority was determined by using the degree of vegetation overobligation, and whether or not the allotment is scheduled for an AMP.

Source: Sonoma-Gerlach Unit Resource Analyses 1979, and Management Framework Plan 1980.

VEGETATION ALLOCATION PROGRAM

It is assumed that livestock use would remain at 116,551 AUMs. It is also assumed that the 1,644 AUMs of average annual trespass use would continue. Big game is presently allocated 6,430 AUMs (existing use is 12,962 AUMs). There is no vegetation allocated for wild horses and burros, but existing use is 66,012 AUMs. Table 1-8 shows the relationship between available vegetation and existing use. Table 1-8 also shows projected future vegetation production and demand under the no action alternative.

Existing wild horse and burro use would remain at 66,012 AUMs annually. With no AUMs allocated to wild horses and burros, continued overuse would occur. There would be no specific areas where horses would be gathered. Reductions of wild horse and burro numbers would only be considered:

I. On areas where individuals have requested removal of horses from private lands because they were damaging it,

2. Where, because of extreme deterioration of range resources, horses or burros would have to be removed to insure that no further damage would occur, or

3. Where, because of circumstances resulting from No. 2 above, a die-off of horses or burros appears imminent.

Priorities for gathering wild horses and burros in areas that meet any of the above criteria would be decided yearly at the district level.

LEVELS OF GRAZING MANAGEMENT

The level of grazing management in each allotment would remain as it is at the present time, as would period-of-use. These are shown in Table 1-8 for each allotment. Present levels of range supervision would continue, as would present levels of monitoring studies. Existing livestock support facilities would be maintained, but no new ones would be constructed.

NO LIVESTOCK GRAZING ALTERNATIVE

Under the no livestock grazing alternative, all domestic livestock grazing on BLM administered public land within the Sonoma-Gerlach Resource Area would be eliminated. Available vegetation would be allocated to reasonable numbers of big game animals, and to wild horses and burros in each herd use area and herd management area. See Tables 1-9 and 1-10 for initial and future allocations and use, by allotment.

VEGETATION ALLOCATION PROGRAM

Under this alternative, big game animals would receive an allocation of 16,869 AUMs. Wild horses and burros would receive an initial allocation of 14,795 AUMs. This would increase to 41,175 AUMs by 2024 due to increases in vegetation productivity. Excess wild horses and burros would be removed to maintain their use at or below the 41,175 AUM level. Vegetation not allocated to wild horses and burros or to big game would be used for non-consumptive uses such as watershed protection.

IMPLEMENTATION SCHEDULE

Under this alternative, no new livestock support facilities would be built, nor would existing facilities be maintained unless they were necessary for other resource uses, such as wild horses and burros or wildlife. In order to allow wild horses and burros greater mobility and to facilitate the movements of wildlife, certain fences would be removed from the public land. These are listed by priority in Table 1-11. Wild horses and burros would be removed from checkerboard land in the priority shown in Table 1-12. The removal would be completed in one year. Livestock removals would begin after the District Manager's decisions, with no priority needed since removal would begin on all allotments simultaneously.

MAXIMIZING LIVESTOCK USE ALTERNATIVE

VEGETATION ALLOCATION PROGRAM

Under this alternative the maximum development of range improvements throughout the resource area would occur wherever the improvements are technically feasible and within Bureau policy in order to maximize livestock use. Economic reasonability would be disregarded; however, the costs of the projects are listed (Table 1-13). Vegetation would be allocated to livestock by allotment or

TABLE 1-8
NO ACTION ALTERNATIVE - PRESENT VEGETATION ALLOCATIONS, EXISTING USE, AND FUTURE VEGETATION PRODUCTION (AUMs)
SONOMA-GERLACH RESOURCE AREA

Allotment	Available Vegetation a/ (1980)	Existing Use b/: Average Last Three Years Livestock Use c/	Existing Use b/: Average Last Three Years Trespass (Documented) c/	Existing Use b/: Mule Deer d/	Existing Use b/: Antelope d/	Existing Use b/: Wild Horses & Burros	Total Vegetation Used e/ (1980)	Un-Used Vegetation (1980)	Over-Used Vegetation (1980)	Existing Period-of-Use	Existing Level of Grazing Management	Estimated Future Production (2024) f/
Blue Wing	19,816	22,068	156	865	0	20,556	43,645	0	23,829	Yearlong	Non-AMP	4,756
Buffalo Hills	23,089	9,586	248	6,280	644	4,152	20,910	2,179	0	3/1 to 12/31	Non-AMP	24,474
Calico	1,721	2,574	0	44	22	348	2,988	0	1,267	4/1 to 10/15	Non-AMP	1,033
Clear Creek	2,423	3,062	68	50	0	492	3,672	0	1,249	11/1 to 8/30	Non-AMP	1,454
Coal Canyon-Poker	2,904	2,345	0	120	0	2,652	5,117	0	2,213	11/1 to 7/15	AMP	1,074
Cottonwood Canyon	168	60	0	22	0	24	106	62	0	3/1 to 8/31	Non-AMP	197
Coyote	3,297	2,682	0	35	234	0	2,951	346	0	4/1 to 12/1	AMP	3,495
Desert Queen	730	2,834	362	0	0	708	3,904	0	3,174	Yearlong	Non-AMP	0
Diamond S	682	1,025	17	36	0	828	1,906	0	1,224	4/15 to 9/30	Non-AMP	34
Dolly Hayden	3,952	3,302	156	84	0	2,856	6,398	0	2,446	Yearlong	Non-AMP	2,371
Goldbanks	1,544	2,040	0	114	0	948	3,102	0	1,558	Yearlong	AMP	371
Harmony	239	347	7	27	0	180	561	0	322	4/1 to 9/20	Non-AMP	33
Humboldt House	516	577	0	83	0	60	720	0	204	12/1 to 9/30	Non-AMP	428
Humboldt Sink	300	1,377	0	3	0	0	1,380	0	1,080	6/1 to 4/30	Non-AMP	0
Jersey Valley	610	989	0	59	0	960	2,008	0	1,398	11/1 to 3/15	Non-AMP	0
Klondike	1,483	2,115	45	70	0	1,848	4,078	0	2,595	4/1 to 12/31	Non-AMP	74
Leadville	2,603	2,566	0	178	38	840	3,622	0	1,019	4/1 to 11/30	AMP	2,160
Licking	60	152	0	13	0	0	165	0	105	3/1 to 6/30	Non-AMP	3
Majuba	3,320	503	0	70	21	1,680	2,274	1,046	0	11/1 to 6/30	Non-AMP	3,884
Melody	616	290	0	0	0	0	290	326	0	4/20 to 8/15	Non-AMP	862
North Buffalo	1,640	963	0	4	0	0	967	673	0	11/16 to 4/6	Non-AMP	1,919
Pleasant Valley	8,755	8,553	0	438	0	1,944	10,935	0	2,180	3/1 to 12/31	Non-AMP	7,267
Pole Canyon	209	540	0	14	4	192	750	0	541	5/1 to 9/30	Non-AMP	0
Prince Royal	208	153	0	58	0	0	211	0	3	5/1 to 7/5	Non-AMP	208
Pumpernickel	6,097	4,957	0	106	0	192	5,255	842	0	Yearlong	Non-AMP	6,463
Ragged Top	496	784	0	89	0	2,184	3,057	0	2,561	Yearlong	Non-AMP	0
Rawhide	2,488	2,417	0	104	0	1,704	4,225	0	1,737	2/1 to 12/31	Non-AMP	1,493
Rochester	2,428	1,959	0	56	0	2,052	4,067	0	1,639	Yearlong	Non-AMP	1,457
Rock Creek	1,751	2,192	0	38	0	408	2,638	0	887	5/1 to 10/15	AMP	1,051
Rodeo Creek	5,596	6,014	479	175	68	1,092	7,828	0	2,232	Yearlong	Non-AMP	4,645
Rye Patch	1,462	1,744	0	81	0	816	2,641	0	1,179	10/20 to 8/31	AMP	541
Seven Troughs	4,034	6,183	49	611	1	4,344	11,188	0	7,154	Yearlong	Non-AMP	202
Soldier Meadows	25,294	3,423	0	747	216	5,244	9,630	15,664	0	Yearlong	Non-AMP	35,412
Sonoma	804	1,510	0	39	0	264	1,813	0	1,009	5/4 to 10/3	AMP	113
South Buffalo	7,621	8,839	0	471	0	168	9,478	0	1,857	Yearlong	AMP	6,325
Star Peak	2,789	3,225	38	536	0	3,624	7,423	0	4,634	Yearlong	Non-AMP	139
Thomas Creek	413	631	0	25	0	192	848	0	435	3/1 to 8/15	Non-AMP	99
White Horse	1,073	1,970	19	43	0	2,460	4,492	0	3,419	11/1 to 7/31	Non-AMP	0
Total	143,231	116,551	1,644	11,788	1,248	66,012	197,243	21,138	75,150			114,037

a/ Available vegetation is the result of recompilation of the 1947 and 1960s range surveys (Appendix A Section 1).
b/ Existing use is the actual use being made of the vegetation resource, as opposed to existing obligations, which is an apportionment of resources among uses. Not shown in the Table is an existing use of 14 AUMs of bighorn sheep use in Buffalo Hills Allotment. These AUMs are included in the total vegetation used column for Buffalo Hills Allotment. For analytical purposes, it is assumed that future use would be the same as existing use.
c/ The last three years includes use made between 3/1/77 and 2/29/80. Soldier Meadow Allotment is an exception to the three year average. Because of various legal and administrative factors, this allotment had either no use or comparatively little use during the three year period. Therefore, the 1980-81 grazing season use is used.
d/ Existing big game numbers were supplied by NDOW for their management units. The procedure outlined in Appendix A, was used to apportion these numbers by allotment.
e/ Total vegetation used includes average last three years livestock use, average last three years trespass, competitive big game use, and wild horse and burro use.
f/ Estimated future production was derived using the methods outlined in Appendix A, Section 1.

Source: U.S. Department of Interior, Bureau of Land Management, Winnemucca District, Sonoma-Gerlach Resource Area Unit Resource Analyses, 1979.

TABLE 1-9
NO LIVESTOCK GRAZING ALTERNATIVE
INITIAL ALLOCATIONS (AUMs), YEAR 1982
SONOMA-GERLACH RESOURCE AREA

Allotment a/	Available Vegetation b/	Proposed Initial Allocations c/ Mule Deer	Antelope	Bighorn Sheep	Wild Horse & Burro	Total Used	Total Unused
Blue Wing	19,827	701	49	106	4,319	5,175 d/	14,652
Buffalo Hills	23,320	6,294	1,106	1,142	4,399	12,941	10,379
Calico	1,741	46	44	86	158	334	1,407
Clear Creek	2,478	176	0	20	0	196	2,282
Coal Canyon-Poker	2,909	97	1	31	0	129	2,780
Cottonwood Canyon	166	18	0	0	33	51	115
Coyote	3,299	35	411	7	0	453	2,846
Desert Queen	730	0	0	0	0	0	730
Diamond S	717	129	0	38	420	587	130
Dolly Hayden	3,953	68	0	18	0	86	3,867
Goldbanks	1,546	92	0	18	66	176	1,370
Harmony	258	95	0	7	0	102	156
Humboldt House	523	67	0	23	0	90	433
Humboldt Sink	302	2	0	3	0	5	297
Jersey Valley	600	48	0	1	276	325	275
Klondike	1,480	57	0	10	0	67	1,413
Leadville	2,629	179	67	176	410	832	1,797
Licking	88	45	0	0	0	45	43
Majuba	3,324	57	92	0	0	149	3,175
Melody	616	0	0	0	0	0	616
North Buffalo	1,640	15	0	0	0	15	1,625
Pleasant Valley	8,760	354	0	97	148	599	8,161
Pole Canyon	232	15	7	37	95	154	78
Prince Royal	210	47	0	13	0	60	150
Pumpernickel	6,160	222	0	38	66	326	5,834
Ragged Top	481	72	0	0	0	72	409
Rawhide	2,493	84	0	46	16	146	2,347
Rochester	2,429	45	0	15	296	356	2,073
Rock Creek	1,776	134	0	43	0	177	1,599
Rodeo Creek	5,648	177	137	150	1,105	1,569	4,079
Rye Patch	1,468	66	0	24	0	90	1,378
Seven Troughs	4,024	495	26	0	0	521	3,503
Soldier Meadows	25,335	786	429	264	2,754	4,233	21,102
Sonoma	863	141	0	29	0	170	693
South Buffalo	7,640	381	0	135	234	750	6,890
Star Peak	2,788	434	0	82	0	516	2,272
Thomas Creek	463	90	0	35	0	125	338
White Horse	1,073	35	0	7	0	42	1,031
Total	143,989	11,799	2,369	2,701	14,795	31,664	112,325

a/ No allotment management plans would be implemented on any allotments in this alternative.

b/ Available vegetation as determined by the 1979 recompilation of the 1947 and 1960s range surveys.

c/ Initial allocations are to reasonable numbers of big game and the existing numbers of wild horses and burros.

d/ Blue Wing Allotment did not have sufficient available vegetation remaining in the herd use areas after big game allocations to satisfy existing numbers of wild horses and burros, thus creating a shortage of 498 AUMs in wild horse and burro allocations in that allotment.

Source: U.S. Department of the Interior, Bureau of Land Management, Winnemucca District, Sonoma, Blue Wing, and Buffalo Hills Unit Resource Analyses 1980, and Winnemucca District Office files.

TABLE 1-10
NO LIVESTOCK GRAZING ALTERNATIVE - ESTIMATED FUTURE PRODUCTION AND USE, (AUMs) YEAR 2024
SONOMA-GERLACH RESOURCE AREA

Allotment Name	Available Vegetation 2024 a/	Estimated Future Use b/				Estimated Vegetation Used 2024	Estimated Vegetation Not Used 2024
		Mule Deer	Antelope	Bighorn Sheep	Wild Horses & Burros		
Blue Wing	24,790	701	49	106	12,720	13,576	11,214
Buffalo Hills	29,570	6,294	1,106	1,142	8,200	16,742	12,828
Calico	2,099	46	44	86	410	586	1,513
Clear Creek	3,094	176	0	20	0	196	2,898
Coal Canyon-Poker	3,775	97	1	31	0	129	3,646
Cottonwood Canyon	200	18	0	0	182	200	0
Coyote	3,992	35	411	7	0	453	3,539
Desert Queen	1,383	0	0	0	0	0	1,383
Diamond S	857	129	0	38	690	857	0
Dolly Hayden	4,779	68	0	18	0	86	4,693
Goldbanks	1,855	92	0	18	1,724	1,834	21
Harmony	314	95	0	7	0	102	212
Humboldt House	706	67	0	23	0	90	616
Humboldt Sink	425	2	0	3	0	5	420
Jersey Valley	1,571	48	0	1	954	1,003	568
Klondike	1,841	57	0	10	0	67	1,774
Leadville	3,201	179	67	176	994	1,416	1,785
Licking	128	45	0	0	0	45	83
Majuba	4,080	57	92	0	0	149	3,931
Melody	745	0	0	0	0	0	745
North Buffalo	1,984	15	0	0	0	15	1,969
Pleasant Valley	10,654	354	0	97	1,581	2,032	8,622
Pole Canyon	242	15	7	37	183	242	0
Prince Royal	327	47	0	13	0	60	267
Pumpernickel	7,406	222	0	38	144	404	7,002
Ragged Top	1,150	72	0	0	0	72	1,078
Rawhide	3,035	84	0	46	41	171	2,864
Rochester	3,832	45	0	15	1,442	1,502	2,330
Rock Creek	2,142	134	0	43	0	177	1,965
Rodeo Creek	6,831	177	137	150	6,367	6,831	0
Rye Patch	1,765	66	0	24	0	90	1,675
Seven Troughs	8,710	495	26	0	722	1,243	7,467
Soldier Meadow	30,635	786	429	264	3,612	5,091	25,544
Sonoma	1,075	141	0	29	0	170	905
South Buffalo	9,589	381	0	135	1,209	1,725	7,864
Star Peak	3,351	434	0	82	0	516	2,835
Thomas Creek	547	90	0	35	0	125	422
White Horse	1,296	35	0	7	0	42	1,254
Total	183,976	11,799	2,369	2,701	41,175	58,044	125,932

a/ Available vegetation in 2024 includes improvements based on an increase in production brought about by reduced grazing pressure, increases due to improvement in areas formerly not allocated because of low production, and removal of horses in checkerboard land ownership areas.

b/ Estimated future use includes use by reasonable numbers of big game, and wild horses in areas not having a checkerboard land ownership pattern.

Source: U.S. Department of the Interior, Bureau of Land Management, Winnemucca District, Sonoma-Gerlach Resource Area Management Framework Plan (1980) and Range Survey Compilation Records (1979).

TABLE 1-11
IMPLEMENTATION SCHEDULE FOR FENCE REMOVAL a/
NO LIVESTOCK GRAZING ALTERNATIVE
SONOMA-GERLACH RESOURCE AREA

Year b/	Project Number	Project Name	Approximate Miles	Cost/ Unit c/	Cost
1982	0307	Granite Mountain Drift Fence	11.0	$3,600	$ 39,000
1982	4172	Leadville & Coyote Allotment Fences	14.5	/mile	52,000
1982	4566	Coyote Allotment Fence	16.0		57,600
1982	4270	Coyote Allotment Fence	6.0		21,600
1983	1081	Pole Canyon Allotment Fence	6.5		23,400
1983	4073	Leadville Allotment Fence	5.0		18,000
1983	4033	Leadville Allotment Fence	12.0		43,200
1983	4171	Leadville Allotment Interior Fence	6.0		21,600
1984	0770	Calico Allotment Fence	10.0		36,000
1984	4087	Stanley Camp Fence	6.0		21,600
1984	4074	Crutcher Canyon Drift Fence	7.0		25,200
1984	0978	C-2-N Fence (sections not in district boundary)	8.0		28,800
1984	0780	East Boundary Fence	8.0		28,800
1985	4023	Diamond S Fence	15.0		54,000
1985	0527	Winnemucca Seeding Fence	6.2		22,320
1985	4205	Sonoma Boundary Fence	6.0		21,600
1985	4539	Rock Creek Allotment Boundary Fence	8.0		28,800
1986	4061	Big Squaw Valley Fence	2.0		7,200
1986	0465	Rock Creek Spray Fence	6.0		21,600
1986	4737	Mahogany Exclosure Fence	6.0		21,600
1986	0697	Pole Creek Division Fence	7.0		25,200
1986	4598	North Buffalo Allotment Fence	4.0		14,400
1986	4078	Goldbanks Fence	14.5		52,200
1987	4077	Grass Valley Fence	7.0		25,200
1987	4274	Goldbanks Allotment Fence	20.5		73,800
1987	1068	Pleasant Valley Fence	3.0		10,800
1987	1177	Table Mountain Fence	4.7		16,920
1987	0561	Chabagno Holding Field Fence	1.5		5,400
1988	1091	Dun Glen Fence	15.0		54,000
1988	0843	Ballard-Sweeney Fence	3.0		10,800
1988	4211	Rye Patch Interior Fence	2.0		7,200
1988	1140	Humboldt House Fence	2.0		7,200
1988	4080	Coal Canyon Fence	14.0		50,400
1988	0531	Button Point Seeding Fence	4.5		16,200
			275.1		$990,360

a/ Under the no grazing alternative, those portions of livestock control fences that are located in big game areas, or which interfere with wild horse movements, would be removed.

b/ Priority was established based on wildlife habitat values of the area where fences are located. It is assumed for analysis purposes that all implementation would be completed in seven years.

c/ Costs per unit were developed by the Division of Operations, Winnemucca District at 1980 prices.

Source: U.S. Department of the Interior, Bureau of Land Management, Winnemucca District, Sonoma-Gerlach Resource Area Unit Resource Analyses, 1980.

TABLE 1-12

REMOVAL OF
WILD HORSES AND BURROS
FROM CHECKERBOARD LAND
NO LIVESTOCK GRAZING ALTERNATIVE
SONOMA-GERLACH RESOURCE AREA

Checkerboard Use Areas	Wild Horses/Burros to be Removed
Truckee	64
Shawave	446
Humboldts	699
Trinity	220
Antelope	203
East Range	982
Seven Troughs	286/48
Sonoma	140
Total	3,040/48

Source: Sonoma-Gerlach Management Framework Plan 1980.

combination of allotments, and to existing use of big game. This allocation is based on information obtained from the 1979 recompilation of the 1947 and 1960s range surveys and recommendations made in the Sonoma-Gerlach MFP Step I for range.

This action would initially (1982) allocate 130,196 AUMs to livestock, and 13,036 AUMs to big game. This compares with an existing use of 116,551 AUMs for livestock (based upon the average licensed use for the last three to five years), 13,036 AUMs for big game and 66,012 AUMs for wild horses and burros (Table 1-14).

The short-term (1991) estimated future production is based upon additional vegetation becoming available through range improvements such as water developments and land treatments. The estimated allocation in year 1991 would be 216,746 AUMs for livestock, and 13,036 AUMs for big game (Table 1-15). This would be an increase over the initial allocation for livestock of 86,550 AUMs, with no additional increases over the initial allocations to big game.

The long-term (2024) estimated future production is based upon additional vegetation becoming available through grazing management systems (AMPs), reductions in grazing intensity of livestock to the estimated carrying capacity, and/or the complete removal of wild horses and burros. The estimated allocation in year 2024 would be 251,466 AUMs for livestock, 13,036 AUMs for big game and no allocation of AUMs to wild horses and burros (Table 1-15). This would be an increase over the initial allocation for livestock of 121,270 AUMs, with no additional increases over the initial allocations to big game.

LEVELS OF GRAZING MANAGEMENT

MANAGEMENT INTENSITY

The proposed level of grazing management by allotment for this alternative is shown in Table 1-3. This level of management is intensive management with implementation of AMPs. There are 19 allotments or combinations of existing allotments proposed for intensive management with implementation of AMPs. In addition, there are seven allotments or combinations of existing allotments already in intensive management for review and revision of the current AMP if necessary.

PERIODS-OF-USE

Periods-of-use for each allotment are shown in Appendix B and Table 1-1. These periods-of-use are designed to improve the condition of the vegetation by providing rest from livestock grazing during the critical growth period of key management species. Periods-of-use would be established on each allotment until the time AMPs could be implemented. Periods-of-use could be modified upon implementation of AMPs since the physiological requirements of key management species would be met during each grazing cycle through the application of grazing treatments.

GRAZING TREATMENTS, GRAZING SYSTEMS, AND UTILIZATION LEVELS

Grazing treatments, grazing systems, and utilization levels for this alternative (Maximizing Livestock Use) would be the same as those described in the proposed action section.

LIVESTOCK SUPPORT FACILITIES

The livestock support facilities and land treatments that would be implemented under this alternative are shown in Table 1-13. Land treatments are based on MFP Step I recommendations (as modified to eliminate treatments in sage grouse strutting grounds) while livestock support facility numbers and locations were estimated in order to provide a base for analysis purposes (see Appendix D, Section 1). The approximate locations of these land treatments and support facilities for this alternative are shown on the Livestock Support Facilities Map. The treatment method, acres treated, anticipated AUM increases and cost breakdowns by allotment are shown in Appendix D, Section 2.

This alternative has 21,290 acres proposed for sagebrush control to release understory perennial grasses from competition with these shrubs. Sagebrush control may be accomplished by discing, chaining, burning, spraying, or other methods. Since spraying is one ofthe most widespread control practices, it will be considered in greater detail here.

The chemical herbicide would be applied aerially or by ground spray vehicle at the rate of one and one-half to two pounds of 2,4-D low volatile ester per acre, using water as a carrier. Two growing seasons rest from grazing would be required after spraying to allow key vegetation species an opportunity to occupy the void left by the dead brush.

Certain safeguards would be necessary to limit spray drift and avoid damage to wildlife habitat (see Appendix F). Drift problems associated with aerial spraying can be avoided by spraying when wind speed is less than seven miles per hour and by

TABLE 1-13

LIVESTOCK SUPPORT FACILITIES
FOR MAXIMIZING LIVESTOCK USE a/
SONOMA-GERLACH RESOURCE AREA

Facilities	Units	Cost/Unit b/	Total Cost
Wells	·44.0 each	$5,100 each d/	$ 224,400
Springs	8.0 each	2,250 each	18,000
Pipelines	15.5 mile	2,600 mile	40,300
Toughs	106.0 each	500 each	53,000
Fences	411.0 mile	3,600 mile	1,479,600
Cattleguards	19.0 each	2,700 each	52,250
Subtotal			$ 1,867.550
Land Treatments			
Sagebrush Control	21,290 acres	$16/acre	340,640
Seed and/or Reseed	16,172 acres	$30/acre	485,160
Sagebrush Control then Seed	243,784 acres	$60/acre	14,627,040
Subtotal			$15,452,840
Grand Total			$17,320,390

a/ Approximate locations are shown on the Livestock Support Facilities Map (see Appendix D, Sections 1, 2 for a list of proposed livestock support facilities by allotment).

b/ Costs per unit were developed by the Division of Operations, Winnemucca District, and the Division of Technical Services, Nevada State Office, Bureau of Land Management, 1980, and the U.S. Forest Service, Winnemucca, Nevada (personal communication with Mr. Bob Tonioli), 1979. The costs were developed at 1980 prices and do not include future maintenance and replacement cost.

c/ Well site investigations have not yet been conducted, and it is assumed for analysis purposes that groundwater is available.

d/ Wells differ in depth; therefore, this reflects average unit cost.

Source: U.S. Department of the Interior, Bureau of Land Management, Sonoma-Gerlach Management Framework Plan Step I, Winnemucca District Office files; Division of Technical Services, Nevada State Office, Reno, Bureau of Land Management; and the U.S. Forest Service, Department of Agriculture (personal communication with Mr. Bob Tonioli) compiled, 1979-1980.

TABLE 1-14
MAXIMIZING LIVESTOCK THROUGH MANAGEMENT AND DEVELOPMENT ALTERNATIVE
INITIAL ALLOCATIONS, YEAR 1982 (AUMs) a/
SONOMA-GERLACH RESOURCE AREA

	Present Demand					Existing Use				Proposed Initial Allocation - Year 1982 g/			
			Reasonable Number d/										
Allotment	Authorized Livestock Use b/	Wild Horse & Burro c/	Mule Deer	Antelope	Bighorn Sheep	Average Livestock Licensed Use e/	Wild Horse & Burro c/	Big Game h/	Total Allocated Vegetation f/	Livestock	Wild Horse & Burro	Mule Deer	Antelope
Intensive Management with AMPs													
Blue Wing	24,160	20,556	701	49	106	22,068	20,556	865	19,816	18,951	0	865	0
Seven Troughs	9,163	4,344	495	26	0	6,183	4,344	612	4,034	3,422	0	611	1
(Total)	(33,323)	(24,900)	(1,196)	(75)	(106)	(28,251)	(24,900)	(1,477)	(23,950)	(22,373)	(0)	(1,476)	(1)
Buffalo Hills	11,920	4,152	6,294	1,106	1,142	9,586	4,152	6,924	23,090	16,166	0	6,280	644
Calico	2,584	348	46	44	86	2,574	348	66	1,721	1,655	0	44	22
(Total)	(14,504)	(4,500)	(6,340)	(1,150)	(1,228)	(12,160)	(4,500)	(6,990)	(24,811)	(24,311)	(0)	(6,324)	(662)
Clear Creek	3,111	492	176	0	20	3,062	492	50	2,423	2,424	0	50	0
Dolly Hayden	3,709	2,856	68	0	18	3,302	2,856	84	3,952	3,952	0	84	0
(Total)	(6,820)	(3,348)	(244)	(0)	(38)	(6,364)	(3,348)	(134)	(6,375)	(6,241)	(0)	(134)	(0)
Cottonwood Canyon	60	24	18	0	0	60	24	22	168	146	0	22	0
Desert Queen	3,355	708	0	0	0	2,834	708	0	730	730	0	0	0
Diamond S	1,158	828	129	0	38	1,025	828	36	682	646	0	36	0
Harmony	348	180	95	0	7	347	180	27	239	212	0	27	0
Melody	1,020	0	0	0	0	290	0	0	616	616	0	0	0
Thomas Creek	629	192	90	0	35	631	192	25	413	388	0	25	0
(Total)	(3,155)	(1,200)	(314)	(0)	(80)	(2,293)	(1,200)	(88)	(1,950)	(1,862)	(0)	(88)	(0)
Humboldt House	727	60	67	0	23	577	60	83	516	433	0	83	0
Humboldt Sink	1,427	0	2	0	3	1,377	0	3	300	297	0	3	0
Jersey Valley	1,581	960	48	0	1	989	960	59	610	551	0	59	0
Klondike	2,205	1,848	57	0	10	2,115	1,848	70	1,483	1,413	0	70	0
Prince Royal	153	0	47	0	13	153	0	58	208	150	0	58	0
Star Peak	3,722	3,624	434	0	82	3,225	3,624	536	2,789	2,253	0	536	0
(Total)	(6,080)	(5,472)	(538)	(0)	(105)	(5,493)	(5,472)	(664)	(4,480)	(3,816)	(0)	(664)	(0)
Licking	153	0	45	0	0	152	0	13	60	47	0	13	0
North Buffalo	3,294	0	15	0	0	936	0	4	1,640	1,636	0	4	0
(Total)	(3,447)	(0)	(60)	(0)	(0)	(1,115)	(0)	(17)	(1,700)	(1,683)	(0)	(17)	(0)
Majuba	1,100	1,680	57	92	0	503	1,680	91	3,320	3,229	0	70	21
Pleasant Valley	10,392	1,944	354	0	97	8,553	1,944	438	8,755	8,317	0	438	0
Pole Canyon	540	936	15	7	37	540	192	18	209	191	0	14	4
Rodeo Creek	6,631	1,092	177	137	150	6,014	1,092	243	5,596	5,353	0	175	68
(Total)	(7,171)	(1,284)	(192)	(144)	(187)	(6,554)	(1,284)	(261)	(5,805)	(5,544)	(0)	(189)	(72)
Pumpernickel	9,440	192	222	0	38	4,957	192	106	6,097	5,991	0	106	0
Ragged Top	155	2,184	72	0	0	784	2,184	89	496	407	0	89	0
Rawhide	2,721	1,704	84	0	46	2,417	1,704	104	2,488	2,884	0	104	0
Rochester	3,964	2,052	45	0	15	1,959	2,052	56	2,428	2,372	0	56	0
(Total)	(6,685)	(3,756)	(129)	(0)	(61)	(4,376)	(3,756)	(160)	(4,916)	(4,756)	(0)	(160)	(0)
Soldier Meadows	16,070	5,244	786	429	264	3,423	5,244	963	25,294	24,331	0	747	216
White Horse	1,970	2,460	35	0	7	1,970	2,460	43	1,073	1,030	0	43	0
Revision and/or Update of Existing AMPs													
Coal Canyon-Poker	3,144	2,652	97	1	31	2,345	2,652	120	2,904	2,784	0	120	0
Coyote	3,051	0	35	411	7	2,682	0	269	3,297	3,028	0	35	234
Goldbanks	2,051	948	92	0	18	2,040	948	114	1,544	1,430	0	114	0
Leadville	2,567	840	179	67	176	2,566	840	216	2,603	2,357	0	178	38
Rodeo Creek	2,192	408	134	0	43	2,192	408	38	1,751	1,713	0	38	0
Sonoma	1,510	264	141	0	29	1,510	264	39	804	765	0	39	0
(Total)	(3,702)	(672)	(275)	(0)	(72)	(3,702)	(672)	(77)	(2,555)	(2,478)	(0)	(77)	(0)
Rye Patch	1,981	816	66	0	24	1,744	816	81	1,462	1,381	0	81	0
South Buffalo	9,157	168	381	0	135	8,839	168	471	7,621	7,150	0	471	0
Total	153,115	66,012	11,799	2,369	2,701	116,551	66,012	13,036	143,232	130,196	0	11,788	1,248

a/ The periods-of-use for this alternative are the same as the proposed action, with the exception of Diamond-S Allotment which would be 7/1 to 2/28.

b/ Authorized livestock use includes active use plus regular nonuse.

c/ Wild horse and burro use was estimated from 1977 inventory figures using a 11% yearly increase.

d/ Reasonable numbers as derived cooperatively between the Nevada Department of Wildlife and the Winnemucca Bureau of Land Management.

e/ The last three year average actual licensed livestock use. Soldier Meadows Allotment is an exception to the three year average. Because of various legal and administrative factors, this allotment had either no use or comparatively little use during the three year period. The use in the 1980-81 grazing season of 16,067 AUMs would be an indicator of future licensed use. There are eight other exceptions to the three year average: Jersey Valley, Licking, North Buffalo, Pleasant Valley, Prince Royal, Pumpernickel, Rochester and Star Peak Allotments. These allotments have a five year average licensed use.

f/ Allocated vegetation as determined by the 1947 and 1960s range surveys.

g/ The proposed initial allocation categorizes the estimated total vegetative production (1979 recompiled range survey) by each use (14 AUMs of bighorn sheep use occur in the Buffalo Hills Allotment which are included with the antelope allocation.)

h/ Existing big game numbers were provided by Nevada Department of Wildlife on a planning unit basis. The procedure outlined in Appendix A, Section 2 was used to apportion existing numbers by allotment. Big game existing use includes mule deer, antelope and bighorn sheep (14 AUMs bighorn sheep use only in Buffalo Hills Allotment).

Source: U.S. Department of the Interior, Bureau of Land Management, Winnemucca District, Sonoma-Gerlach Unit Resource Analyses, Management Framework Plan, Winnemucca District Office files, and the grazing Environmental Impact Statement preparation plan 1980.

TABLE 1-15

MAXIMIZING LIVESTOCK USE THROUGH MANAGEMENT AND DEVELOPMENT ALTERNATIVE
ESTIMATED PRODUCTION AND USE, YEAR 1991 AND 2024 (AUMs)
SONOMA-GERLACH RESOURCE AREA

		Estimated Future Production Through Range Improvements Year 1991 b/			Estimated Future Production Through Management Year 2024				Estimated Use - Year 1991				Estimated Use - Year 2024			
Allotment	Available Vegetation a/ 1982	Water Developments	Land Treatments	Available Vegetation	Improvement Through Grazing Systems c/	Improvement Through Reduction In Grazing Intensity d/	Improvement Through Mgmt e/	Available Vegetation	Livestock	Wild Horse & Burro	Mule Deer	Antelope f/	Livestock	Wild Horse & Burro	Mule Deer	Antelope
Intensive Management with AMPs																
Blue Wing	19,816	6,158	35,752	61,726	961	4,035	1,140	67,862	60,861	0	865	0	66,997	0	865	0
Seven Troughs	4,034	521	929	5,484	194	817	4,690	11,185	4,872	0	611	1	10,573	0	611	1
(Total)	(23,850)	(6,679)	(36,681)	(67,210)	(1,155)	(4,852)	(5,830)	(79,047)	(65,733)	(0)	(1,476)	(1)	(77,570)	(0)	(1,476)	(1)
Buffalo Hills	23,090	0	7,191	30,281	1,107	0	816	32,204	23,357	0	6,280	644	25,280	0	6,280	644
Calico	1,721	0	0	1,721	85	358	0	2,164	1,655	0	44	22	2,098	0	44	22
(Total)	(24,811)	(0)	(7,191)	(32,002)	(1,192)	(358)	(816)	(34,368)	(25,013)	(0)	(6,324)	(666)	(27,378)	(0)	(6,324)	(666)
Clear Creek	2,423	330	2,840	5,593	120	505	120	6,338	5,543	0	50	0	6,288	0	50	0
Dolly Hayden	3,952	215	819	4,986	196	0	6	5,188	4,902	0	84	0	5,104	0	84	0
(Total)	(6,375)	(545)	(3,659)	(10,579)	(316)	(505)	(126)	(11,526)	(10,445)	(0)	(134)	(0)	(11,392)	(0)	(134)	(0)
Cottonwood Creek	168	34	0	202	8	0	0	210	180	0	22	0	188	0	22	0
Desert Queen	730	883	0	1,613	36	153	751	2,553	1,613	0	0	0	2,553	0	0	0
Diamond S	682	0	1,539	2,221	33	141	0	2,395	2,185	0	36	0	2,359	0	36	0
Harmony	239	0	851	1,090	11	48	8	1,157	1,063	0	27	0	1,130	0	27	0
Melody	616	0	623	1,239	30	129	0	1,398	1,239	0	0	0	1,398	0	0	0
Thomas Creek	413	0	366	779	20	84	0	883	754	0	25	0	858	0	25	0
(Total)	(1,950)	(0)	(3,379)	(5,329)	(94)	(402)	(8)	(5,833)	(5,241)	(0)	(88)	(0)	(5,745)	(0)	(88)	(0)
Humboldt House	516	0	0	516	21	90	183	810	433	0	83	0	727	0	83	0
Humboldt Sink	300	0	0	300	14	62	69	445	297	0	3	0	442	0	3	0
Jersey Valley	610	69	0	679	28	115	883	1,705	620	0	59	0	1,646	0	59	0
Klondike	1,483	18	0	1,501	72	305	122	2,000	1,431	0	70	0	1,930	0	70	0
Prince Royal	208	0	759	967	7	31	146	1,151	909	0	58	0	1,093	0	58	0
Star Peak	2,789	0	1,978	4,767	131	551	32	5,481	4,231	0	536	0	4,945	0	536	0
(Total)	(4,480)	(18)	(2,737)	(7,235)	(210)	(887)	(300)	(8,632)	(6,571)	(0)	(664)	(0)	(7,968)	(0)	(664)	(0)
Licking	60	0	0	60	2	10	66	138	47	0	13	0	125	0	13	0
North Buffalo	1,640	1,219	1,302	4,161	82	344	0	4,587	4,157	0	4	0	4,583	0	4	0
(Total)	(1,700)	(1,219)	(1,302)	(4,221)	(84)	(354)	(66)	(4,725)	(4,204)	(0)	(17)	(0)	(4,708)	(0)	(17)	(0)
Majuba	3,320	379	2,294	5,993	166	0	140	6,299	5,902	0	70	21	6,208	0	70	21
Pleasant Valley	8,755	224	0	8,979	429	1,803	130	11,341	8,541	0	438	0	10,903	0	438	0
Pole Canyon	209	196	0	405	10	42	0	457	387	0	14	4	439	0	14	4
Rodeo Creek	5,596	380	676	6,652	276	1,163	20	8,111	6,409	0	175	68	7,868	0	175)	68
(Total)	(5,805)	(576)	(676)	(7,057)	(286)	(1,205)	(20)	(8,568)	(6,796)	(0)	(189)	(72)	(8,307)	(0)	(189)	(72)
Pumpernickel	6,097	199	0	6,296	299	1,256	42	7,893	6,190	0	106	0	7,787	0	106	0
Ragged Top	496	269	0	765	21	0	1,030	1,816	676	0	89	0	1,727	0	189	0
Rawhide	2,488	0	0	2,488	122	514	34	3,158	2,384	0	104	0	3,054	0	104	0
Rochester	2,428	393	0	2,821	119	500	1,044	4,484	2,765	0	56	0	4,428	0	56	0
(Total)	(4,916)	(393)	(0)	(5,309)	(241)	(1,014)	(1,078)	(7,642)	(5,149)	(0)	(160)	(0)	(7,482)	(0)	(160)	(0)
Soldier Meadows	25,294	0	3,181	28,475	1,262	0	0	29,737	27,512	0	747	216	28,774	0	747	216
White Horse	1,073	0	345	1,418	53	223	0	1,694	1,375	0	43	0	1,651	0	43	0
Revision and/or Update of Existing AMPs																
Coal Canyon-Poker	2,904	495	1,401	4,800	0	602	268	5,670	4,680	0	120	0	5,550	0	120	0
Coyote	3,297	0	1,039	4,336	0	0	2	4,338	4,067	0	35	234	4,069	0	35	234
Gold Banks	1,544	241	1,744	3,529	0	317	0	3,846	3,415	0	114	0	3,732	0	114	0
Leadville	2,603	0	1,830	4,433	0	0	41	4,474	4,217	0	178	38	4,258	0	178	38
Rock Creek	1,751	0	1,032	2,783	0	366	0	3,149	2,745	0	38	0	3,111	0	38	0
Sonoma	804	0	1,631	2,435	0	165	47	2,647	2,396	0	39	0	2,608	0	39	0
(Total)	(2,555)	(0)	(2,663)	(5,218)	(0)	(531)	(47)	(5,796)	(5,141)	(0)	(77)	(0)	(5,719)	(0)	(77)	(0)
Rye Patch	1,462	0	1,748	3,210	0	297	0	3,507	3,129	0	81	0	3,426	0	81	0
South Buffalo	7,621	185	2,272	10,078	0	1,572	377	12,027	9,607	0	471	0	11,556	0	471	0
Total	143,232	12,408	74,142	229,782	5,915	16,598	12,207	264,502	216,746	0	11,788	1,248	251,466	0	11,788	1,248

a/ Available vegetation as determined by the 1979 recompilation of the 1947 and 1960s range surveys.

b/ Estimated future vegetation production that would become available through the development of water and through land treatments, such as sagebrush control, prescribed burning and seedings.

c/ The methodology for estimating increases in available vegetation through the implementation or revision of grazing systems is listed in Appendix A, Section 1.

d/ An improvement in the available vegetation would result through reductions in intensity of livestock and wild horse and burro use. The methodology for determining estimated increases is listed in Appendix A, Section 1.

e/ Certain areas which did not meet minimum production criteria, i.e., 32 acres per AUM, would improve through intensive livestock grazing management, livestock reductions, and reductions of wild horse and burro populations. These areas have the potential to become suitable for livestock grazing.

f/ Fourteen AUMs of bighorn sheep use occur in the Buffalo Hills Allotment which are included with the antelope allocation.

Source: U.S. Department of the Interior, Bureau of Land Management, Winnemucca District, Sonoma-Gerlach Unit Resource Analyses, Management Framework Plan Winnemucca District Office files, and the grazing Environmental Impact Statement preparation plan 1980.

leaving buffer strips of 1,500 feet around houses, croplands, and known sensitive plant locations. A 300-foot buffer strip would be necessary around meadows, drainages, and water sources to protect wildlife habitat. No spraying would take place within two miles of sage grouse strutting grounds, and islands of brush would be left in spray areas in sage grouse habitat. In mule deer use areas, unsprayed strips would alternate with sprayed strips, each a maximum one-quarter mile wide.

In this alternative all land treatments and livestock support facilities would be constructed, maintained, and/or implemented within the Standard Operating Procedures incorporated in this chapter.

GENERAL IMPLEMENTATION SCHEDULE

After the final EIS and the District Manager's land use decision (MFP III), all adjustments in grazing use and management would be implemented in accordance with the general implementation schedule for maximizing livestock use (Table 1-16). It is assumed that adjustments in grazing use would be implemented within three years following issuance of decisions. AMPs would be completely implemented within seven years, and fully functional in nine years (seven years for full implementation of AMPs and two years for required rest of land treatments). The criteria used in determining the order of priority of AMP implementation are as shown in the proposed action section.

This alternative recommends complete removal of all wild horses and burros from the Sonoma-Gerlach Resource Area. There are limiting factors that would prevent immediate gathering of all wild horses and burros (e.g., foaling season, weather conditions and/or foal age). Complete elemination of wild horses and burros from an area is difficult as the last wild horses and/or burros are the most difficult to gather. It is estimated that seven years would be needed to completely remove all wild horses and burros from the Sonoma-Gerlach Resource Area. Approximately 1,040 wild horses and/or burros per year would have to be removed over approximately a seven-year period to complete the removal (assuming a continued 11 percent yearly increase in wild horse and burro numbers).

The Herd Use Areas occurring in the checkerboard land pattern shown in Table 1-12 would be given first priority for gathering, followed by those areas shown in Table 1-17.

MAXIMIZING WILD HORSE AND BURRO ALTERNATIVE

This alternative would provide vegetation for the maximum number of wild horses and burros and would provide for the maximum feasible increase of vegetation for wild horses and burros in the long term in four Herd Management Areas and ten Herd Use Areas. All allocations to livestock would be in areas where wild horses and/or burros do not occur.

This action would initially (1982) allocate 95,007 AUMs to livestock, 24,539 AUMs to wild horses and burros, and 16,869 AUMs to big game (Table 1-18). The big game allocation includes 12 areas identified for bighorn sheep reintroduction and 2 areas for antelope reintroduction. This compares with an existing use of 116,551 AUMs by livestock (based upon the average licensed use for the last three years), 66,012 AUMs for wild horses and burros, and 13,036 AUMs for big game.

Future (2024) allocations would increase to 182,092 AUMs for livestock, 66,802 AUMs for wild horses and burros, and remain at 16,869 AUMs for big game (Table 1-19). This would be an increase over the initial allocations for livestock and wild horses and burros of 87,085 AUMs and 42,263 AUMs, respectively.

Wild horses would be managed on four herd management areas; (Button Point (a portion of the present Sonoma herd use area), Buffalo Hills, Granite Mountain, and Rodeo Creek the (present Fox and Lake Range herd use areas). All livestock grazing would be eliminated in the herd management areas, and any future available AUMs would be allocated to wild horses and burros.

Wild horses and burros would be managed on ten herd use areas (Augusta Mountains, Black Rock West, Blue Wing Mountains, Calico Mountains, Lava Beds, Nightingale Mountains, Selenite Range, Stillwater Range, Tobin Range, and Warm Springs Canyon). Livestock use would not be allocated inside herd use areas.

On those allotments where there are no wild horses or burros, management would be at the level shown for the proposed action (Table 1-3). On allotments grazed in conjunction with wild horse and burro herd use areas, management would be at the levels shown in Table 1-3. The periods-of-use for livestock in these allotments are shown on Table 1-1.

The support facilities and land treatments that would be accomplished are shown in Table 1-20. The Standard Operating Procedures listed in this chapter would be followed. Under this alternative,

TABLE 1-16
GENERAL IMPLEMENTATION SCHEDULE
FOR THE MAXIMIZING LIVESTOCK USE ALTERNATIVE a/
SONOMA-GERLACH RESOURCE AREA

Allotment Name	Priority b/	Implementation Year c/
Intensive Management with AMPs d/		
Cottonwood Canyon	1	1982
Humboldt House	1	1982
Soldier Meadow	1	1982
Buffalo Hills-Calico	2	1983
Desert Queen	2	1983
White Horse	2	1983
Humboldt Sink	3	1984
Licking-North Buffalo	3	1984
Majuba	3	1984
Blue Wing-Seven Troughs	4	1985
Harmony-Melody-Thomas Creek-Diamond S	4	1985
Jersey Valley	4	1985
Pumpernickle	5	1986
Ragged Top	5	1986
Rawhide-Rochester	5	1986
Klondike-Prince Royal-Star Peak	6	1987
Pole Canyon-Rodeo Creek	6	1987
Clear Creek-Dolly Haden	7	1988
Pleasant Valley	7	1988
Revision and/or Update of Existing AMPs e/		
Coal Canyon-Poker	1	1982
South Buffalo	2	1983
Goldbanks	3	1984
Rock Creek-Sonoma	4	1985
Leadville	5	1986
Coyote	6	1987
Rye Patch	7	1988

a/ All allotments would have periods of use, proper stocking rates and kind of livestock established in 1982. All allotments would have AMPs established or revised, probably in the priority established in this Table. This schedule can be modified, depending on funding and/or cooperation with the livestock user.

b/ Allotments having first priority would have AMPs implemented or revised in 1982, those with second priority in 1983, third priority in 1984, and so on to the last group in 1988.

c/ For analysis purposes it is assumed that all AMPs would be implemented within seven years.

d/ Soldier Meadow was given first priority because of the presence of threatened species. Buffalo Hills-Calico was given second priority because of the presence of a large ACEC and because of the wildlife values present. Bases for priority ratings on remaining allotments in this group were severity of reductions, potential for increasing carrying capacity through management, and condition of the soil and vegetation resources and the degree of deterioration.

e/ Potential for increasing carrying capacity through management determined priorities in this group.

Source: U.S. Department of Interior, Bureau of Land Management, Winnemucca District, Sonoma-Gerlach Area Management Framework Plan 1980.

TABLE 1-17
REMOVAL OF WILD HORSES AND BURROS
FOR THE MAXIMIZING LIVESTOCK ALTERNATIVE
SONOMA-GERLACH RESOURCE AREA

Allotment	Estimated Number Wild Horse/Burros for Removal	Priority for Removal a/
Intensive Management with AMPs		
Blue Wing	1097/62	1,2,4,5,6
Seven Troughs	63/ 1	1
(Total)	(1160/63)	
Buffalo Hills	346	1
Calico	29	1
(Total)	(375)	
Cottonwood Canyon	2	4
Diamond S b/	69	2
Jersey Valley	80	4
Pleasant Valley	9	4
Pole Canyon	16	2
Rodeo Creek	91	2
(Total)	(107)	
Pumpernickel	4	3
Rawhide	1	3
Rochester	18	3
(Total)	(19)	
Soldier Meadows	419/18	3
Revision and/or Update of Existing AMPs		
Gold Banks	4	4
Leadville	70	4
South Buffalo	14	4
Jersey Valley	80	4
Total	2,332/81	

a/ Priority for removal was determined by using the degree of vegetation overobligation, and whether or not the allotment is scheduled for an AMP.
b/ Diamond S Allotment is within a checkerboard land area, but was handled separately due to possible land exchange, and identification for wild horse HMA status under other alternatives.

Source: Sonoma-Gerlach Management Framework Plan 1980.

TABLE 1-18
MAXIMIZING WILD HORSE AND BURRO ALTERNATIVE
INITIAL ALLOCATIONS (AUMs), YEAR 1982
SONOMA-GERLACH RESOURCE AREA

Allotment	Available Vegetation a/	Proposed Initial Allocations: Livestock b/	Mule Deer c/	Antelope c/	Bighorn Sheep c/	Wild Horse & Burro	Total Used	Total Unused
Blue Wing	19,827	14,652	701	49	106	4,319	19,827 d/	0
Seven Troughs	4,024	3,503	495	26	0	0	4,024	0
(Total)	(23,851)	(18,155)	(1,196)	(75)	(106)	(4,319)	(23,851)	0
Buffalo Hills	23,320	4,922	6,294	1,106	1,142	9,856	17,863	0
Calico	1.741	1,407	46	44	86	158	1,741	0
(Total)	(25,061)	(6,329)	(6,340)	(1,150)	(1,228)	(19,014)	(19,604)	(0)
Clear Creek	2,478	2,282	176	0	20	0	2,478	0
Dolly Hayden	3,953	3,709	68	0	18	0	3,795	158
(Total)	(6,431)	(5,991)	(244)	(0)	(38)	(0)	(6,273)	(158)
Coal Canyon-Poker	2,909	2,780	97	1	31	0	2,909	0
Cottonwood Canyon	166	60	18	0	0	33	111	55
Coyote	3,299	2,846	35	411	7	0	3,299	0
Desert Queen	730	730	0	0	0	0	730	0
Diamond S	717	0	129	0	38	550	587	0
Goldbanks	1,546	1,370	92	0	18	66	1,546	0
Harmony	258	156	95	0	7	0	258	0
Melody	616	616	0	0	0	0	616	0
Thomas Creek	463	338	90	0	35	0	463	0
(Total)	(1,337)	(1,110)	(185)	(0)	(42)	(0)	(1,337)	(0)
Humboldt House	523	433	67	0	23	0	523	0
Humboldt Sink	302	297	2	0	3	0	302	0
Jersey Valley	600	275	48	0	1	276	600	0
Klondike	1,480	1,413	57	0	10	0	1,480	0
Prince Royal	210	150	47	0	13	0	210	0
Star Peak	2,788	2,272	434	0	82	0	2,788	0
(Total)	(4,478)	(3,835)	(538)	0	(105)	(0)	(4,478)	(0)
Leadville	2,629	1,797	179	67	176	410	2,629	0
Licking	88	43	45	0	0	0	88	0
North Buffalo	1,640	1,625	15	0	0	0	1,640	0
(Total)	(1,728)	(1,668)	(60)	(0)	(0)	(0)	(1,728)	(0)
Majuba	3,324	1,100	57	92	0	0	1,249	2,075
Pleasant Valley	8,760	8,161	354	0	97	148	8,760	0
Pole Canyon	232	0	15	7	37	173	154	0
Rodeo Creek	5,648	0	177	137	150	5,184	1,569	0
(Total)	(5,880)	(0)	(192)	(144)	(187)	(5,357)	(1,723)	(0)
Pumpernickel	6,160	5,834	222	0	38	66	6,160	0
Ragged Top	481	155	72	0	0	0	227	254
Rawhide	2,493	2,347	84	0	46	16	2,493	0
Rochester	2,429	2,073	45	0	15	296	2,429	0
(Total)	(4,922)	(4,420)	(129)	(0)	(61)	(312)	(4,922)	(0)
Rock Creek	1,776	1,599	134	0	43	0	1,776	0
Sonoma	863	693	141	0	29	0	863	0
(Total)	(2,639)	(2,292)	(275)	(0)	(72)	(0)	(2,639)	(0)
Rye Patch	1,468	1,378	66	0	24	0	1,468	0
Soldier Meadows	25,335	16,070	786	429	264	2,754	20,303	5,032
South Buffalo	7,640	6,890	381	0	135	234	7,640	0
White Horse	1,073	1,031	35	0	7	0	1,073	0
Totals	143,989	95,007	11,799	2,369	2,701	24,539	126,671	7,574

a/ Available vegetation (AUMs) as determined by the compilation of the range surveys in 1947 and the 1960s.
b/ Vegetation (AUMs) which occurs outside the present Wild Horse and Burro Use Area boundaries and checkerboard land use areas subject to the current rangeland suitability criteria listed in Appendix A, Section 1.
c/ Reasonable numbers as derived cooperatively between Nevada Department of Wildlife and the Winnemucca Bureau of Land Management.
d/ Blue Wing Allotment did not have sufficient available vegetation remaining in the herd use areas to satisfy existing numbers of wild horse and burros, thus creating a shortage of 498 AUMs in wild horse and burro allocations in that allotment.

Source: U.S. Department of the Interior, Bureau of Land Management, Winnemucca District, Sonoma-Gerlach Management Framework Plan 1980.

TABLE 1-19
MAXIMIZING WILD HORSE AND BURRO ALTERNATIVE
PRODUCTION AND USE (AUMs), YEAR 2024
SONOMA-GERLACH RESOURCE AREA

Allotment	Total Allocated Vegetation a/	Estimated Future Use				
		Livestock b/	Mule Deer c/	Antelope c/	Bighorn Sheep c/	Wild Horse & Burro
Blue Wing	67,795	42,856	701	49	106	24,083
Seven Troughs	11,046	9,803	495	26	0	722
(Total)	(78,841)	(52,659)	(1,196)	(75)	(106)	(24,805)
Buffalo Hills	34,337	13,050	6,294	1,106	1,142	12,745
Calico	2,184	1,598	46	44	86	410
(Total)	(36,521)	(14,648)	(6,340)	(1,150)	(1,228)	(13,155)
Clear Creek	6,384	6,188	176	0	20	0
Dolly Hayden	5,189	5,103	68	0	18	0
(Total)	(11,573)	(11,291)	(244)	(0)	(38)	(0)
Coal Canyon-Poker	5,673	5,544	97	1	31	0
Cottonwood Canyon	200	0	18	0	0	182
Coyote	5,225	4,772	35	411	7	0
Desert Queen	2,553	2,553	0	0	0	0
Diamond S	1,869	0	129	0	38	1,702
Goldbanks	3,840	855	92	0	18	2,875
Harmony	1,176	1,074	95	0	7	0
Melody	1,398	1,398	0	0	0	0
Thomas Creek	567	442	90	0	35	0
(Total)	(3,141)	(2,914)	(185)	(0)	(42)	(0)
Humboldt House	727	637	67	0	23	0
Humboldt Sink	447	442	2	0	3	0
Jersey Valley	1.640	637	48	0	1	954
Klondike	1,997	1,930	57	0	10	0
Prince Royal	1,093	1,033	47	0	13	0
Star Peak	5,478	4,962	434	0	82	0
(Total)	(8,568)	(7,925)	(538)	(0)	(105)	(0)
Leadville	4,926	1,785	179	67	176	2,719
Licking	130	85	45	0	0	0
North Buffalo	4,587	4,572	15	0	0	0
(Total)	(4,717)	(4,657)	(60)	(0)	(0)	(0)
Majuba	6,297	6,148	57	92	0	0
Pleasant Valley	11,315	9,283	354	0	97	1,581
Pole Canyon	448	0	15	7	37	389
Rodeo Creek	8,163	0	177	137	150	7,699
(Total)	(8,611)	(0)	(192)	(144)	(187)	(8,088)
Pumpernickel	7,904	7,500	222	0	38	144
Ragged Top	1,742	1,670	72	0	0	0
Rawhide	3,157	2,986	84	0	46	41
Rochester	4,445	2,943	45	0	15	1,442
(Total)	(7,602)	(5,929)	(129)	(0)	(61)	(1,483)
Rock Creek	2,839	2,662	134	0	43	0
Sonoma	2,706	2,536	141	0	29	0
(Total)	(5,545)	(5,198)	(275)	(0)	(72)	(0)
Rye Patch	3,513	3,423	66	0	24	0
Soldier Meadows	29,033	21,506	786	429	264	6,048
South Buffalo	12,046	8,464	381	0	135	3,066
White Horse	1,694	1,652	35	0	7	0
Totals	265,763	182,092	11,799	2,369	2,701	66,802

a/ Total allocated vegetation (AUMs) in the future (2024) is based on increased production brought about by water developments, grazing management systems, reduction in grazing intensity, and improvement of areas now unsuitable due to low forage production.
b/ Future vegetation (AUMs which occurs outside present Wild Horse and Burro Use Area Boundaries and checkerboard land use areas subject to the rangeland suitability criteria listed in Appendix A, Section 1.
c/ Reasonable numbers as cooperatively derived by Nevada Department of Wildlife and Winnemucca Bureau of Land Management.

Source: U.S. Department of Interior, Bureau of Land Management, Winnemucca District, Sonoma-Gerlach Management Framework Plan 1980.

TABLE 1-20

SUPPORT FACILITIES FOR MAXIMIZING WILD HORSE AND BURRO ALTERNATIVE a/
SONOMA-GERLACH RESOURCE AREA

Facilities	Units		Units Inside Herd Use Areas		Cost/Unit b/	Total Cost
Wells c/	42.0	each	9.0	each	$5,100 each d/	$ 214,200
Springs	8.0	each	4.0	each	2,250 each	18,000
Pipelines	15.0	mile	4.5	mile	2,600 mile	40,300
Troughs	102.0	each	27	each	500 each	51,000
Fences	692.0	mile	283	mile	3,600 mile	2,491,200
Fence Removal	31.9	mile	31.9	mile	500 mile	15,950
Cattleguards	18.0	each	0	each	2,700 each	49,500
Subtotal						$ 2,880,150
Land Treatments						
Seed and/or Reseed	14,752	acres	7.434	acres	$30/acre	$ 442,560
Sagebrush Control & Seed	230,112	acres	76,151	acres	$60/acre	$ 13,806,720
Subtotal						14,249,280
Grand Total						$ 17,129,430

a/ Approximate locations are shown on Livestock Support Facilities Map (See Appendix C, Sections 1, 2 for a list of proposed livestock support facilities by allotment).

b/ Costs per unit were developed by the Division of Operations, Winnemucca District, and the Division of Technical Services, Nevada State Office, Bureau of Land Management, 1980, and the U.S. Forestry Service, Winnemucca, Nevada (personal communication with Mr. Bob Tonioli), 1979. These costs were developed at 1980 prices and do not include future maintenance and replacement cost.

c/ Well site investigations have not yet been conducted, and it is assumed for analysis purposes that ground water is available.

d/ Wells differ in depth; therefore, this reflects average unit cost.

Source: U.S. Department of the Interior, Bureau of Land Management, Sonoma-Gerlach Management Framework Plan Step II, Winnemucca District files, Division of Technical Services, Nevada State Office, Reno, Bureau of Land Management and the U.S. Forest Service, Department of Agriculture (personal communication with Mr. Bob Tonioli), compiled, 1979-1980.

cattle would be removed within three years following the issuance of the final decision on the following allotments: Diamond S, Pole Canyon, and Rodeo Creek.

Approximately 32 miles of fence would be removed from the Button Point, Buffalo Hills, Granite Mountain, and Rodeo Creek areas to ensure free movement of wild horses and burros (Table 1-21). Included here are two fences removed for the benefit of bighorn sheep, antelope, and deer as well as wild horses. These are fence numbers 307 in the Granite Mountains and 1081 in Rodeo Creek totalling 19.4 miles. Construction of three fences, relocation of one fence, and one reseeding would be accomplished specifically for wild horses. These facilities, their cost and priority for implementation are shown in Table 1-22.

This alternative recommends the removal of approximately 3,400 wild horses and 49 burros from the Sonoma-Gerlach Resource Area. This number includes complete removal of wild horses and burros from checkerboard land areas, and reductions to estimated carrying capacity in the remaining use areas. It is estimated that seven years would be needed to completely remove all wild horses and burros from the specified areas. The herd use areas occurring in the checkerboard land pattern (Table 1-12) would be given first priority for gathering, followed by areas having deteriorated range resources due to over obligation of the range. Approximately 740 wild horses and/or burros per year would have to be removed over a seven year period to complete the removal (assuming an 11 percent yearly increase in wild horse and burro numbers).

STANDARD OPERATING PROCEDURES

Certain requirements are inherent in the implementation of any federal action on Bureau managed lands. These requirements, or Standard Operating Procedures, are designed to mitigate impacts stemming from the construction of support facilities necessary to implement any federal act.

The following will be applied to any action resulting from the planning system. These requirements will be part of the standard analysis process.

1. Environmental assessment will be conducted before implementation so that, depending on impact, modification or abandonment of the project may be considered.

2. Compliance with wilderness directives on proposed projects will be in accordance with Section 603(a) of the Federal Land Policy and Management Act (1976) which provides that until Congress acts on wilderness study areas or on lands still under wilderness review, the following policy will prevail: existing multiple-use activities, including grazing, will continue, but new or expanded existing uses will be allowed only if the impacts would not impair the area's suitability for designation as wilderness. Proposed uses and projects will be analyzed on a case-by-case basis to assure compliance with the *Interim Management Policy and Guidelines for Lands Under Wilderness Review*. Certain exceptions to the above stated policy concerning grazing, mining, and mineral leasing activities are explained in the IMP document.

3. Threatened or endangered plant or animal species' clearance is required before implementation of any project. Consultation with the Fish and Wildlife Service per Section 7 of the Endangered Species Act is necessary if a threatened or endangered species or their habitat may be impacted. If there is deemed to be an adverse impact, either relocation or abandonment of the project will follow.

4. Cultural resource protection requires compliance with Section 106 of the National Historic Preservation Act of 1966, Section 2(b) of Executive Order 11593 and Section 101(b)(4) of the National Environmental Policy Act (NEPA) of 1969. Prior to project approval, intensive field (Class III) inventories will be conducted in specific areas that would be impacted by implementing activities. If cultural or paleontological sites are found, every effort will be made to avoid adverse impacts. However, where that is not possible the BLM will consult with the State Historic Preservation Officer and the Advisory Council on Historic Preservation in accordance with the Programmatic Memorandum of Agreement by and between the Bureau and the Council, dated January 14, 1980. This agreement sets forth a procedure for developing appropriate mitigative measures to lessen the impact of adverse effects (see Appendix E). The BLM is committed to upgrading cultural resource inventory data in the planning area as manpower and funding allow. In the Bureau's ongoing inventory, survey efforts are concentrated on those areas identified as being archeologically sensitive (see Appendix M, Section 1). Since one of the criteria for sensitivity is proximity to water, those areas which receive heaviest grazing are focused on. As significant sites are found, the BLM will take measures to protect them. Impacts to National Register and National Register Eligible sites will be assessed on a regular basis. Management decisions will be regularly reviewed

TABLE 1-21

IMPLEMENTATION SCHEDULE
FOR FENCE REMOVAL
MAXIMIZING WILD HORSE AND BURRO ALTERNATIVE
SONOMA-GERLACH RESOURCE AREA

Year	Fence Number	Project Name	Miles	Cost/Unit Cost	Species Benefited a/	Total Cost
1 (1983)	307	Granite Mountain Drift Fence	11.0	$3,600/mile	W.H., A, B, D	39,600
	972	C-2-N Fence	8.0	$3,600/mile	W.H.	28,800
Subtotal			19.0			68,400
2 (1984)	1081	Pole Canyon Allotment Fence	8.4	$3,600/mile	W.H., A, B, D	30,240
Subtotal			8.4			30,240
3 (1985)	351	Button Point Seeding Fence	4.5	$3,600/mile	W.H.	16,200
Subtotal			4.5			16,200
Total			31.9			114,840

a/ W.H. = Wild Horses
A = Antelope
B = Bighorn Sheep
D = Mule Deer

Source: Sonoma-Gerlach Unit Resource Analyses and Management Framework Plan 1980.

TABLE 1-22
IMPLEMENTATION SCHEDULE
FOR ACCOMPLISHMENT OF SUPPORT FACILITIES
MAXIMIZING WILD HORSE AND BURRO ALTERNATIVE
SONOMA-GERLACH RESOURCE AREA

Year	Facility	Unit	Cost a/	Total Cost
1 (1983)	Button Point Reseeding	3,036 ac.	$ 30.	$ 91,080
	C-2-N Fence Relocation	20 mi.	$3600.	$ 72,000
	Granite Mountain HMA Boundary Fence	22 mi.	$3600.	$ 79,200
Sub-Total				$ 242,280
2 (1984)	Buffalo Hills HMA Boundary Fence	91 mi.	$3600.	$ 327,600
	Rodeo Creek HMA Boundary Fence	180 mi.	$3600.	$ 648,000
Sub-Total				$ 975,600
Total				$1,217,880

a/ Costs per unit were developed by the Division of Operations, Winnemucca District, and the Division of Technical Services, Nevada State Office, Bureau of Land Management, 1980, and the U.S. Forest Service, Winnemucca, Nevada (personal communication with Bob Tonioli), 1979. These costs were developed at 1980 prices and do not include future maintenance and replacement cost.

Source: Sonoma-Gerlach Management Framework Plan, 1980.

and revised based on the findings of surveys and monitoring of sites.

5. Visual resource management requires all actions to be in compliance with BLM Visual Resource Management Design Procedures in BLM Manual 8400. On any project which has a visual contrast rating that exceeds the recommended maximum for the visual class zone in which it is proposed, the visual contrasts are considered significant and mitigating measures must be examined. The ultimate decision in these cases of whether a particular project's visual impact is positive or negative, acceptable or unacceptable, and whether mitigating measures must be implemented, rests with the District Manager and must be made on a project-by-project basis.

6. Areas of critical environmental concern will receive priority designation and protection during the land use planning process per Sections 201 and 202 of the Federal Land Policy and Management Act.

7. All disturbed areas, if capable of producing vegetation, will be reseeded with native and/or introduced species to prevent erosion and replace ground cover. These areas will be protected from livestock use for at least two growing seasons.

8. Deferral of livestock use will be in effect for a minimum of two growing seasons following brush control projects so vegetation may be reestablished.

9. Minimal clearing of vegetation will be accomplished from project sites requiring excavation.

10. Vegetation manipulation will not be allowed in riparian areas. Sagebrush control treatments will not be allowed within two miles of sage grouse strutting areas, islands of native vegetation and native vegetation in drainages will be retained. Ten percent of the vegetation will be preserved for wildlife cover and forage during regrowth of young brush plants.

11. Raptor protection will be accomplished by inventories in areas of proposed vegetation manipulation to identify and then protect raptor nesting sites.

12. Soils inventories will be completed prior to project planning to determine project feasibility.

13. A fire management plan will be developed before any prescribed burning occurs.

14. Project area cleanup will be accomplished by removing all refuse to a sanitary landfill.

15. Fence construction must comply with BLM Manual 1732. Lay-down fences will be constructed in wildlife and wild horse and burro areas if necessary and feasible. Fences in wild horse areas will be constructed so as not to interfere with normal distribution and movement patterns of the majority of animals within the herd use areas or herd management areas.

16. Spring developments will be fenced on a case by case basis to prevent overgrazing and trampling of adjacent vegetation, and to provide escape areas for small wildlife. Water for these spring developments will be maintained at the source.

17. Water for wildlife and wild horses and burros is to be made available in allotments, rested pastures, and in areas utilized by wild horses and burros.

18. Water improvement sites will have bird ramps in watering troughs.

19. Excess wild horses and burros will be removed from public lands and put in the custody of individuals, organizations or other government agencies. No field destruction of wild horses or burros will be allowed without the approval of the Secretary of the Interior, except for humane reasons with sick or lame animals.

20. Range improvement maintenance will comply with BLM Manual 7120, and IMNV-80-72. Existing fences and cattle guards built for livestock management will be covered by cooperative agreements with individual livestock permittees. Minor maintenance will be the responsibility of the permittee, while reconstruction or crisis maintenance will be BLM's responsibility. Maintenance of highway fences damaged by vehicles is the responsibility of the State Highway Department. BLM controlled water developments including wells, pipelines, wildlife watering devices, storage tanks, catchments, pit tanks, reservoirs, and springs will generally be maintained by the cooperator. However, with some water developments, such as wells, the BLM will have the well drilled and maintain the below ground facilities, and the permittee will maintain the above ground facilities.

21. Access to project sites will be effected by using existing access roads for off-road vehicles. No permanent roads and trails will be built.

22. Air quality will be protected as all Bureau and Bureau-authorized activities must be designed to prevent air quality deterioration beyond the established standards specified in the Nevada Ambient Air Quality Standards. The Federal Land Policy and Management Act (FLPMA) of 1976 specifies the protection of air and atmospheric quality on BLM administered lands in Sec.102(a)(8) and in compliance with state and

federal laws in Sec. 202 (c)(8). FLPMA also requires an active role in preventing air quality violations on BLM administered lands in Sec. 302(c). The Clean Air Act of 1977 has specific requirements for the federal land managers to protect the air over lands under their jurisdiction. .

23. Water quality is assured by the Federal Water Pollution Control Act of 1972 which establishes the states and local governments as the controls on non-point pollution, the class of pollution most likely to be generated by Bureau and Bureau-authorized activities. The State of Nevada enacted the Nevada Water Pollution Control Regulations in February 1978, establishing standards for water quality in the State. It is the Bureau's responsibility to abide by the State's water quality standards and prevent degradation of water quality as a result of Bureau and Bureau-authorized actions. .

24. Water availability will be ascertained by well site investigation before water well development. The investigaton will involve a detailed hydro-geological study of the site to determine ground-water availability. .

25. Sagebrush treatment areas will receive 2,4-D herbicide applications in accordance with the guidelines listed in Appendix F. .

26. Well development on public lands will be contingent upon the granting of a permit from the State Water Engineer in accordance with Nevada water law.

MANAGEMENT SUPERVISION PROCEDURES

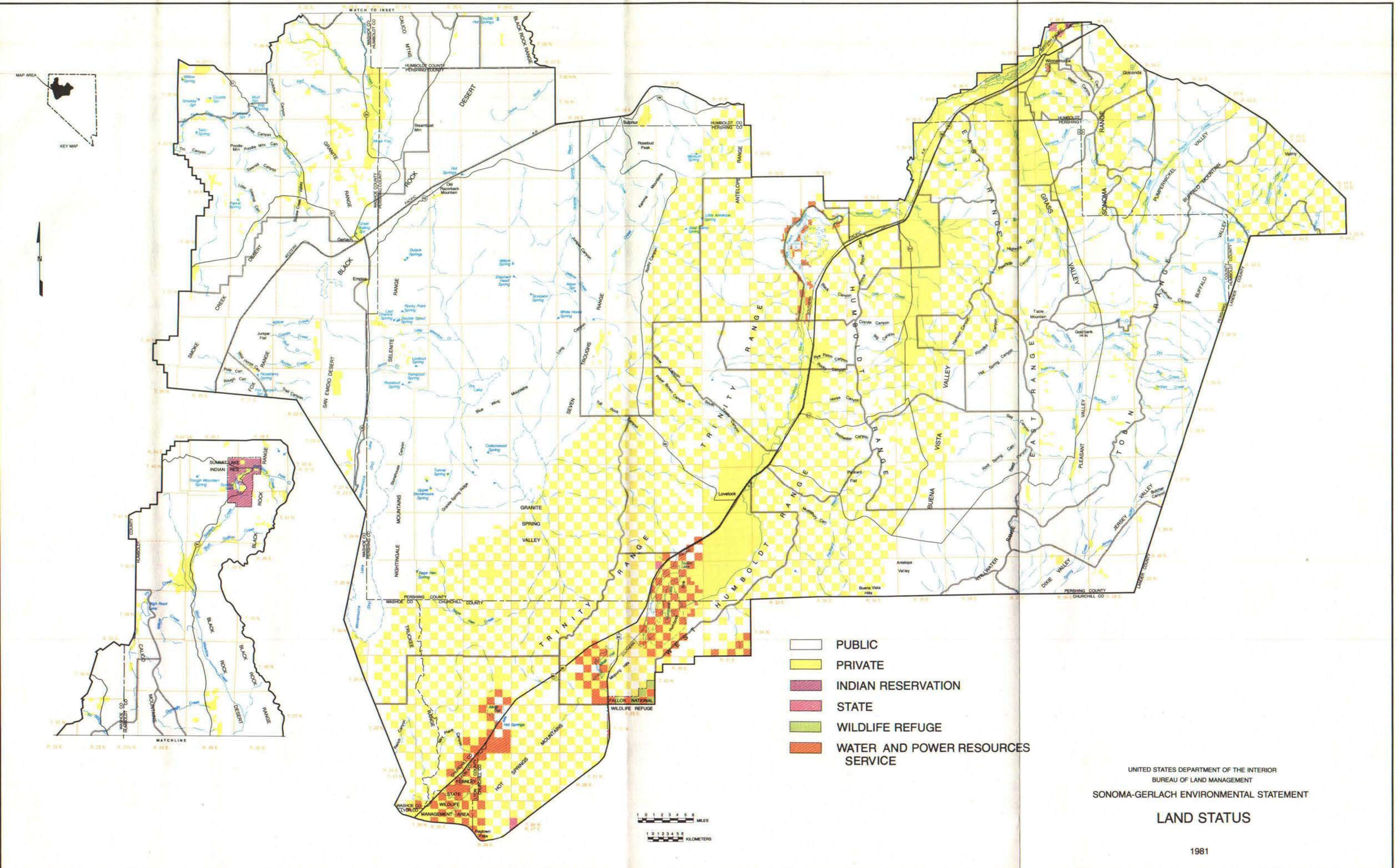
EVALUATION AND MODIFICATION

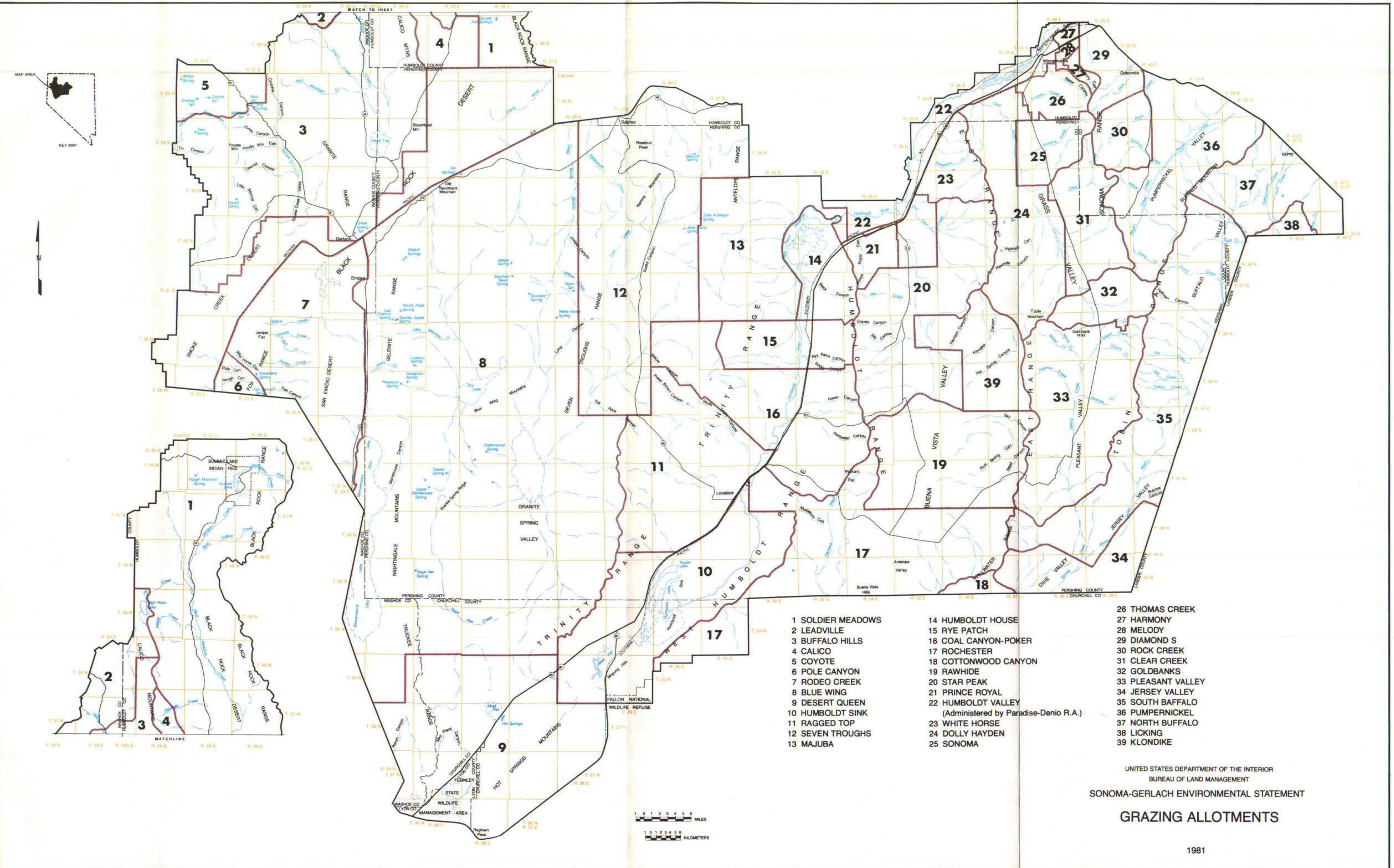
A monitoring and evaluation program to evaluate current and proposed management is included in the alternatives including the proposed action. The program includes resource studies to monitor changes in plant composition and ground cover. At a minimum these studies would monitor actual grazing use, vegetation utilization, range condition and trend, and climatic conditions (BLM Manual 4413.3). Implementation of additional studies, if needed, would occur on the resource values of the allotment to evaluate the effects of the alternatives, including the proposed action, on wildlife habitat, riparian vegetation, aquatic habitat, watershed condition, and wild horse and burro physical condition, distribution and movement patterns.

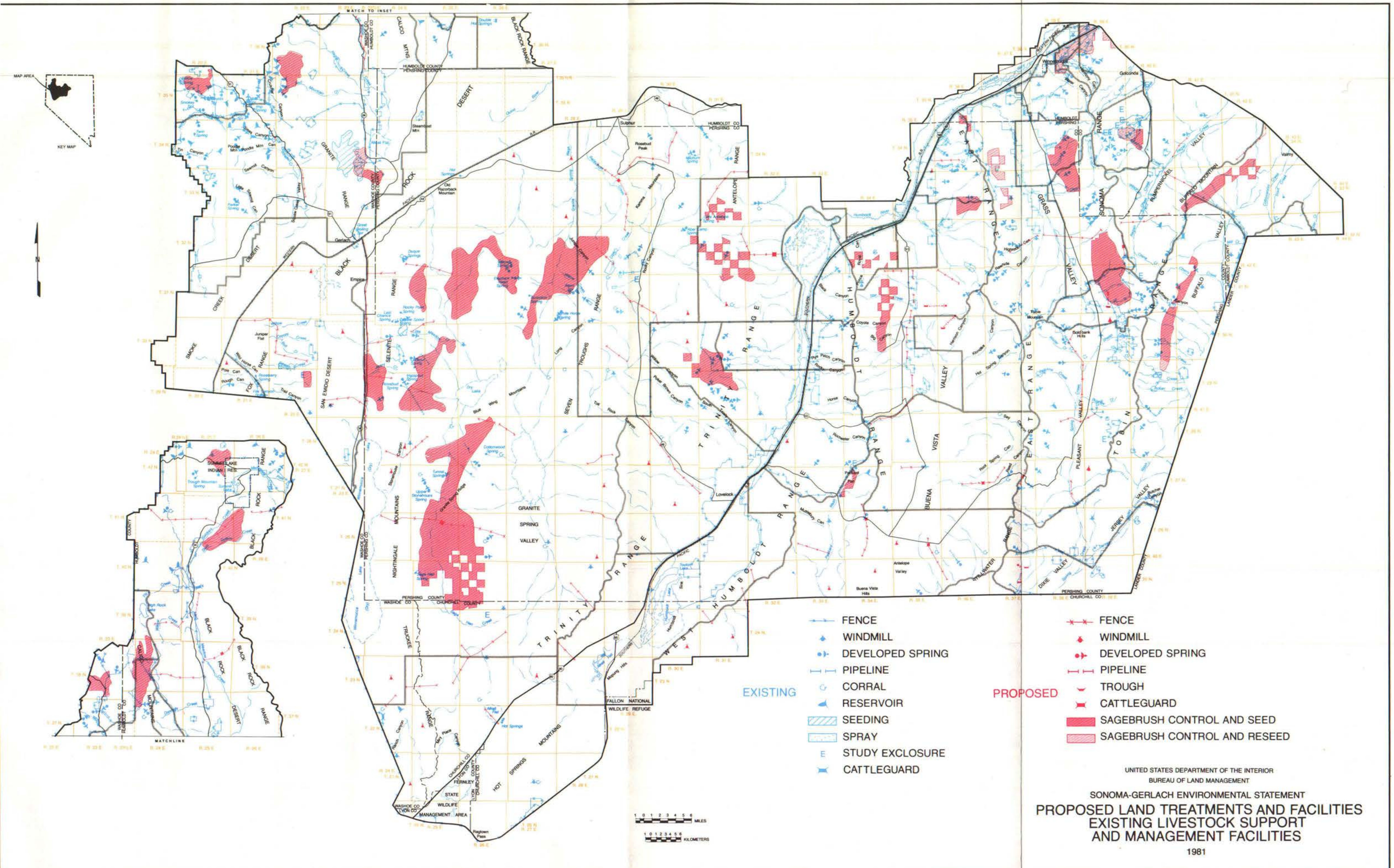
If evaluation procedures determined that objectives were not being achieved, modifications would be made that could include changes in period-of-use, livestock and/or wild horse and burro numbers, management intensity, grazing system, or any combination of revisions in order to attain management objectives. Significant modifications would require the preparation of an Environmental Assessment prior to the actual modification, in accordance with Section 9(a) of Public Law 95-514 (Public Rangelands Improvement Act). In addition, during extraordinary conditions (i.e., drought), the authorized officer would be empowered to make adjustments in grazing use where such adjustments would aid in the attainment of objectives (43 Code of Federal Regulations 4110.3-2a).

ADMINISTRATION

Livestock grazing would be administered through the issuance of term permits through the local BLM office. Permits would specify the allotment, periods-of-use, and numbers and kind of livestock. Livestock would continue to be marked with ear tags, and compliance with the terms of the permit would be ensured by year-round monitoring of grazing. Grazing use beyond the limits of the permitted use and not approved by the BLM would be considered trespass and appropriate action would be taken in accordance with 43 Code of Federal Regulations 4150.


PUBLIC
PRIVATE
INDIAN RESERVATION
STATE
WILDLIFE REFUGE
WATER AND POWER RESOURCES SERVICE
UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
SONOMA-GERLACH ENVIRONMENTAL STATEMENT
LAND STATUS
1981
MILES
KILOMETERS
KEY MAP
MAP AREA
MATCH TO INSET
MATCHLINE
BLACK ROCK DESERT
SMOKE CREEK DESERT
SAN EMIDIO DESERT
SELENITE RANGE
NIGHTINGALE MOUNTAINS
SEVEN TROUGHS RANGE
GRANITE SPRING VALLEY
TRINITY RANGE
WEST HUMBOLDT RANGE
HUMBOLDT RANGE
BUENA VISTA VALLEY
EAST RANGE
SONOMA RANGE
GRASS VALLEY
PLEASANT VALLEY
TOBIN RANGE
JERSEY VALLEY
HOT SPRINGS MOUNTAINS
TRUCKEE RANGE
Gerlach
Empire
Lovelock
Winnemucca
Golconda
FERNLEY STATE WILDLIFE MANAGEMENT AREA
FALLON NATIONAL WILDLIFE REFUGE
SUMMIT LAKE INDIAN RES.
PERSHING COUNTY
CHURCHILL COUNTY
WASHOE CO
HUMBOLDT COUNTY


1 SOLDIER MEADOWS
2 LEADVILLE
3 BUFFALO HILLS
4 CALICO
5 COYOTE
6 POLE CANYON
7 RODEO CREEK
8 BLUE WING
9 DESERT QUEEN
10 HUMBOLDT SINK
11 RAGGED TOP
12 SEVEN TROUGHS
13 MAJUBA
14 HUMBOLDT HOUSE
15 RYE PATCH
16 COAL CANYON-POKER
17 ROCHESTER
18 COTTONWOOD CANYON
19 RAWHIDE
20 STAR PEAK
21 PRINCE ROYAL
22 HUMBOLDT VALLEY
(Administered by Paradise-Denio R.A.)
23 WHITE HORSE
24 DOLLY HAYDEN
25 SONOMA
26 THOMAS CREEK
27 HARMONY
28 MELODY
29 DIAMOND S
30 ROCK CREEK
31 CLEAR CREEK
32 GOLDBANKS
33 PLEASANT VALLEY
34 JERSEY VALLEY
35 SOUTH BUFFALO
36 PUMPERNICKEL
37 NORTH BUFFALO
38 LICKING
39 KLONDIKE
UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
SONOMA-GERLACH ENVIRONMENTAL STATEMENT
GRAZING ALLOTMENTS
1981
MATCH TO INSET
MATCHLINE
MAP AREA
KEY MAP
MILES
KILOMETERS



UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

SONOMA-GERLACH ENVIRONMENTAL STATEMENT

PROPOSED LAND TREATMENTS AND FACILITIES
EXISTING LIVESTOCK SUPPORT
AND MANAGEMENT FACILITIES

1981

CHAPTER 2

DESCRIPTION OF THE AFFECTED ENVIRONMENT

CHAPTER 2

DESCRIPTION OF THE AFFECTED ENVIRONMENT

INTRODUCTION

This chapter presents the environment as it exists today within the Sonoma-Gerlach Resource Area and serves as a basis on which impacts of the alternatives including the proposed action may be assessed.

Emphasis has been placed on those resource components most likely to be impacted. Analysis, including the scoping process, indicated that resource components such as minerals, timber and air quality would not be affected, and therefore, they are not discussed.

In preparation of this EIS, the primary data sources are documents of the Bureau planning system. Other references supplementary to or updating planning system data are cited within the body of the text by author and date of publication. A listing of these references appears in the Bibliography.

CLIMATE

The weather features across the Sonoma-Gerlach Resource Area are typical of a dry continental-type climate receiving a majority of its precipitation from the Pacific Ocean during October to June. The remaining amount of precipitation, approximately 12 percent, occurs as thunderstorms from the Gulf of Mexico during mid-July to September (Houghton 1969). Average annual precipitation varies from 4 inches on valley floors to 20 inches in the mountains. Humidity averages 20 percent year-round.

Large daily and seasonal temperature variations are common across the resource area, with an average low for January of 25 degrees and an average high in July of 84 degrees (Houghton et al. 1975). The frost-free period averages from 112 to 150 days (Sakamoto et al. 1970).

SOILS

Soils data for the Sonoma-Gerlach Resource Area are taken from seven soil surveys and two general soils maps. The seven surveys consist of two second order, three third order, and two fourth order soil surveys. Second order surveys delineate soils on a map scale between 1:12,000 and 1:31,680; third order surveys delineate soils on a map scale between 1:24,000 and 1:250,000; and a fourth order surveys delineate soils on a map scale between 1:100,000 and 1:300,000.

The second order surveys are the Lovelock survey, conducted by the Soil Conservation Service (SCS), and the Surprise Valley-Home Camp Area, California-Nevada Soil Survey conducted jointly by the SCS, the Forest Service, and the BLM. The Sonoma survey, executed by the SCS under contract to the BLM, the Buffalo-Pumpernickle Valley survey, performed jointly by the SCS and BLM under a cooperative agreement, and the South Washoe County Survey completed by the SCS are third order surveys. The Dixie Valley survey, conducted by the Division of Water Resources, Carson City, Nevada, the Agricultural Experiment Station, University of Nevada, Reno, Nevada, and the SCS, is one of the fourth order surveys. The other fourth order survey is the North Cal-Neva Resource Conservation and Development Project, executed by the SCS. These surveys include private lands and Reclamation Withdrawal lands, and in combination cover 43.8 percent of the resource area. See Appendix G, and Watershed Boundaries and Soil Survey Locations Map.

Range site interpretations were developed only for the second and third order surveys which amount to 10 percent of the area. As such, data on range sites are incomplete.

Other soils data for the Sonoma-Gerlach Resource Area are derived from the general soils maps from Humboldt and Pershing counties. The general soils maps classify soils at the family level (USDA, SCS, Soil Taxonomy, December 1975). For a summary of chemical and physical properties of the soils found in the resource area, reference the Sonoma-Gerlach URA Soils section (1979).

EROSION

Gullies are the major sites of active erosion in the area and major contributors of sediment. This erosion is caused by high intensity runoff periods such as occur during accelerated snow melt or high intensity rainstorms. The resulting high flows carry soil away from the channel sides and bottom and the gullies are widened and deepened. Prominent in the area is the head-cut process whereby the channel is deepened through the agitating action of water flowing in a waterfall fashion over an abrupt gradient change.

Sediment yield (soil transported by water from one point to another) was estimated using the Pacific Southwest Inter-Agency Committee (PSIAC) method (Appendix H, Section 1). Phase I Inventory of the Watershed Conservation and Development System was employed as the basic data source (Appendix H, Section 2). A sediment yield value expressed in tons/acres was assigned on the basis of the land's geology, soil, climate, runoff, topography, ground cover, land use, upland erosion, channel erosion, and sediment transport. Results show that total sediment yield from the area is estimated at 5,009,330 tons annually or an average of 1.0 ton per acre per year. This yield is below the three to five tons/acre/year limit set by the Soil Conservation Service for allowable yield (Grant 1973).

WATER RESOURCES

The Humboldt River is the only prominent river within the resource area. Approximately 35 percent of the total area is drained by the Humboldt. Surface water from the remaining portion flows into numerous valley playas scattered throughout the area. (See the Perennial Streams and Sensitive Plants Map.)

WATER QUANTITY

The total area runoff is 80,136 acre feet (State of Nevada 1971), occurring mostly during the months of February, March, April, and May (see representative stream flow in Figure 2-1). The main sources of runoff are snowmelt and rainfall from lands over 5,000 feet in elevation. The majority of the surface water, springs and streams, occurs in the mountainous locations. Overall, the area has 335 miles of perennial stream, 42 percent on public lands. Also, there are 1,109 springs and 40 reservoirs on public and private lands. Evaporation rates vary from 46 to 52 inches annually with the period of highest evaporation being in late July and lowest in December-February.

The total annual consumption of water is estimated to be 80,000 acre feet, 15 percent of which is from underground sources, with Irrigation the predominant user (State of Nevada 1971). Livestock, wild horses, burros, mule deer, antelope, and bighorn sheep consume about 169 acre feet annually. Animal water consumption was computed using animal numbers from Chapter 1 and standard species consumption rates.

WATER QUALITY

Surface water quality varies throughout the EIS area. Preliminary water quality survey data collected by BLM in 1980 indicate that, except for a few thermally influenced springs, all surface waters are suitable for livestock and irrigation uses. Major influences by man on the surface waters are from agriculture, livestock grazing, and mining.

VEGETATION

INTRODUCTION

The Sonoma-Gerlach Resource Area supports vegetation typical of the Great Basin region. The extremes of climate, elevation, exposure, and soil type all combine to produce a diverse growth environment for a wide variety of plants. Vegetation varies from salt-tolerant shrubs and grasses which inhabit the lower valley bottoms, to the sagebrush steppe in the intermediate elevations, to the mountain brush in the higher elevations. The boundary of these vegetation zones can be a gradual or abrupt change, depending on the extremeties of the factors listed above.

VEGETATION COMMUNITIES

The Sonoma-Gerlach Resource Area contains 11 broad vegetation communities which are summarized in Table 2-1. In addition, Table 2-1 contains general information on each community (e.g., associated species, landform, and soil characteristics). These communities are depicted on the Vegetation Communities Map in this chapter. Vegetation communities were identified and delineated as a result of the 1979 recompilation of the 1947 and 1960s ocular reconnaissance range surveys, in accordance with BLM Manual 4412.11A. Vegetation communities were identified according to the current vegetation aspect into a standard type classification as presented in BLM Manual 4412.11A.

The following cited references indicate the present position of most vegetation communities (including riparian and aspen communities discussed in the following sections) as they relate to climax in the Sonoma-Gerlach Resource Area. In the past, uncontrolled livestock grazing has induced retrogression of many climax vegetation communities to a stage of disclimax, held in place by continued livestock grazing.

With the advent of modern man, plant communities changed radically. Man brought new species of both plants and animals which resulted in reduced populatons of native fauna. Plant populations

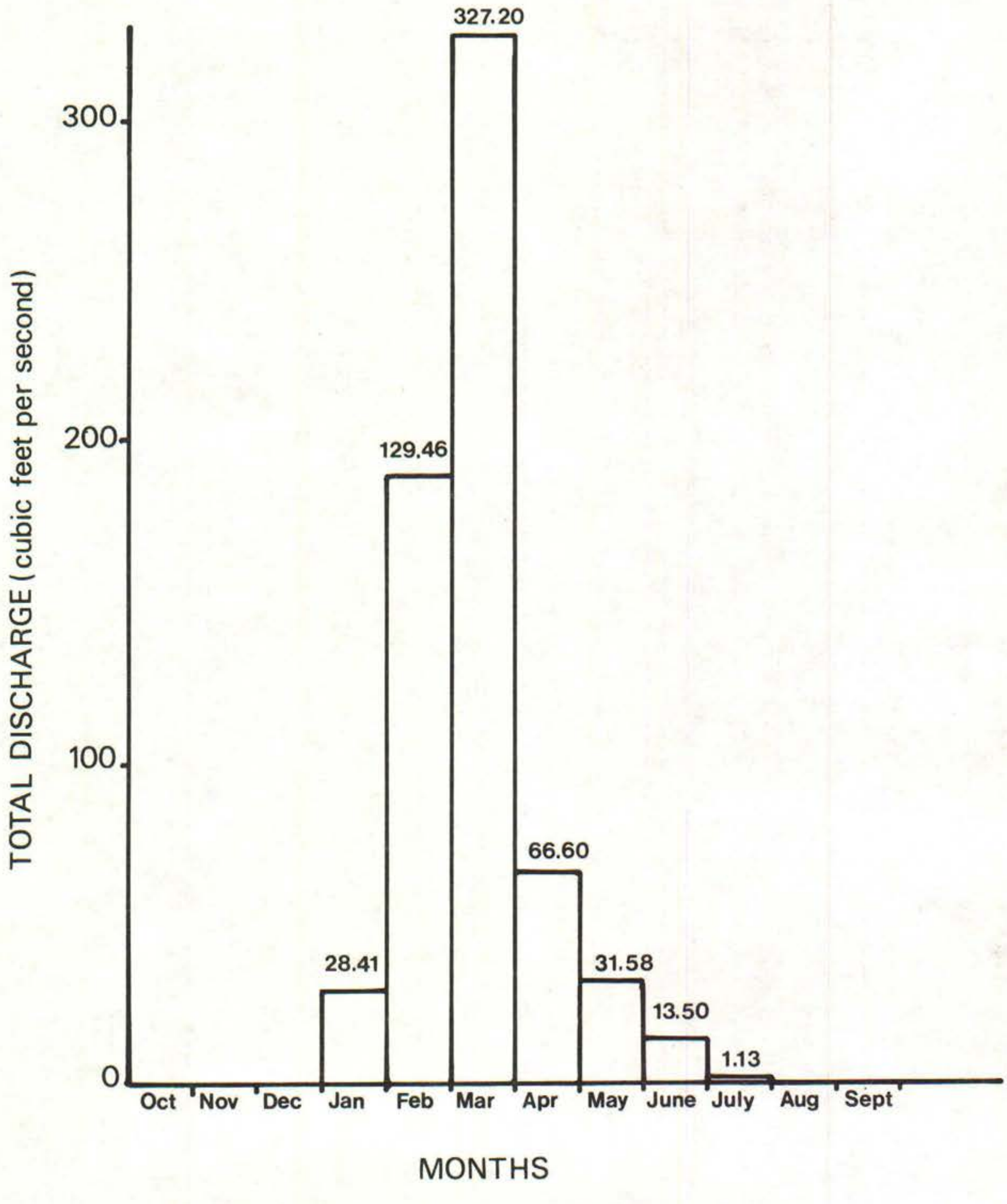


FIGURE 2-1 TYPICAL ANNUAL STREAM FLOW. South Willow Creek near Gerlach, Nevada (Drainage area 31 sq. miles)

Source: U.S. Department of the Interior, Geological Survey. Water Resources Data for Nevada. Water Data Report NV-78-1. Carson City, Nevada, 1978.

Table 2-1
VEGETATION TYPES

Code	Vegetation Type	Acreage	Percent of Total Area	Elevation (feet above sea level)	Average Precipitation	Soil Characteristic	Landform	Associated Species
01	Grass	20,583	<1	4300-5000	6-8	Mixed	Bottoms & fans	crested wheatgrass, basin wildrye, inland saltgrass, big sagebrush, black greasewood
02	Meadow	69	<1	4000-8000	6-20	Deep Loamy	Adjacent to streams & springs	big bluestem, sedge, rush, willow, mountain dandelion
04	Sagebrush	1,731,515	41	4300-9000	8-18	Mixed	Valleys to mountains	bottlebrush squirreltail, bluebunch wheatgrass, Indian ricegrass, spiny hopsage, horsebrush, snowberry
07	Waste	171,840	4	3900-10,000	4-20	Mixed	Valleys to mountains	nonforage species, halogeton, tumblemustard, poverty sumpweed, allenrolfea, pepperweed, Russian thistle
08	Barren	181,890	4	3900-10,000	4-20	Deep alkaline silt-clay	Valley bottoms	None
09	Juniper	3,057	<1	5000-6000	8-14	Shallow-rocky	Benches & upper ridges	bluebunch wheatgrass, Salina wildrye, big & low sagebrush
13	Saltbush	1,478,590	35	4000-6000	4-8	Alkaline	Bottoms & Fans	bottlebrush squirreltail, shadscale, Torrey saltbush, black greasewood, bud sage
14	Greasewood	582,492	14	4000-4500	4-7	Deep alkaline silt-clay	Valley bottoms	inland saltgrass, alkali sacaton, allenrolfea, shadscale, rubber rabbitbrush, big sagebrush
15	Winterfat	20,139	<1	4400-5000	6-8	Silt	Lower benches	bottlebrush squirreltail, Indian ricegrass, big sagebrush, bud sagebrush
16	Desert shrub	14,692	<1	4500-5000	6-8	Mixed	Lower benches & foothills	gray horsebrush, spiny horsebrush, spiny hopsage, bottlebrush squirreltail, big sagebrush
18	Annuals	54,975	1	4500-8000	6-16	Mixed	Valleys to mountains	poverty sumpweed, pepperweed, Russian thistle, tumblemustard, cheatgrass, halogeton
TOTAL		4,259,842	100					

a/ Riparian and aspen communities usually cover too small an area to be delineated by the survey method used (less than 160 acres) however, due to their importance they are discussed in the vegetation communities section of this chapter.

Source: U.S. Department of the Interior, Bureau of Land Management, Winnemucca District, Sonoma-Gerlach Resource Area Unit Resource Analyses, 1980.

changed under the reduced native animal impact and the increased grazing pressure of domestic animals. Those plants that were most palatable to domestic livestock declined in vigor and abundance and became minor elements in the plant community. Less palatable plants increased. Entire plant communities changed their composition and brush and woody plants increased on many rangelands. Climax plants ultimately may disappear from vegetation retrogression, induced by grazing. They leave first from the most accessible and, hence, most grazed areas, and soon are evident only under the protection of stout shrubs or cactus. Later, even these disappear, often leaving nothing but annual invaders (Stoddart, Smith and Box 1975). The retrogression of climax bunchgrass communities to annuals was further expressed by Kormondy (1969) when he indicated that bluebunch wheatgrass has been lost on many sites to cheatgrass since man brought livestock to the United States from Europe.

Holmgren and Hutchings (1972) also indicated the effects of improper livestock grazing on salt desert shrub communities when they concluded that on pastures grazed heavily in late winter, shadscale had become dominant while the two most valuable shrub species (budsage and winterfat) had declined (Figure 2-2). Laycock (1970) reported the effects of heavy spring grazing that damaged good condition ranges by reducing herbaceous production by more than 50 percent and increasing sagebrush production by 78 percent. Tueller (1973) reported that Clements (1949) made reference to sagebrush disclimax as an extensive vegetation formation of the Great Basin in which big sagebrush has achieved post-climax dominance, a position maintained by continuous overgrazing of the formerly dominant bunchgrasses.

Riparian Vegetation

Riparian vegetation is a critical vegetation community in the Sonoma-Gerlach Resource Area. These habitat sites provide forage, water and cover for wildlife, livestock, and wild horses and burros. Although most riparian types are highly productive sites, they usually cover too small an area to be delineated on the Vegetation Types Map. There is an estimated 2,000 acres of riparian vegetation in the resource area. Riparian vegetation is usually associated with perennial waters; however, intermittent and/or ephemeral water sources have some degree of riparian vegetation.

Typical riparian species include aspen (*Populus tremuloides*), willow (*Salix spp.*), chokecherry (*Prunus spp.*), sedge (*Carex spp.*), rush (*Juncus spp.*), and bluegrass (*Poa spp.*). Riparian vegetation is a major factor in control of soil erosion and stream sedimentation, thus influencing water quality. Refer to the vegetation communities section for a discussion of the present position of these communities in relation to climax.

Aspen

Aspen (*Populus tremuloides*) vegetation communities occur primarily in locations with year-round soil moisture, such as areas adjacent to streambanks, spring vicinities, and areas of heavy winter snow accumulation. Aspen usually occupies deep loam soils, but may also inhabit shallow, gravelly areas.

Reproduction of aspen is accomplished primarily by root suckering which occurs in open, deteriorating stands. Growth is initiated by increased light coming through the canopy (Schenbeck and Dahlem 1977). Farmer (1962) describes a phenomenon known as apical dominance which may override the growth-initiating factors in an aspen stand. Apical dominance is the process of an auxin being produced in stems above the ground and translocated to the roots where it inhibits the formation of suckers. This auxin flow is interrupted only when most of the mature trees are killed at one time, such as by fire or clear-cutting. The result is profuse root suckering within the stand (Schier 1975).

The aspen vegetation community amounts to an estimated 3,748 acres in the Sonoma-Gerlach Resource Area, due primarily to the lack of available water and associated habitat discussed above. This information is based on an extensive inventory of tree species and their distribution in the resource area, conducted in December of 1978, by means of aerial photograph interpretation and observations by Winnemucca District personnel.

Aspen communities are unique in the resource area due to their limited acreage and in that they furnish critical habitat (e.g., forage and cover) for wildlife and livestock. Aspen is particularly sensitive because indiscriminate browsing of the tips of reproductive root suckers suppresses growth and endangers existence of individual stands. Refer to the vegetation communities section for a discussion of the present position of these communities in relation to climax.

PHENOLOGY

The Winnemucca District Office participated in a four-year (1976-1979) statewide phenology study conducted by Natural Resource Consultants (NRC). The phenology study sites in the Winnemucca District are located in Rock Creek Allotment, Sonoma-Gerlach Resource Area.

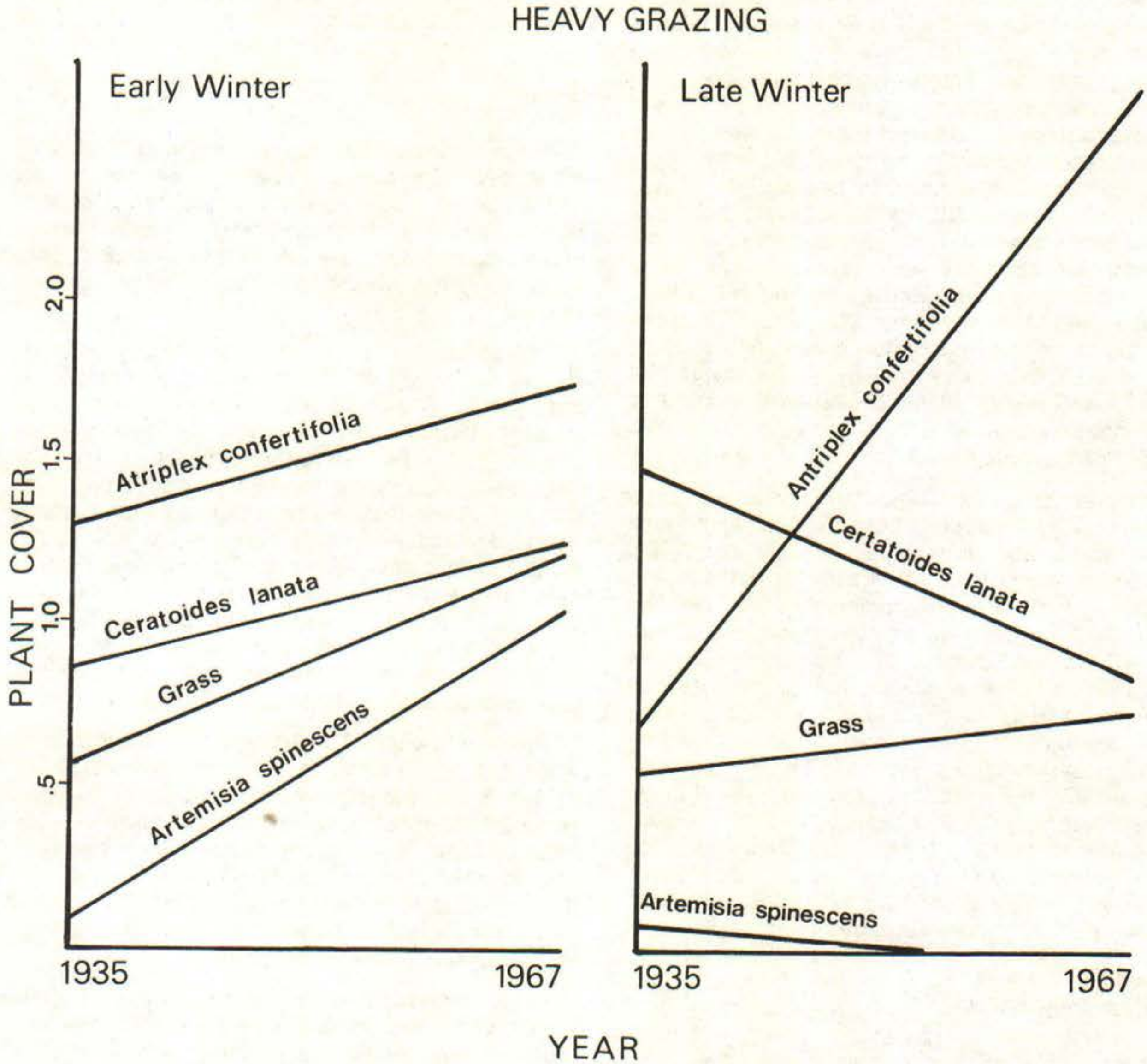


Figure 2-2: Plant cover trends (regressions on time) for species grazed by sheep at a heavy rate of stocking. Trends at left are for areas grazed during dormant season, those at right are for areas grazed at the beginning of the spring growing season.
(Desert Exp. Range, Utah)

Source: Holmgren and Hutchings (1972)

Data collected from the Winnemucca District phenology studies were used to determine critical growth periods of key management species. Due to the lack of data from the Winnemucca studies on some key management species, data from the Battle Mountain District phenology studies were used to determine critical growth periods. The Battle Mountain District studies were conducted on areas with similar vegetation communities to those in the Winnemucca District studies (i.e., elevation, composition, species) and provided needed information to determine critical growth periods. In addition to the studies listed above, supplemental research was undertaken (Cook and Stoddard 1964, Blaisdell and Pechanec 1949, Pearson 1964, Krall et al. 1971, and NRC, Inc. 1976 through 1979) to facilitate the determination of critical growth periods of key management species. Table 1-4 shows critical growth periods of key management species in the Sonoma-Gerlach Resource Area.

Variations in phenology occur from year to year, and are due most probably to variations in amounts and timing of precipitation and to variations in seasonal temperatures from one year to the next. Due to this variation in phenology data, a four-year average of the phenological stages of growth was determined (Figure 2-3) to develop average critical growth periods of key management species. These data (average critical growth periods) were used to determine proper periods-of-use for each allotment in the Sonoma-Gerlach Resource Area. Establishment of proper periods-of-use would provide for the physiological requirements of key management species, thus perpetuating their continued existence and/or maintenance in vegetation communities.

SENSITIVE PLANTS

No officially listed federal or state threatened or endangered (T/E) plants are known to occur in the resource area. The Northern Nevada Native Plant Society (NNNPS) maintains an annually revised list of candidate species for threatened/endangered status and "species of special concern". The Nevada T/E Plant Map Book published in 1978 by the Nevada State Museum summarized location information available at that time on T/E plants. A subsequent update of status at a November 2, 1979, workshop sponsored by NNNPS and field work conducted during 1979 has resulted in an update of the map book information. The recently completed *Proposed Threatened and Endangered Plants of Nevada: An Illustrated Manual* provides the most current recommended status for Nevada sensitive plants. Table 2-2 shows the current situation for sensitive plants, based on information from this latter source. Approximate locations of these plants are shown on the Perennial Streams and Sensitive Plants Map.

VEGETATION PRODUCTION

The available vegetation (existing vegetation production) was estimated using the 1979 recompilation of the 1947 and 1960s ocular reconnaissance range surveys, in accordance with BLM Manual 4412.11A. The estimated carrying capacity was derived by ocular estimates of the current years growth (at the time of survey) and should be used as a starting point for establishing proper stocking rates and management actions.

Vegetation production would decrease or increase as related to deterioration or improvement in range condition. Factors influencing change in range condition are composition, density, cover, and vigor of desirable rangeland species (key management species). The amount of vegetation production would vary depending upon site potential, present range condition, natural seed sources, climatic conditions, and management actions employed.

The BLM has developed a basic rangeland suitability guide to aid field personnel in determining the amount of suitable vegetation production available for grazing by domestic livestock and wild horses and burros, while keeping in mind the various aspects of the plant-soil environment. These rangeland suitability criteria and standards are founded on three parameters of major influence (productivity, slope, and distance from reliable water).

The application of these suitability criteria and standards in the range surveys for the Sonoma-Gerlach Resource Area has resulted in the rangeland being classified as one of the following: (1) suitable, (2) potentially suitable, and/or (3) unsuitable. See Table 2-3 for a summary of the Sonoma-Gerlach Resource Area rangeland suitability classification. Appendix I illustrates by allotment and criteria the rangeland suitability classification for the resource area. See Appendix A, Section 1, for methodology used and application of rangeland suitability criteria to range survey data to determine vegetation production.

The current vegetation production in the Sonoma-Gerlach Resource Area is 140,260 AUMs suitable for livestock and wild horses and burros. In addition, see Appendix A for additional AUMs available to big game by alternatives.

FIGURE 2-3

AVERAGE PHENOLOGY OF MANAGEMENT SPECIES ON THE WINNEMUCCA DISTRICT a/

SHRUBS

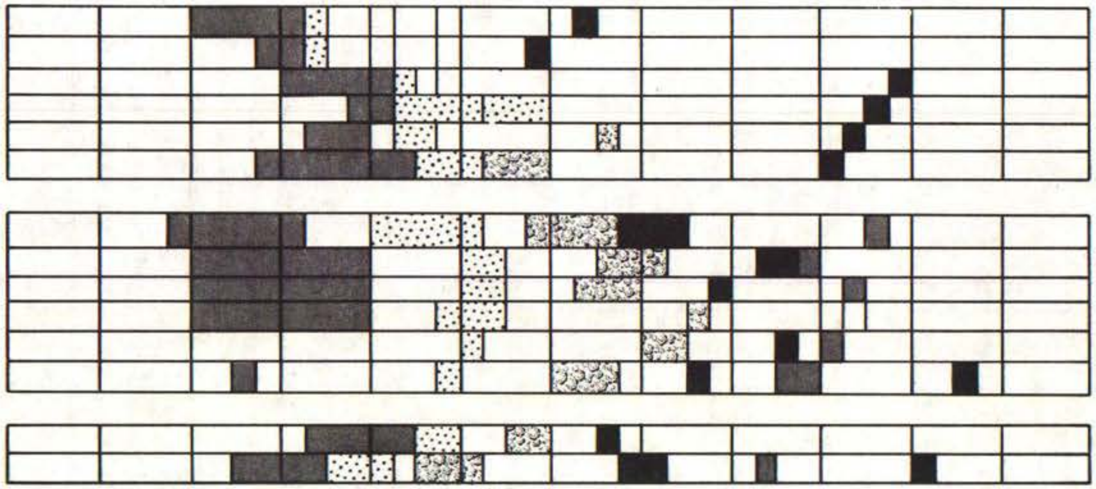
bud sagebrush (Artemisia spinescens)
spiny hopsage (Grayia spinosa)
willow (Salix spp.)
serviceberry (Amalanchier alnifolia)
snowberry (Symphoricarpos spp.)
Mormon-tea (Ephedra)

GRASSES

bottlebrush squirreltail (Sitanian hystrix)
bluebunch wheatgrass (Agropyron spicatum)
Thurber needlegrass (Stipa thurburiana)
Basin wildrye (Elymus cinereus)
Idaho fescue (Festuca idahoensis)
Indian ricegrass (Oryzopsis hymenoides) b/

FORBS

tapertip hawksbeard (Cepis acuminata)
globemallow (Shaeralcea spp.)



KEY

Symbol	Shrubs	Grasses	Forbs
	Leaf Growth	Growth Starts	Growth Starts
	Twig Growth	Flower Stalks Appear	Flow Stalks Appear
	Full Bloom	Seed Dissemination	Full Bloom
	Leaves Dry & Drop	Plants Dry	Plants Dry

a/ No data available for Populus tremuloides, Ceratoides lanata, Balsamorhiza hookeri, Purshia tridentata, Cercocarpus ledifolius, Poa nevadensis, Agropyron cristatum, Stipa comata, Oryzopsis webberi, and Balsamhoriza sagittata, also key management species. Data taken from Nevada Rangeland Phenology, Bureau of Land Management 1976 to 1979. Published by Natural Resources Consultants. Winnemucca District Phenology Study Sites.

b/ Data taken from Nevada Rangeland Phenology, Bureau of Land Management, 1976 to 1979. Published by Natural Resource Consultants. Battle Mountain District Phenology Study Sites.

Table 2-2
SENSITIVE PLANTS

Scientific Name	Common Name	Recommended Status a/
Astragalus porrectus	Lahontan milkvetch	T
Astragalus pterocarpus	winged milkvetch	S
Camissonia nevadensis	Nevada camissonia	S
Cymopterus corrugatus	corrugated cymopterus	S
Elodea nevadensis	Nevada waterweed	E
Eriogonum anemophilum	wind-loving buckwheat	S
Lomatium ravenii	Lassen desert-parsley	S
Opuntia pulchella	beautiful cholla	S
Orycetes nevadensis	Nevada digger	T
Penstemon arenarius	dune penstemon	T
Phacelia glaberrima	smooth phacelia	T
Phacelia inconspicua	inconspicuous phacelia	E
Psorothamnus kingii	king's indigo bush	S

a/ Status recommended by the Nevada Threatened and Endangered Plant Workshop held in Reno, Nevada, on November 2, 1979.

E: Endangered
T: Threatened
S: Species of Special Concern

Source: Nevada Threatened and Endangered Plant Workshop, Reno, Nevada, 2 November 1979; Memorandum to District Files from Mike Yoder-Williams, Botanist, 1/16/80; H. Mozingo and M. J. Williams, 1980, "Proposed Threatened and Endangered Plants of Nevada: An Illustrated Manual", Bureau of Land Management and U.S. Fish and Wildlife Service publication.

Table 2-3

RANGELAND SUITABILITY SUMMARY FOR THE SONOMA-GERLACH RESOURCE AREA

Suitability	Acres	Percent of Resource Area	AUMs
Suitable	2,402,164	57	140,260
Potentially suitable	738,475	17	24,615
Unsuitable	1,119,203	26	23,677
TOTAL	4,259,842	100	188,552

Source: U.S. Department of the Interior, Bureau of Land Management, Sonoma-Gerlach Resource Area, Range Unit Resource Analyses 1979.

TABLE 2-4

CONDITION CLASSES

Range Condition Class	Percentage of Present Plant Community that is Climax for the Range Site
Excellent	76-100
Good	51- 75
Fair	26- 50
Poor	0- 25

Source: Sonoma-Gerlach Unit Resource Analyses, 1980.

Table 2-5

ECOLOGICAL RANGE CONDITION a/

Range Condition Class	Acres	Percent
Excellent	226,444	5
Good	746,063	18
Fair	1,323,764	31
Poor	1,959,809	46
Total	4,256,080	100

a/ Includes fenced public land. The Melody Allotment has been seeded to crested wheatgrass, thus has no ecological range condition class and the public acreage is not included in the total acres.

Source: Sonoma, Blue Wing, and Buffalo Hills Unit Resource Analyses, 1980.

ECOLOGICAL RANGE CONDITION

Ecological range condition for the Sonoma-Gerlach Resource Area was based on the Soil-Vegetation Inventory Method (SVIM) where data were available, and where inventory data were not available, professional judgement (based on the experience of BLM personnel) was used to estimate the condition.

Ecological condition is the present state of an ecological site in relation to the natural potential (climax) plant community for that site. It is an expression of the relative degree to which the kinds, proportions, and amounts of plants in a plant community resemble those of the climax plant community for the site. Ecological condition must not be confused with "livestock vegetation condition"; because livestock vegetation condition is a measure of the ability of the vegetation to provide a "sustained yield" of high quality vegetation for different kinds of livestock and wild horses and burros.

Four "condition classes" are used to express the degree to which the composition of the present plant community reflects that of the climax. They are shown on Table 2-4.

Estimated ecological range condition summary acres and percentage for the Sonoma-Gerlach Resource Area are shown in Table 2-5. Acres and percentage breakdowns by allotment for estimated ecological range condition in the Sonoma-Gerlach Resource Area are shown in Appendix J, Section 1.

TREND

While condition is the current state of health of the range, trend is the direction in which condition is moving: upward trend indicates an improving range condition, downward trend indicates a deteriorating range condition, and stable trend indicates no discernible change in condition.

Generally, trend information has not been documented in a detailed manner for the Sonoma-Gerlach Resource Area. Detailed trend information does not exist on some allotments; however, the majority of the trend information is based upon professional judgement (visual observations of allotments by field personnel) and will be used only for analysis purposes (Sonoma-Gerlach Resource Area, Range Unit Resource Analyses 1979).

Currently (1980) there are 59 trend plots and 12 exclosures located in the Sonoma-Gerlach Resource Area. As mentioned above, lack of detailed data, due primarily to an insufficient number of years of data collection, prohibit the use of this information.

The estimated trend for the Sonoma-Gerlach Resource Area is 7 percent (296,753 acres) of the public land in an upward trend, 25 percent (1,062,301 acres) with stable trend, and 68 percent (2,896,026 acres) in downward trend. These total acres do not include Melody Allotment, since no ecological range condition rating or trend was determined because the entire allotment was artificially seeded to crested wheatgrass. Acres and percentage breakdowns by allotment for trend direction are shown in Appendix J, Section 2.

LIVESTOCK GRAZING

There are 48 permittees authorized to graze livestock on 38 allotments within the Sonoma-Gerlach Resource Area. Of these 48 permittees, 8 graze livestock (cattle, sheep, and/or domestic horses) in allotments administered by another District, but the allotments are within the Sonoma-Gerlach Resource Area boundary. The remaining permittees, and one of the 8 permittees mentioned above, graze livestock in and are administered by the Sonoma-Gerlach Resource Area. Of the total permittees 39 are licensed to graze cattle, 1 is licensed to graze cattle and domestic horses, 7 are licensed to graze sheep, and 1 is licensed to graze both cattle and sheep. The authorized livestock have harvested an average of 116,551 AUMs of vegetation annually over the past three to five years (see Table 1-1).

The majority of cattle ranchers using the public land in the resource area are running cow-calf operations, while some operate cow-yearling operations, dependent on current market prices. Most cattle ranchers in the resource area follow a yearlong breeding program. Bulls are generally turned out with the cows and remain on the range with the cows for the entire grazing period. This results in year-round calving and lower calving crops (Vavra and Raleigh 1976). Calving percentage (percentage of calves weaned) for cow-calf operations was approximately 68 percent in this area (Mitchell and Garrett 1978), as compared to 86 percent in the United States as a whole (Ensminger 1968), with an overall herd death loss of approximately 2-4 percent. Most operators brand in the spring and sell their calves in the winter and spring (Torell et al. 1980). Weaning weights for cow-calf operations average 433 pounds (Mitchell and Garrett 1978).

Sheep operations in the resource area are widespread in grazing area as compared to cow-calf operations. Most sheep operations graze or trail through several allotments, while most cattle operations graze within only one or two allotments. Sheep ranchers in the resource area follow a seasonal breeding program rather than a yearlong program. Breeding bucks in the resource area are either rented, raised on the ranch, and/or brought in from another source. Breeding of ewes is usually dependent upon the type of lambing method. Most sheep operations in the resource area lamb on the open range; however, some are converting to shed lambing. For range lambing, the rams are usually put with the ewes during November or December, whereas in shed lambing, the rams are put with the ewes after the lambs are weaned. Most lambing is planned to allow for abundant forage during the period between lambing and weaning. If range ewes are lambed without sheds it is more desirable to have the lambs born in April and early May. If sheds are available however, range lambs may be born in February and March.

Lambs are weaned in late August, September, or early October, at which time the sheep are trailed back to the ranch or put into corrals on the range for separation of market lambs for sale. The ewes are then usually put back onto the range (most sheep operators have year-round grazing permits, with exception of two months off during the winter months, e.g., November and December). When sheep are off the public rangeland they are kept on private pastures. Most sheep operators market their lambs by contract sale for the whole crop earlier in the season. In some operations the lambs are separated into three categories: feeders, fat lambs, and/or second lambs. Feeder lambs are fattened for a short period after shipment, fat lambs are immediately slaughtered after shipment, and second lambs are held for feeding for several weeks after shipment before slaughter. Generally the average lambing crop is 100-115 percent, but can be as high as 125 percent and average weaning weights are 80-95 pounds, but can be 100 pounds for early lambs (personal communication with Tom Belzarena and Stanley Ellison July, 1980). Generally there are 1,000 to 1,200 head of sheep per band and herders are obtained from Peru, Mexico, and some old timers remain in the resource area from France (personal communication with Tom Belzarena and Stanley Ellison July, 1980).

Livestock use of the public lands is managed in accordance with the seasons. Grazing usually begins in the spring in the valleys and lower foothills and progresses to higher elevations in early summer. Livestock are moved back down in early fall when cold weather and/or snow forces them off the summer range. The majority of the permittees are also licensed for various periods of winter use at lower elevations (Table 2-6), thus resulting in yearlong livestock grazing on the public rangeland. Other permittees use hay and/or private pasture to hold livestock while off the public rangeland through the winter.

The entire authorized livestock preference within the resource area is attached to land base properties. In most cases the base property is located within the resource area, and consists of the home ranch of the permittee, which is contiguous to the authorized use allotment. There are exceptions to this, as preferences or qualifications are attached to intermingled, unfenced private lands or 'parallel bases' (see glossary) in several situations, and in some operations the base is noncontiguous to the allotment.

The huge expanses of land and the availability of yearlong grazing have allowed a few ranchers to operate a low cost, low labor style of ranching described by many ranchers in the area as a wild-cow operation. In general wild-cow operations are characterized by use of large, unfenced grazing areas where the cattle must fend for themselves for most of the year. With this level of management, livestock distribution becomes a problem. This results in almost 100 percent utilization of forage plants close to water and little use in areas away from water. In addition, grazing is difficult to administer in these vast areas.

Extensive blocks of public land make up a major portion of the resource area. Small tracts of private land, usually associated with springs or streams, are found scattered throughout the area (see Land Status Map). The larger private tracts occur on good soils where ground water or river water is available for irrigation. Public and privately-owned land (railroad land grants) form a checkerboard pattern that makes grazing administration difficult and hinders the range improvement program.

Administration of livestock grazing on public lands within the resource area has been difficult due to historical use by ranchers and Bureau licensing procedures (e.g., periods-of-use have been established based on the historical use and/or convenience of the livestock operator, rather than the physiological requirements of key management species). Livestock distribution patterns, common turn out and off dates of livestock, salting practices, and lack of livestock control are also based upon historical use of the rangeland and/or convenience of the livestock operator, rather than basic needs of the vegetation resource. Staggered or pyramid licensing procedures (see glossary) have made supervision of license compliance difficult and often have resulted in livestock trespass on the public rangeland (USDI, BLM 1979). Increased supervision and gradual elimination of staggered licenses combined with eartagging of livestock have reduced livestock trespass within the resource area. Currently the resource area processes approximately 10-15 livestock trespasses each fiscal year (personal communication with Sonoma-Gerlach Resource Area Manager).

TABLE 2-6

PRESENT LIVESTOCK GRAZING SITUATION

Allotment Name	Permittee a/	Approximate Numbers and Kind of Livestock b/	1979 Periods of Use c/	Use Areas Other than Sonoma-Gerlach Resource Area d/	Permittee's Yearlong Dependency e/	Permittee's Critical Period Dependency f/	Last Three to Five Year's Average Use (AUMs)	1979 Licensed Livestock Use (AUMs)	Active Preference (AUMs)
Blue Wing	E	2000S	12/12-03/25	PV, SU	6	0	1,400	1,386	1,505
	O	2029C	03/01-02/28	PV	80	80	19,478	19,535	21,460
	L	1750S	12/07-03/17	PV, SU	6	0	1,190	1,181	1,195
Buffalo Hills	H	876C	03/01-01/01	PV	84	100	8,789	10,450	11,112
	V	96C	04/01-12/01	PV	63	95	729	734	739
	II	15C	04/15-08/31	PV	38	90	68	68	69
Calico	V	396C	04/01-10/15	PV	54	100	2,574	2,580	2,584
Clear Creek	ZZ	982S	11/20-01/08	PV, EL, BM, FS	3	0	321	336	370
	I	401C) 84C)	03/01-08/31) 11/01-02/28)	PV, PD	57	100	2,741	2,166	2,741
Coal Canyon-Poker	LL	2100S	03/21-03/29	PV	1	0	126	98	492
	P	224C	03/01-02/28	PV	83	90	2,219	2,589	2,588
	RR	Total Nonuse		PV	0	0	0	0	64
Cottonwood Canyon	WW	10C	03/01-08/31	PV, CA	50	100	60		60
Coyote	S&T	315C	04/01-12/01	PV, SU	66	98	2,480	2,735	2,734
	L	650S) 1000S)	04/15-04/30) 05/01-05/20)	PV, SU	2	8	202	202	317
Desert Queen	J	731C) 135C)	11/01-04/30) 05/01-10/31)	PV	31	53	2,754	3,251	3,277
	C	16C	11/01-10/31	PV	42	0	80	80	78
Diamond S	OO	429C) 110C) 64C) 4C) 134C)	05/01-06/30) 07/01-07/31) 08/01-08/31) 09/01-09/30) 04/15-06/15)	PV, PD	20	74	1,025	1,161	1,158
Dolly Hayden	I	429C) 82C)	03/01-08/31) 11/01-02/28)	PV, PD	64	100	3,302	2,607	3,709
	N	Exchange of Use Only		PV	-	-	-	-	-
	XX	Exchange of Use Only		PV	-	-	-	-	-
Goldbanks	ZZ	1300S	10/10-11/10	PV, EL, BM, FS	1	0	159	159	160
	F	213C) 188C)	04/01-10/31) 12/01-01/31)	PV	74	100	1,881	1,898	1,891
Harmony	YY	28C	04/01-09/20	PV, PD	47	100	159	367	159
	A	47C	05/01-08/31	PV	33	80	188	190	189
Humboldt House	G	29C) 49C) 49C)	03/01-03/31) 04/01-09/30) 12/01-02/28)	PV	80	100	470	0	620
	LL	1000S	08/30-09/17	PV	1	4	107	107	107
Humboldt Sink	C	420C	11/01-04/30) 06/01-07/31)	PV	27	25	1,377	1,380	1,365
	D	0C	03/01-02/28	PV	0	0	0	62	62
	FF	Exchange of Use Only		PV, PD	-	-	-	-	-
Jersey Valley	TT	149C	03/10-03/15) 11/01-02/28)	PV, BM, CA	55	0	989	921	1,035
	CCC	Nonuse	03/01-07/31	CA, BM	0	0	0	0	546
Klondike	N	300C) 350C) 380C) 173C)	04/01-04/31) 05/01-05/31) 06/01-10/31) 11/01-12/31)	PV	46	73	2,115	2,205	2,205
Leadville	K	324C	04/01-11/30	PV	66	99	2,566	2,561	2,567
Licking	BBB	38C	03/01-06/30	PV, BM	33	60	152	152	153
Majuba	HH	143C	11/01-06/30	PV, PD	29	26	503	246	1,100
Melody	A	75C	04/20-08/15	PV	32	77	290	586	1,020

TABLE 2-6

PRESENT LIVESTOCK GRAZING SITUATION

Allotment Name	Permittee a/	Approximate Numbers and Kind of Livestock b/	1979 Periods of Use c/	Use Areas Other than Sonoma-Gerlach Resource Area d/	Permittee's Yearlong Dependency e/	Permittee's Critical Period Dependency f/	Last Three to Five Year's Average Use (AUMs)	1979 Licensed Livestock Use (AUMs)	Active Preference (AUMs)
North Buffalo	VV	1250S) 2000S) 850S) 1850S) 2000S) 1900S)	03/12-03/14) 03/31-04/14) 04/01-04/05) 04/02-04/06) 04/06-04/20 & 11/16-11/17 & 11/18-11/19) 11/17-11/18)	PV, EL, BM, PD	2	3	461	461	1,194
	ZZ	600S) 725S) 250S)	03/01-03/15) 12/16-02/28) 01/16-02/28)	PV, EL, BM, FS	6	0	502	410	2,100
Pleasant Valley	Y	213C) 84C)	04/01-09/30) 10/01-11/30)	PV	57	100	1,446	1,328	1,456
	JJ	337C) 228C) 25C)	04/01-08/31) 09/01-11/30) 12/01-12/31)	PV	59	100	2,391	2,391	2,677
	QQ	60C) 160C) 180C) 8C)	03/01-03/31) 04/01-04/30) 05/01-10/31) 11/01-11/30	PV	61	100	1,308	1,888	1,308
	AA	384C) 240C)	03/01-09/30) 10/01-12/31)	PV	74	100	3,408	3,192	4,951
Pole Canyon	BB	108C	05/01-09/30	PV, SU	42	80	540	0	540
Prince Royal	MM	28C	05/01-06/30	PV, PD	17	40	56	0	56
	LL	2100S	06/29-07/05	PV	<1	1	97	95	97
Pumpernickel	PP	30C) 110C)	10/01-03/31) 04/01-09/30)	PV	64	100	840	840	840
	NN	75C) 33C)	03/01-08/31) 11/01-02/28)	PV	65	100	582	582	582
	CC	175C) 334C) 175C)	03/01-03/11) 04/01-04/30) 11/01-02/18)	PV, FS	30	20	1,209	1,212	1,212
	ZZ	660S) 1500S) 1500S) 1300S)	03/01-04/30) 10/04-11/10) 10/05-01/15) 11/01-01/28)	PV, EL, BM, FS	13	20	2,326	2,008	6,806
Ragged Top	C	87C	06/01-09/30	PV	15	22	157	156	155
	Q	1835S	12/01-03/05	PV, SU	0	0	0	0	0
	LL	1648S	12/20-03/20	PV	3	0	627	539	0
Rawhide	X	191C	02/01-11/30	PV	82	89	1,870	2,139	2,139
	Y	27C	04/01-11/30	PV	67	100	216	224	220
	AA	38C	03/01-12/31	PV	73	97	331	331	362
	LL	Exchange of Use Only		PV	-	-	-	-	-
Rochester	LL	2100S-	03/28-04/04	PV	<1	1	112	112	1,400
	AA	Non-Use	03/01-12/31	PV	0	0	0	0	400
	X	120C	03/01-11/30	PV	74	99	1,069	1,386	1,386
	GG	65C	03/01-02/28	PV, CA, EL	100	100	778	778	778
Rock Creek	CC	488C) 160C)	05/01-08/31) 09/01-10/15)	PV, FS	37	80	2,192	2,192	2,192
Rodeo Creek	J	150C) 835C)	11/01-04/30) 05/01-10/31)	PV	58	99	5,851	5,851	6,462
	L	255S) 245S)	03/01-03/16) 12/06-02/28)	PV, SU	5	0	163	166	169

TABLE 2-6

PRESENT LIVESTOCK GRAZING SITUATION

Allotment Name	Permittee a/	Approximate Numbers and Kind of Livestock b/	1979 Periods of Use c/	Use Areas Other than Sonoma-Gerlach Resource Area d/	Permittee's Yearlong Dependency e/	Permittee's Critical Period Dependency f/	Last Three to Five Year's Average Use (AUMs)	1979 Licensed Livestock Use (AUMs)	Active Preference (AUMs)
Rye Patch	EE	207C) 199C) 48C) 237C)	03/01-03/31) 05/01-08/31) 09/01-09/30) 10/20-02/28)	PV	55	60	1,577	1,844	1,816
	LL	1000S	08/06-08/30	PV	1	3	167	167	165
Seven Troughs	O	380C	03/01-02/28	PV	92	92	4,195	3,981	4,404
	UU	813S	01/01-03/31	PV, PD	5	0	488	1,280	1,492
	Q	2045S	12/02-03/20	PV, SU	6	0	1,500	1,600	3,267
Soldier Meadows	KK	21C) 1117C)	03/01-06/30) 07/01-02/28)	PV, SU, PD	26	100	3,423	9,018	16,070
Sonoma	CC	302C	05/04-10/03	PV, FS	42	78	1,510	1,510	1,510
South Buffalo	AAA	736C	03/01-02/28	PV, BM	100	100	8,839	9,530	9,035
	Y	15C	04/01-11/30	PV	0	0	0	120	122 g/
Star Peak	LL	45C) 90C) 135C) 40C) 945S) 495S) 945S)	03/01-03/15) 03/16-03/31) 04/01-10/31) 11/01-02/28) 04/05-06/28) 08/07-09/14) 09/15-10/01)	PV	19	28	2,140	2,425	2,426
	W	29C	04/01-09/30	PV	50	100	174	380	385
	MM	50C) 11C)	04/01-08/31) 09/01-09/30)	PV, PD	44	100	261	260	260
	R h/	100C	03/01-09/15	PV	54	100	650	0	650
Thomas Creek	A	148C) 188C)	04/16-05/15) 05/16-08/15)	PV	12	30	270	268	268
	YY	Exchange of Use Only		PV, PD	-	-	-	-	0
	SS	22C) 25C)	03/01-03/31) 04/01-06/30)	PV	32	0	97	97	97
	B	66C	04/01-07/31	PV	33	80	264	264	264
White Horse	I	470C) 200C) 125C	03/01-07/15) 07/16-07/31) 11/01-02/28)	PV, PD	35	79	1,970	2,317	1,970
Sonoma Planning Unit	34							57,735	71,189
Blue Wing Planning Unit	7							33,235	37,933
Buffalo Hills Planning Unit	7							34,365	43,363
Total	48	42,206 AUs			2,884	4,233	116,551	125,335	153,115
Average					38	56			

a/ Alphabetical code used to protect the privacy of allotment permittees.
b/ Numbers and kinds of livestock from 3 to 5 year average.
c/ Periods of use from 3 to 5 year average.
d/ PV = Private; FS = Forest Service; EL = Elko District, BLM; BM = Battle Mountain District, BLM; CA = Carson City District, BLM;
SU = Susanville District, BLM; PD = Paradise-Denio Resource Area, Winnemucca District, BLM.
e/ Yearlong dependency based on the formula: $\frac{\text{AUMs on Sonoma-Gerlach Resource Area (3-5 year average)}}{\text{Total Herd Size x 12 Months}}$
f/ Critical period based on the time from April 1-September 1, follows the formula:
$$\frac{\text{AUMs on Sonoma-Gerlach Resource Area between April 1 and September 1}}{\text{Total Herd Size x 5 months (April 1 - Sept. 1)}}$$

g/ Adjudicated preference in the South Buffalo Allotment - but since the construction of the Buffalo-Pleasant Valley fence, 1976, this use has been made north of that fence. The area north of this fence is now considered part of the Pleasant Valley Allotment.

h/ The operator sold the base property while the status of the grazing preference was under an appeal. The privileges were lost after litigation and no preference is attached to the base property at this time.

In the past, yearly permittee turnover within the Sonoma-Gerlach Resource Area has averaged approximately 25 percent. However, since the planning effort started within the resource area, ranch transfers have dropped down to approximately eight percent yearly, which is probably due to the insecurity of future levels of livestock grazing on public rangeland (personal communication with Sonoma-Gerlach Resource Area Manager).

The dependency of each permittee for grazing on the public land in the resource area is shown in Table 2-6. The livestock population in the resource area is estimated to be 32,700 animals (17,000 cattle and 15,700 sheep). Vegetation requirements for the estimated livestock population are 241,680 AUMs. Bureau administered public rangeland supplies 116,551 AUMs (based on three to five year average livestock licensed use) and 153,115 AUMs authorized livestock use (the amount of AUMs that could be authorized each year). This indicates a 38 percent yearlong dependence on public rangelands for average livestock licensed use. During the spring-summer grazing period (4/1 to 8/31) or critical period, dependence on public rangeland increases to approximately 56 percent for the average livestock licensed use. This small increase in dependence is characteristic of the Sonoma-Gerlach ranching operations, because many of the livestock operators allow their livestock to graze public range on a year-round basis. Those that do remove their livestock generally do so for only two months in the winter. Consequently, the high dependence on the public rangelands for summer grazing, which is characteristic of other districts, is not the case in the Sonoma-Gerlach Resource Area because the extended grazing period spreads dependence fairly evenly throughout the year.

WILDLIFE

There is a wide variety of wildlife species inhabiting the Sonoma-Gerlach Resource Area; however, only those species or groups of species likely to be significantly affected by the proposed action or alternatives will be addressed here. For a complete listing of all vertebrate species known or believed to occur in the resource area, refer to the Physical Profile sections of the various Unit Resource Analyses prepared for the resource area.

BIG GAME

Three species of big game animals inhabit the Sonoma-Gerlach Resource Area. These are the mule deer, the pronghorn antelope, and the California bighorn sheep. The mule deer is by far the most abundant and widespread, followed by the pronghorn. The bighorn sheep currently exists in very low numbers in one mountain range, but was once abundant and widespread. The mule deer and the pronghorn antelope occupy much the same areas in the western third of the resource area, but the antelope is largely absent from the remainder of the area. Refer to the Big Game Distribution Maps for information on occupied or potentially occupied areas.

Throughout their ranges, big game animals compete with domestic livestock for forage, and in many areas, they also compete with wild horses and/or burros. The degree of this competition varies from area to area, depending on the condition and makeup of the plant communities present and the time of occupancy. There is some natural separation of areas of use by the various wild and domestic animals, and some differences in dietary selection, but in essence, all herbivores are competing for the same limited resources.

Mule Deer

Mule deer occupy every major and most minor mountain ranges in the Sonoma-Gerlach Resource Area. They are found in all but two grazing allotments, though in very low numbers in some. Deer numbers have fluctuated considerably in recent years, but are presently at relatively high levels. These high numbers are the result of improved harvest management (initiated by Nevada Department of Wildlife) and a series of relatively mild winters which have allowed higher fawn survival. There are at present approximately 3,929 mule deer on public land within the resource area (which is essentially reasonable numbers). This is only an approximation, since accurate counts cannot be made, and since deaths, emigration, and immigration occur throughout the year, and because populations could be greatly reduced through the effects of climate or other factors. Table 2-7 shows approximate existing deer numbers by allotment.

There are, at present, 3,550 AUMs of vegetation allocated for mule deer in the Sonoma-Gerlach Resource Area. However, 2,666 of these AUMs are within the Soldier Meadows Allotment. The remaining 884 are divided as follows: 400 in the Blue Wing Allotment, and 484 in the allotments around the Humboldt Range. Most allotments have no vegetation allocation for deer, even though deer use most of them.

There have been no terrestrial wildlife habitat inventories conducted within the Sonoma-Gerlach Resource Area, and this prevents quantifying deer habitat as to amounts in various condition classes. Generally, summer deer ranges are in somewhat

TABLE 2-7
EXISTING STATUS OF BIG GAME

Allotment	Species	Estimated Existing Number a/	Seasonal Use b/	Population Trend c/	Conflicts d/
Blue Wing	Mule Deer	288	Summer (05/01-10/31) Yearlong (01/01-12/31)	Up	Excessive livestock, wild horse, burro use; probable spring competition for grass lack of quality browse, forbs; poor riparian condition.
Buffalo Hills	Mule Deer	2093	Summer (05/01-10/31) Winter (12/01-04/30) Spring (03/01-05/30) Yearlong (01/01-12/31)	Up	Competition from livestock on spring and winter ranges; wildfires; lack of forbs; poor riparian, meadow, aspen condition.
	Antelope	263	Winter (10/16-04/15) Yearlong (01/01-12/31)	Up	
	Bighorn Sheep	6	Yearlong (01/01-12/31)	Unknown	
Calico	Mule Deer	15	Yearlong (01/01-12/31)	Down	Excessive livestock and wild horse use; poor riparian condition; lack of forbs, quality browse.
	Antelope	9	Yearlong (01/01-12/31)	Up	
Clear Creek	Mule Deer	17	Summer (05/01-10/31) Winter (11/01-04/30)	Static to Slightly up	Excessive livestock use; poor riparian, aspen, meadow condition.
Coal Canyon/Poker	Mule Deer	40	Summer (05/01-10/31) Yearlong (01/01-12/31)	Up	Excessive livestock, wild horse use; poor meadow, riparian condition.
Cottonwood Canyon	Mule Deer	7	Yearlong (01/01-12/31)	Up	Excessive livestock use; limited browse, forb supply; dense pinyon-juniper.
Coyote	Mule Deer	12	Winter (01/01-12/31) Spring (03/01-05/30)	Up	Livestock competition in use pastures; poor forb production.
	Antelope	98	Yearlong (01/01-12/31)	Up	
Desert Queen	-	-	-	-	-
Diamond S	Mule Deer	12	Summer (05/01-10/31) Winter (11/01-04/30)	Static to Slightly up	Excessive livestock and wild horse use; poor riparian, aspen condition.
Dolly Haden	Mule Deer	28	Summer (05/01-10/31) Yearlong (01/01-12/31)	Up	Poor summer range condition, lack of forbs, quality browse.
Goldbanks	Mule Deer	38	Summer (05/01-10/31) Yearlong (01/01-12/31)	Up	Poor browse composition, over use of meadows, riparian.
Harmony	Mule Deer	9	Summer (05/01-10/31) Winter (11/01-12/310	Static to Slightly up	Excessive livestock use; poor riparian, aspen condition.
Humboldt House	Mule Deer	28	Summer (05/01-10/31) Yearlong (01/01-12/31)	Up	Excessive livestock, wild horse use; poor riparian condition.
Humboldt Sink	Mule Deer	1	Yearlong (01/01-12/31)	Static	Poor forage composition; excessive livestock use.
Jersey Valley	Mule Deer	20	Yearlong (01/01-12/31)	Up	Dense pinyon-juniper; excessive livestock use, wild horse use.
Klondike	Mule Deer	23	Summer (05/01-10/31) Yearlong (01/01-12/31)	Up	Excessive livestock, wild horse use; poor meadow, riparian condition; poor summer range condition.
Leadville	Mule Deer	59	Winter (01/01-12/31) Spring (03/01-05/30) Yearlong (01/01-12/31)	Up	Excessive livestock, wild horse use; poor meadow condition probable competition in use pastures.
	Antelope	16	Yearlong (01/01-12/31)	Up	
Licking	Mule Deer	4	Summer (05/01-10/31) Winter (10/31-04/30)	Static to Slightly up	Excessive livestock use; poor riparian condition.
Majuba	Mule Deer	23	Yearlong (01/01-12/31)	Up	Poor meadow, riparian condition; poor forage composition.
	Antelope	9	Yearlong (01/01-12/31)	Static to down	
Melody	-	-	-	-	-

TABLE 2-7
EXISTING STATUS OF BIG GAME

Allotment	Species	Estimated Existing Number a/	Seasonal Use b/	Population Trend c/	Conflicts d/
North Buffalo	Mule Deer	1	Winter (11/01-04/30)	Static to Slightly up	Excessive livestock use; poor riparian condition
Pleasant Valley	Mule Deer	146	Summer (05/01-10/31) Yearlong (01/01-12/31)	Up	Excessive livestock, wild horse use; poor riparian, aspen condition.
Pole Canyon	Mule Deer Antelope	5 2	Yearlong (01/01-12/31) Yearlong (01/01-12/31)	Static Static to down	Poor riparian, aspen condition; excessive livestock, wild horse use.
Prince Royal	Mule Deer	19	Summer (05/01-10/31) Yearlong (01/01-12/31)	Up	Excessive livestock use of riparian areas, poor forage composition.
Pumpernickel	Mule Deer	35	Summer (05/01-10/31) Winter (11/01-04/30) Yearlong (01/01-12/31)	Up	Excessive livestock use of riparian, aspen, meadow areas.
Ragged Top	Mule Deer	30	Yearlong (01/01-12/31)	Up	Poor vegetation composition; poor water availability.
Rawhide	Mule Deer	35	Yearlong (01/01-12/31)	Up	Excessive livestock use; poor forage composition.
Rochester	Mule Deer	19	Yearlong (01/01-12/31)	Up	Excessive livestock use; pinyon-juniper encroachment.
Rock Creek	Mule Deer	13	Summer (05/01-10/31) Winter (11/01-04/30)	Static to Slightly up	Excessive livestock, wild horse use of riparian meadow, aspen habitat; probable competition in spring,winter.
Rodeo Creek	Mule Deer Antelope	58 28	Yearlong (01/01-12/31) Yearlong (01/01-12/31)	Static Static to down	Poor riparian meadow condition; excessive livestock, wild horse use.
Rye Patch	Mule Deer	27	Summer (05/01-12/31) Yearlong (01/01-12/31)	Up	Excessive livestock, wild horse use, poor meadow, riparian condition.
Seven Troughs	Mule Deer Antelope	204 1	Summer (05/01-10/31) Yearlong (01/01-12/31) Yearlong (01/01-12/31)	Up Static to down	Excessive livestock, wild horse and burro use; lack of quality browse, forbs; poor riparian condition; mining activity.
Soldier Meadows	Mule Deer Antelope	249 90	Summer (05/01-10/31) Winter (11/01-04/30) Yearlong (01/01-12/31) Summer (05/01-10/31) Yearlong (01/01-12/31)	Down Up	Excessive use of some riparian, meadow habitat; past excessive use by wild horses.
Sonoma	Mule Deer	13	Summer (05/01-10/31) Winter (11/01-04/30)	Static to Slightly up	Excessive livestock, wild horse use; poor aspen, riparian, meadow condition; human disturbance.
South Buffalo	Mule Deer	157	Summer (05/01-10/31) Yearlong (11/01-04/30)	Up	Excessive livestock, wild horse use; poor riparian, meadow, aspen condition, poor forb production.
Star Peak	Mule Deer	179	Summer (05/01-10/31) Yearlong (11/01-04/30)	Up	Excessive livestock, wild horse use; poor riparian, meadow, aspen condition; mining disturbance.
Thomas Creek	Mule Deer	8	Summer (05/01-10/31) Winter (11/01-04/30)	Static to Slightly up	High recreational use; poor riparian, aspen condition; excessive livestock, wild horse use.
White Horse	Mule Deer	14	Summer (05/01-10/31) Yearlong (01/01-12/31)	Up	Excessive livestock, wild horse use; poor riparian, meadow condition; lack of quality summer forage.

a/ Existing big game numbers were supplied by Nevada Department of Wildlife (NDOW) for their management units. The procedure outlined in Appendix A, Section 2 was used to apportion these numbers by allotment.

b/ Dates of use given are approximate; they may vary considerably depending on annual climatic fluctuations.

c/ Population trends were taken from NDOW publications and other information supplied by NDOW.

d/ Conflicts were obtained from NDOW publications, Bureau of Land Management studies and records, and professional observation.

Source: U.S. Department of Interior, Bureau of Land Management, Winnemucca District Files, 1980.

better condition than winter or spring deer ranges because they receive more precipitation. The additional precipitation permits greater vegetation production, providing cover and forage in larger amounts and of higher quality than on winter deer ranges. However, even on summer deer ranges, forb production is usually low, the exception being years of high spring precipitation. Many summer ranges lack preferred forage species such as bitterbrush, mountain mahogany, snowbush ceanothus, and serviceberry. This, coupled with the lack of forbs and with competition with livestock and wild horses and burros, often means deer are in less than good condition when they leave summer ranges.

Deer winter ranges are generally in poor condition. Most are used yearlong by livestock and/or wild horses and burros, and they are seriously affected by wild fires and man's activities. Most winter ranges produce little in the way of preferred browse species, and deer often compete with other herbivores for what forage is available.

The only identified mule deer spring ranges in the resource area lie along the lower slopes of the Granite Range. Mule deer are known to use these ranges heavily during the early spring months, when they seek the first green grass of the year. These areas are also used heavily by domestic livestock, and competition for this green grass can be severe.

Deer make considerable use of specific habitat types that are often intermingled, in small acreages, within the broad habitat types. These specific habitat types include aspen groves, riparian zones, mahogany groves, and meadows. Deer use these sites as fawning, thermal (protection against climatic extremes) and hiding cover, and as sources of forage. These areas are generally in poor condition throughout the resource area, partially because of excessive use by large herbivores. Aspen and mahogany reproduction is inhibited because suckers and seedlings are repeatedly browsed off, and understory vegetation is heavily grazed. Meadows and riparian areas are often gullied because excessive grazing removes vegetation cover, allowing excessive erosion.

Most deer migration in the resource area is altitudinal; deer simply go up the mountains in summer, and descend to the lower slopes and valley edges in winter. In only two areas are significant migrations into and out of the resource area known to occur. In both cases, deer from outside the resource area migrate into it for the winter, then return to summer ranges outside. Deer from California migrate into the Buffalo Hills each winter, and deer from the Sheldon Antelope Range, and perhaps from Mahogany Mountain in the Susanville District, move into the Warm Springs Canyon area each winter.

A number of deer concentration areas are known to exist within the resource area. The entire Granite Range has high numbers of deer, but the northern (around Fox Mountain) and southern areas (Granite Peak vicinity) hold high concentrations, the upper elevations in summer, the lower elevations in winter and spring. In the northwest, the Mahogany Creek drainage holds large numbers of deer in the summer, and the northern extreme of the Sonoma Range (near Winnemucca) holds large numbers of deer during the winter, while the higher elevations between Pole Creek and Rock Creek have high concentrations of deer during the summer. The lower areas around Rock and Clear creeks (Sonoma Range), North and South Hog canyons (Tobin Range), and Buena Vista Creek (Humboldt Range) have concentrations of deer during the winter.

Antelope

With the exception of a small herd found north of Rye Patch Reservoir, antelope are found only in the western one-third of the resource area. At one time, however, they undoubtedly occupied most of the resource area. Within recent time, a small herd that used the Porter Springs area has disappeared (NDOW 1980). Table 2-7 gives antelope numbers by allotment.

Antelope populations are currently at record or near record levels in all areas except in the Rye Patch area, where only a few antelope remain (this has never been a large herd) (NDOW 1980). These record high numbers of antelope are, to some extent, the result of improved censusing techniques. However, there is no doubt that there has been considerable growth in antelope numbers since 1972. At the present time, there is a yearlong average of approximately 516 antelope using the resource area. This number is only approximate because of births, deaths, and migrations, all of which greatly affect the number of antelope present at any one time. Migration especially affects antelope numbers, since there is a considerable seasonal movement in the Buffalo Hills area. Summer and winter populations vary considerably in this area.

Antelope feed heavily on browse species during most seasons, but will take large quantities of forbs in the spring and summer if they are available. Antelope take very little grass (Sundstrom et al. 1973). Preferred browse species such as bitterbrush are not abundant in most antelope ranges in the resource area, and forbs are seldom available. Antelope must compete with livestock and/or wild horses and burros for available forage, and must often take nonpreferred forage when preferred forage is used by other herbivores. Antelope presently have an allocation of 2,880 AUMs in the resource area. However, 2,400 of these AUMs are allocated in the Soldier Meadows Allotment, where only 429 AUMs are needed, while 480 are in the Buffalo Hills Allotment, where 1,106 are needed. Other allotments used by antelope have no allocation for them.

Again, there are no terrestrial habitat inventories in the Sonoma-Gerlach Resource Area that would allow the division of antelope range into various condition classes. Using data from the Vegetation Section, Chapter 2, almost 74 percent of the area in those allotments in which antelope occur is in fair (28.8 percent) or poor (44.9 percent) condition. Most of the area in these same allotments (72 percent) is in a downward trend. While these figures may not be directly applicable to antelope habitat, they are undoubtedly reflective of antelope habitat conditions.

Antelope use meadows as sources of forbs. Forbs in meadows retain succulence and nutritive value longer into the summer than do those in surrounding rangelands because of the greater amounts of water available, even on "dry" meadows. Domestic livestock and wild horses also use meadows, usually heavily. Where livestock and wild horses and burros have access to meadow habitat, it is invariably closely cropped, with much bare ground, and often with deep gullies which effectively lower the water table. Only where meadows are protected from livestock and/or wild horses and burros do meadows approach their potential in production and habitat condition.

There is a considerable amount of seasonal antelope migration within, into, and out of the resource area. There are no known established routes for these migrations; they are generally from one seasonal range into an adjoining seasonal range. Considerable numbers (approximately 140) of antelope from western Washoe County winter in the Buffalo Hills area. This migration considerably increases the winter antelope population of the resource area over the summer population.

There are three antelope concentration areas in the resource area. These are: (1) in and around Warm Springs Canyon (winter), (2) Dolly Varden Basin and adjacent areas to the east (yearlong), and (3) northwest corner of the Buffalo Hills (winter). These areas are shown on the Big Game Distribution Maps.

Bighorn Sheep

California bighorn sheep presently occur only in the Granite Range, north of Gerlach. Four sheep (three ewes, one ram) were released in this area in March 1980, by the Nevada Department of Wildlife, in cooperation with the Bureau of Land Management. Two lambs have since been born, making a total of six sheep. California bighorn sheep occupied several mountain ranges in the resource area as recently as 1927, but they since have become extinct in the area. It is believed that competition with domestic livestock for forage, contraction of diseases from domestic livestock, and overhunting contributed to this extinction (Buechner 1960).

Nevada Department of Wildlife has identified 12 areas within the resource area as being suitable or potentially suitable for reintroduction of bighorn sheep (see Big Game Distribution Maps). It is estimated that public land in these areas could support 1,126 bighorn sheep, given suitable habitat conditions.

Bighorn sheep depend heavily on grass, taking few forbs and little browse (Wilson et al. 1978). They evolved using vegetation in a climax condition, with much more grass available then than now. This means that there must be considerable vegetation improvement for the sheep to do well. The exception would be the Granite Range where the recent introduction occurred; much of this area has received lighter than normal livestock use in recent years and has a higher than usual quantity of perennial grass present, at least at the higher elevations. The lower elevations, where the bighorn sheep would winter, are not in as good a condition because livestock have continued to use these areas.

UPLAND GAME

Sage Grouse

Sage grouse occupy most of the sagebrush areas of the Sonoma-Gerlach Resource Area. Nevada Department of Wildlife estimates that there is a base population in the resource area of approximately 5,500 grouse. At least 60 percent of these birds are found in the western third of the resource area. The remainder are found in small isolated populations scattered throughout the rest of the area (see the Sage Grouse Distribution Map). Sage grouse are very susceptible to the vagaries of spring precipitation, which can cause their numbers to decline or increase considerably from year to year (Call 1979).

The life cycle of sage grouse apparently revolves around four types of habitat: strutting grounds, nesting areas, brooding areas, and wintering grounds. Comparatively few strutting grounds have been located in the resource area; it is known that more exist since several areas occupied by grouse have no known strutting grounds. Most sage grouse nests occur within two miles of a strutting ground (Braun et al. 1977). The various areas of grouse habitat that have been identified to date are shown on the Sage Grouse Distribution Map.

These four habitats make up a habitat complex upon which sage grouse depend. The loss of any one component of the complex, or the degradation of all, means the loss of a grouse population. This is what has happened to several populations in the resource area. Overall habitat degradation has resulted in the apparent disappearance of several populations (NDOW 1980).

As an indication of this habitat degradation, the following figures are offered. Approximately 77 percent of the rangeland in the resource area is in fair or poor condition, and some 68 percent is in a downward trend (see Appendix J, Sections 1, 2). This indicates that habitat conditions for the grouse are generally bad, and getting worse. Nowhere is this more evident than on meadows. Grouse depend heavily on meadows as sources of forbs and water during the summer (Savage 1969). Only where meadows are protected from overuse by domestic livestock and wild horses and burros are the meadows in good condition and providing near their potential as sage grouse habitat. Where domestic livestock and/or wild horses and burros have unrestricted access to meadows, the meadow vegetation is invariably closely cropped and in a depauperate condition (many native meadow species are missing), and there is usually much bare ground. In addition, such meadows are subject to accelerated erosion, resulting in gullying and lowering of water tables. Such meadows provide only marginal sage grouse habitat.

OTHER WILDLIFE

There is a wide variety of small game and nongame wildlife species within the Sonoma-Gerlach Resource Area that is dependent on the "special features" of the overall area. Special features are such things as aspen groves, meadows, wet and dry riparian zones, and the like; in essence, a special feature is almost anything which provides habitat diversity in an otherwise arid, monotypic shrub habitat. It is the diversity of habitat provided by these special features that allows many wildlife species to inhabit the resource area.

Habitat diversity greatly influences the quality of wildlife habitat. This is especially true for songbirds and small mammals. Habitat diversity is of two types: among or between habitat types (where two or more habitat types meet, i.e., aspen and big sagebrush, or a cliff and a riparian area), and within habitat types (layering of vegetation, i.e., understory, midstory, and canopy). Within reasonable limits, the greater the habitat diversity, the greater the species abundance, and the greater the abundance of individuals of a given species.

Excessive use by domestic livestock, wild horses and burros, and wildlife has decreased habitat diversity within the resource area. Loss of diversity among habitats has occurred through overgrazing of meadows, which allows excessive erosion and sagebrush encroachment. The same thing has occurred in aspen groves, where understory vegetation has been greatly reduced through grazing or browsing; carried on long enough, this leads to complete loss of understory and midstory vegetation and eventually to canopy loss through loss of aspen reproduction.

It is not known if this loss of habitat diversity has resulted in the complete elimination of any species from the resource area, but it is entirely possible that it has done so. Habitat alteration was undoubtedly a contributing factor in the extinction of bighorn sheep populations in the resource area, and it is known to be a contributing factor in the decline of some species in Nevada. There is no doubt that the continued excessive grazing use of such special feature habitats will result in the eventual loss of numerous wildlife species in the resource area.

THREATENED OR ENDANGERED SPECIES

There are no known federally listed threatened or endangered terrestrial species of wildlife in the Sonoma-Gerlach Resource Area.

AQUATIC HABITAT

Habitat for the fishery resource in the Sonoma-Gerlach EIS Area consists of 29 rivers and streams, 2 lakes, 5 reservoirs, and a series of warm springs (Tables 2-8 and 2-9).

There are a total of 335 stream miles in the EIS area, and 142 of these are on public land. The public stream miles were surveyed for habitat condition, and 68 percent were in fair or poor condition (Stream Survey conducted by BLM, 1977) (Table 2-10, and Perennial Streams and Sensitive Plants Map). The common cause is overgrazing of the riparian zone by livestock. Most of the data on species occurrence were collected in 1954, and it is strongly suspected that many of the streams no longer support a fishery. Some streams have been eliminated from the Nevada Department of Wildlife stocking program because of poor habitat condition. Approximately four streams, which are in good

TABLE 2-8

LOCATIONS AND PHYSICAL CHARACTERISTICS OF THE STREAMS IN THE SONOMA-GERLACH RESOURCE AREA

Stream	Planning Unit	Valley or Mountain Range	Total Length (miles)	BLM Administered (approx. miles)	Game Species Present	Stream Condition % Optimum a/	Bank Stability % Optimum	Current Conflicts
Cottonwood Creek	Buffalo Hills	Granite Mountains	9.0	3.0	0	61	74	Livestock
Granite Creek		Granite Mountains	5.0	2.0	BNT (?)	45	88	Livestock
Mahogany Creek		Black Rock Range	12.0	6.0	LT	74	95	
Mud Meadow Creek		Mud Meadow Valley	36.0	Mostly Public				Livestock
Negro Creek		Granite Mountains	14.0	2.0	BT			Livestock
Red Mountain Creek		Granite Mountains	16.0	4.0	BNT, BT	58	63	Livestock
Rock Creek		Granite Mountains	6.0	3.0	0	65	94	Livestock
Donnelly Creek		Calico Mountains	11.0	9.0	0	54	76	Livestock
Slum Gullion Creek		Black Rock Range	10.0	8.0	0	46	55	Livestock, horses
Snow Creek		Black Rock Range	6.0	3.0	LT (?)	56	77	Livestock, horses
Soldiers Creek		Black Rock Range	10.0	8.0	Unknown	59	53	Livestock, horses
Summer Camp Creek		Black Rock Range	4.0	2.0	LT	73	99	Livestock
Buena Vista Creek	Sonoma	Humboldt Range	7.0	4.0	BT, RT	51	68	Livestock, mining
Bushee Creek		Tobin Range	7.0	6.0		34	43	Livestock
Clear Creek		Sonoma Range	10.0	8.0	BT, RT	59	78	Livestock
Cottonwood Creek		Humboldt Range	5.0	3.0	BT	63	88	Livestock, mining
Coyote Creek	Sonoma	Humboldt Range	5.0	4.0	BNT, BT, RT	49	72	Agriculture
El Dorado Canyon		Humboldt Range	4.0	2.0		58	88	Livestock
Golconda Canyon		Tobin Range	5.0	3.0		26	26	Livestock, mining
Hoffman Canyon Creek		Tobin Range	5.0	4.0	BT, CT, RT	52	53	Livestock, mining
Humboldt River		Humboldt River Valley	85.0	(0)	LB, WCR, BB, BNT, CC, RT, WP, SP, YP	-	-	-
Indian Creek		Humboldt Range	6.0	3.0	BT	64	92	Livestock
Pole Creek		Sonoma Range	11.0	6.0	BT	68	89	-
Rock Creek		Sonoma Range	14.0	2.0	BT, LT	-	-	-
Rocky Creek		Humboldt Range	5.0	4.0	BNT, BT, RT	53	88	Livestock
Sonoma Creek		Sonoma Range	6.0	6.0	RT, BT	66	78	Livestock
Star Creek		Humboldt Range	6.0	2.0	BNT, BT, RT	46	73	Livestock, mining
Thomas Canyon		Sonoma Range	8.0	3.0	BT	76	77	Livestock
Water Canyon	Sonoma	Sonoma Range	7.0	2.0	RT	56	72	Livestock, woodcutting, recreation

a/ Stream Condition Classification (Based on % of Habitat Optimum)
70% - above = Excellent
60% - 69% = Good
50% - 59% = Fair
49% - below = Poor

FISH KEY

BB = Black bullhead
BNT = Brown trout
BT = Brook trout
CC = Channel catfish
LB = Largemouth bass
LT = Lahontan cutthroat trout
RT = Rainbow trout
SP = Sacramento perch
WCR = White crappie
WP = Walleye pike
YP = Yellow perch

Source: U.S. Department of the Interior, Bureau of Land Mangement, Winnemucca District, Sonoma, Blue Wing and Buffalo Hills Unit Resource Analyses 1979.

TABLE 2-9

LOCATIONS AND PHYSICAL CHARACTERISTICS OF RESERVOIRS
IN THE SONOMA-GERLACH RESOURCE AREA

Lake/Reservoir	Valley or Mountain Range	Surface Acres	Volume Acre/ Feet	Ownership	Fish Species Present	Conflicts (acres) and Type
Red Mountain Reservoir	Granite Range	30.0	-	Private	BNT, LB, BNB, LTC	Livestock use, Waterfowl
Van Vleck Reservoir	Soldier Meadows	250.0	2,750	Private	SMB, TS, LTC, LR	
Squaw Valley Reservoir	Smoke Creek Desert	47.0	1,200	Private	RT, RB, GS, LB	Livestock use
Summit Lake	Black Rock Mountains	560.0	5,000	Indian Reservation	LR, LT	
Soldier Meadows Hot Springs	Black Rock Desert	10 Sections	-	Mostly Private	DD	Geothermal potential 10 sections of dace habitat
Rye Patch Reservoir	Humboldt River	11,400.0	171,000	-	BB, BNB, BNT, CC, GS, LB, RT, SP, WBA, WCR, WP, YP, WC	Agricultural, Sewage disposal
Sonoma Lake	Sonoma Mountains	1.0	-	-	None	Winterkill

FISH KEY

B = Bluegill
BB = Black bullhead
BNB = Brown bullhead
BNT = Brown trout
BT = Brook trout
CC = Channel catfish
CT = Cutthroat trout

DD = Desert dace
GS = Green sunfish
LB = Largemouth bass
LR = Lahontan redshiner
LT = Lahontan cutthroat trout
LTC = Lahontan tui chub
RT = Rainbow trout

SMB = Smallmouth bass
SP = Sacramento perch
TS = Tahoe sucker
WBA = White bass
WC = White catfish
WCR = White crappie
WP = Walleye pike
YP = Yellow perch

Source: U.S. Department of the Interior, Bureau of Land Management, Winnemucca District, Sonoma, Blue Wing, and Buffalo Hill,s Unit Resource Analyses 1979.

TABLE 2-10

SUMMARY OF STREAM CONDITION IN THE SONOMA-GERLACH RESOURCE AREA

Condition	Class	Number of Streams in Class	Total Number of Miles in Class	Number of Public Miles in Class	Percent of Surveyed Public Stream Miles in Class
Excellent	70+	3	24	11	10
Good	60-69	6	43	24	22
Fair	50-59	10	81	48	45
Poor	49	6	38	25	23
No Data	-	4	149	34	
Total		29	335	142	100

Source: U.S. Department of the Interior, Bureau of Land Management, Winnemucca District, Sonoma, Blue Wing, and Buffalo Hills Unit Resource Analyses 1979.

condition and accessible to the public, are stocked regularly by the Nevada Department of Wildlife. The major river which drains approximately 35 percent of the EIS area is the Humboldt River. It is a slow moving, warmwater river that contains warmwater fish species (Table 2-8). The Humboldt River system is a closed system which begins in eastern Nevada and drains into the Humboldt Sink located in the southern portion of the Winnemucca BLM District.

The majority of the streams in the EIS area are small, coldwater mountain streams, 3 to 6 feet wide, which disappear into the water table soon after leaving the mountains. There are approximately 260 miles of this type of stream, both public and private, which support, or if the habitat condition were improved, could support a sport fishery.

There are two lakes and four reservoirs totaling approximately 12,288 surface acres (Table 2-9). The major reservoirs were constructed by private individuals or groups to store irrigation water. For the most part the reservoirs are located on private land. Sonoma Lake is subject to winter freezeout and not suitable as fish habitat. Summit Lake is located on the Summit Lake Indian Reservation. It contains a population of Lahontan cutthroat trout.

The only native sport fish in the EIS area is the Lahontan cutthroat trout which has been federally designated a "threatened" species. Summit Lake and its tributaries, Mahogany Creek and Snow Creek, support one of the few self-reproducing populations of lake run Lahontan cutthroat trout left in the world. This species originally evolved as a lake dwelling fish that spawned in small coldwater feeder streams. Within the EIS area this type of habitat occurs only in the Summit Lake system. Parts of Mahogany Creek and Snow Creek flow through public land. The upper watershed of Mahogany Creek has been designated the Lahontan Cutthroat Trout Natural Area and part of it has been fenced to exclude livestock. All other sport fish species existing and currently being stocked in the EIS area are native to other parts of the United States or the world.

The desert dace, a native species of minnow, is found only in a few warm springs in Soldier Meadows Valley in the northern end of the EIS area. This fish has been designated as a "rare" species by the Nevada Department of Wildlife and is under review by the U.S. Fish and Wildlife Service.

WILD HORSES AND BURROS

Wild horses are currently found on 22 use areas and burros on 7 of those areas in the Sonoma-Gerlach Resource Area (Wild Horse and Burro Use Area Map). See Table 2-11 for use areas and allotments involved. Eight areas are within the checkerboard land pattern, where every other section of land is privately owned (see Table 1-12). These areas as shown on the Wild Horse and Burro Use Area Map have an estimated population of 3,182 wild horses and 48 wild burros.

The various use areas are close to each other. This lends itself to migration of horses and burros between these areas. The Wild Horse and Burro Use Area Map shows suspected migration routes between areas.

There are an estimated 5,372 wild horses and 129 wild burros currently in the Sonoma-Gerlach Resource Area compared to 3,100 horses and 43 burros estimated in 1971, when the Wild and Free Roaming Horse and Burro Act was signed into law. In the Winnemucca District, there are approximately 7,817 wild horses and 179 burros presently compared to between 3,943 and 4,108 horses and burros in 1971. Statewide, there are between 34,980 and 36,252 wild horses and 1,562 and 1,619 burros presently while in 1971 there were between 15,389 and 16,529 horses and 769 and 826 burros. Nationwide there is a range between 69,509 and 72,037 wild horses and burros compared with an estimated 43,890 to 47,140 in 1971 (see Appendix K, Section 2). Consequently, the Sonoma-Gerlach Resource Area has 68 percent of the wild horses and burros in the District, approximately 15 percent of the statewide population and 8 percent of the nationwide population.

Data collected in 1977 from captured horses has shown a wide variety of colors within the districts horse populations. The colors documented include Appaloosa, Bay, Black, Brown, Buckskin, Chestnut, Gray, Palomino, Pinto, Roan, and Sorrel. The most prevalent of the above colors are Bay, Black, Brown and Sorrel. In the Winnemucca District there were 2,129 horses gathered between July of 1979 and January of 1980. In the four independent gatherings a total of 26 horses (one percent) died at the trap site. A total of 155 (seven percent) died at the holding facility or after adoption. It is impossible to estimate how many of these horses would have died naturally from old age, malnutrition, disease, or parasites, but it is assumed that a number of the 181 would have died from natural causes.

Accurate figures concerning populations, yearly increases, and birth and death rates are difficult to estimate. The annual increase for the wild horse population is estimated to be between 4 and 13 percent (Wolfe 1980). Using computer simulation of a hypothetical horse population, Wolfe assumed a fedundity (foals per female) rate of one foal per female over four years old, 70 to 90 percent foal

TABLE 2-11
CURRENT WILD HORSE AND BURRO USE AREAS

Use Area	Allotments	Percent of Use Area in Allotment	Estimated Number of Animals a/	Class	Vegetation Use (AUMs) e/
Antelope Range c/	Majuba	63	136	Horse	1,632
	Seven Troughs	37	67	Horse	804
Augusta Mountains	Jersey Valley	100	78	Horse	936
Black Rock (West)	Soldier Meadows	100	259 b/	Horse	3,108
Blue Wing Mountains	Blue Wing	100	53	Horse	636
			32	Burro	384
Buffalo Hills	Buffalo Hills	100	128 b/	Horse	1,536
Calico Mountain	Buffalo Hills	23	97 b/	Horse	1,164
	Calico	13	29	Horse	348
	Leadville	34	70	Horse	840
	Soldier Meadows	30	53	Horse	636
East Range c/	Dolly Haden	26	238	Horse	2,856
	Goldbanks	5	75	Horse	900
	Klondike	18	154	Horse	1,848
	Pleasant Valley	19	153	Horse	1,836
	Rawhide	10	39	Horse	468
	Star Peak (East)	13	118	Horse	1,416
	White Horse	9	205	Horse	2,460
Fox and Lake Range	Pole Canyon	8	16	Horse	192
	Rodeo Creek	92	91	Horse	1,092
Granite Range	Buffalo Hills	100	121	Horse	1,452
Humboldts c/ & d/	Coal Canyon-Poker	19	214	Horse	2,568
	Humboldt House	7	5	Horse	60
	Prince Royal	5	0		0
	Rawhide	11	102	Horse	1,224
	Rye Patch	4	41	Horse	492
	Rochester	36	153	Horse	1,836
	Star Peak (West)	18	184	Horse	2,208
Kamma Mountains	Seven Troughs	100	16	Horse	192
			1	Burro	12
Lava Beds	Blue Wing	88	779	Horse	9,348
	Blue Wing	12	23	Burro	276
	Seven Troughs	12	47	Horse	564
Nightingale Mountains	Blue Wing	100	260	Horse	3,120
Selenite Range	Blue Wing	100	5	Horse	60
			7	Burro	84
Seven Troughs c/	Blue Wing	27	62	Horse	744
			41	Burro	492
	Seven Troughs	73	224	Horse	2,688
			7	Burro	84
Shawave Mountains c/	Blue Wing	100	446	Horse	5,352
Sonoma Range c/	Clear Creek	31	41	Horse	492
	Diamond S (Button Point)	15	69	Horse	828
	Harmony	3	15	Horse	180
	Pumpernickel	16	12	Horse	144
	Rock Creek	19	34	Horse	408
	Sonoma	10	22	Horse	264
	Thomas Creek	6	16	Horse	192
Stillwater Range	Cottonwood Canyon	9	2	Horse	24
	Jersey Valley	8	2	Horse	24
	Pleasant Valley	13	4	Horse	48
	Rawhide	3	1	Horse	12
	Rochester	54	18	Horse	216
	South Buffalo	13	4	Horse	48
Trinity Range c/	Coal Canyon-Poker	29	7	Horse	84
	Majuba	4	4	Horse	48
	Ragged Top	48	182	Horse	2,184
	Rye Patch	19	27	Horse	324
Truckee Range c/	Blue Wing	43	5	Horse	60
	Desert Queen	57	59	Horse	708
Tobin Range	Goldbanks	10	4	Horse	48
	Pleasant Valley	41	5	Horse	60
	Pumpernickel	4	4	Horse	48
	South Buffalo	45	10	Horse	120
			107	Horse	1,284
Warm Springs Canyon	Soldier Meadows	100	18	Burro	216
			5,372	Horse	64,464
			129	Burro	1,548
TOTALS			5,501		66,012

a/ Numbers estimated from 1977 inventory using an 11 percent net annual increase. It should be noted that all wild horse and burro inventories were conducted from either fixed-wing aircraft or helicopter and that aerial surveys are at best a rough estimate of actual population size. Caughley (1974) found in his study and literature search that the closest an aerial survey ever came to the actual population size was 89 percent (see Sonoma-Gerlach Unit Resource Analyses).

b/ Numbers estimated from 1979 inventory.

c/ Areas within the checkerboard land pattern.

d/ There are two burros estimated to be in this area yearlong using 24 AUMs.

e/ Vegetation use (AUMs) was determined with the assumption that each animal used the vegetation for 12 months a year.

Source: U.S. Department of the Interior, Bureau of Land Management, Winnemucca District, Sonoma, Blue Wing, and Buffalo Hills Unit Resource Analyses (1979), Sonoma-Gerlach Management Framework Plan (1980), and Winnemucca District Office files.

survival, and 85 to 90 percent adult survival. For the purposes of this analysis an annual rate of increase of 11 percent was used to estimate wild horse and burro populations (see Appendix K, Section 1). Present health and condition is estimated to be fair, but probably ranges between very poor and good.

Vegetation presently has not been allocated to wild horses and burros within the resource area. The diet overlap among wild horses, burros and cattle is direct. There is less overlap of diets between horses and big game than between horses and cattle, but it does exist. A study in the Granite Range, Elko County, in northeastern Nevada, showed the dietary overlap for wild horses and deer was 3 percent, while the dietary overlap for horses and cattle was 77 percent (Nawa 1978). See Appendix K, Section 3 for further background data on diets.

The demand by livestock, wild horses, burros, and big game for vegetation in wild horse and burro areas significantly exceeds estimated annual vegetation production by 141 percent (Table 2-12). The result is deteriorating range condition and wild horse and burro herds that are more susceptible to adverse environmental changes (Appendix J). This was the case in the Buffalo Hills die-off in 1977 in the Sonoma-Gerlach Resource Area of the Winnemucca District, where an estimated 300 horses died of starvation.

VISUAL RESOURCES

The Sonoma-Gerlach Resource Area contains a variety of scenic qualities which have been classified into Visual Resource Management (VRM) classes following the procedures in BLM Manual 8400. The Winnemucca District files (8400) contain a discussion of management classes and their development. The resource area contains examples of four visual resource management classes. Appendix L, Section 1 can be consulted for the definitions of the VRM classes.

Approximately 8,820 acres are Class I, 476,220 acres are Class II, and 471,390 acres are Class III. The remainder of the resource area is Class IV. However, approximately 137,600 acres of Class II quality and 39,680 acres of Class III quality are located on playas where no grazing occurs. Table 2-13 shows VRM classes by allotment.

Visual class designations of III and IV denote varying degrees of generally average scenery or areas that are seldom seen and therefore not subject to significant impacts from visual change. Seedings are an exception in that they usually create a visual contrast greater than the acceptable level for a Class II area. Appendix L, Section 2, lists the average visual impacts of range improvements. The Visual Resource Management Classes Map illustrates by class.

CULTURAL RESOURCES

Presently 1,250 cultural resource sites are known to exist in the EIS area. For management purposes, sites have been classified into the following types: open aboriginal, rock shelters and caves, rock art, isolated finds and small sites, historic sites, permanent historic trails, explorer routes, and historic railroad routes. Site locations are plotted on maps in the Winnemucca District Office. The draft Class I inventories which have been completed for the Sonoma, Blue Wing, and Buffalo Hills Planning units contain site-specific information concerning location, ownership status, site description, significance, rating, condition, and existing protective and interpretive measures.

The inventory status for cultural resources in the EIS area is poor. Only .56 percent (23,788.16 acres) of the resource area has been intensively inventoried at a Class III level. In addition, 1.69 percent (72,187.18 acres) has been inventoried at a Class II level. No extensive, random sampling of the cultural resources in the Sonoma-Gerlach Resource Area has been undertaken to date, making it extremely difficult to make accurate, quantified, predictive statements.

Archeologically sensitive areas are identified for the Sonoma-Gerlach Resource Area and on file at the Winnemucca District Office. These are areas of high probability for finding sites--based on present data. The methodology utilized in determining archeologically sensitive areas and reservations concerning the use of these data in predicting site occurence are outlined in Appendix M, Section 1.

Several National Register properties are located in the EIS area. A segment of the Applegate-Lassen emigrant trail passes through the Blue Wing and Buffalo Hills Planning units. The Applegate-Lassen trail is a mile wide corridor and also includes four separate locations known as Lassen's grave, Fly Canyon, Hardin City and Soldiers Meadow or Camp McGarry Outpost. All of these are listed on the *National Register of Historic Places* as one site.

Also listed on the *National Register of Historic Places* are the Rye Patch Archeological District, Humboldt Cave and Leonard Rockshelter. The Lovelock Chinese Settlement and the Adobe at Rud-

TABLE 2-12

EXISTING VEGETATION (AUM) DEMAND
IN THE WILD HORSE AND BURRO USE AREAS
SONOMA-GERLACH RESOURCE AREA

Herd Use Areas	a/ Available Vegetation	b/ Big Game Demand	c/ Wild Horse & Burro Demand	d/ Livestock Demand	Total Demand
Antelope	2,211	0	2,436	1,694	4,130
Augusta Mountains	447	0	936	88	1,024
Black Rock (West)	9,580	0	3,108	2,616	5,724
Blue Wing Mountains	702	0	1,020	483	1,503
Buffalo Hills	9,478	141	1,536	1,200	2,877
Calico Mountains	10,643	40	2,988	6,247	9,275
East Range	13,319	165	11,784	14,776	26,725
Fox and Lake Range	5,717	0	1,284	5,490	6,774
Granite Range	7,627	166	1,452	2,861	4,479
Humboldts	5,587	329	8,388	8,896	17,613
Kamma Mountains	0	0	204	1,285	1,489
Lava Beds	5,607	50	10,188	4,911	15,149
Nightingale Mountains	1,038	0	3,120	1,691	4,811
Selenite Range	1,601	250	144	2,658	3,052
Seven Troughs	4,937	25	4,008	3,295	7,328
Shawave Mountains	1,591	25	5,352	2,174	7,551
Sonoma Range	7,626	0	2,508	9,713	12,221
Stillwater Range	2,735	94	372	1,950	2,416
Trinity Range	2,486	25	2,640	2,973	5,638
Truckee Range	372	0	768	2,524	3,292
Tobin Range	7,957	0	276	5,918	6,194
Warm Springs Canyon	8,583	0	1,500	2,255	3,755
TOTALS	109,844	1,310	66,012	85,698	153,020

a/ Available vegetation as determined by the recompliation of the 1947 and 1960's range surveys.
b/ Reasonable numbers of all big game species combined.
c/ Numbers estimated from 1977 aerial inventory using an 11 percent rate of increase and assuming each animal uses the vegetation for 12 months a year.
d/ Demand taken from Wild Horse section of Sonoma, Blue Wing, and Buffalo Hills Unit Resource Analyses.

Source: U.S. Department of the Interior, Bureau of Land Mangement, Winnemucca District, Sonoma-Gerlach Resource Area, Sonoma, Blue Wing, and Buffalo Hills Unit Resource Analyses 1979.

TABLE 2-13

VISUAL RESOURCE MANAGEMENT CLASSES
BY ALLOTMENT AND ACREAGES
IN THE SONOMA-GERLACH RESOURCE AREA

Allotment	VRM Class a/	Acreage
Blue Wing	II	19,840
	III	32,320
Buffalo Hills	II	104,320
	III	23,040
Calico	II	26,240
Clear Creek	III	5,760
Coal Canyon-Poker	II	10,240
	III	78,200
Coyote	III	3,840
Desert Queen	II	1,600
	III	29,440
Diamond S	II	7,680
	III	9,900
Dolly Hayden	II	3,200
	III	15,040
Harmony	III	4,800
Humboldt House	II	19,200
Humboldt Sink	II	2,560
	III	28,440
Leadville	II	6,400
Majuba	II	2,240
	III	6,720
Melody	III	4,480
North Buffalo	II	4,800
	III	15,680
Prince Royal	II	7,360
Pumpernickel	II	680
	III	19,840
Ragged Top	III	14,070
Rock Creek	II	300
	III	8,000
Rodeo Creek	III	28,800
Rye Patch	II	7,040
	III	60,800
Soldier Meadows	I	8,820
	II	108,200
Sonoma	III	14,700
Star Peak	II	1,920
	III	8,960
Thomas Creek	III	8,000
White Horse	II	4,800
	III	10,880b/

a/ For definition of VRM classes, consult Appendix L, Section 1.
b/ The rest of the resource area is rated as Class IV.

Source: U.S. Department of Interior, Bureau of Land Management, Winnemucca District, Sonoma-Gerlach Management Framework Plan, 1980 dell Ranch have also been determined eligible for the *National Register of Historic Places*.

The majority of the cultural resource sites in the EIS area are in a somewhat deteriorated condition due to vandalism, erosion, and/or grazing. Vandalism of sites takes several forms. The most prevalent of these is the locally popular recreational activity of "arrowhead hunting", which effectively robs archeological sites of important chronological indicators. Unauthorized excavation is another common source of resource deterioration. Rockshelters are particularly susceptible, but open sites are not immune either. Roads in the vicinity of cultural resource sites dramatically increase the potential for vandalism by providing access to sites.

Because historical and archeological sites are situated on or just below the ground surface they are susceptible to disturbance or destruction by ongoing erosional and weathering processes. All cultural resource sites in the EIS area have been subjected, to some degree, to the forces of natural erosion. In those areas where overgrazing and reduction of vegetation have occurred, accelerated erosion and deterioration of cultural resource sites has resulted.

Trampling by cattle and wild horses, as well as disturbances resulting from range development projects and wild horse traps, have caused deterioration to cultural resource sites in the past. A more detailed description of the impacts to cultural resources due to livestock, wild horse and range developments may be found in Appendix M, Section 2.

RECREATION RESOURCES

The recreation resources in the Sonoma-Gerlach Resource Area were identified and evaluated using the Recreation Information System (RIS) in BLM Manual 6111. Activities such as fishing, various types of hunting, winter sports, vegetation and mineral collecting, and various types of sightseeing were evaluated based on criteria set up to rate the quality of various locations in the resource area.

Although some areas are highly rated, usage in the resource area is generally light and dispersed, with the exception of the Black Rock Desert and the area surrounding it. Part of the desert is on the *National Register of Historic Places* and a large expanse has been nominated as a National Natural Landmark. The Black Rock Desert is enjoyed by rock hounds, history buffs, wild horse enthusiasts, seekers of solitude, people with geologic interests and others who enjoy recreating in the desert. Although not as heavily used as the Black Rock Desert, Mahogany Creek is important because it is designated a natural area. The creek is the spawning ground for a rare species of trout (see Aquatic Habitat section).

Visitor counts have not been conducted, but it is estimated that the resource area receives between 150,000 to 200,000 visitor days a year. A visitor day is 12 hours of site use, whether it is 12 people for one hour, one person for 12 hours or any combination between. Not all recreation activities would be affected by changes in grazing. Those that are expected to be influenced are hunting, fishing, and zoological sightseeing (viewing wild horses).

WILDERNESS POTENTIAL

A wilderness inventory, in accordance with Section 603(a) of the Federal Land Policy and Management Act (FLPMA), is currently being completed on the public lands within the Sonoma-Gerlach Resource Area. The Wilderness Inventory Handbook described procedures involved in conducting the inventory. Lands tentatively determined to possess wilderness characteristics via this inventory are referred to as proposed Wilderness Study Areas (WSAs). The State Director's decisions concerning location and acreage of each WSA was published on November 15, 1980. Unless formally protested, these decisions were scheduled to become final on December 15, 1980. However, some protests have been received and will be reviewed by the State Director.

Until Congress acts and officially designates wilderness areas, grazing, mining, and mineral leasing uses that existed on the date of approval of FLPMA (October 21, 1976) may continue in the same manner and degree as on that date, even if this impairs wilderness suitability. New or expanded activities will be allowed only if these uses meet the guidelines set forth in the Interim Management Policy and Guidelines For Lands Under Wilderness Review, and the Minerals CFR 3802 regulations.

The affected environment is identified as the area which might be influenced by the proposed action and/or alternatives. The areas discussed are those proposed WSAs within the Sonoma-Gerlach Resource Area where proposed land treatments could affect wilderness suitability.

Eleven proposed WSAs were identified within the Sonoma-Gerlach Resource Area during the 1979-1980 wilderness intensive inventory conducted by the BLM (Table 2-14). These areas were so identified because they contain 5,000 acres or more of natural and roadless public land and have outstanding opportunities for solitude and primitive and un-

TABLE 2-14

PROPOSED WILDERNESS STUDY AREAS
IN THE SONOMA-GERLACH RESOURCE AREA

Study Areas			Acreage	Allotments
NV-020-006A	East Fork High Rock Canyon	a/	3,960	Soldier Meadows
NV-020-007	High Rock Lake		62,527	
NV-020-008	Little High Rock Canyon	a/	10,130	Leadville
NV-020-012	Poodle Mountain	a/	109,898	Coyote, Buffalo Hills
NV-020-014	Fox Mountain Range		72,347	Rodeo Creek
NV-020-019	Calico Mountains		65,861	Buffalo Hills, Calico, Soldier Meadows
NV-020-200	Selenite Mountains		31,920	Cook Sheep Use Area Blue Wing
NV-020-201	Mt. Limbo		24,126	Blue Wing
NV-020-406	Mt. Tobin		21,952	South Buffalo, Goldbanks
NV-020-621	Paiute Peak	b/	27,456	
NV-020-622	North Black Rock Range	b/	25,945	Soldier Meadows
	TOTAL		456,122	

a/ Proposed study areas that are contiguous with the Susanville, California District (only acreage administered by Winnemucca District given).

b/ Area contiguous with Paradise/Denio Resource Area. Acreage indicated is for Sonoma/Gerlach Resource Area only.

Source: U.S. Department of the Interior, Bureau of Land Management, Winnemucca District, Wilderness Study Files, compiled 1980.

confined types of recreation. Detailed reports of each intensive inventory area are on file with the U.S. Department of the Interior, Bureau of Land Management, Winnemucca District Office and Nevada State Office.

ECONOMICS

INTRODUCTION

The Sonoma-Gerlach EIS Area includes portions of five northern Nevada counties. This analysis will in many instances utilize aggregate data, derived by combining Humboldt and Pershing county totals, as a base of reference. Pershing County is 95 percent contained within the resource area, and constitutes 63 percent thereof. Humboldt County comprises only 14 percent of the resource area, but the portion included contains the city of Winnemucca, the region's major population center. The importance of Winnemucca to the Sonoma-Gerlach Resource Area economy necessitates the inclusion of Humboldt County data in order to accurately portray economic conditions in the region.

Winnemucca is the major source of trade for the Sonoma-Gerlach Resource Area, and is more than double the size of any other community in the region. The city of Lovelock, in southern Pershing County, does provide some goods and services in that portion of the EIS Area, however. Additional purchases are made outside the region, primarily in Reno and Elko, Nevada.

The Sonoma-Gerlach economy is predominately based on agriculture, mining, and the tourist-oriented industries. According to economic base theory, a basic industry is one which produces goods for export out of the local economy. These exports bring new money into the region, thus providing the base for employment and income upon which the balance of the local economy depends. Base industries provide economic stability, but only to the extent that they themselves are stable. For example, activity in the mining industry is subject to boom and bust cycles due to its dependence on fluctuating national and international market conditions (Fillo et al. 1978). Tourism is highly seasonal in nature, and dependent upon external conditions such as fuel prices. Agriculture therefore has been the most stable element in the resource area's economic base.

DESCRIPTION OF THE AFFECTED ECONOMIC SECTORS

There are four sectors of the EIS area economy which would experience direct revenue, income, and employment impacts as a result of changes in the range livestock grazing program administered by the BLM. These sectors are agriculture, construction, government (primarily federal), and the activity generated within the trade and service sectors as a result of a change in the supply of wildlife and outdoor recreation. (See Table 2-15 for the income and employment generated by these sectors in 1978.) In addition, there are indirect revenue, income, and employment effects which would impact the EIS area economy as a whole. These indirect impacts are generated through a multiplier effect which results from direct expenditures within the EIS area.

Agriculture-Ranching

There are 48 ranching operations with BLM grazing permits in the Sonoma-Gerlach EIS Area (which represents approximately 75 percent of all ranches in the EIS area (1974 Census of Agriculture)). While these ranches are authorized 152,447 AUMs per year of active preference, three-to-five year average licensed use has been 116,551 AUMs, 76.5 percent of active preference. EIS Area permittees depend upon forage provided by public lands for an average of 38 percent of total annual requirements. Dependence during the critical spring-summer grazing period (April 1 - September 1) increases to 56 percent; 23 of the Sonoma-Gerlach operators are 90-100 percent dependent on BLM forage during this period, as evidenced in Table 2-16. A portion of the livestock operators (particularly the larger ones) utilize public range to some extent on a year-round basis.

Ranch Classification

In order to facilitate economic analysis, ranches in the Sonoma-Gerlach Resource area were broken down into five categories, as listed below:

a) Small Cattle Ranch; Summer Use (4/1-9/30); 0-350 cattle

b) Medium Cattle Ranch; Summer Use (4/1-9/30);350-1,000 cattle

c) Medium Cattle Ranch; Winter Use (11/1-3/31);350-1,000 cattle

d) Large Cattle Ranch; Year-round Period-of-Use; Over 1,000 cattle

e) Sheep Ranch; Winter Use (12/1-3/31); All sizes

Ranch budgets were then developed by the Economics, Statistics and Cooperatives Service, based on information supplied by 13 area producers and data collected by the BLM. While these budgets

TABLE 2-15

1978 INCOME AND EMPLOYMENT
PERSHING AND HUMBOLDT COUNTIES

Sector	Humboldt Co. Income (1,000's of dollars)	Sector as a percent of total	Humboldt County Employment	Sector as a percent of total	Pershing Co. Income (1,000's of dollars)	Sector as a percent of total	Pershing County Employment	Sector as a percent of total
Agriculture	5,124	11	442	11	5,003	25	197	14
Mining	867	2	87	2	(D)	(D)	(D)	(D)
Construction	3,973	9	222	6	1,081	5	33	2
Manufacturing	2,689	6	286	7	487	2	47	3
Transportation & Public Utilities	4,480	10	221	6	1,129	6	53	4
Wholesale Trade	2,323	5	146	4	308	1	13	1
Retail Trade	7,744	17	755	20	1,279	11	237	16
Finance, Insurance & Real Estate	1,496	3	98	2	320	1	18	1
Services	7,861	17	775	20	(D)	(D)	(D)	(D)
Government								
Federal	2,197	5	163	4	300	1	30	2
State & Local	6,750	15	668	17		13	273	19
TOTAL	45,504		3,863		20,068		1,443	

(D) Not shown to avoid disclosure of confidential information. Data are included in totals.

Source: U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economics Information System, Personal Income by Major Sources 1973-1978 and Employment by Type and Broad Industrial Sources 1973-1978, 1980.

TABLE 2-16

OPERATOR DEPENDENCY ON PUBLIC LAND

Percent Dependency	YEAR LONG DEPENDENCY a/				CRITICAL PERIOD DEPENDENCY a/			
	Number of Small Operators (<350 head)	Number of Medium Operators (350-1,000 head)	Number of Large Operators (>1,000 head)	Number of Sheep Operators	Number of Small Operators (<350 head)	Number of Medium Operators (350-1,000 head)	Number of Large Operators (>1,000 head)	Number of Sheep Operators
0-10	1	--	--	6	2	--	1	6
11-20	1	2	--	2	--	--	--	2
21-30	--	2	1	--	--	3	--	--
31-40	3	1	1	--	--	--	--	--
41-50	4	1	1	--	1	--	--	--
51-60	3	2	2	--	1	1	1	--
61-70	4	2	--	--	--	--	--	--
71-80	2	2	--	--	2	2	--	--
81-90	--	1	2	--	1	1	1	--
91-100	1	--	1	--	12	6	5	--

a/ Weighted averages were used in the cases of operators which had differing dependencies in two or more allotments.

Source: Percentage of dependency derived from Table 2-6.

are presented in their entirety in Appendix S a summary of relevant information concerning the ranch types is presented in Table 2-17. It must be emphasized that the ranch types illustrated represent "typical" ranches only. Each ranch has a unique set of characteristics which will cause its operation to differ from those of the typical ranches.

As revealed in Table 2-17, net ranch income for all ranch classes was positive after the payment of cash costs and the non-cash allocation made to family labor and asset depreciation. This income represents the funds available to service long term debts and to provide the rancher with a return for his management and risk.

Agriculture is an exporting industry which constitutes a significant portion of the EIS area's economic base. During 1978, agriculture accounted for 25 percent of Pershing County income, and 11 percent of Humboldt County income. In the EIS area as a whole, 639 persons were employed in the agricultural sector, accounting for a total area income figure of $10,127,000.

Livestock receipts as a percentage of total agricultural revenue for the EIS area have been declining over recent years, as revealed in Table 2-18. This trend may be attributed in part to the growth of the potato industry, particularly in Humboldt County. Another factor which has contributed to the recent decline in the importance of the livestock industry is the cyclical nature of beef prices. The years following 1974 were characterized by low beef prices. Beginning in 1978 however, prices started to rise again and currently exceed the pre-1979 levels. Indications from the U.S. Department of Agriculture are that cattle numbers are increasing in Nevada in response to rising beef prices. This occurence may moderate the declining importance of the livestock sector in terms of total agricultural receipts in the years to come.

Rancher Wealth

The Bureau of Land Management does not recognize the right to treat grazing permits as real property. A grazing permit is a revocable privilege, as explicitly stated during the licensing process, and is not a right. Historically, however, the economic benefits derived by area ranchers from the use of public range have exceeded the fees they are charged. The existence of this imbalance, or "consumer surplus", has meant that ranchers are willing to pay extra for the opportunity to use public lands, thereby causing the grazing permit to acquire a market value (Vale 1979, Neilson and Workman 1971). The permits can be bought or sold in the market place, or used as collateral for loans (Corbett 1978). Although not officially recognized as real property, BLM grazing permits have nonetheless become an integral element in the capital and credit structure of EIS area ranchers.

The market value of federal AUMs is generally higher in northern Nevada than in the southern portion of the State because of higher range productivity (Falk 1980). Market value is also affected by abundance of water, number of range improvements, whether an allotment is grazed in common or by a single permittee, and the degree of dependence on federal AUMs. Recently, the security of BLM AUMs has also become an important issue. Fear of downward adjustments in the number of active preference AUMs alloted to specific ranches has caused the value of an individual AUM to decline (Calandar 1980; Falk 1980). Currently, market value ranges from $25 to $60 per AUM, with an average value of about $50 in northern Nevada (Falk 1980).

Permit market value is based upon active preference, which is the total number of AUMs a rancher is authorized to use. Total active preference in the Sonoma-Gerlach EIS area is 152,447 AUMs. At an average market value of $50 per AUM, BLM grazing permits in themselves contribute $7,622,350 to the wealth of EIS area ranchers.

Contract Construction

Contract construction in the EIS area accounted for $5,054,000 or 7.7 percent of total personal income during 1978. This contribution to EIS area income resulted from the employment of 255 persons by the construction industry (refer to Table 2-15). An income multiplier of 1.2502 (Nevada State Engineers Office 1978) indicates that contract construction contributed a total of $6,318,000 in both direct and indirect income to the EIS area economy during 1978.

Recreation and Wildlife

The proposed action and alternatives would affect wildlife populations in some portions of the Sonoma-Gerlach Resource Area. These population adjustments are expected as a result of alteration of habitat conditions, as well as changes in the amount of vegetation allocated to wildlife. Game species expected to be affected most include mule deer, antelope, and sage grouse. Other upland species may be affected to a lesser degree (see Wildlife sections, Chapter 3). Adjustment in wildlife populations would influence the number of hunter days spent in the resource area, thereby impacting expenditures, income and employment (primarily in the trade and service sectors). Approximately 10,300 hunter days were expended pursuing the af-

TABLE 2-17

SELECTED RANCH CHARACTERISTICS
SONOMA-GERLACH RESOURCE AREA

	Ranch Class				
	Small	Med.-Summer	Med.-Winter	Large	Sheep
Livestock					
Cows/Ewes	138	440	480	1,430	2,950
Replacements	18	62	67	143	----
Yearlings	51	83	85	241	----
Bulls/Rams	9	22	24	119	105
Total AUMs Required	2,688	8,005	8,692	26,160	9,245
BLM AUMs a/	863	2,810	2,871	14,364	9,578
Percent BLM is of Total	46%	50%	35%	70%	24%
Deeded Range AUMs	420	700	793	2,117	2,615
Range Lease AUMs	---	533	831	801	674
Irrigated Pasture AUMs	245	427	2,585	1,591	1,497
Crop Residue AUMs	204	597	702	1,010	704
Hay AUMs	583	1,744	738	2,328	1,536
Land Acreage					
Deeded Range-Acres (4 Ac/AUM)	1,680	2,800	3,172	8,468	10,460
Irrigated Pasture-Acres (.25 Ac/AUM)	61	107	646	398	374
Hayland Acres (3 Tons/Acre)	59	175	74	175	77
Land Values					
Irrigated Hay ($900/Acre)	53,100	157,500	66,600	157,500	69,300
Irrigated Pasture ($250/Acre)	15,250	26,750	161,500	99,500	93,500
Range Land ($100/Acre)	168,000	280,000	317,200	846,800	1,046,000
Total Land Value	236,350	464,250	545,300	1,103,800	1,208,800
Interest on Land (i. = 9.3%)	21,980	43,175	50,713	102,653	112,418
Gross Revenue	35,479	104,029	113,285	266,494	192,165
Cash Costs	15,988	51,167	56,115	132,580	87,857
Return Above Cash Costs	19,491	52,862	57,170	133,914	104,308
Other Costs b/	8,912	20,350	22,200	41,016	28,616
Net Ranch Income	10,579	32,512	34,970	92,898	75,692
Opportunity Cost c/	33,838	78,591	89,322	215,015	142,356
Net of all Costs (Loss)	(23,259)	(46,079)	(54,352)	(122,117)	(66,664)

a/ BLM AUMs defined as the forage necessary to sustain a cow-calf unit for one month. This requirement represents 800 pounds of air dried forage. The other AUMs listed represent the Economics, Statistics, and Cooperatives Service (ESCS) definition of an AUM which is the forage required to support an animal unit for a month. This requirement represents 600 pounds of air dried forage.

b/ Other costs include the non-cash allocations which must be made for family labor and asset depreciation.

c/ Opportunity cost as used herein is the amount area permittees could have earned (the amount foregone) had they invested in other enterprises, or saved equivalent sums at current interest rates (FHA rate of 10.7 percent was used to determine the figures above).

Source: ESCS Ranch Budgets and Linear Program inputs, 1980, Colorado State University.

TABLE 2-18

COMPARISON OF LIVESTOCK RECEIPTS TO TOTAL AGRICULTURAL RECEIPTS
SONOMA-GERLACH RESOURCE AREA
(Thousands of Dollars)

Year	Livestock Receipts	Crop Receipts	Total Receipts	Livestock As a Percent of Total
1973	24,133	15,620	38,753	60.7
1974	16,180	20,567	36,747	44.0
1975	15,890	24,021	39,911	39.8
1976	17,101	26,288	43,389	39.4
1977	15,700	26,816	42,516	36.9
1978	20,500	23,306	43,806	46.8

Source: U.S. Department of Commerce, Bureau of Economic Analysis, Farm Income and Expenditures, 1979 and 1980.

TABLE 2-19

GROSS GAMING REVENUES IN HUMBOLDT AND PERSHING COUNTIES, 1971-1978
(thousands of dollars)

Year	Gross Gaming Revenues	% increase over previous year
1971	2,011	-
1972	2,318	15.2
1973	2,664	14.9
1974	2,961	11.1
1975	3,346	13.0
1976	3,944	17.8
1977	4,830	22.5
1978	6,132	27.0

Source: 1979 Nevada Statistical Abstract

TABLE 2-20

PERSHING AND HUMBOLDT COUNTIES, AND STATE OF NEVADA
UNEMPLOYMENT RATES
SONOMA-GERLACH RESOURCE AREA

	1973	1974	1975	1976	1977	1978
Humboldt County	3.0	3.7	6.3	6.2	4.8	3.4
Pershing County	3.3	3.6	4.6	4.2	6.0	4.3
Nevada	6.1	7.7	9.6	8.9	7.0	4.5

Source: Nevada Employment Security Department Area Labor Review, Balance of State (1978 and 1979) and Labor Force Summaries and Establishment Based Industrial Employment, Data Sheets 1973-1976.

fected game species in the resource area in 1978. These hunter days contributed an estimated $175,000 in revenue to the EIS area economy and approximately $117,000 to income.

While other recreational activities (such as fishing and off road vehicle use) also contribute to the EIS area economy, these activities are not expected to be significantly impacted by the alternatives, and will not be considered further. Economic impacts resulting from changes in hunter days are based on a study by Garrett (1970) at the University of Nevada, Reno.

Government

The federal government sector accounted for $2,197,000 or five percent of total Humboldt County income during 1978, and employed 163 persons. Only Humboldt County data is used, since the affected governmental agency would be the BLM, whose Winnemucca District Office accounts for the majority of federal government employment and income in the EIS area. An estimated sectoral multiplier of 1.3503 indicates that activity within the (federal) government sector generated total direct and indirect income amounting to $2,967,000 during 1978.

TOTAL INCOME

Aggregate income for the Sonoma-Gerlach EIS area totalled $65,572,000 during 1978. The major sectors contributing to these earnings were wholesale and retail trade, mining, services, government,and agriculture, as indicated in Table 2-15.

Unadjusted per capita income in 1978 for the region was approximately $7,600, considerably below the 1978 Nevada State average of $9,377 per year. Examination of EIS area income distribution data also reveals a higher than state average number of families earning incomes below $10,000 annually. In Pershing County, 11.3 percent of all families earn incomes below established poverty level criteria, as compared to a state average of 7 percent (1979 Nevada Statistical Abstract). Low or negative net income for farm/ranch proprietors has contributed to low per capita income levels in recent years.

EMPLOYMENT

Total employment in Humboldt and Pershing counties during 1978 was 5,306 persons. Of these, 21.7 percent were employed in the trade sector, 21.3 percent were employed by the government (federal, state and local) and 12.0 percent were engaged in the agricultural sector. The importance of the trade and service sectors in terms of both income and employment illuminates a major characteristic of the Sonoma-Gerlach economic base: the importance of tourism to the area economy.

Winnemucca is the source of the majority of the tourist-generated revenue. Its location on Interstate 80, Highway 95, and close proximity to the Oregon and Idaho borders, places it in a good position to cater to pass through and visiting tourists. The growth in the tourist industry can best be illustrated by observing the growth in the gaming industry, which is probably the major force attracting tourists to Nevada (Fillo et al. 1978). Table 2-19 illustrates the growth in gaming revenues in Humboldt and Pershing counties from 1971-1978.

The Nevada State unemployment rate in 1978 was 4.5 percent. During the period 1973-1978, both Humboldt and Pershing counties were consistently below the statewide unemployment rate, as indicated in Table 2-20. This may in part be attributed to the continuing outmigration of the younger age groups from the area. These age groups historically experience comparatively high unemployment rates.

POPULATION

The 1978 population of Pershing County totalled 3,000 residents. Of these, 1,647 or 54.9 percent reside in the city of Lovelock, with the remainder dispersed throughout the county in small communities such as Imlay, Mill City and Unionville (Sonoma-Gerlach PAA). In order to better approximate total EIS area population, the Pershing County total must be supplemented with the populations of Winnemucca (4,377) and the Empire-Gerlach region (698). The resulting estimate for the Sonoma-Gerlach EIS area population totals 8,075, 1.2 percent of Nevada state population (1979 Nevada Statistical Abstract; Gerlach figures from 1970 Census Bureau data).

Although population density for Pershing County averages 0.5 persons per square mile, the population is concentrated onto a relatively small number of acres, leaving much of the EIS area virtually unpopulated. Nevada averages 6.5 persons per square mile.

Tax Base and Fiscal Structure

The assessed valuation of the Pershing County tax base appears in Table 2-21. This section will focus only on Pershing County, since EIS area ranches contribute a small percentage to the tax base of the other counties in the resource area.

TABLE 2-21
PERSHING COUNTY ASSESSED VALUATION

Tax Category	1970-71	1978-79	Percent Increase a/ from 1970-71 1978-79	Percent 1978 is of Total
Agricultural Land				
Cultivated	1,898,831	3,386,563	+ 78.3	8.2
Wild Hay & Meadow Hay	22,480	31,672	+ 40.9	< .1
Pasture	229,768	224,757	- 2.2	.5
Grazing	1,445,885	364,907	- 74.8	.9
TOTAL AGRICULTURAL LAND	3,596,964	4,007,899	+ 11.4	9.8
Livestock and Bees	641,285	799,102	+ 24.6	1.9
Rural Improvements	580,850	1,723,755	+ 196.7	4.2
Other Improvements	3,900,083	5,364,851	+ 37.6	13.1
Special Lands	761,020	14,153,055	+1759.7	34.5
Urban Lands	618,352	1,176,985	+ 90.3	2.9
Personal Property	2,163,255	2,990,798	+ 38.3	7.3
Mining	484,530	4,157,935	+ 758.1	10.1
Utilities	12,937,914	18,741,356	+ 44.9	45.6
TOTAL GROSS VALUATION	25,684,253	53,115,736	+ 108.8	
LESS: Total Exemptions	2,840,453	12,053,417	+ 324.3	
TOTAL NET VALUATION	22,843,800	41,062,319	+ 79.8	

a/ Real property is assessed once every five years, with assessed valuation being based upon market value of the assets. This reliance on market value incorporates the effects of inflation into asset valuation; this accounts for a substantial portion of the increase over 1970-71 values.

Source: Segregation of Assessment Roll of Pershing County, Nevada, 1970-71 and 1978-79.

(EIS Area ranchers in Humboldt County, for example, own slightly under 5 percent of total agricultural land and improvements; the contribution of Sonoma-Gerlach operators to the tax bases of Washoe, Churchill, and Lyon Counties would be even less significant).

The overall contribution of the ranch industry to assessed valuation in Pershing County is substantial, however. In fiscal year 1978-79 the assessed valuation of all agricultural land and livestock was $4,807,001 or 11.7 percent of total Pershing County assessed valuation. Sonoma-Gerlach permittees owned at least 14 percent of this agricultural land, and 55 percent of the livestock in the county (research done at Pershing County Assessor's Office 1980). Investment in real property such as farm equipment and machinery, irrigation systems, rural improvements, and other personal property add to the contribution of EIS Area ranchers to the county tax base.

Agriculture's share of assessed valuation has been declining. In fiscal year 1970-71, the assessed valuation of agricultural land and livestock and bees represented 18.5 percent of total assessed value. By 1978-79 this percentage had declined to 11.7 percent, despite an increase in the number of acres under cultivation. Continuation of this trend will probably continue due to the passage of State Bill (S.B.) No. 77. This legislation, which will be implemented over a five year period and finalized during FY 1983-84, will exempt livestock held for business purposes from taxation. During FY 78-79 livestock represented 1.9 percent of total assessed valuation in Pershing County.

There is a direct relationship between the market value of ranches and their associated income-generating livestock carrying capacity. Since some alternatives considered in this EIS would alter the allowable use associated with some ranches, there could be an effect occurring to alter the market value of these ranches. This could, in turn, alter the level of future assessed valuations. The Pershing County tax rate on agricultural assets is the mill levy on a dollar of real property (the amount of tax, in cents, to be paid on a hundred dollars of real property). The applicable county tax rate (including school district tax) of 1.9255 mills indicates that taxes on total assessed valuation contributed $790,655 to county revenue during 1978.

SOCIAL CONDITIONS

RANCHING COMMUNITY

Information in this section was obtained through informal interviews conducted by a BLM social scientist with 17 (35 percent) of the 48 area ranchers in the fall of 1980. Highlights of those interviews with emphasis on significant issues follows (see Appendix T, Section 1 for methodology utilized in social analysis).

RANCHING COMMUNITY CHARACTERISTICS

The average age of ranchers interviewed is 59 years and of their wives is 53 years. (According to the 1974 Census of Agriculture the average age of farm operators in Pershing County, Humboldt County and the State of Nevada is 53.3 years, 50.5 years and 52.1 years, respectively.) Children of ranchers who lived on the ranch were an average of 28 years. Eighty-two percent (14) of those operators interviewed have been on their present ranches five or more years. Average length of time ranchers have been on present ranches is 26 years. Eighty-eight percent (15) have been in ranching all their lives. Most of their wives and children also were born on ranches, somewhere within or near the planning area.

All ranchers interviewed identified ranching as their primary occupation. Only one operator held a supplemental part-time job, though wives on four ranches and children living on two ranches held other jobs. Also one rancher supplements his income some years with hay production. However, several operators in the large class have small dependencies on ranching for their income (see Economic Section, Chapter 3, Proposed Action).

Average years of education for ranchers was 11.5 years, for wives it was 14.3 years, and for rancher children living on the ranch it was 12.25 years. (According to the 1979 Nevada Statistical Abstract, median school years completed for persons 25 and over in Pershing County is 12.1 years for males and 12.3 for females. In Humboldt County it is 11.8 years for males and 12.1 years for females. For Nevada the median is 12.4 years for both males and females. This compares to a national average of 12.2 years for males and 12.1 years for females.) Twenty-nine percent of the ranchers, 46 percent of the wives and 33 percent of rancher children working on ranches have other job experience. However, many of the ranchers and wives who do have other job experience acquired it many years ago.

All of the ranching operations visited were basically family-run operations with family and extended family members all sharing the workload. When a task requires a larger labor force, neighboring ranchers generally provide assistance. Ranchers stated that they could use more help, but that they could not afford to pay for it.

The sheep ranchers, a large operator and one rancher who has only recently entered the livestock business do hire help. Sheepherders are predominately of Basque descent. Other hired hands include mostly Mexicans and aging buckaroos.

Eighty-eight percent (15) of the ranchers interviewed had children. Seventy-three percent (11) of these ranchers had one or more children who currently are in ranching and who will continue the family ranching operation, economics permitting. Despite the hardships caused by inheritance taxes and inflation, most ranchers believe that, unless government regulation makes it impossible, family-run ranches will continue to be a tradition in this area as long as there are youth who have the self-discipline and fortitude to forfeit the luxuries available to their peers in non-ranching occupations.

RANCHER LIFESTYLE

While all ranchers interviewed consider their operations to be a business, none maintain that it is a lucrative one. Due to rising prices of farm equipment, fuel and feed, frequently low beef prices, and annual fluctuations in available forage, operators say that many years they just barely break even. Even when a profit is made, it usually is not a large one and it generally is immediately applied to expanding the operation. When asked why they remain in a business with such small and uncertain profits, the most frequent initial response was that it was all they had ever done. Underlying this response is the fact that they have stayed in this business despite its economic drawbacks because they enjoy certain nonmonetary aspects of ranching. Some elaborated on these aspects mentioning the independence it provided, the satisfaction of working for oneself, their enjoyment of working outside with animals, the variety of the work, and the endless challenge of new problems to resolve.

Ranching is considered beneficial to family life. The family unit is by necessity a very cooperative one as the success of the operation depends upon it. Children learn responsibility and develop self-confidence at an early age. More importantly, children and parents are able to spend more time together and take more active part in each others lives than is generally possible. Children work with parents, developing an understanding and respect for their parents work and learning through experience. In those instances where three generations of family members live and work together on a ranch, similar benefits to those experienced by children and parents are experienced by grandparents and grandchildren. Some also experience satisfaction from knowing that they are part of a ranching tradition that spans generations. In those cases where the ranch has been inherited, this generational linkage to the land may be strengthened by the presence of structures on the ranch built by ancesters. Often these buildings are crafted from local materials and constructed using styles and techniques brought from the "old country". Even if the ranch is not inherited, these embue a ranch with a sense of history and a connection with development of the ranching industry in the area.

Ranching also provides a wide range of opportunities for women involved in the business. While most fulfill traditional roles of wife, mother, and homemaker, many also choose to ride and work side by side with the men. Bookkeeping and veterinary needs are also often attended to by the women. One of the operations visited was run by a woman. As functioning vital members of ranching enterprises, wives often enjoy a coequal status with the men (Bresch, personal communication).

RANCHER ATTITUDES

All ranchers interviewed felt strongly that livestock should have dominant use of public range lands, based not only on historic use patterns, but also on the idea that the best use of the land is the most productive one. Ranchers feel that they have earned rights to the public range lands through years of investments in range improvements and in their base properties, as well as through payments of grazing fees. Because of their dependence on public lands to supplement their total forage supply, many ranchers would face economic difficulties if use of the lands were withdrawn. With increased operating costs and low returns, many operations are managing to do little more than keep pace with inflation.

Ranchers interviewed did not feel that their allotments were overgrazed and maintained that the range is in as good a condition as it has ever been, if not better. They admit that there have been operators who have overgrazed, but contend that these have gone out of business because of their abuse or have been controlled by the BLM's trespass program. They do not feel that a rancher can afford to abuse the range as it will only hurt him economically in the end.

Ranchers find fault with the data on which the proposed reductions and changes in period-of-use are based. They point out that the range survey data used is quite old and maintain that the range has improved in many instances. They feel that some of the range survey data being utilized were recorded during a drought year and thus misrepresent the true condition of the range. Many believe that to accurately determine range productivity, condition and trend studies should be conducted over a series of years both good and bad. Some express the opinion that the key to understanding the range in this area is moisture-in wet years there is plentiful forage while in dry years there is not.

Range suitability criteria are also questioned. They believe that they should be given more credit for 50 percent or more slope because their cattle do graze these areas. Also, some plant species which they say contribute heavily to the diet of their cattle have not been counted and should be in the ranchers' estimation.

Many ranchers expressed discontent concerning the BLMs handling of range improvements in the past. They assert that arrangements are made to repair or install range improvements but that more often than not nothing comes of it due to frequent changes in personnel or policy. They would like to be allowed to install their own range improvements with BLM providing materials and assistance if required.

Ranchers, in general, express extremely negative attitudes concerning wild horses. Wild horses, they say, eat their feed, mess up water holes, eat the salt they put out for their cattle, damage the fences, and inhibit cattle from approaching the waterholes to drink by intimidating them. Additionally, they maintain that the horses cause erosion by pawing the earth and eating the grass right down to the ground as they say cattle do not. Part of the hostility ranchers bear toward wild horses is related to their feeling that the horses are directly responsible for a sizable portion of the proposed reductions in AUMs and changes in periods-of-use. It is believed that any overgrazing that has taken place is due to the rapid increase in numbers of wild horses which has taken place since the passage of the Wild and Free Roaming Horse and Burro Act in 1971.

Although many ranchers are self-proclaimed horse lovers, their equine admiration does not extend to the wild horses in the resource area. These are considered to be too small in stature and of too inferior quality in general to be useful. They believe that many proponents of wild horse preservation do not have a true understanding of the quality of the horses on the public range, the damage they cause to the range, and the hardships the horses are causing ranchers. The ranchers feel that they are producing an important product and paying for the privilege, whereas the horses seem to them to be a basically useless and non-paying use of the public land.

Most ranchers interviewed expressed an appreciation for wildlife and a belief that cattle and wildlife are compatible. It is their contention that wildlife communities are actually attracted and nurtured by ranchers. They maintain that wild birds and animals consume grain and alfalfa from their fields as well as utilizing their water and salt. This being the case, they feel they deserve to be credited in livestock AUMs for their loss. In some areas, squirrels and rabbits which consume large amounts of hay, and coyotes which are said to prey on livestock are considered to exist in excessive numbers. Poisoning controls are blamed for increased problems with these animals. Deer are held responsible for diseasing some water holes, causing cows to abort.

Although a few ranchers have no real problems with hunters, most voice serious complaints concerning sportsmen. Many ranchers are hunters themselves and do not object to the sport itself but to those individuals who are irresponsible and who abuse their privileges. These hunters leave gates open allowing cattle to escape. Trespass fines, rustling, and lost time spent regathering cattle are the consequences which ranchers complain they must bear. More vandalistic acts include cut fences, and fenceboards burned for firewood; water troughs, buildings and windmills shot full of holes; poached cattle, and heirloom woodstoves as well as other belongings stolen from camps. Hunters also come on private land leaving their trash behind them. Some ranchers suggest that hunters be charged for use of the public lands as other users are and that rather than reducing livestock AUMs in order to allocate vegetation to wildlife, the number of hunters should be reduced.

Few complaints were registered about other recreation groups except in the Gerlach area where the Black Rock Desert attracts many recreationists on weekends and holidays. Similar problems are experienced with them as with hunters. Hiring of rangers to patrol the area and the sale of recreation permits were suggested remedies to these problems (see Appendix T, Section 2 for other ranching community attitudes and values concerning program management).

REGIONAL

The following section deals with the attitudes and values of planning area residents (see Appendix T, Section 1 for Methodology utilized).

The Sonoma-Gerlach Resource Area includes most of Pershing County as well as portions of Humboldt, Washoe, Churchill and Lyon counties. Winnemucca, the Humboldt County seat is the largest town and major source of trade within the area. Second in size and importance is Lovelock, the county seat of Pershing County. Empire, Gerlach, Imlay, Mill City, and Unionville are other small towns in the area (see Economics Section, Chapter 2 and Sonoma-Gerlach PAA for more detailed discussion of population distribution and regional characteristics).

Residents attribute economic, cultural and social significance to ranchers presence in the area. Ranching is valued for the part it has played historically in the development of Nevada and for its stability as an economic contributor. In addition, regional attitudes are very supportive of ranchers because of their generational linkage to the area, personal aquaintance in many instances and civic and leadsership roles filled by them.

According to a survey conducted in 1980 by the Governor's Commission on the Future of Nevada, the characteristic of the area that appealed most to respondents from Pershing and Humboldt Counties (where the majority of the population of the area reside), is its open spaces, sparse population and uncongested rural atmosphere. Ranchers are perceived as being a major ingredient of that rural atmosphere. The survey also revealed that agriculture was ranked highest among economic activities that respondents would like to see expanded in these two counties. Interviews with area residents supported these findings.

In general, area residents are sympathetic to the ranchers and hold views similar to theirs on most issues. However, hunting, fishing and ORV use are popular uses of the public lands by area residents (Sonoma-Gerlach PAA, 1980:119). Seventy-four percent of Humboldt County residents interviewed in the Governor's survey said they would not accept reduced access to hunting and fishing. However, in the Gerlach area where a large number of recreationalists attracted by the Black Rock Desert descend upon the town on weekends and holidays augmented by hunters during hunting season, residents complained of prolific incidents of vandalism, drunkeness, trespassing and troublemaking. Although no estimates for visitor use for any areas in the planning area are available according to the Sonoma-Gerlach PAA (1980:116) the Black Rock Desert receives the largest number of visitations. Residents of Unionville registered similar complaints concerning hunters and recreationalists.

Area residents express generally negative attitudes about the proliferation of government regulations, which they perceive as being excessive. Environmentalists are perceived as aggravating the problem by constantly demanding more studies consequently, handcuffing the BLM so that employees cannot perform even the basic functions. Opposition to government regulations was demonstrated during the November 1980 election when a majority of voters in Pershing County cast votes in favor of the Sagebrush Rebellion.

STATE AND NATIONAL

The following deals with the attitude and values of state and national groups who have manifested an interested in the EIS area (see Appendix T, Section 1 for Methodology utilized). The three wild horse and burro protection associations contacted have a combined membership of 39,000 people (Majewski, personal communication 1980). Although the groups draw their membership from all across the country and overseas, most of the members live in the western United States. A fourth organization is dedicated to the international protection of wild animals but has a special interest in the wild horse and burro populations in this area. It has a membership of 100,000 persons (Crail, personal communication 1980). The overall objective of the four groups concerning the EIS area is to see wild horses and burros preserved and protected in their natural environment. They believe strongly that these animals seen wild and free-roaming in their native settings preserve an integral part of our national heritage for future generations and are a living symbol of freedom and the outdoor spirit.

While one of the three wild horse protection groups espouses leaving the horses alone for nature to take care of, the other two groups advocate some degree of herd management. These two groups are in favor of balanced use of public lands with reductions in numbers of all grazing animals, including horses, so that numbers are compatible with the carrying capacity of the land, the forage, and the water. They emphasize reseeding and rehabilitation of the range rather than wholesale removal of horses, which they feel are less responsible for overgrazing the range than livestock are. Predetermination of horse numbers by manipulation of age and sex ratios was also recommended as an alternative method of controlling horse populations.

The fourth group feels that present wild horse and burro numbers are too low and advocates maximum development of water resources as a solution which would enable both the wild horses and the small ranchers to coexist without either group suffering reductions.

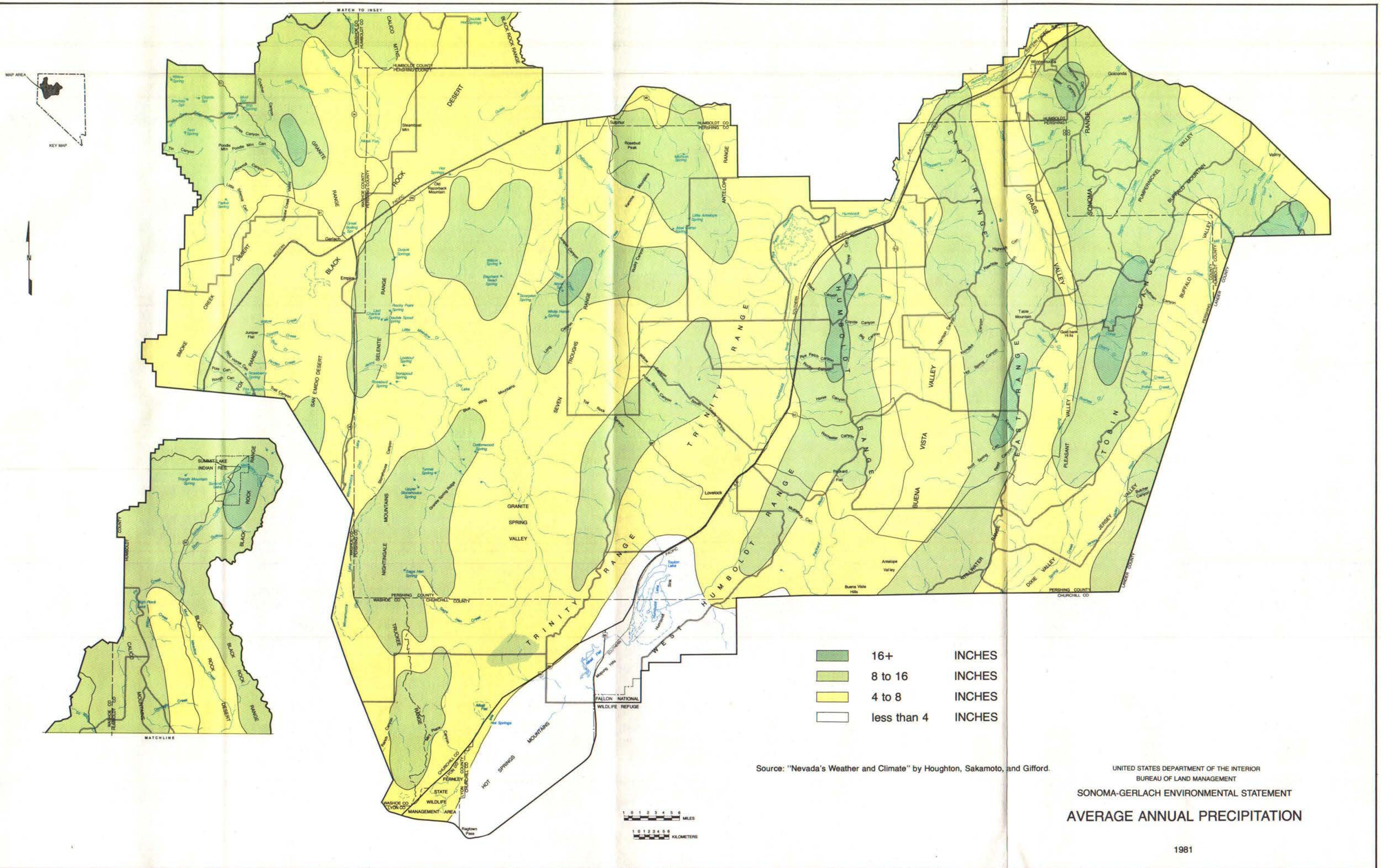
Although the groups prefer that the horses be allowed to remain in their natural environment, the Adopt-A-Horse Program is generally approved of as a "safety valve". Representatives mention that many of the program's initial problems have been overcome and that national distribution centers have made it very effective, though the adoption process still takes too long.

Representatives of these groups take exception with the perception of many ranchers interviewed that these horses are uselessly small, inbred, vagrant cowponies. Small size, they say is the result of adaption to a rugged, arid environment and not in-breeding. They maintain that adopted horses do make good pets, jumping horses and endurance runners, and they cite examples of them being used as plow horses. Although they agree that many of the horses are descendents of escaped rancher's horses they feel this is irrelevant since they are wild and free roaming now and have been all their lives. While representatives do find the horses aesthetically pleasing to observe in their natural environment, they feel that beauty is also a moot point. What is important to them is that they are preserving the freedom of these animals and protecting them from the cruelties they feel the mustanger system perpetuated.

The primary concerns of the wildlife group contacted are to insure the welfare and enhancement of wildlife resources, and to protect and preserve wildlife for their intrinsic and ecological, as well as consumptive uses. The group, which is largely composed of professionals in wildlife fields in the State of Nevada, espouses multiple use of public lands, with equitable allocation of available vegetation to all grazing animals. The group feels that the Great Basin is a sensitive area which has been degraded by overuse in the past, primarily by livestock. They also feel that riparian areas, which are critical wildlife habitat areas, have been sacrificed too often in past management decisions and should receive special protection. In the area of wild horses, the group feels numbers need to be reduced, and that native wildlife should be given some preference over wild horses. They generally approve of fence removals, and support the reintroduction of bighorn sheep.

The remaining two environmental groups contacted have a combined membership of approximately 1,400 people, mostly Nevadans. Representatives of these groups stressed the commitment of members to protecting the environmental integrity of the public lands, which they look upon as public trusts to be preserved for future generations. They support designations of wilderness areas, preservation of archeological sites, and protection of soils, watershed, native range species, and wildlife habitat areas. They generally consider wild horses to be a recreational resource that contributes to range diversity, but do not feel overall that horses should be given priority over native wildlife species.

Recreation and wildlife groups stated that their membership does appreciate the use of cattle on the range as management tools. They also feel that ranchers help maintain the "open spaces" quality of the area. There is appreciation overall for the nostalgia associated with the ranching culture and recognition of its social significance to the area. The groups still feel, however, that livestock are responsible for most of the overgrazing on public lands, and that livestock numbers on public lands must be reduced if range deterioration is to be reversed. They believe, though, that ecological conditions can be improved without putting the ranches out of business. (See Appendix T, Section 2 for other state and national attitudes and values).



Source: "Nevada's Weather and Climate" by Houghton, Sakamoto, and Gifford.

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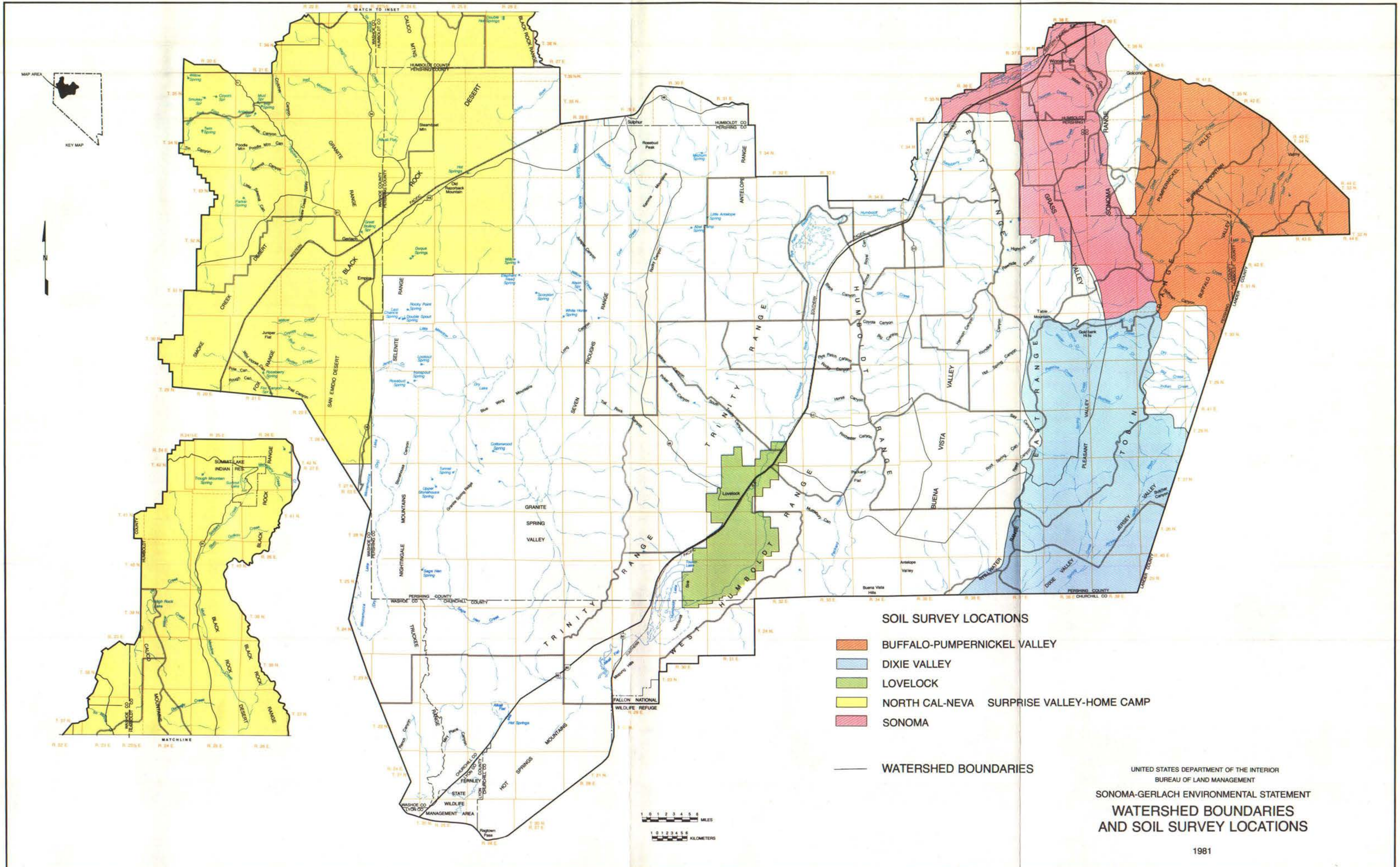
BUREAU OF LAND MANAGEMENT
SONOMA-GERLACH ENVIRONMENTAL STATEMENT

AVERAGE ANNUAL PRECIPITATION

1981

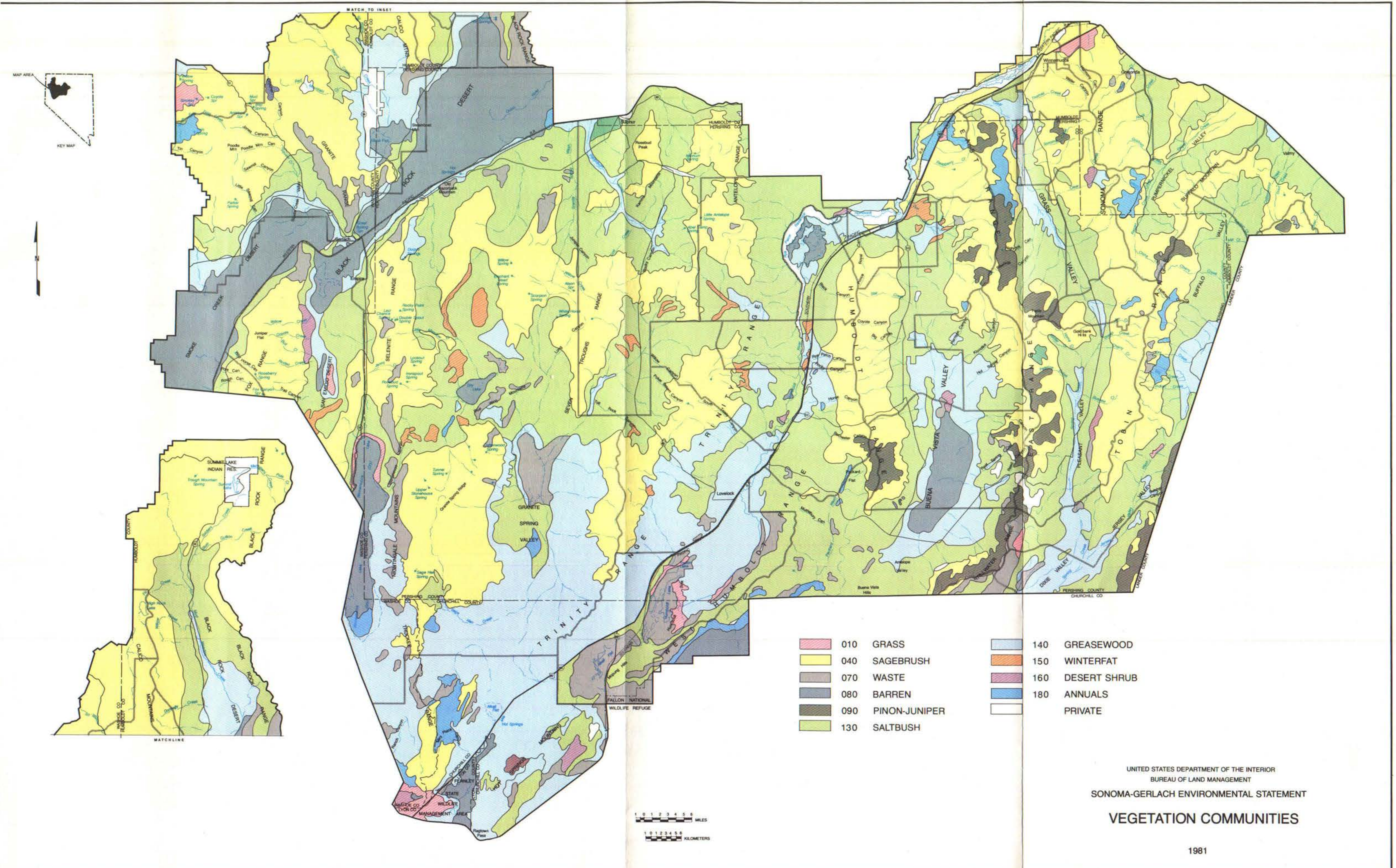


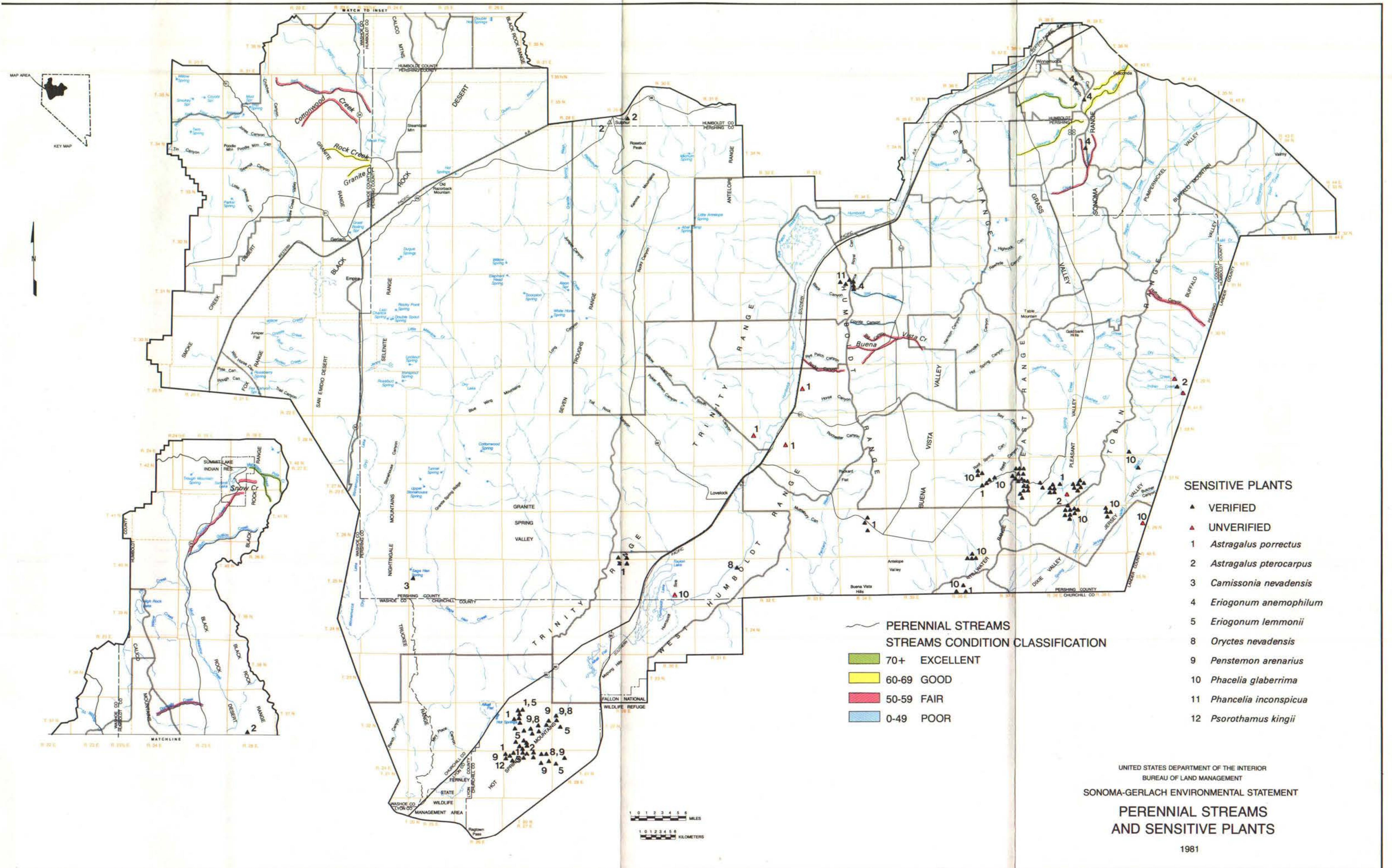
UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

SONOMA-GERLACH ENVIRONMENTAL STATEMENT

WATERSHED BOUNDARIES AND SOIL SURVEY LOCATIONS

1981

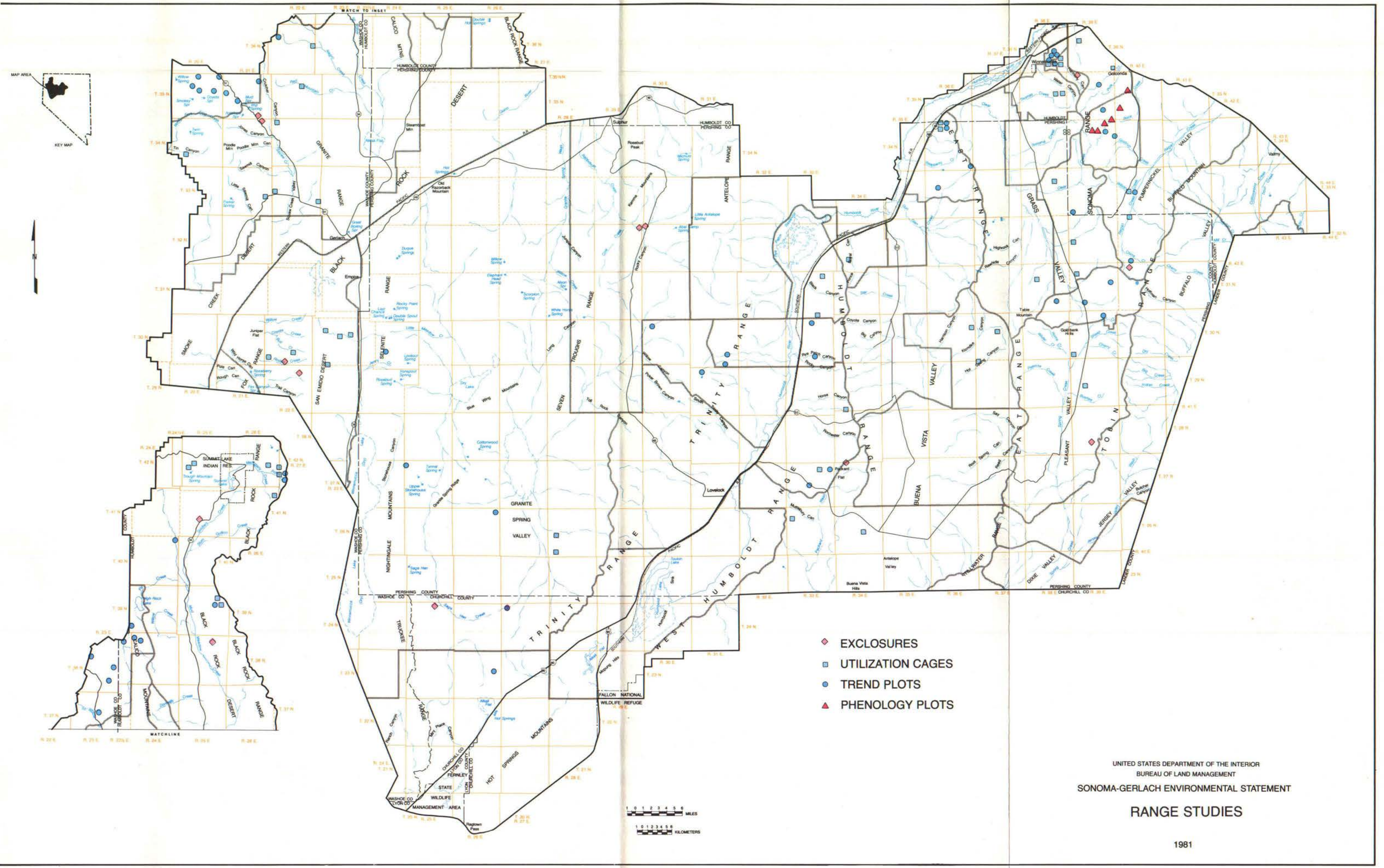

MAP AREA
KEY MAP
MATCH TO INSET
MATCHLINE
010 GRASS
040 SAGEBRUSH
070 WASTE
080 BARREN
090 PINON-JUNIPER
130 SALTBUSH
140 GREASEWOOD
150 WINTERFAT
160 DESERT SHRUB
180 ANNUALS
PRIVATE
MILES
KILOMETERS
UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
SONOMA-GERLACH ENVIRONMENTAL STATEMENT
VEGETATION COMMUNITIES
1981



UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
SONOMA-GERLACH ENVIRONMENTAL STATEMENT

PERENNIAL STREAMS AND SENSITIVE PLANTS

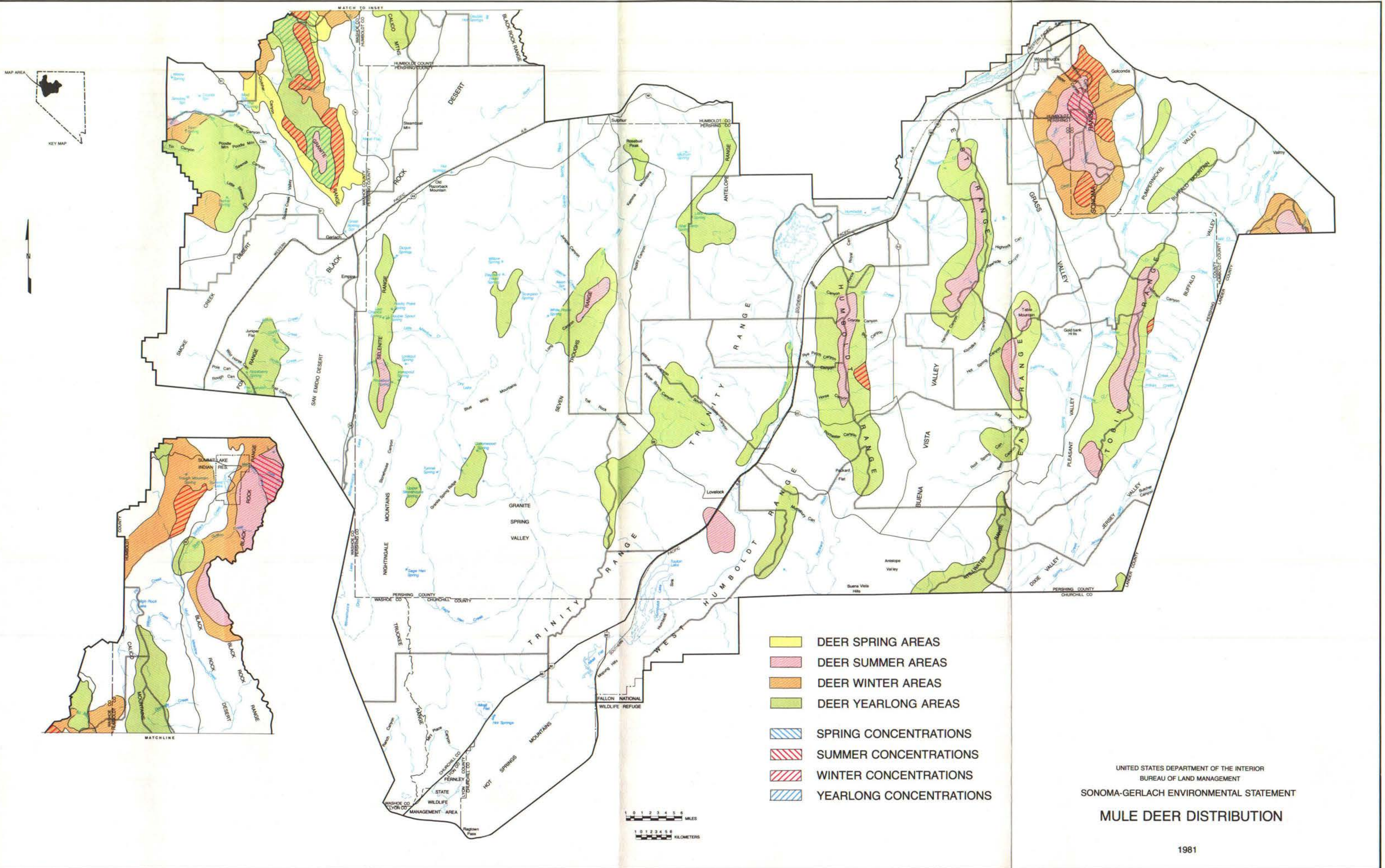
1981



UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
SONOMA-GERLACH ENVIRONMENTAL STATEMENT

RANGE STUDIES

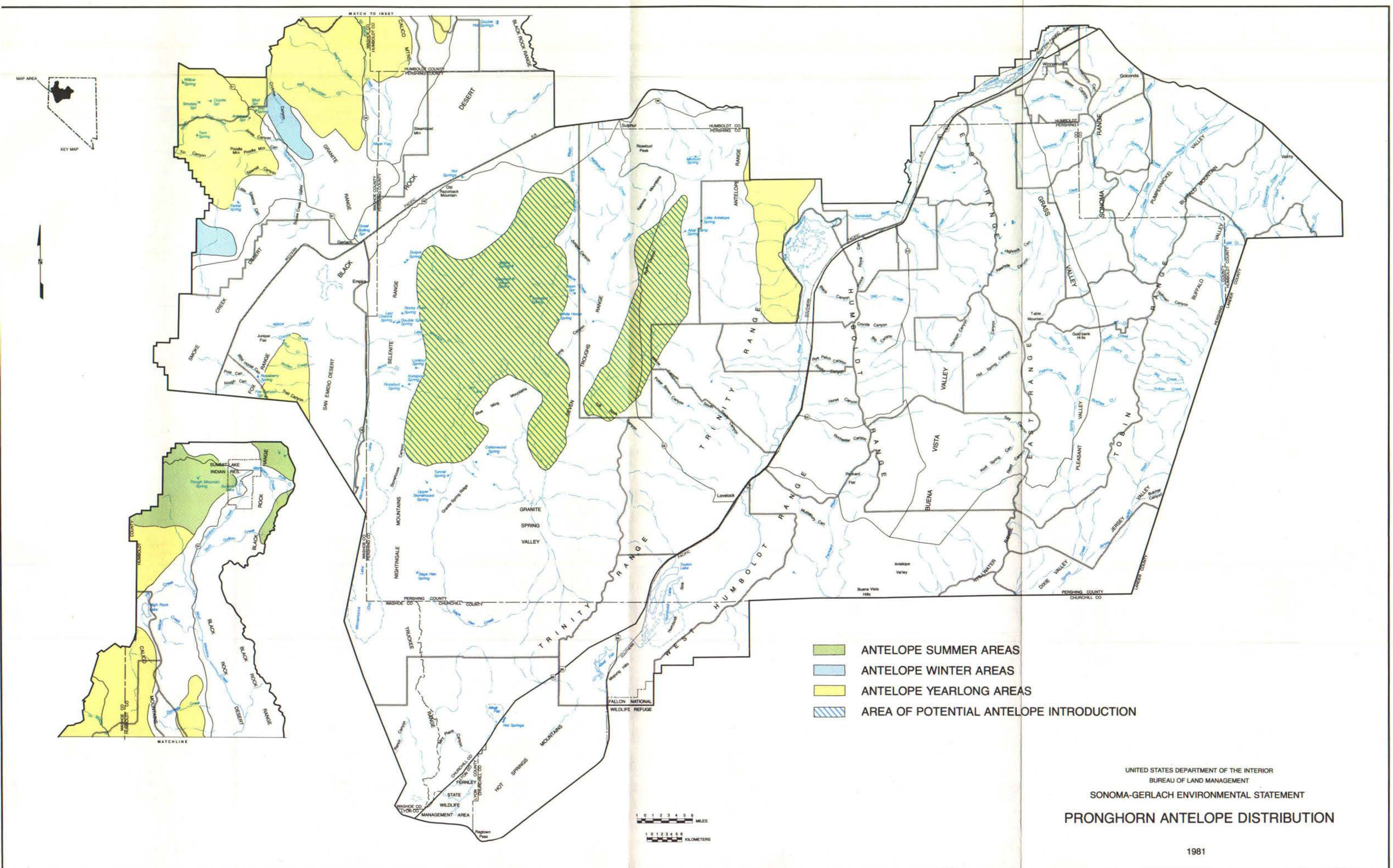
1981



UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
SONOMA-GERLACH ENVIRONMENTAL STATEMENT

MULE DEER DISTRIBUTION

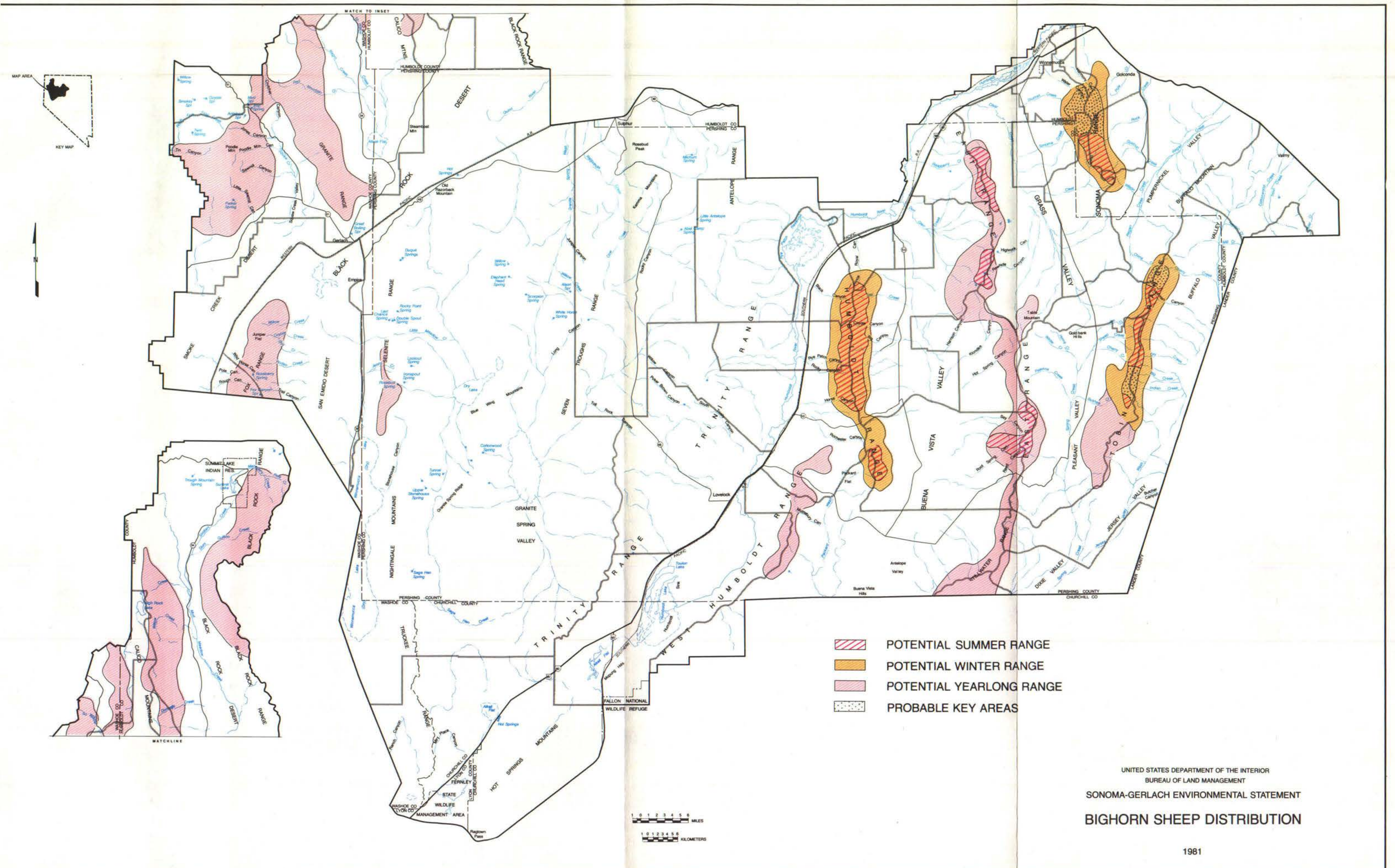
1981



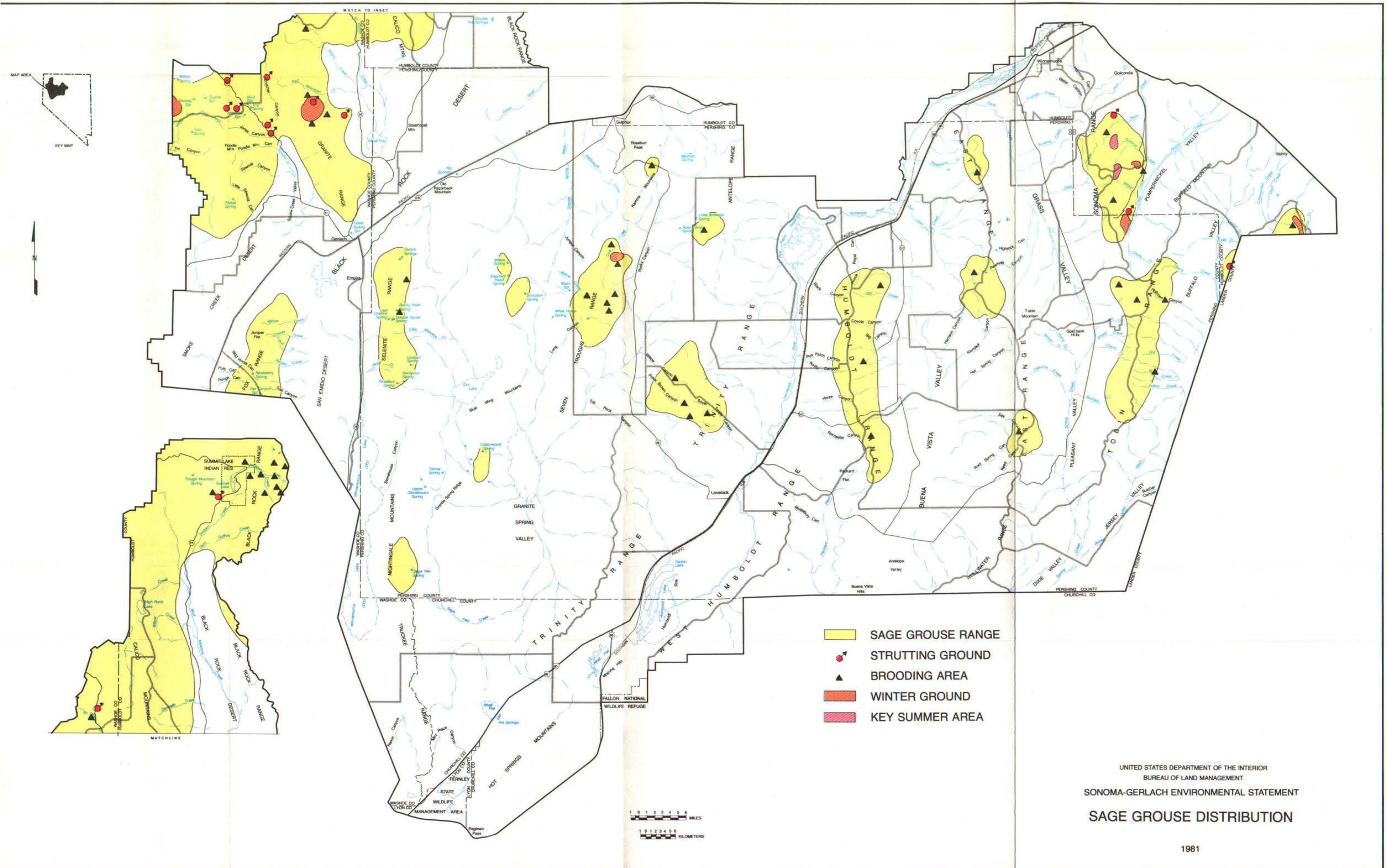
UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
SONOMA-GERLACH ENVIRONMENTAL STATEMENT

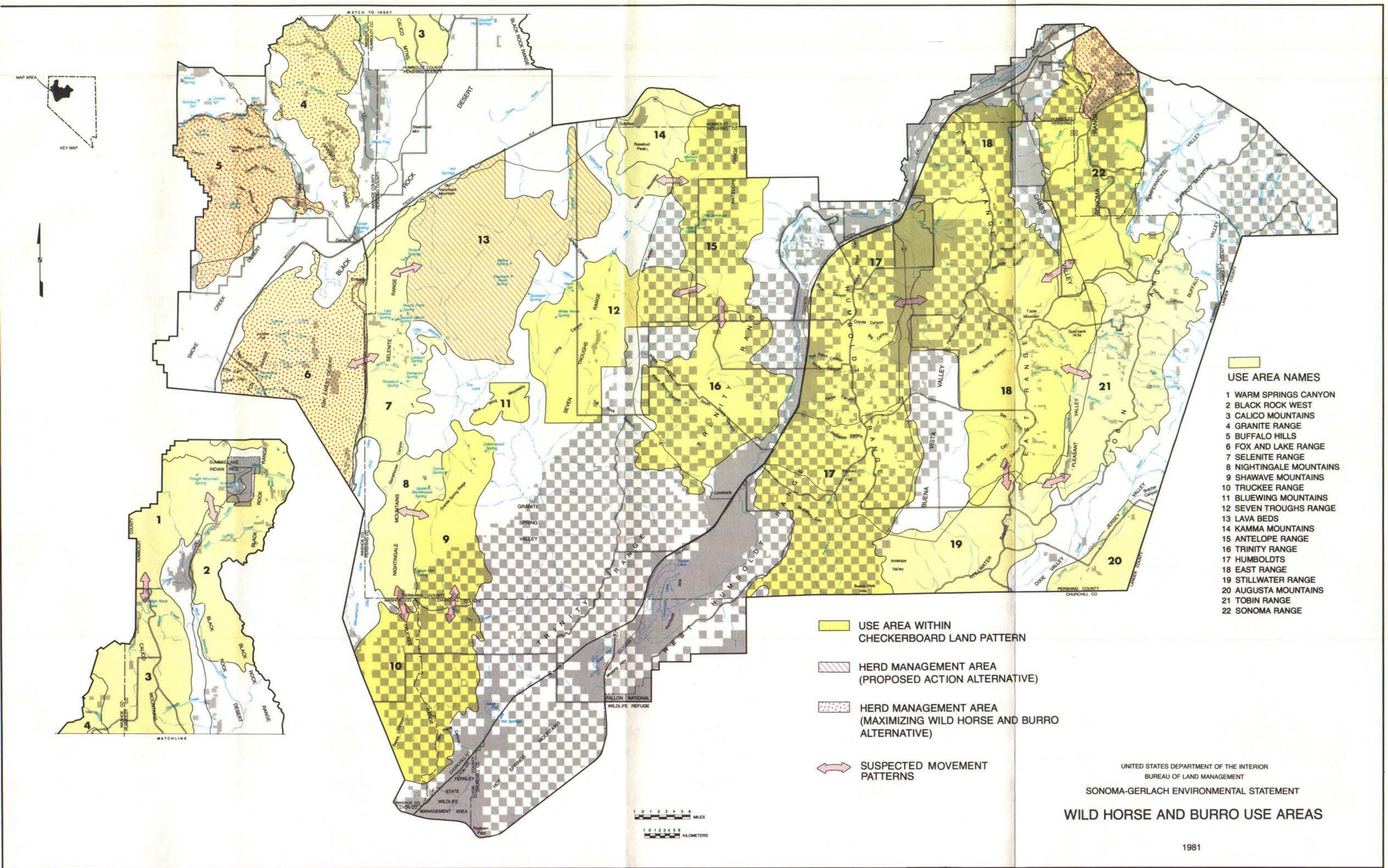
PRONGHORN ANTELOPE DISTRIBUTION

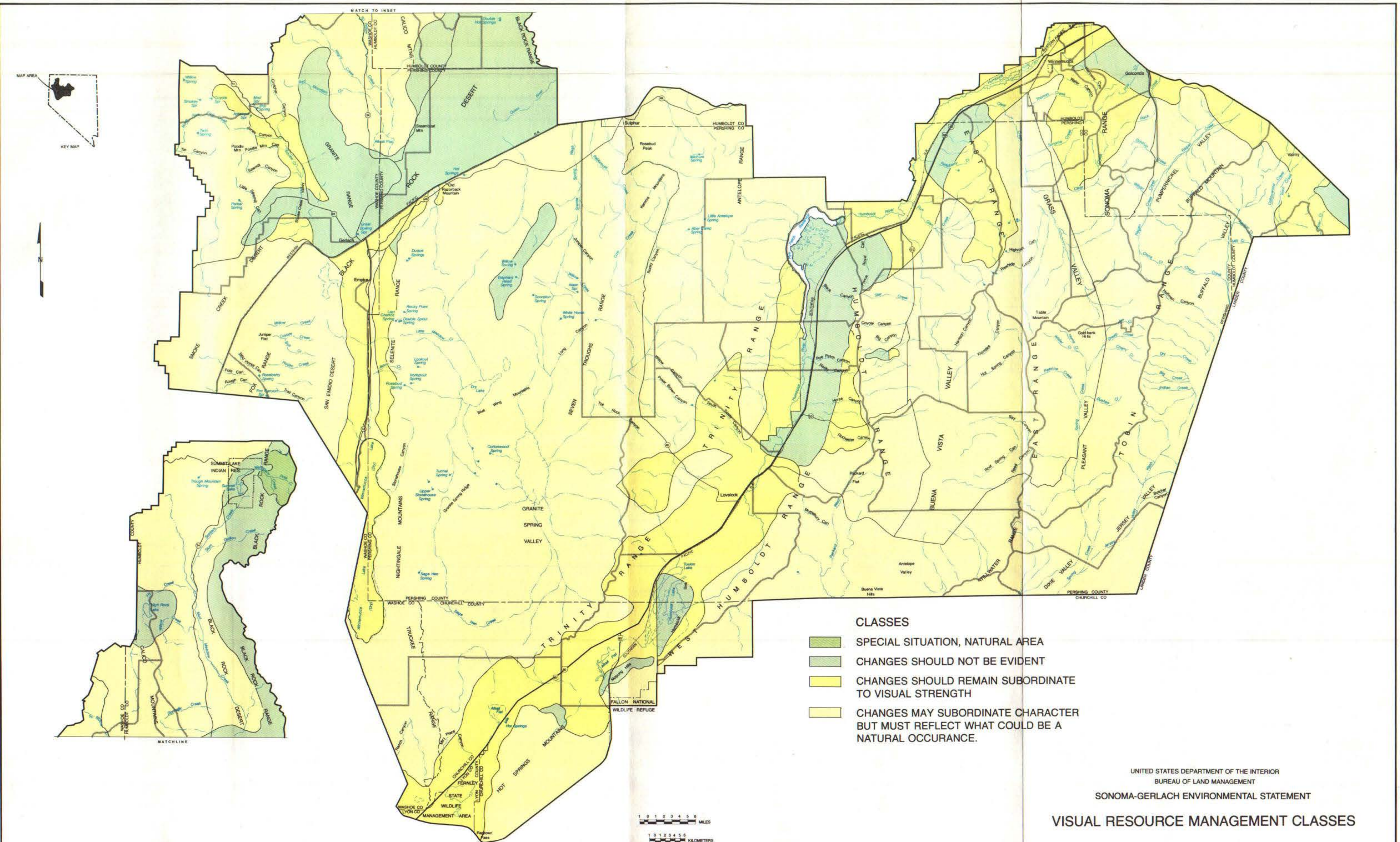
1981



POTENTIAL SUMMER RANGE
POTENTIAL WINTER RANGE
POTENTIAL YEARLONG RANGE
PROBABLE KEY AREAS
UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
SONOMA-GERLACH ENVIRONMENTAL STATEMENT
BIGHORN SHEEP DISTRIBUTION
1981
MATCH TO INSET
MATCHLINE
KEY MAP
MAP AREA
MILES
KILOMETERS
BLACK ROCK DESERT
SMOKE CREEK DESERT
SAN EMIDIO DESERT
GRANITE RANGE
FOX RANGE
SELENITE RANGE
NIGHTINGALE MOUNTAINS
GRANITE SPRING VALLEY
SEVEN TROUGHS RANGE
TRINITY RANGE
WEST HUMBOLDT RANGE
HUMBOLDT RANGE
EAST RANGE
STILLWATER RANGE
BUENA VISTA VALLEY
SONOMA RANGE
TOBIN RANGE
PLEASANT VALLEY
GRASS VALLEY
BUFFALO VALLEY
JERSEY VALLEY
DIXIE VALLEY
HOT SPRINGS MOUNTAINS
FALLON NATIONAL WILDLIFE REFUGE
STATE WILDLIFE MANAGEMENT AREA
PERSHING COUNTY
CHURCHILL COUNTY
WASHOE CO
HUMBOLDT COUNTY
Winnemucca
Lovelock
Gerlach
Empire
Fernley
Golconda
Valmy


SAGE GROUSE RANGE
STRUTTING GROUND
BROODING AREA
WINTER GROUND
KEY SUMMER AREA
UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
SONOMA-GERLACH ENVIRONMENTAL STATEMENT
SAGE GROUSE DISTRIBUTION
1981
MATCH TO INSET
MATCHLINE
KEY MAP
MILES
KILOMETERS
HUMBOLDT CO
PERSHING CO
WASHOE CO
CHURCHILL CO
SONOMA RANGE
EAST RANGE
HUMBOLDT RANGE
TRINITY RANGE
TOBIN RANGE
SELENITE RANGE
NIGHTINGALE MOUNTAINS
GRANITE SPRING VALLEY
FALLON NATIONAL WILDLIFE REFUGE

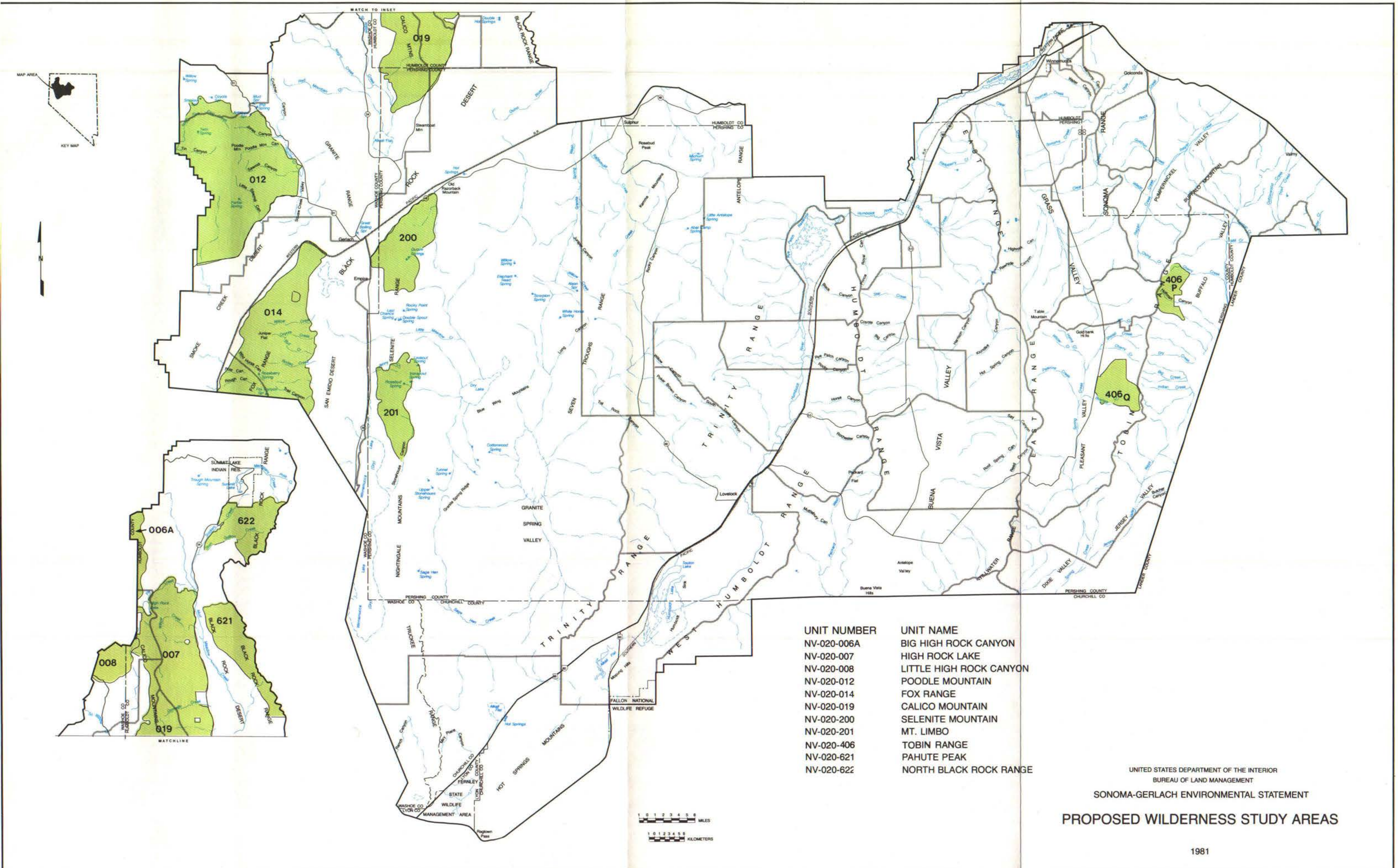

USE AREA NAMES
1 WARM SPRINGS CANYON
2 BLACK ROCK WEST
3 CALICO MOUNTAINS
4 GRANITE RANGE
5 BUFFALO HILLS
6 FOX AND LAKE RANGE
7 SELENITE RANGE
8 NIGHTINGALE MOUNTAINS
9 SHAWAVE MOUNTAINS
10 TRUCKEE RANGE
11 BLUEWING MOUNTAINS
12 SEVEN TROUGHS RANGE
13 LAVA BEDS
14 KAMMA MOUNTAINS
15 ANTELOPE RANGE
16 TRINITY RANGE
17 HUMBOLDTS
18 EAST RANGE
19 STILLWATER RANGE
20 AUGUSTA MOUNTAINS
21 TOBIN RANGE
22 SONOMA RANGE
USE AREA WITHIN CHECKERBOARD LAND PATTERN
HERD MANAGEMENT AREA (PROPOSED ACTION ALTERNATIVE)
HERD MANAGEMENT AREA (MAXIMIZING WILD HORSE AND BURRO ALTERNATIVE)
SUSPECTED MOVEMENT PATTERNS
MILES
KILOMETERS
MATCH TO INSET
MATCHLINE
KEY MAP
MAP AREA
UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
SONOMA-GERLACH ENVIRONMENTAL STATEMENT
WILD HORSE AND BURRO USE AREAS
1981



UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
SONOMA-GERLACH ENVIRONMENTAL STATEMENT

VISUAL RESOURCE MANAGEMENT CLASSES

1981


UNIT NUMBER
UNIT NAME
NV-020-006A
BIG HIGH ROCK CANYON
NV-020-007
HIGH ROCK LAKE
NV-020-008
LITTLE HIGH ROCK CANYON
NV-020-012
POODLE MOUNTAIN
NV-020-014
FOX RANGE
NV-020-019
CALICO MOUNTAIN
NV-020-200
SELENITE MOUNTAIN
NV-020-201
MT. LIMBO
NV-020-406
TOBIN RANGE
NV-020-621
PAHUTE PEAK
NV-020-622
NORTH BLACK ROCK RANGE
UNITED STATES DEPARTMENT OF THE INTERIOR
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SONOMA-GERLACH ENVIRONMENTAL STATEMENT
PROPOSED WILDERNESS STUDY AREAS
1981
MATCH TO INSET
MATCHLINE
KEY MAP
MAP AREA
MILES
KILOMETERS
BLACK ROCK DESERT
GRANITE RANGE
SMOKE CREEK DESERT
SAN EMIDIO DESERT
SELENITE RANGE
NIGHTINGALE MOUNTAINS
SEVEN TROUGHS RANGE
TRINITY RANGE
HUMBOLDT RANGE
WEST HUMBOLDT RANGE
EAST RANGE
BUENA VISTA VALLEY
GRASS VALLEY
SONOMA RANGE
TOBIN RANGE
PLEASANT VALLEY
HOT SPRINGS MOUNTAINS
GRANITE SPRING VALLEY
Lovelock
Winnemucca
Gerlach
FALLON NATIONAL WILDLIFE REFUGE
006A
007
008
012
014
019
200
201
406 P
406 Q
621
622

CHAPTER 3

ENVIRONMENTAL CONSEQUENCES

CHAPTER 3

ENVIRONMENTAL CONSEQUENCES

INTRODUCTION

This chapter of the Environmental Impact Statement (EIS) discusses the significant impacts that would result from implementation of each of the alternatives including the proposed action. Documentation of both adverse and beneficial impacts that affect the environmental components, as discussed in Chapter 2, will be presented. Also discussed in this chapter are: mitigating measures (not included under Standard Operating Procedures of Chapter 1) needed to lessen adverse or enhance beneficial impacts; unmitigatable unavoidable adverse impacts; relationship between short-term use and long-term productivity; and irreversible or irretrievable commitment of resources.

Analysis of climatic conditions revealed impacts would be insignificant. Therefore, this component will receive no further documentation in this EIS.

Where the subheadings mitigating measures, unavoidable adverse impacts, short-term use verses long-term productivity, and irreversible and irretrievable commitment of resources do not appear, no further discussion follows as these impacts were considered insignificant.

BASIC ASSUMPTIONS

To facilitate the process of analyzing the effects of each alternative, including the proposed action, basic assumptions were made. They are:

1. Coordinated Resource Management and Planning (CRMP) concepts may be considered prior to initiating any adjustments to livestock, wildlife, and wild horses and burros as well as during the development of activity plans, establishment of monitoring studies and subsequent evaluations.

2. Impacts mitigated through the Standard Operating Procedures in Chapter 1 will not receive further discussion in this Chapter.

3. Unless otherwise noted, all impacts identified in this Chapter are assumed to be direct impacts.

4. Short-term impacts are those which would occur during intensive grazing management development (years 1982-1989). Long-term impacts are those remaining after grazing management is developed (year 2024).

5. Areas identified as intensive wilderness study areas will not be considered for land treatments, range improvement projects or Allotment Management Plans (AMPs) until a final decision on their wilderness status has been made.

6. Wild horses and burros will be removed or reduced to management levels as specified in the Management Framework Plan (MFP) within seven years following completion of the EIS.

7. It is assumed that water will be determined available at planned well sites prior to development and that the Nevada State Water Engineer will permit this use.

8. Adjustments to estimated carrying capacity for livestock would be implemented over a 3-year period (proposed regulation change to 5-year period) and would be based on utilization studies and actual use data.

9. Allotment Management Plans will be monitored and evaluated following the implementation so that periodic adjustments, if necessary, can be made on those plans not meeting multiple use objectives. Adjustments will be based on utilization studies, actual use data, trend, condition, etc.

10. The BLM will have the funding and work force to implement and supervise the proposed intensive grazing management (Allotment Management Plans) and associated livestock support facilities.

11. Baseline data for vegetation condition, trend and production are the most reliable data currently available, as are wild horse and burro population data. Available data were used whenever they were applicable and extrapolated to areas for which no data were available.

12. When evaluating potentially significant adverse impacts, a worst case analysis will be included if there is incomplete or unavailable information and this information is essential to a reasoned choice among alternatives.

DETERMINATION OF SIGNIFICANT IMPACTS

The purpose of this section is to identify the process for determining whether an impact is significant, and to define the threshold used in each resource to identify significant impacts.

An environmental impact is defined as a change in the ecosystem or the human environment caused by an act of man. Impacts to the social and economic components are also included as they are considered part of the human environment. An impact becomes significant for some affected interest when it meets both of the following criteria:

1. The amount of change varies from a threshold; and,

2. Varying from that threshold takes on new importance to that affected interest (i.e., according to a particular viewpoint or value system, it is or is not acceptable to cross that threshold).

The threshold is a standard to be used by BLM specialists to judge whether or not actions proposed in alternatives including the proposed action in the EIS would cause significant impacts and, if significant, whether the impact would be adverse or beneficial.

A threshold is a maximum or minimum number, or other parameter, established by somebody or something that would be impacted. It may be an individual or interest group, or it may be a tolerance within the ecosystem itself. The threshold is set according to a particular point of view (value system), based on the best available information. Thresholds may change as new information becomes available.

Thresholds may be specifically defined levels of resource use, production or development which are established as maximum or minimum constraints. A threshold may be a single defined level such as a drinking water standard, or it may be a range with maximum and minimum levels defined.

When an environmental impact exceeds a threshold, that impact becomes significant. Significant impacts are either adverse or beneficial. An affected interest is an individual person or species, or any other part or process of the ecosystem affected by the impact.

Different affected interests hold different values that influence their respective viewpoints. A value system is a set of values held by an affected interest. Usually the values we hold strongly shape our opinions, attitudes, and behavior, and thus our judgement about what is significant.

The following are thresholds which have been developed for each resource. They represent the professional opinion of the resource specialist involved unless otherwise noted.

SOILS

The threshold for sediment yield is the loss of three to five tons/acre/year of soil. The Soil Conservation Service has established an allowable sediment yield of three to five tons/acre/year depending upon the depth of the soil. Therefore, soil erosion would become significantly adverse when it exceeds that threshold (Grant 1973) as a result of the alternatives or proposed action.

WATER RESOURCES

The threshold for water consumption is exceeding five percent of the total annual runoff. The thresholds for water quality are:

1. Turbidity - Ten nephelometer turbidity units (NTUs).

2. Temperature - summer maximum of 23 degrees C.

3. Fecal Coliform Bacteria - 200 milliliter for bathing and water contact sports.

These water quality thresholds are based on the Nevada Water Pollution Control Regulations of 1979 and the water quality criteria for the pollution standards outlined in Article 4.1.4 Water Quality Criteria For Designated Beneficial Uses. Exceeding these thresholds would be a significant adverse impact.

VEGETATION

Thresholds are:

1. Vegetation Trend - Five percent change in existing acreage.

2. Vegetation Condition - Five percent change in existing acreage.

3. Vegetation Production - Ten percent change in existing AUMs.

4. Vegetation community - Five percent change in existing acreage.

LIVESTOCK GRAZING

The threshold of significance for changes in livestock grazing preference is any figure differing over 10 percent or more from the last three to five years average use. Ten percent is used as a measure of significance because of its acceptance as a reduction limitation in the Department of the Interior appropriation act for fiscal year 1980. In addition, the threshold of significance in the no livestock grazing alternative was based on livestock permittee dependence (yearlong) on public rangeland of greater than 10 percent.

In calf/lamb crops weaned and weaning weights there are two thresholds. First, an increase in calf crop or lamb crop weaned of more than three percent; and an increase of calf or lamb weaning weights of more than 10 pounds or 5 pounds, respectively, would be considered significant. Second, any decrease in present calf/lamb crops or weaning weights would be considered significant.

WILDLIFE

There are three thresholds for wildlife. The first is existing habitat quality, with a significant impact being any change in habitat quality. The second threshold is reasonable numbers of big game in each allotment. A significant beneficial impact is any impact which aids in attaining or maintaining reasonable numbers, while an adverse impact is any impact that prevents big game populations from reaching or maintaining reasonable numbers in any allotment. The third threshold is the existing sage grouse population, with a significant impact being any change in population numbers.

AQUATIC HABITAT

The threshold is good condition or better. Anything less than good condition is an adverse impact because the Bureau is to be in compliance with BLM Manual 6740 Wetland-Riparian Area Protection and Management. This manual states, "Important fisheries (which include important, threatened, endangered, or sensitive aquatic or riparian species) will receive special management consideration . . . . Management will be adjusted to provide for recovery of riparian habitat to a Class II (good) or greater level along shorelines or streambanks (1/2 mile or more segments) rated in Class II (fair) or IV (poor)." The scope of the term "important fishery" was intended to include sport fisheries, especially if they provide or have the potential to provide a major recreational resource in the area (Paul Cuplin, BLM Fisheries Biologist (co-author 6740 Manual), personal communication, 10 June 1980). The threshold is existing condition for both reservoirs (water quality) and fish populations.

WILD HORSES AND BURROS

The threshold for changes is a measure of the horse numbers to be removed in order to reach carrying capacity of the range. If it is necessary to reduce horses by more than 50 percent to reach estimated carrying capacity there would be an adverse impact. If a necessary reduction is 50 percent or less there would be a beneficial impact.

Any change in the number of herd use areas from the present, not including checkerboard herd use areas, would be considered significant. Any change in health and condition of wild horses and burros from the present situation would be considered significant. A death loss due to round-up greater than six percent or less than three percent would be considered significant.

VISUAL RESOURCES

The threshold is exceeding contrast ratings found in BLM Manual 8421.

CULTURAL RESOURCES

Since cultural resources are nonrenewable, all impacts are considered significant. Any reduction of these impacts would be beneficial to the resource.

RECREATION

The threshold is the existing situation for the quality of the recreation experience. The threshold for visitor days is any change plus or minus from that projected by the Nevada State Comprehensive Outdoor Recreation Plan.

WILDERNESS

The threshold for determining significant impacts to potential Wilderness Study Areas is impairment or non-impairment of wilderness suitability. Impairment would be an adverse impact. Non-impairment would be a beneficial impact.

ECONOMICS

Three economic aggregations were used as bases of comparison in determining impact thresholds. These classifications begin at the individual household level, progress (through aggregation of households) into a sectoral level (agriculture, construction, etc.), and culminate in the combination of all sectors into an overall view of the EIS area economy via countywide data. Threshold values were established largely on the basis of professional judgement, with impacts discussed in terms of effect on employment as below:

a. Any impact which causes the gain/loss of one job will be deemed significant at the individual level.

b. Any impact which causes an adjustment in sectoral employment of five percent or more will be deemed significant at the sectoral level.

c. Any impact which causes an adjustment of one percent or more in EIS area employment, as measured by the Humboldt and Pershing County unemployment rates, will be deemed a significant impact on the EIS area economy.

d. A change in an individual ranch proprietors income of five percent or more will be considered significant.

e. A change of ten percent in the contribution of BLM AUMs to rancher wealth will be considered significant.

SOCIAL CONDITIONS

In analyzing social impacts, the threshold level was defined as the existing situation or status quo. Quality of life components (i.e., opportunities for a reasonable income and a reasonable standard of living, a decent home and neighborhood, peace of mind, community and family stability, meaningful employment, etc.) were the major foci in determining individual and family social impact significance. Any increment of change in the social condition of an individual and his family, or any change in their perception of opportunities for personal and family development was considered a significant impact. On the community, regional, state and national levels, impacts were considered significant if one or more of these various groups indicated that their social well-being would be changed in any measurable or perceptual way. Some of the major evaluation categories of social well-being which were used included: the value various groups place on natural resources and resource uses, the viability and stability of organizations and institutions, continuity of values such as rural orientation, improvement of conditions associated with the achievement of economic stability and improved personal income. (The above relies heavily on information in an Abt Associates Study, Social Assessment Manual 1977.)

PROPOSED ACTION

SOILS

The proposal would result in a reduction in vegetation consumption and soil compaction (Meehan and Platts 1978). Grazing treatments which include rest periods and controlled utilization levels would increase vegetation cover. The increased vegetation cover would aid in dissipating the energy of rainfall before it strikes the soil surface, thus impeding the flow of water and promoting infiltration (Pacific Southwest Inter-Agency Committee 1968; USDA 1976). The greater the infiltration rate, the less runoff and erosion would occur (Lull 1959). Increased vegetation cover decreases runoff on watersheds contributing water to gullies, thus indirectly decreasing gully erosion (Grant 1973). Since the proposal would result in a decrease in livestock trampling, soil compaction would be decreased and the infiltration rate increased (Meehan and Platts 1978).

The effect, approximately four to five years after implementation of the proposal, would be a decrease in sediment yield from 1.00 to 0.90 tons/acre/year over the entire resource area (Table 3-1). This yield is well below the three to five tons/acre/year limit set by the Soil Conservation Service (SCS) for tolerable yield (Grant 1973).

All sediment yields were calculated using data from Phase I Inventory of the Watershed Conservation and Development System and the Pacific Southwest Inter-Agency Committee method for determining sediment yield (Appendix H, Section 1).

The land surfaces disturbed (an action taken which results in a partial or complete loss of vegetation cover) for range improvements such as fences, wells, spring developments, troughs, and pipelines would increase sediment yield. Total acreage involved would amount to approximately 456 acres or 0.008 percent of the resource area in the period between initial disturbance and revegetation, normally three to four years, and approximately 53 acres in the period after revegetation (Appendix H). The sediment yielded from the 53 acres in the period after revegetation is not considered to have a significant impact on the soil resource.

Range treatments, which include seeding, reseeding, and sagebrush control followed by seeding are proposed for 244,864 acres or 4 percent of the area. There would not be an area-wide change in sediment yield in the period between initial disturbance and revegetation, normally three to four years due to the range treatments. However, yields on specific treatment sites would change from the

TABLE 3-1

PRESENT AND PREDICTED SEDIMENT YIELDS a/
SONOMA-GERLACH RESOURCE AREA
(tons/acre/year)

Watershed b/	Present Erosion	Proposed Action	No Action	No Livestock Grazing	Maximizing Livestock	Maximizing Wild Horses & Burros
004 Winnemucca	1.29	.83	1.32	.86	.83	.83
006 Spaulding Canyon	1.07	.80	1.21	.80	.80	.80
009 Golconda	.75	.62	.75	.62	.61	.62
010 Pumpernickel	1.10	.97	1.16	.97	.97	.97
018 Duck Flat	.71	.60	.72	.62	.60	.60
019 Buffalo Hills	.86	.72	1.04	.72	.72	.72
020 Hualapi Flat	.97	.74	1.10	.75	.75	.74
022 High Rock Lake	.73	.59	.86	.58	.60	.59
023 Mud Meadow	.94	.85	.97	.86	.70	.85
024 Summit Lake	.86	.78	.88	.80	.77	.78
040 San Emidio	1.14	1.10	1.21	1.10	1.10	1.10
043 Rabbithole	1.01	.96	1.04	.97	.96	.96
044 Majuba Mountain	.87	.85	.87	.83	.85	.85
045 Adobe Flat	.90	.87	.90	.88	.87	.87
046 Twin Buttes	.83	.76	.88	.77	.76	.76
047 Winnemucca Lake	1.04	1.02	1.04	1.04	1.02	1.02
049 Black Rock Canyon	.87	.86	.87	.86	.86	.86
051 Buffalo Valley	.93	.64	1.44	.65	.64	.64
052 Trout Creek	.84	.80	.86	.80	.80	.80
054 Buena Vista	1.15	1.10	1.21	1.10	1.10	1.10
056 Dun Glen	1.32	1.13	1.46	1.16	1.13	1.13
057 Humboldt	1.40	1.31	1.44	1.32	1.31	1.31
Average c/	1.00	.90	1.04	.90	.73	.90

a/ Predicted sediment yields reflect long-term effect. Long-term reduction in sediment yield would begin after seedling establishment when vegetation cover conditions improve (approximately four to five after implementation).

b/ Watershed area boundaries do not correspond with allotment boundaries.

c/ Average is computed as a weighted average which considers the acreage of each watershed and its relative contribution to the resource area.

Source: U.S. Department of The Interior, Bureau of Land Management, Winnemucca District, Sonoma-Gerlach URA, 1979, Sonoma-Blue Wing-Buffalo Hills URAs, Phase I Inventory, Data fromWatershed Conservation and Development System using Pacific Southwest Inter-Agency Committee Methodology for obtaining sediment yield.

present 0.94 to 1.03 tons/acre/year. Four or five years after the treatment, the sediment yield on these sites would be reduced to 0.74 tons/acre/year. All the present and predicted sediment yields are below the three to five tons/acre/year limit set by the SCS (Grant 1973). Conequently the proposed range treatments are considered to have an insignificant impact on the soils resource.

CONCLUSION

The proposed action would not have a significant impact on the soils resource. Sediment yields from the range treatment areas would increase by 10 percent over the first three to four years of the short-term period but would decrease by 27 percent over the last five to six years of the short-term period and over the long-term period. The resource area would experience an overall long-term decrease in sediment yield of 10 percent (Table 3-1).

WATER RESOURCES

WATER QUANTITY

Total runoff from the resource area is approximately 80,136 acre feet. Under the proposed action annual water consumption by livestock, wild horses, and big game would be just over 230 acre feet (see Table 3-2). This amounts to .2 percent of the total annual runoff, therefore animal consumption is considered to have an insignificant impact on the water quantity.

WATER QUALITY

Under section 208 of the Water Pollution Control Act of 1972 the State of Nevada sets regulations and standards for water pollution in Nevada. The regulations and standards are found in the Nevada Water Pollution Control Regulations of 1979 and the water quality criteria for the pollution standards are outlined in article 4.1.4 Water Quality Criteria for Designated Beneficial Uses.

The beneficial uses affected by the proposed action would be cold-water aquatic life, bathing, and water contact sports. The water quality parameters affected by the proposed action would be turbidity (sedimentation), water temperature, and fecal coliform levels (from livestock wastes).

It would be considered a significant and adverse impact if the proposed action or alternative were to cause any public water to exceed Nevada water quality criteria, thereby interferring with public uses of these waters and associated resources or creating a health hazard. There would be no significant impacts to surface springs and water holes.

Turbidity

Nine streams were documented as exceeding turbidity criteria for cold-water aquatic life (1980 Water Quality Survey for the EIS area conducted by BLM). Turbidity in stream waters results from sediments or soils eroding from the streambanks, gullies, and the watershed. The proposed action would reduce sedimentation from watershed erosion by improving soil stabilizing vegetation cover, but would not reduce streambank or gully erosion into streams. This would be a significant adverse impact because sedimentation in streams contributes to the reduction of or in part prevents the establishment of a cold water fishery.

Therefore, sedimentation is considered to be a significant adverse impact to stream water quality. Data presented in the Soils Section, however, reflect low overall sediment yield rates. As stated in the Soils Section of Chapter 2, gully erosion is a major contributor of sediment. While gully erosion at specific sites is often severe, the sediment yielded from these sites becomes insignificant when averaged in with the entire resource area.

Temperature

Three streams were documented as exceeding temperature criteria for cold water aquatic life. Water temperature, for the most part, is controlled by shade-producing vegetation along the streams unless cooler ground water enters the stream periodically (Brown 1970). There are no provisions specifically outlined in the proposed action to protect or re-establish riparian vegetation along the streams, and therefore it is expected that the downward trend in stream habitat condition would allow no improvement in stream water temperature unless the streams are fenced. This would be a significant and adverse impact.

Fecal Coliform Bacteria

Fecal coliform bacteria grow in the digestive tract of warm-blooded animals. Nevada water quality standards allow none to be present in untreated water used for drinking. Although it is not proposed that any resource area waters be used for drinking without treatment, many waters are used for swimming and bathing, for which water quality standards are somewhat less stringent.

Fecal coliform counts are expected to vary depending on the number of cattle allowed along a

TABLE 3-2
LONG-TERM ANNUAL WATER CONSUMPTION a/
SONOMA-GERLACH RESOURCE AREA
(acre-feet)

Species	Existing Use	Proposed Action	No Livestock	No Action	Maximize Livestock	Maximize Wild Horses & Burros
Livestock	107.3	210.7	0	108.8	235.9	126.5
Wild Horses	60.7	18.4	37.9	60.7	0	38.7
Big Game	.9	1.6	1.6	.6	.9	1.6
TOTALS	168.9	230.7	39.5	170.1	236.8	166.8

a/ Water consumption is based on the following rates:

Cattle	10 gallons/day/animal
Horses	10 gallons/day/animal
Deer	1 gallons/day/animal
Antelope	1 gallons/day/animal
Bighorn Sheep	1 gallons/day/animal

Source: Water consumption data for livestock and horses from Stoddart et al. (1955), big game from Sonoma, Blue Wing, and Buffalo Hills URAs (1980).

particular stream. Four streams exceeded Nevada fecal coliform criteria for bathing and water contact sports in 1980 (water quality survey conducted by BLM). The proposed action would not be expected to change the current situation and maintaining coliform levels above Nevada water quality criteria constitutes a health hazard to any person wishing to use these waters for any water contact sports such as wading or bathing.

CONCLUSION

The continued grazing along EIS area streams is expected to cause nine streams to exceed turbidity criteria for cold water aquatic life. Three streams would exceed temperature criteria for cold water aquatic life and four streams would exceed fecal coliform criteria for bathing and water contact sports.

VEGETATION

ECOLOGICAL RANGE CONDITION AND TREND OF VEGETATION COMMUNITIES

The following discussions pertain to the ecological range condition and trend of all vegetation communities except for riparian and aspen communities, which are discussed later.

Changes in ecological range condition and trend of vegetation communities, as a result of the proposed action, would be attributed to changes in composition, density, cover, and vigor of rangeland vegetation. The rate of change in condition would vary, depending upon site potential of each vegetation community, present vegetation condition (vigor), present cover, natural seed sources, extent of range improvements, and climatic conditions (Stoddart and Smith 1955). Rate of recovery within a species would be proportional to the state of vigor, the lower the vigor the less rapid the recovery (Cook and Child 1971).

Range sites with a high productive potential and in fair condition should show positive changes in range trend in a few years, while range sites with a lower productive potential may require the long-term (year 2024) or longer to show appreciable improvement. Holmgren and Hutchings (1972) found very little response in the salt desert shrub type after 32 years of protection from grazing. Therefore, greasewood and shadscale saltbrush types are expected to show little improvement over the long-term due to their low site potential.

The proposed action is expected to result in a significant improvement to ecological range condition and trend of vegetation communities other than the salt desert shrub and greasewood types. The improvement in ecological range condition is anticipated to be an overall 10 percent with an overall 63 percent improvement in ecological range trend. Management actions that can be attributed to bringing about these improvements include implementation of periods-of-use, Allotment Management Plans (AMPs), removal of excess wild horses and burros, allocation of available vegetation to the estimated carrying capacity and range improvements.

The cited references and discussions below are the basic principles of theory for anticipated improvements in vegetation communities of the Sonoma-Gerlach Resource Area from the above proposed management actions. The resultant improvements in vegetation communities are quantified by changes in ecological range condition and trend acreage using the methodology described in Appendix N, Sections 1 and 2. The methodology used in determining changes in ecological range condition and trend is based on the following discussions of the proposed management actions. These proposed management actions would have an accumulative effect on the overall projected changes.

The proposed periods-of-use would alter the current use in most allotments. These proposed periods-of-use (Table 1-1) are designed to provide rest from and/or delay of grazing pressure during the majority of the critical growing period of key management species (Table 1-4); which consists of no livestock grazing in March, April, and in some allotments, May and June, also. In addition, some allotments are proposed for winter grazing use only and rest the remainder of the year. The following cited references are indicative of how proper periods-of-use (as specified in the proposed action) would benefit the vigor of key management species in the Sonoma-Gerlach Resource Area. As these species increase in vigor they would begin to regain dominance in vegetation communities, which would facilitate the successional movement towards climax.

Later turnout dates would result in less grazing pressure during the growing season than would earlier turnout dates for a given stocking rate (Hanley 1979). The delay would allow key management species the opportunity to flower and build up their carbohydrate reserves before they would be weakened by grazing (Blaisdell and Pechanec 1949; Britton et al. 1979). Martin (1978) indicated that rest periods allow for recovery of preferred plants. Laycock (1967) reported that desert ranges in poor condition grazed only in the fall and those protected from grazing improved in vigor and species composition, while those in good condition and grazed in the spring deteriorated. Cook et al. (1964) indicated that desert ranges of the intermountain region (primarily salt desert shrub types) are adapted to winter grazing but they are not adapted to spring use. Cook et al. (1964) indicated beyond question that stock need to leave the desert range as soon as growth of the shrubs is underway. Herbel (1971) reported in a research summary the following cited references in regard to period-of-use as it relates to ecological range condition. Mueggler (1950) concluded that heavy fall stocking did not markedly affect the range condition. However, spring and fall grazing reduced the range condition from good to poor. Laycock (1961), in his study, indicated the following results:

> Range condition remained essentially unchanged where grazing was continued in the same season as formerly. However, range condition improved from poor to fair on the area grazed in the spring prior to 1950 and in the fall from 1950 to 1957.
>
> The area changed to spring grazing in 1950 deteriorated from good to poor condition by 1957. Spring deferment and heavy fall grazing improved range condition faster that a complete exclusion of livestock.

Cook (1971) reported that Johnson 1956; Pechanec 1945; Short and Woolfolk 1945; Weaver and Darland 1947 regard change of vigor as one of the important indicators of change in range condition since it is frequently the first response to a change in management. Trlica et al. (1971) indicated that depletion of carbohydrate reserves is believed to be a primary factor for loss in plant vigor and subsequent range deterioration.

Based on the above cited references and discussion, the implementation of the proposed periods-of-use would meet the physiological requirements of key management species by providing for their buildup of carbohydrate reserves, aid in the reproductive processes, and increase their vigor, thereby increasing percent composition of desirable species in plant communities. This would have a beneficial impact on the improvement of ecological range condition and trend of vegetation within the resource area. Thus, implementation of the proposed periods-of-use would contribute to the significantly beneficial impact of an overall 10 percent improvement in ecological range condition and the 63 percent improvement in ecological range trend of vegetation communities in the resource area.

The proposed action recommends the implementation of AMPs and/or revision of existing AMPs in all but four allotments (Cottonwood Canyon, Jersey Valley, Ragged Top, and Diamond S allotments) (see Table 1-1). The grazing treatments in Chapter 1 could be used to formulate the grazing systems also mentioned in Chapter 1 for implementation of AMPs specified in Table 1-1. Shiflet and Heady (1971) indicated that each grazing system must be tailored to fit the vegetation, climate, growing season, and management objectives of the allotment in which it is to be used. It was assumed that the grazing systems implemented in the Sonoma-Gerlach Resource Area would be tailored as listed above to constitute a system to provide for the betterment of the rangeland resource. The following cited references are expressive of how grazing systems would benefit ecological range condition and trend of vegetation in the Sonoma-Gerlach Resource Area. Although the following research was not related entirely to ecological range condition, there is a direct correlation. However, it cannot be quantified.

Shiflet and Heady (1971) summarized studies conducted on the benefits of specialized grazing systems:

> Heady (1961) showed the most commonly stated benefit to be improved range condition resulting from increased plant vigor and seed production and from the establishment of more seedlings of desirable species.
>
> Hanson et al. (1931) reported that using a specialized system in Colorado resulted in a 53 percent increase in plant density and an 18 percent decrease in the number of undesirable plants. Hyder and Sawyer (1951) reported an increase in climax bunchgrass plants from using a deferred rotation system. Hubbard (1951) obtained improved range condition with a deferred rotation system; he suggested that one of the benefits of the system is in restoring overgrazed ranges. Johnson (1964) indicated the use of deferred rotation and rotation systems improved range condition on a mountain range in Wyoming. King and Merrill (1960) indicated that range condition on units in his grazing system had improved 25 percent more than on units grazed continuously at the same intensity and with the same classes of livestock.

Reardon and Merrill (1976) reported that deferred rotation systems allow the better forage plants to become more numerous and more vigorous. Leithead (1960) found that on a bunchgrass-sagebrush range of 8,450 acres that 82 percent changed one condition class as a result of deferred rotation grazing for 10 years. Kothmann et al. (1969) showed that yearly vegetation records obtained from the treatment pastures have indicated that heavy continuous grazing has resulted in a deterioration of the vigor and species composition of the vegetation as compared to the Merrill four pasture deferred rotation grazing system. Shiflet and Heady (1971) also reported that others determining improved range condition or carrying capacity, or both from grazing systems include Hormay (1955), Woolfolk (1960), and Martin (1966).

The above cited references indicate the anticipated beneficial impacts to ecological range condition and trend of vegetation communities from the implementation of grazing systems. The improvement in vigor and percent composition of desirable species resulting from grazing systems would facilitate the dominance of these species in vegetation communities, thus aiding the secondary succession towards climax. The anticipated beneficial impacts to ecological range condition and trend of vegetation communities from grazing systems would contribute to the significantly beneficial impact of an overall 10 percent and 63 percent improvement, respectively in the Sonoma-Gerlach Resource Area.

Vegetation would be allocated to livestock, big game, and wild horses and burros up to the estimated carrying capacity of the vegetation resource to achieve a utilization level of the key management species of not more than 50 percent (Table 1-4). As a result of this, livestock use would be reduced in 28 allotments for an overall downward adjustment of two percent from the three to five year average livestock licensed use (see Chapter 1 and Table 1-1). In addition, wild horse and burro use would initially decrease from the existing 66,012 AUMs (5,501 horses and burros) in the whole resource area to 13,415 AUMs (1,118 horses and burros) in three herd management areas, which represents an 80 percent decrease. Big game allocations would increase from the current allocation of 6,430 AUMs to 16,869 AUMs for reasonable numbers of big game, which would be an increase of 3,833 AUMs over existing use (13,036 AUMs) of big game. An allocation to reasonable numbers of big game represents a 162 percent increase over current allocations and a 29 percent increase over existing use by big game.

The following cited references are representative of the relationships between grazing intensity (stocking rates) and ecological range condition and trend of vegetation in the resource area.

Hanley (1979) reported that "Stocking rates have a direct bearing on the magnitude of herbivore grazing pressure. Low stocking rates will favor a change from low to high steady-states and will maintain a high level equilibrium. Conversely, high stocking rates will favor a change from high to low steady-states and will maintain a low level equilibrium. It is conceivable that with a high enough stocking rate the system may be forced from a low level equilibrium point to extinction." Houston (1966) in a ten year study at the Miles City Station, Montana, indicated that heavy grazing did not allow improvement in range condition or reduced range condition rating. Frischknecht et al. (1953) indicated that light or moderate grazing intensity can either maintain or increase the number of plants and future density. Van Poollen and Lacey (1979) indicated that a reduction in grazing intensity from heavy to moderate would increase herbage yield by increasing species composition. Cook et al. (1964) indicated in relation to effect of intensity of harvesting, without exception, that the more herbage removed, the more plants died and the smaller were the remaining plants. Cook and Stoddart (1963) expressed the harmful effects of increased grazing intensity; "Percent plants killed and reduction in crown cover increased with increased intensity of forage removal during all seasons for both phases of the study." Clements (1949) made reference to the "sagebrush disclimax" as an extensive vegetation formation of the Great Basin in which big sagebrush has achieved post-climax dominance, a position maintained by continious overgrazing of the formerly dominant bunch-grasses.

Based on the above cited references and discussion, the reduction in grazing intensity from heavy to moderate would facilitate an increase in plant vigor and litter production, which would result in an increase in the percent composition of desirable species in plant communities. This would have a beneficial impact on ecological range condition and trend of vegetation within the resource area. Thus, the reduction in grazing intensity would contribute to the significantly beneficial impact of an overall 10 percent improvement in ecological range condition and an overall 63 percent improvement in ecological range trend of vegetation communities in the resource area.

The proposed action recommends seeding areas lacking adequate desirable understory vegetation to mixtures of desirable grasses, forbs, and, in some cases, shrubs. This would result in seeding and/or reseeding 14,752 acres and sagebrush control then seed on 230,112 acres (see Table 1-5). These land treatments would cause a conversion of existing predominately sagebrush types to artificially maintained vegetation communities of predominately grassland species. This represents a vegetation aspect conversion of approximately six percent over the resource area. This would result in a significantly adverse impact on vegetation aspect, ecological range condition, and trend of vegetation communities within the resource area. Thus, seeding and the maintenance of the seeding would result in a disclimax vegetation community (see Glossary). The replacement of the primary climax vegetation with nonclimax species would essentially result in a neoclimax community (see Glossary), thus not benefiting ecological range condition and trend. However, some land treatments are proposed within Wilderness Study Areas (WSAs) thus, no initiation of these proposed land treatments (see

Appendix C, Section 3) can be done until these WSAs are released from wilderness consideration, by an Act of Congress. If Congress designates these WSAs (Table 3-16) as wilderness areas then the proposed land treatments could not be accomplished. There are 18,506 acres of proposed land treatments within WSAs. The exclusion of these acres (18,506) within WSAs would result in a total of 226,358 acres proposed for land treatments. This represents a vegetation aspect conversion of approximately five percent over the resource area. This would result in a significantly adverse impact on vegetation aspect, ecological range condition, and trend of plant communities within the resource area with the exclusion of proposed land treatments within WSAs.

Vegetation aspects on approximately 456 acres in the short term and 53 acres in the long term would be adversely impacted, due to the construction of livestock support facilities (e.g., springs, wells, pipelines, fences and troughs--see Appendix O). These range improvements would adversely impact ecological range condition and trend of vegetation types on a small amount of acreage and are not considered significant impacts. The indirect beneficial impacts in the long term to ecological range condition and trend from construction of these range improvements were included in the discussion on impacts from implementation of grazing systems. This was done because these range improvments would be necessary to implement a grazing system, thus are considered part of the grazing system.

A significant long-term beneficial impact on vegetation communities would result from implementation of the proposed action. Trend in the upward category would increase from 296,753 acres (7 percent) presently to 729,405 acres (17 percent) in the long term (2024). Trend in the stable category would increase from 1,062,301 acres (25 percent) presently to 3,324,364 acres (78 percent) in the long term. Trend in the downward category would decrease from 2,897,026 acres (68 percent) presently to 202,311 acres (less than 5 percent) in the long term. This would result in an overall 63 percent improvement in ecological range trend of vegetation in the Sonoma-Gerlach Resource Area. For methodology used to determine changes in ecological range trend in the long term see Appendix N, Section 2. Appendix N, Section 3, shows expected trend changes by allotment. Table 3-3 summarizes the expected improvement in ecological range trend for the proposed action as compared with the current situation.

Another significant long-term beneficial impact on vegetation communities as a result of the proposed action would be an improvement in ecological range condition. The following changes are projected:

Excellent Condition - increase by 14,665 acres (1 percent),

Good Condition - increase by 387,984 acres (9 percent),

Fair Condition - decrease by 35,767 acres (1 percent),

Poor Conditon - decrease by 366,882 acres (9 percent)

This represents an overall ten percent improvement in ecological range condition in the Sonoma-Gerlach Resource Area. Table 3-4 summarizes projected improvement in ecological range condition for the proposed action as compared with the current situation. For methodology used in determining change in ecological range condition in the long term see Appendix N, Section 1. Appendix N, Section 4, shows projected changes in ecological range condition by allotment.

The improvement in ecological range condition and trend would be a cumulative result of the above discussed management actions and would continue through year 2024.

OTHER IMPORTANT VEGETATION COMMUNITIES

Riparian vegetation (including riparian aspen communities) in the resource area provides shade, feed, water and shelter, thus making these areas critical habitat for all animals (see Chapter 2). The following cited references indicate the adverse impacts on riparian vegetation from livestock grazing in the Sonoma-Gerlach Resource Area.

Since livestock are attracted to streamsides, overuse of the riparian zone has often resulted in widespead degradation (Platts 1979). Where the ranges were heavily stocked with livestock and confined within man-made barriers, changes in vegetation took place. Livestock grazing can affect the riparian environment by changing, reducing or eliminating vegetation and by actual elimination of riparian areas by channel widening, channel aggredation, or lowering of the water table (Platts 1979). Livestock trampled and compacted the soil, and the high-quality, fibrillar-rooted plants gradually gave way to shallow-rooted annual species or taprooted forbs or shrubs that could exist on areas with lowered water tables (Platts (1979). Thus, livestock grazing has caused retrogression from the climax riparian vegetation.

The proposed action recommends a reduction in grazing intensity (allocation to the estimated carrying capacity) and AMPs with grazing systems to

TABLE 3-3
CHANGES IN RANGE TREND a/

Type of Action - Time Period		Upward			Stable			Downward		
		Acres	Percent	Percent Change from Current	Acres	Percent	Percent Change from Current	Acres	Percent	Percent Change from Current
Current	1982	296,753	7	0	1,062,301	25	0	2,897,026	68	0
Proposed Action	2024	729,405	17	+10	3,324,364	78	+53	202,311	5	-63
No Livestock Grazing	2024	1,204,143	28	+21	2,560,404	60	+35	491,533	12	-56
No Action	2024	2,953	< 1	- 7	1,056,280	25	0	3,196,847	75	+ 7
Maximizing Livestock Use	2024	828,765	19	+12	3,286,158	77	+52	141,157	4	-64
Maximizing Wild Horse and Burro	2024	384,021	9	+ 2	3,333,985	78	+53	538,074	13	-55

Trend Classes: Upward, Stable, Downward.

a/ The Melody Allotment has been seeded to crested wheatgrass. This is a non-native (introduced) species and does not relate to the original climax plant community, thus ecological range trend cannot be determined.

Source: Current trend taken from Appendix J, Section 2; future trend taken from Appendix N, Sections 3, 6, 8, 10, 12.

TABLE 3-4

ESTIMATED ECOLOGICAL RANGE CONDITION (ACRES) a/

		Condition Classes											
		Excellent			Good			Fair			Poor		
Type of Action	Time Period	Acres	Percent	Percent Change From Current	Acres	Percent	Percent Change From Current	Acres	Percent	Percent Change From Current	Acres	Percent	Percent Change From Current
Current	1982	226,444	5	0	746,061	18	0	1,323,765	31	0	1,959,810	46	0
Proposed Action	2024	241,109	6	+1	1,134,045	27	+9	1,287,998	30	-1	1,592,928	37	-9
No Livestock Grazing	2024	245,189	6	+1	1,165,789	27	+9	1,223,654	29	-2	1,621,439	38	-8
No Action	2024	208,713	5	0	603,914	14	-4	934,964	22	-9	2,508,489	59	+13
Maximizing Livestock Use	2024	243,264	6	+1	1,188,854	28	+10	1,289,617	30	-1	1,534,345	36	-10
Maximizing Wild Horse and Burro	2024	232,876	5	0	940,095	22	+4	1,313,352	31	0	1,769,757	42	-4

a/ The Melody Allotment has been seeded to crested wheatgrass. This is a non-native (introduced) species and does not relate to the original climax plant community, thus ecological range condition cannot be determined.

Source: Current condition taken from Appendix J, Section 1; future condition taken from Appendix N, Sections 4, 5, 7, 9, 11.

provide for improvement in riparian vegetation. The affects of these management actions on riparian vegetation are discussed below.

The proposed action recommends allocating vegetation to the estimated carrying capacity. This would result in a reduction of grazing intensity from heavy to moderate (see ecological range condition and trend of vegetation communities). The following cited references indicate the expected impacts of a reduction in grazing intensity on riparian vegetation in the resource area.

Streamside vegetation is directly affected by grazing because riprian zones are usually grazed more heavily than are upland zones (Platts 1979 reference to Holscher and Woolfold 1953 and Armour 1977). Dahlem (1979) indicated that; "The high moisture content of riparian vegetation makes it extremely palatable to livestock, especially in summer when surrounding rangelands are desiccated. The presence of open water and shade add to the attractiveness of riparian zones. The tendency for livestock, especially cattle, to congregate along riparian areas is reinforced by the fact that, in mountainous areas, streams are often located in narrow canyons with steep slopes on both sides. These factors invariably lead to over-grazing and abuse of riparian areas. Both fish habitat and general vegetation conditions deteriorate in this situation." Duff (1979) found that when cattle were introduced into an area that had not been grazed for four years, the riparian vegetation declined 35 percent to present condition in six weeks. Behnke and Raleigh (1978) stated: "It is primarily in arid and semi-arid regions that riparian vegetation is highly susceptible to overgrazing."

The above cited references indicate that even with reduced numbers of livestock (reduction in grazing intensity from heavy to moderate) grazing on riparian zones, the adverse impacts of continued overuse would still occur. This is anticipated because when livestock are allowed to graze they would continue to congregate in riparian areas and over-utilize the available vegetation before moving into less desirable areas (uplands), thus riparian vegetation would continue to be adversely impacted. Therefore, a reduction in grazing intensity would not improve riparian vegetation and the adverse impacts from livestock grazing intensity on riparian vegetation are expected to continue.

The proposed action recommends the implementation of AMPs with grazing systems and/or the revision of existing AMPs with grazing systems on 35 allotments in the resource area. The following cited research indicates the anticipated impacts of grazing systems on riparian vegetation in the resource area.

Platts (1979) indicated that; "Land managers have often failed to recognize that streamside environments are different from other terrestrial systems, and so need specialized management. The stream, the riparian environment, and the adjacent upland environments require different land-management strategies." Studies conducted by the Forest Service over a four year period on Malheur National Forest in Oregon, state: "...determined through infield examination that streamside management objectives cannot be achieved on streams used by livestock season-long. Much of the time, the deferred and deferred-rotation grazing systems were unable to achieve management objectives that have been identified for individual streams. The rest-rotation system was originally thought to be the answer for achieving streamside management objectives. However, the objectives for herbacious vegetation were not being achieved within desired time limits." (Storch 1979).

Behnke and Raleigh (1978) stated; "It seems obvious to us that if the new BLM grazing proposals rely primarily on rest-rotation grazing systems, a continued downward trend will occur in the riparian vegetation with further reduction in fishery and wildlife habitat values." Although property designed grazing systems would promote rangeland improvement on upland sites, they do not normally allow sufficient protection to improve riparian zones. This is not to say that grazing systems providing all or part of the critical growth period rest are not beneficial to riparian vegetation as opposed to yearlong grazing. The rest provided during the critical growth period would increase plant vigor resulting in a slow-down of riparian degradation and possible stabilization of some riparian areas. Table 3-5 shows the anticipated impacts to the condition of riparian-aquatic habitat from differing types of grazing systems. Behnke and Raleigh (1978) stated: "There presently are no such guidelines or range management techniques in use, short of fencing, that can protect riparian vegetation from overgrazing by domestic livestock."

The above cited references indicate that grazing systems designed to improve the upland terrestrial vegetation would not improve riparian vegetation. However, adequate rest periods (such as complete fencing) would allow sufficient recovery of woody key management species on riparian zones, then significant improvement towards climax can be expected. The following cited references show the beneficial effects of sufficient rest on riparian zones.

Mahogany Creek (Sonoma-Gerlach Resource Area) had a reduction of livestock numbers in 1974 and in 1976 had complete livestock grazing removal by fencing. Studies were established in mid-1976 to determine the effects of no livestock grazing on

TABLE 3-5

EFFECTS OF GRAZING ON RIPARIAN-AQUATIC HABITATS
SONOMA-GERLACH RESOURCE AREA

System	Condition of resulting riparian-aquatic habitat
1. Yearlong grazing	Poor
2. Season-long grazing	Poor
3. Deferred grazing	Poor to Fair
4. Rotation grazing	Poor to Fair
5. Deferred-rotation grazing	Poor to Fair
6. Rest-rotation grazing	Poor to variable a/
7. Short duration, high intensity grazing	Variable a/
8. No grazing	Good to excellent

a/ Resource damage, especially bank cutting, within heavy use units may not be repaired within the grazing cycle.

Source: Platts (1978)

the riparian vegetation. Dahlem (1979) concluded the following results after two years of no livestock grazing on portions of Mahogany Creek:

> Following installation of fencing, the cover on these meadows improved 17 percent, from 42 percent of optimum (mostly scattered willows) to 59 percent of optimum. The improvement comes entirely from increased herbacious vegetation made possible by the absence of livestock. Bank stability improved 20 percent over the 2-year period and now approaches the optimum of 100 percent. This improvement occurred largely because of the increase in herbacious vegetation due to the lack of grazing and constant trampling of the stream banks. In addition, there has been a 9 percent improvement in stream bank cover along Mahogany Creek since 1976.

In 1970 BLM constructed a riparian zone enclosure, fencing off livestock use on Big Creek, Rich County, Utah, to monitor the recovery of riparian habitat from livestock-grazing impacts. Duff (1979) reported the following results obtained from the exclosure:

> Habitat studies from 1973 to 1978 have shown the habitat inside the exclosure to recover significantly from rest, while areas outside the exclosure continue to decline as a result of continued livestock use. Riparian vegetation, particularly sedges and grasses, responded significantly inside the exclosure with the initial 4-year rest (1970-74). This vegetation increased 63 percent in 4 years, going from bare, sparsely covered banks to luxuriant, grassy, overhanging banks. Native willow plants which had been severely grazed, hedged back to basal stems, or were decadent, responded more slowly. After 4 years' rest, willow stems had just begun to emerge through the streambank grasses to a mean height of 50 cm.

Duff (1979) recommended: "In degraded habitat, such as exists on Big Creek in its entirety except for the enclosure area, a minimum rest period of 8 plus years would be necessary to restore the habitat for productive fish and wildlife uses, as well as water-quality maintenance."

Due to the lack of committment (MFP) on the type of management action implemented to individual riparian zones, a worst case analysis must be conducted. Based on a worst case analysis of the above discussed impacts to riparian vegetation from the proposed management actions, riparian vegetation would continue to be adversely impacted from livestock grazing. Based on the present condition (see Chapter 2) of riparian vegetation from past livestock overgrazing in the Sonoma-Gerlach Resource Area, the continued use by livestock managed under AMPs and/or reduced stocking rates would not significantly change riparian vegetation. Although riparian vegetation would continue to degrade, this degradation would not exceed the threshold (five percent) change in vegetation aspect, ecological condition and/or trend in the long term. The probability of this worst case analysis actually occurring on riparian zones in the resource area is estimated to be less than five percent. The estimated probability is based on professional judgement of the Sonoma-Gerlach EIS team.

Aspen types are unique in the resource area due to their limited acreage (3,748 acres) and in that they furnish critical habitat (e.g., forage and cover) for wildlife and livestock (see Chapter 2).

The proposed action would have a beneficial impact on non-riparian aspen vegetation communities within the Sonoma-Gerlach Resource Area. Riparian aspen communities were included in the discussion on riparian vegetation above. The beneficial impacts would be accomplished through a reduction in grazing intensity and establishment of allowable utilization levels and grazing systems. These managment actions are discussed below.

The reduction in grazing intensity resulting from allocation of available vegetation to the estimated carrying capacity would result in decreased grazing pressure on aspen root suckers. This would foster a greater density of root suckers reaching sapling size (over 4.5 feet high). Dahlem (1979) observed in a study on Mahogany Creek, Winnemucca District, an 80 percent increase in aspen reproduction during three years of light grazing. Only 20 percent of the aspen suckers were four or more years old, corresponding with previous years of heavy livestock use. As discussed in the ecological range condition/trend of vegetation communities and production portions of this vegetation section the proposed action would promote desirable plant species and increase overall production of the vegetation resource. The projected increase in vegetation should reduce grazing pressure on aspen reproduction, thus allowing root suckers the opportunity to reach sapling size. Coles (1965) reported that sufficient forage for the number of grazing animals would prevent serious damage to aspen reproduction. Heavy use by cattle results in damage to aspen reproduction only where forage is insufficient to support the number of cattle. Thus, a reduction in grazing intensity would result in a beneficial impact to aspen communities through improvement in aspen root suckers reaching sapling size out of livestock use.

The allowable utilization level of aspen is 40 percent (Table 1-4). This should allow aspen root suckers to reach sapling size. Coles (1965) indicated that aspen reproduction which is grazed over 45 percent fails to become successfully established while utilization less than 40 percent will allow some height increase which eventually will permit the young trees to exceed the reach of grazing animals. This would result in a beneficial impact to aspen communities by allowing aspen root suckers to reach sapling size, out of reach of livestock use.

Establishment of grazing systems allowing rest periods for key managment species would again benefit root suckers reaching sapling size, thus beyond livestock and/or big game reach. As discussed in the ecological range condition and trend of vegetation communities and vegetation production portions relating to grazing systems, the proposed action would promote desirable plant species and increase overall vegetation production. As stated in the above discussions, this would reduce grazing pressure on aspen root suckers, which would benefit root suckers reaching sapling size. The improvement of aspen communities by providing replacement trees for continuance of these stands would result in a beneficial impact to the vegetation aspect, ecological condition and trend of these communities.

Based on the above discussions, the proposed action would result in a beneficial impact to the vegetation aspect, ecological condition and trend of aspen communities within the resource area. This would result through aspen root suckers reaching sapling size to provide replacement trees for continuance of these stands through the long-term. Although aspen communities would improve, the improvement would not reach the threshold (five percent) change in vegetation aspect, ecological condition and/or trend in the long term. Thus, the projected beneficial impact to aspen communities from implementation of the proposed action would not be considered significant.

VEGETATION PRODUCTION

The available vegetation (Table 1-1) was estimated as a result of the 1979 recompilation of the 1947 and 1960s ocular reconnaissance range surveys, in accordance with BLM Manual 4412.11A (see Chapter 1). Implementation of the proposed action would result in an overall significantly beneficial impact on vegetation production by increasing the available vegetation production from the current level of 143,721 AUMs to 225,741 AUMs (57 percent increase) in the short term and 265,763 AUMs (85 percent) in the long term (Table 1-2 and Table 3-6). Management actions that can be attributed to bringing about these improvements include water developments, land treatments, grazing systems (AMPs), reduction in grazing intensity, periods-of-use, and areas presently unsuitable with potential to be suitable through management. The resultant improvements in vegetation production are quantified by changes in available AUMs by management action. As stated in the vegetation section on ecological range condition and trend, the proposed action in most recommendations would result in changing downward trend to either stable and/or upward trend in the long term. As the range condition progresses upward towards excellent ecological range condition, the vegetation production would also increase (dependent on range site). Anderson (1962) illustrated the projected decrease or increase in forage yield as related to either deterioration or improvement as measured by range condition class (Figure 3-1). Anderson's forage yield was based on pounds per acre air dry usable forage in the bluebunch wheatgrass-Sandburg bluegrass range site. This illustrates the changes that can be expected when ecological range condition classes change. The upper line of the curve (Figure 3-1) is based upon the average high yield that has been recorded for each condition class. The terminal point represents the average lowest yield that has been recorded for the site. The lower line of the curve is based upon the average lowest yield recorded for each condition class. Proposed management actions that would bring about this change are discussed below by reference to short-term or long-term projections. Refer to Appendix P for projected increases in vegetation production by management action per allotment.

Projected Short-Term (1991) Increases In Vegetation Production

Projected future increases would be in part from the proposed development of land treatments (e.g., rangeland seedings) in 23 allotments. Present production on the proposed treatment areas varies considerably, ranging from 6 to 50 acres per AUM. It was estimated that production on seeded areas would increase to approximately 3 acres per AUM (based on current surveys of seedings in the Paradise-Denio Resource Area, Winnemucca District and professional judgement of Sonoma-Gerlach EIS Team Range Conservationist). Seedings would be planted to a mixture of desirable grasses, forbs, and, in some cases, shrubs. Livestock vegetation production would be improved by converting predominantly brush rangeland sites to more productive grasslands.

The proposed land treatments would seed and/or reseed 14,752 acres and sagebrush control then seed 230,112 acres for a projected increase of 69,612 AUMs over the current available vegetation (see Table 1-2, and also Appendix C, Section 2). This would represent a 48 percent increase in vegetation production over the current available

TABLE 3-6

CHANGES IN ALLOCABLE VEGETATION PRODUCTION (AUMS)
SONOMA-GERLACH RESOURCE AREA

	TIME PERIOD		
Type of Action	Initial (1982)	Short-term (1991)	Long-term (2024)
Proposed Action	143,721	225,741	265,763
No Livestock Grazing	143,989		183,976
No Action	143,231		105,437
Maximizing Livestock Use	143,232	229,782	264,502
Maximizing Wild Horse And Burro	143,989		265,763

Source: Sonoma-Gerlach EIS Team (1980)

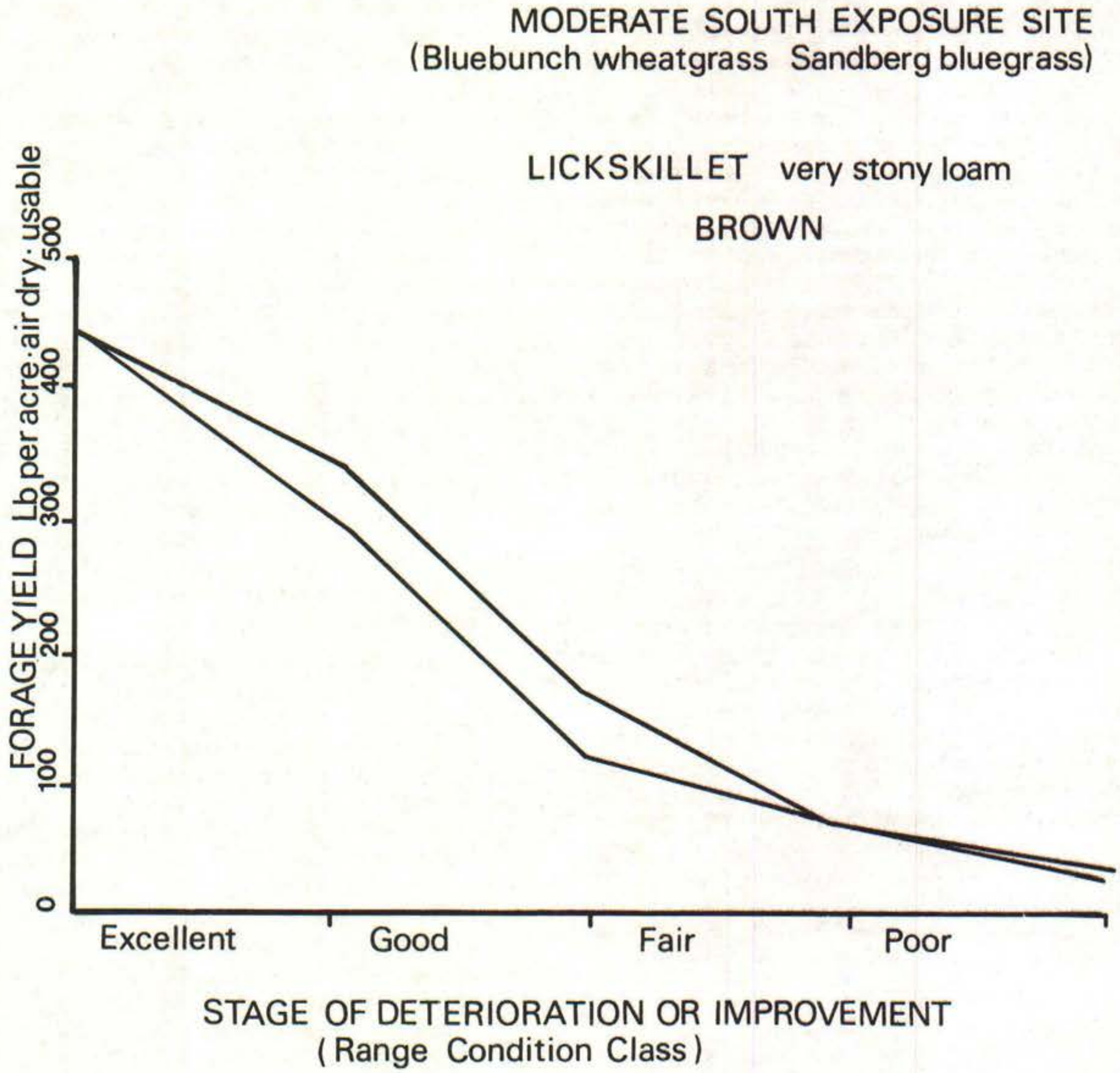

Figure 3-1: Typical yield-behavior curve representing the average amount and variation in forage yield that can be expected from a range site according to range condition class.

Source: Anderson (1962)

vegetation in the short term (nine years). This would be a significant increase in production. However, some land treatments are proposed within Wilderness Study Areas (WSAs); thus, no construction of these proposed land treatments (see Appendix C, Section 3) can be done unless these WSAs are released from wilderness considerations by an Act of Congress. If Congress designates these WSAs (Table 3-16) as wilderness areas, then the proposed land treatments could not be accomplished. There are 18,506 acres of proposed land treatments within WSAs that would amount to a projected 5,009 AUM increase in production. This would result in a total of 226,358 acres proposed for land treatments with a projected increase in production of 64,603 AUMs over the current available vegetation. This would represent a 45 percent increase in vegetation production (excluding land treatments within WSAs) in the short term. This would be a significant increase in production.

Projected future increases from water developments would also contribute to vegetation production (Table 1-2). Areas unsuitable for vegetation allocation due to distance from reliable water greater than four miles are proposed for water development in the short term (nine years). New water sources in these areas would make an additional 12,408 AUMs available for allocation. This increase in available vegetation would represent a 9 percent increase over current available vegetation in the short term (1991). This would not be a significant increase in production; however, this would be a beneficial impact that would contribute to the overall significant beneficial impact of the resource area.

The proposed action would in the short-term increase the current available vegetation by an estimated 82,020 AUMs. This increase in production is considered a significantly benefical impact to livestock grazing (see Livestock Grazing Section of the Proposed Action, Chapter 3) and vegetation production in the Sonoma-Gerlach Resource Area.

Projected Long-term (2024) Increases In Vegetation Production

The allocation of available vegetation to livestock, big game, wild horses and burros would result in approximately a two percent reduction from the three-five year average livestock licensed use (Table 1-1). This would result in livestock AUMs being adjusted to the estimated carrying capacity of the vegetation resource. In addition, wild horses and burros would be removed from the resource area except in three allotments where herd management areas were proposed. The reductions in grazing intensity of livestock, wild horses and burros to the estimated carrying capacity and/or the complete removal of livestock and wild horses and burros in specified allotments would result in a reduction from heavy to moderate use of the vegetation resource. Van Poollen and Lacey (1979) indicated that 35 plus or minus 14 percent increases are realistic estimates of mean herbage response to livestock adjustments that reduce grazing use from heavy to moderate. The area of study in Van Poollen's and Lacey's research was located in a higher precipitation and higher vegetation production zones, thus the lower level of estimated increases (21 percent) was used because of the marginal producing vegetation associated with the Great Basin Region. The 21 percent increase in vegetation production would result in a estimated increase of 22,483 AUMs in the long term for those allotments receiving the reduction in grazing intensity (see Table 1-2 and Appendix P, Section 1). This would represent a 16 percent increase in vegetation production over the current available vegetation in the long term (35 years). This would be a significantly beneficial impact to vegetation production in the resource area.

Additional future increases in vegetation production are projected from the implementation of AMPs on 26 allotments. Grazing systems would be developed for these AMPs based on the physiological requirements of the key management species. In accordance to Van Poollen's and Lacey's (1979) studies, a 13 plus or minus percent increase is a realistic estimate of mean herbage response to grazing systems on Western ranges. Again, based on the marginal production capabilities of the Great Basin Region, the lower level of the vegetation response (5 percent) was used to project vegetation increases from implementation of grazing systems. This would result in a estimated 5,825 AUMs (see Table 1-2 and Appendix P,) increase in available vegetation in the long term period (35 years). This would represent a 4 percent increase in vegetation production over the current suitable vegetation in the long term. This would not be a significant increase in production; however, this would be a beneficial impact that would contribute to the overall significant beneficial impact to the resource area.

Projected future increases in vegetation production included areas presently unsuitable for allocation (more than 32 acres per AUM and areas over four miles from reliable water) with potential to be suitable for allocation through management. It was assumed that these above mentioned areas would also increase the estimated 21 percent with a reduction in grazing intensity from heavy to moderate and would also increase an estimated 5 percent as a result of implementation of grazing systems, as proposed for each allotment in Table 1-2. Those allotments scheduled for both a reduction in grazing intensity and implementation of grazing systems would receive an additive effect which would result in an estimated increase of 26 percent in vegetation production (Van Pollen and Lacey 1979)(see Methodology for Estimating Future Production, Appendix A, Section 1). The estimated increase in vegetation production as a result of areas currently unsuitable for allocation that would become suitable as a result of proper range management in the long term (35 years) is 12,207 AUMs (see Table 1-2 and Appendix P,). This would represent a 9 percent increase in vegetation production over the current available vegetation in the long term. This would not be a significant increase in production; however, this would be a beneficial impact that would contribute to the overall significant beneficial impact to the resource area. The proposed action would in the long term increase the current available vegetation by an estimated 122,535 AUMs (the long-term projections in AUMs include the short-term projected AUMs), which represents an 85 percent increase in vegetation production which would be considered significant.

Implementation of the proposed periods-of-use would indirectly increase vegetation production by providing rest during the critical growth period of key management species. The current grazing practice of continuous grazing of vegetation throughout the spring growing season reduces plant vigor. The following cited references are indicative of how proper periods-of-use (as specified in the proposed action) would benefit the storage of carbohydrate reserves in plants, allow for the reproductive processes, increase vigor and thereby increase the percent composition of desirable species in the Sonoma-Gerlach Resource Area. Therefore this would increase the herbage yield (production) capabilities of vegetation types.

Trlica et al. (1971) reported, "The depletion of carbohydrate reserves is believed to be a primary factor for loss in plant vigor and subsequent range deterioration." Trlica et al. (1971) also indicated that carbohydrate reserves from all plants studies were generally lowest during spring when plants were making most rapid growth (about May 10). Britton et al. (1979) also indicated that plants cannot maintain productive growth status if grazed before early May (5/15). Pearson (1964) indicated that complete harvesting of grass species during the critical period (begins with the root stage and closes with complete maturation of the fruit) depleted root reserves, thus plants are highly susceptible to injury. Blaisdell and Pachanec (1949) said "After the date when substantial regrowth is impossible and before maturity, complete herbage removal can be expected to most seriously impair plant vigor". Stoddard, Smith and Box (1975) indicated that grazing which removes herbage just prior to the onset of the dry season prevents normal food storage, development of roots, and formation of buds. Krall et al. (1971) indicated that cutting anytime from the second week in May through seed maturation reduced the yield the following year and reduction in yield was greatest from cutting at the boot or late boot stage. Blaisdell and Pechanec (1949) also noted in his discussion, "Therefore, it is logical to believe that if a portion or all of the herbage is removed at some time during the growing season, the amount of food materials available for translocation to the roots is reduced. This in turn reduces vigor of the plant and its capacity to produce flower stalks and herbage the following year." Cook (1971) indicated that changes in vigor generally precede changes in the plant composition; therefore, vigor measurements can be a useful tool to the range manager in predicting initial changes in plant composition.

Considering the above references it was assumed that implementation of periods-of-use that provide for the growth of key management species during all or portions of the critical growth period would increase the herbage yield potential of vegetation and eventually through increased number of seed stalks and/or buds increase species composition within plant communities. These proper periods-of-use would indirectly increase vegetation production. The significance of this impact cannot be determined at this time.

The above mentioned anticipated increases in vegetation production from the management actions discussed are expected to make a significant beneficial impact to the overall resource area vegetation production. In summary, the management actions that would increase the available vegetation from the present 143,721 AUMs to 265,763 AUMs (consult Appendix A, Section 1, to balance these figures) include:

1. land treatments on 244,864 acres for an increase in production of 69,612 AUMs (exclusion of land treatments within WSAs would result in a total of 226,358 acres treated for a projected increase of 64,603 AUMs);

2. reductions in grazing intensity from heavy to moderate, which would increase production by 22,483 AUMs;

3. improvement in vegetation production from implementation and/or revision of existing AMPs for an increase of 5,825 AUMs;

4. improvement of areas currently unsuitable with potential to be suitable through management for an increase in vegetation production of 12,207 AUMs; and

5. development of water sources where the present lack of water makes these areas unsuit-

able for grazing would increase production by 12,408 AUMs.

However, the actual magnitude of these increases would depend upon treatment methods used in vegetation manipulation, potential of soils, precipitation received, grazing systems employed, reductions in grazing intensities, proper periods-of-use, and the proper location and installation of livestock support facilities.

Vegetation production on approximately 456 acres in the short term would be adversely impacted, due to the construction of livestock support facilities (e.g., springs, wells, pipelines, fences and troughs). In the long term these acres would eventually rehabilitate naturally with exception of approximately 53 acres which would remain in an adverse impact status on vegetation production. Due to the small amount of acres adversely impacted in the short term and long term this is not considered a significant impact on the resource area.

IMPACTS ON SENSITIVE PLANTS

Through field investigation by Winnemucca District personnel four plants recommended for threatened status, two plants recommended for endangered status, and seven plants listed as species of special concern have been identified in the Sonoma-Gerlach Resource Area (Table 2-2). General locations of these sensitive plants within the resource area are shown on the Perennial Streams and Sensitive Plants Map.

The proposed action has not recommended any land treatment or vegetation manipulations within the known areas of concentrations of these sensitive plants. Thus, land treatments and/or vegetation manipulations would not adversely impact these species.

Information on the distribution of these plants is seriously lacking, so botanical clearances and protection of known populations or individual plants would be necessary prior to any surface disturbance. The Standard Operating Procedures (Chapter 1) will be conducted before any surface disturbance activities are initiated, which would prevent any adverse impacts to sensitive plants from construction.

CONCLUSION

The most significant long-term impact to the vegetation resource in the Sonoma-Gerlach Resource Area would be the overall 10 percent improvement in ecological range condition. This is anticipated to occur by reversal of a predominantly downward trend presently (68 percent) to upward (17 percent) and predominantly stable (78 percent) trend in the long term.

Land treatments totalling 244,864 acres would cause a conversion of the existing predominantly sagebrush types to artifically maintained vegetation communities of predominately grassland species. This represents a vegetation aspect conversion of approximately six percent over the resource area. This would result in a significantly adverse impact on vegetation aspect, ecological range condition and trend of vegetation communities within the resource area. However, the exclusion of proposed land treatments within WSAs would result in a vegetation aspect conversion of 226,358 acres (five percent) within the resource area. This would result in a significantly adverse impact on vegetation aspect, ecological range condition, and trend of plant communities within the resource area with the exclusion of proposed land treatments within WSAs.

The projected increase in vegetation production from land treatments in the proposed action (with or without land treatments proposed within Wilderness Study Areas) would be a significantly beneficial impact. Management actions that would increase the available vegetation from the present 143,721 AUMs to 265,763 AUMs (consult Appendix A, Section 1, to balance these figures) include:

1. land treatments on 244,864 acres for an increase in production of 69,612 AUMs (exclusion of land treatments with WSAs would result in a total of 226,358 acres treated for a projected increase of 64,603 AUMs);

2. reductions in grazing intensity from heavy to moderate, which would increase production by 22,483 AUMs;

3. improvement in vegetation production from implementation and/or revision of existing AMPs for an increase of 5,825 AUMs;

4. improvement of areas currently unsuitable with potential to be suitable through management for an increase in vegetation production of 12,207 AUMs; and

5. development of water sources where the present lack of water makes these areas unsuitable for grazing would increase production by 12,408 AUMs.

Approximately 2,000 acres of riparian vegetation would continue to be adversely impacted by livestock grazing. However, the continued degradation would not result in a significant change to vegetation aspect, ecological condition and/or trend of riparian communities. The proposed action would also result in a beneficial impact to vegetation aspect, ecological condition and trend of aspen communities. The improvement of aspen communities would not result in a significant change in vegetation aspect, ecological condition and/or trend of these communities throughout the long-term.

SHORT-TERM USE VERSUS LONG-TERM PRODUCTIVITY

Some short-term declines and long-term benefits in the vegetation resource would be expected to result from the proposed action. Reductions in livestock, wild horses and burros in the first five years after the final grazing decision is issued and implementing periods-of-use would reduce grazing pressures on many allotments. A further temporary grazing reduction would result in allotments that have land treatments proposed, due to the required two full years growing season rest. The temporary reduction would result through cooperative nonuse agreements with livestock operators before land treatments would be implemented. After allotment management plans have been implemented and in operation for several cycles and vegetation has reached full production in land treatments and rehabilitated around management facilities, then vegetation diversity, quality, vigor, and density of key management species would be expected to increase. Productivity is projected to increase in the long-term (2024) by 122,535 AUMs, or 85 percent of the present available vegetation.

UNAVOIDABLE ADVERSE IMPACTS

The non-significant degradation of 2,000 acres of riparian vegetation would continue even though it might be minimized by grazing systems providing rest periods. This direct impact would continue as long as grazing is allowed on riparian areas. A short-term disturbance of vegetation aspects on 456 acres would occur from implementation of livestock support facilities which would result in 53 acres remaining disturbed in the long term. A long-term loss of regaining ecological climax would occur on the 244,864 acres proposed for artificial seeding treatments; however, with the exclusion of proposed land treatments within WSAs, a total of 226,358 acres would be lost in regaining ecological climax.

LIVESTOCK GRAZING

In the initial allocation (1982) the proposed action would adjust the present AUMs to the estimated carrying capacity (available vegetation). This would result in a net decrease of 2,846 AUMs (116,551 to 113,705 AUMs) from the three to five-year average livestock licensed use (refer to Chapter 3, Vegetation Production in the Proposed Action). This represents a two percent decrease of available AUMs to livestock in the initial allocation (see Table 3-7). This adjustment would result from an increase of 26,698 AUMs on 10 allotments and a decrease of 29,544 AUMs on 28 allotments (Table 1-1). This adjustment would not be a significant impact on livestock grazing in the resource area as a whole. However, the downward adjustment would have a significant adverse impact on livestock grazing in 25 allotments, when considered on an allotment basis rather than the resource area. In addition, the proposed action would totally eliminate livestock grazing in one allotment to provide for a wild horse and burro herd management area: this action would be a significant adverse impact on livestock grazing. The initial allocation would result in a significantly beneficial impact to livestock grazing in nine allotments from upward adjustments to the average livestock licensed use.

The proposed action in the short term (1991) would adjust the AUMs from the last three to five-year average livestock licensed use for a net estimated increase of 75,696 AUMs (116,551 to 192,247 AUMs) (refer to Chapter 3, Vegetation Production in the Proposed Action). This represents an estimated increase of 65 percent over the last three to five-year average livestock licensed use. This adjustment would result from an estimated increase of 83,960 AUMs on 23 allotments and an estimated decrease of 8,264 AUMs on 15 allotments (Table 1-2). This adjustment would have a significant beneficial impact on livestock grazing in the resource area as a whole. However, the short term adjustment would have a significant adverse impact on livestock grazing in 13 allotments. The short-term adjustment in AUMs would result in a significantly beneficial impact to livestock grazing in 20 allotments from upward adjustments to the average livestock licensed use.

The anticipated increases in vegetation production (AUMs) are projected using land treatments proposed within WSAs. As specified in the Vegetation Production section of the Proposed Action (Chapter 3), these land treatments (Appendix C, Section 3) would not be constructed until Congress acts on the designation or release of the proposed WSAs. This would result in 5,009 AUMs projected increase unavailable to livestock grazing. Thus, the adjusted increase in AUMs would be 70,687 AUMs (61 percent increase over the three to five year average livestock licensed use). The adjusted increase in available livestock AUMs would also be a significantly beneficial impact to livestock grazing in the resource area.

The proposed action in the long term (2024) would adjust the AUMs from the last three to five-year average livestock licensed use for a net esti-

TABLE 3-7

SIGNIFICANCE OF LIVESTOCK ALLOCATIONS a/
SONOMA-GERLACH RESOURCE AREA

	TIME PERIOD								
	Initial (1982)			Short-term (1991)			Long-term (2024)		
Type of Action	Livestock Allocation (AUMs)	Percent Change From 3-5 Year Average Livestock Licensed Use	Significance b/ >10% Change (# of Allotments	Livestock Allocation (AUMs)	Percent Change From 3-5 Year Average Livestock Licensed Use	Significance b/ >10% Change (# of Allotments	Livestock Allocation (AUMs)	Percent Change From 3-5 Year Average Livestock Licensed Use	Significance b/ >10% Change (# of Allotments)
Proposed Action									
Sonoma-Gerlach Resource Area	113,705	- 2	0	192,247	+ 65	+	228,880	+ 96	+
Individual Allotment		>- 10	25		>- 10	13		>- 10	7
		>+ 10	9		>+ 10	20		>+ 10	28
No Livestock Grazing c/									
Sonoma-Gerlach Resource Area	None	-100	-	None	-100	-	None	-100	-
Individual Allotment		>- 10	All		>- 10	All		>- 10	All
		>+10	None		>+ 10	None		>+ 10	None
No Action d/									
Sonoma-Gerlach Resource Area	116,551	None	0	116,551	None	0	116,551	None	0
Individual Allotment		>- 10	None		>- 10	None		>- 10	None
		>+ 10	None		>+ 10	None		>+ 10	None
Maximizing Livestock Use									
Sonoma-Gerlach Resource Area	130,196	+ 12	+	216,476	+ 86	+			
Individual Allotment		>- 10	23		>- 10	11	251,466	+116	+
		>+ 10	11		>+ 10	23		>- 10	5
								>+ 10	31
Maximizing Wild Horse and Burro									
Sonoma-Gerlach Resource Area	95,007	- 18	-	N/A	N/A	N/A	182,092	+ 56	+
Individual Allotment		>- 10	25	N/A	N/A	N/A		>- 10	13
		>+ 10	7					>+ 10	21

a/ > Greater Than
\+ Significant Beneficial Impact
\- Significant Adverse Impact
0 Not Significant
N/A Not Applicable

b/ Based on Threshold Level of Greater than 10 percent change from 3 to 5 year average Livestock Licensed Use

c/ In the No Livestock Grazing Alternative, significant adverse impacts from no AUM allocation to livestock was based on the livestock permittees dependence on the public rangeland (greater than 10 percent dependence would be significant). Although all livestock grazing use in allotment would have a significant adverse impact (greater than 10 percent reduction in AUMs).

d/ Livestock use for the No Action Alternative is based on the last three to five year average livestock licensed use.

mated increase of 112,329 AUMs (116,551 to 228,880 AUMs) (refer to Chapter 3, Vegetation Production in the Proposed Action). This represents an estimated increase of 96 percent over the last three to five-year average livestock licensed use. This adjustment would result from an estimated increase of 116,046 AUMs on 29 allotments and an estimated decrease of 3,717 AUMs on nine allotments (Table 1-2). This adjustment would have a significant beneficial impact on livestock grazing in the resource area as a whole. The long term adjustment would have a significant adverse impact on livestock grazing in seven allotments. The long-term adjustment in AUMs would result in a significantly beneficial impact to livestock grazing in 28 allotments from upward adjustments to the average livestock licensed use. These adjustments in the proposed action for the initial, short term, and long term for each individual permittee are shown in the Economics Section.

A significant adverse impact would result in the initial allocation (1982) from the establishment of proposed periods-of-use (Table 1-1). Refer to the Social Conditions and Economic sections for a discussion of impacts from periods-of-use on livestock grazing operations. Proposed periods-of-use would be in effect until revision and/or updating of existing AMPs and implementation of AMPs in existing non-AMP allotments. This would affect all allotments in the Sonoma-Gerlach Resource Area.

In the short term (1991), as AMPs would be implemented, proposed periods-of-use would no longer be in effect except in four allotments (Cottonwood Canyon, Diamond S, Jersey Valley, and Ragged Top) which are not designated for implementation of AMPs, thus the adverse impact would be reduced in all but four allotments. These proposed periods-of-use are designed to provide rest and/or delay of grazing pressure during the majority of the critical growing period of key management species (which consists of no livestock grazing in March, April, and in some allotments, May and June, also). The elimination of spring livestock grazing would result in livestock operators having to provide alternative sources of feed for their livestock. Livestock would also be off the rangeland when vegetation is most nutritious for livestock production, and public rangeland would be lost as lambing grounds for sheep operators that lamb on the range. Due to the lack of private rental pastures in the resource area, most permittees would be forced to buy feed and put their livestock in a feedlot, truck their livestock out of the resource area to rental pastures, or go out of the livestock business. In addition, those permittees with parallel base property (see Glossary) would have to find an alternate source of pasturing or fence their private property to provide a source of feed off the public rangeland. Sheep operations which lamb on the range would be forced to find alternate lambing grounds on public range and/or private rental pastures to lamb. The period-of-use change could facilitate a conversion to shed lambing on private lands.

It cannot be predicted what each permittee would do with their livestock during the period off the public rangeland since it would be a decision made by each individual permittee. Because most of the above actions translate into economic impacts, they are also discussed in the Social Conditions and Economic sections of this chapter.

As shown in the Vegetation Section of Chapter 3, ecological range condition would improve significantly under the proposed action. This would result from stocking the public rangeland at or below the estimated carrying capacity and initiating grazing systems and periods-of-use based on the physiological requirements of key management species. The estimated projection of increased forage quality and quantity would result in an improved nutritional base for livestock production. An increase in rangeland nutrition would benefit reproduction, lactation, growth, and fattening processes of livestock, which would increase livestock production.

The projected changes in livestock production are based on the above increase in rangeland nutrition, cited references, and professional judgement.

The following cited references (Kothmann et al. 1969; Kothmann et al. 1970; and Waldrip et al. 1964) were conducted in the rolling plains of Texas. This area of Texas receives approximately 24 inches of precipitation per year. Under rangeland conditions, rainfall affects the level of nutrition and livestock production more than any single factor, as shown in a 21-year study by Knox 1953 in Waldrip et al. 1964. Thus, the results determined from these studies would be expected to occur in a shorter period of time and be greater in degree than would the same management action implemented in the Sonoma Gerlach Resource Area. However, the same principles of theory are expected to occur in the Sonoma-Gerlach Resource Area, given more time and lesser results. Kothmann et al. (1969) indicated that the Merrill (four-pasture deferred-rotation system) grazing system significantly increased livestock production when compared to continuous, moderate use; however, heavy continuous use produced considerably more kilograms of calf weight per hectare than any other treatment. Although heavy continuous grazing produced more weight of calf per unit area, it is not the preferred grazing system because the yearly vegetation records in Kothmann's study (1969) indicated that heavy continuous grazing resulted in a deterioration of the vigor and species composition of the vegetation. Thus the high level of production per unit area obtained from heavy stocking was, in effect, reducing the potential of future production. Kothmann et al. (1969) indicated that the Merrill system weaned calves significantly heavier than any other treatment studied.

Based upon this research, it appears that under heavy continuous grazing by more cows, a higher total weight of calves per unit area is achieved, but that under a deferred-rotation grazing system by fewer cows, higher calf weaning weights are achieved, while promoting increased long-term rangeland productivity.

Kothmann et al. (1970) again confirmed that both two and four-pasture deferred-rotation grazing systems were effective in increasing the weaning weights of calves. Waldrip et al. (1964) reported the advantage of four-pasture deferred-rotation systems in his summation, "Cows in a four-pasture system of deferred-rotation grazing consistently weaned more and larger calves than cows under continuous grazing or cows under a two-pasture system of deferred-rotation grazing." Another indicator of livestock production as related to grazing systems and increased production of the rangeland was noted by Hughes (1980) in the Little Wolf Allotment (Arizona Strip), where a rest-rotation system showed a 10 percent increase in calf crop and a 22-pound increase in calf weights. A major portion of these increases must be attributed to large chainings and plowings, which increased usable forage in otherwise low forage production areas. However, increases in livestock production are variable and dependent on the type of grazing systems designed for each individual allotment and livestock operation. Thus, projected increases in livestock production would depend on the proper grazing system for the livestock operator as related to the vegetation within each allotment, as to whether these following projections could be obtained.

Kothmann et al. (1970) also showed that percent calf crop weaned increased from 88.2 percent under moderate continuous grazing to 90.5 percent under a two-pasture deferred-rotation system, and to 93.7 percent under a four-pasture deferred-rotation system over an eight-year period. This represents a 2-6 percent increase in calf crop weaned from moderate continuous grazing to deferred-rotation systems. Ralphs et al. (1980) conducted a performance testing program to provide an evaluation of beef production in relation to extensive range improvements and livestock husbandry practices that were implemented between 1970 and 1976. His results concluded a 7 percent (86 to 93) increase in calf crop weaned from implementation of a rest-rotation grazing system.

From the data cited and professional judgement, it was estimated that under the proposed action the calf crop weaned would increase 2-7 percent (estimated mean of 5 percent) in the long term depending on the type of grazing system employed in combination with the degree of rangeland productivity. This would mean an increase in present calf crop weaned from 68 percent currently to an estimated 70 to 75 percent in 35 years. The estimated average increase of 5 percent in the calf crop weaned would be a significant beneficial impact. Refer to the Economics Section of this chapter for a discussion of beneficial impacts from an increase in calf crop weaned.

Kothmann et al. (1970) showed that weaning weights of calves increased from 501 pounds under a moderate continuous grazing to 506 pounds under a two-pasture deferred-rotation system, and 521 pounds under a four-pasture deferred-rotation system over an eight-year period. This represents a 5 to 20 pound (one to four percent) increase in calf weaning weights from moderate continous use to deferred-rotation systems. Ralphs et al. (1980) illustrated that average weaning weights increased from 347 pounds in 1970 to 363 pounds in 1976 (16 pounds or five percent) for the rest-rotation grazing system established in his study.

From the data cited and professional judgement, it was estimated that under the proposed action the calf weaning weights would increase one to five percent (estimated mean of three percent and/or estimated mean of 13 pounds) in the long term depending on rangeland productivity and/or the grazing system employed. This would indicate an increase in calf weaning weights from 433 pounds currently to an estimated 437-455 pounds (estimated mean increase to 446 pounds) in 35 years. The estimated mean increase of 13 pounds in calf weaning weights would be considered a significant beneficial impact. Refer to the Economics Section of this chapter for a discussion of the beneficial impacts from an increase in calf weaning weights.

Since sheep operations are in dual use with cattle operations in the resource area, reference material was based on dual use data. Huss et al. (1969) studies were conducted on the Edwards Plateau of Texas where precipitation averages 18 inches. However, the same principles of theory, that grazing systems would increase livestock production, should apply to grazing systems implemented in the Sonoma-Gerlach Resource Area. Huss et al. (1969) showed that percent lamb crop increased from 105.6 percent under yearlong use to 111.5 percent under two-pasture rotation and 113.7 under four-pasture rotation over a seven-year period. This represents a six to eight percent increase in percent lamb crop from yearlong use to rotational use. This would mean an increase in percent lamb crop from 100-115 percent (mean lamb crop should be 108 percent) currently to an estimated 106-124 (estimated mean increase to 115 percent) percent in 35 years. The estimated mean increase of seven percent in lamb crop would be considered significant. Huss et al. (1969) showed that lamb weight increased from 79.1 pounds under yearlong use to 82.0 pounds under two-pasture rotation and 79.4 pounds under four-pasture rotation over a seven-year period. This represents a three pound or four percent increase in lamb weight from yearlong use to rotational use. This would mean an increase in lamb weight from 80-95 pounds (mean lamb weight of 88 pounds) currently to an estimated 83-98 pounds (estimated mean increase to 91 pounds) in 35 years. The estimated mean increase of three pounds in lamb weight would not be considered significant.

Implementation of grazing systems and periods-of-use would create an additional workload on the livestock permittee. This increased workload would originate in two ways. One, more frequent movement and control of livestock would be required within a grazing system. This would affect the cattle operator more than the sheep operator. Sheep operations would not be significantly affected because these operations currently employ full-time herders to control sheep movement, while cattle operators would have to increase the work force to properly comply with the grazing system. Two, the required livestock support facilities and/or land treatments necessary to implement the desired grazing systems would, as past experience indicates, create a heavy burden on all installation and/or maintenance of these support facilities. Some permittees could adjust to this situation with their present work force, while other permittees would be forced to hire additional employees to handle the increased workload. This would not change the method of operation, but would add to the cost.

Administration problems and historical use of the rangeland that have resulted in trespass, overuse, improper periods-of-use, lack of livestock control, and poor salting practices would be significantly reduced and/or eliminated with implementation of the proposed action. Adequate supervision combined with ear-tagging of livestock and elimination of staggered or pyramid licenses (see Glossary) would substantially reduce trespass. The intensive management of each allotment at or below estimated carrying capacity would alleviate the current overuse problem. Periods-of-use would be based on the physiological requirements of key management species rather than historical use of the range (usually based on rancher convenience). Intensive management of allotments would result in regular herd checks and more handling of livestock, combined with proper salting practices, would gain better distribution of livestock, and help prevent overuse of site-specific areas. The above changes in administration procedures would facilitate implementation of the proposed management actions; thus, in determining significance levels for livestock production, consideration was given to benefits anticipated from proper administrative procedures.

CONCLUSION

The initial allocation (1982) would not have a significant impact on the resource area as a whole because the net downward adjustment would be 2 percent; however, this would have a significant adverse impact on livestock grazing in 25 allotments because the downward adjustments range from 14 to 100 percent below the average livestock licensed use. The initial allocation would result in a significantly beneficial impact to livestock grazing in nine allotments from upward adjustments to the average livestock licensed use. The short-term (1991) adjustments would have a significant beneficial impact on livestock grazing in the resource area as a whole with or without land treatments proposed within Wilderness Study Areas because the net increase in AUMs would be an estimated 65 percent or 61 percent, respectively. However, there would be a significant adverse impact in the short term on livestock grazing in 13 allotments because the downward adjustments in these allotments would range from 14 to 100 percent below the average livestock licensed use. The short-term adjustment in AUMs would result in a significantly beneficial impact to livestock grazing in 20 allotments from upward adjustments to the average livestock licensed use. The long-term (2024) adjustment in AUMs would have a significant beneficial impact to livestock grazing in the resource area as a whole because the net increase in AUMs would be an estimated 96 percent over average livestock licensed use. However, seven allotments would be significantly adversely impacted because these allotments would have downward adjustments ranging from 16 to 100 percent below average livestock licensed use (see Table 3-7). Also, the long-term adjustment in AUMs would result in a significantly beneficial impact to livestock grazing in 28 allotments from upward adjustments to the average livestock licensed use.

Establishment of the proposed periods-of-use in the resource area would create a significant adverse impact until full implementation of AMPs (short-term, 1991). This would create a need for additional pasture and/or feed while livestock are off the public rangeland. This would also eliminate most public range lambing by sheep operations.

The implementation of grazing systems would increase the work force needed to comply with the grazing system and installation and/or maintenance of range improvements.

In the long term, percent calf crop weaned would increase an estimated two to seven percent (mean five percent), calf weaning weights would increase an estimated one to five percent (estimated mean increase of 13 pounds), percent lamb crop would increase an estimated six to eight percent and lamb weight would increase an estimated three pounds as a result of improved vegetation quality and increased vegetation availability.

SHORT-TERM USE VERSUS LONG-TERM PRODUCTIVITY

The proposed action would result in initial declines in livestock grazing, but would result in long-term increases in livestock production. In the short term, livestock numbers would be reduced to the estimated carrying capacity in combination with big game, wild horses and burros. However, the implementation of proper periods-of-use, grazing systems, administration procedures to prevent overuse, and livestock support facilities to gain better distribution of livestock would in the long term increase livestock production. This would be accomplished through greater weight gains and a greater percent of livestock reproduced.

UNAVOIDABLE ADVERSE IMPACTS

The initial adjustment (1982) could force some livestock permittees to reduce their herd size, move to rented pasture, buy additional feed, or go out of the livestock business as a result of the stocking rates being adjusted to the estimated carrying capacity and proposed periods-of-use. For most permittees this adverse impact would be minimized and/or alleviated upon full implementation of AMPs. However, for some livestock permittees this adverse impact would continue throughout the long term (35 years). The implementation of AMPs and periods-of-use would create an additional workload for many livestock permittees that would require a greater work force be hired. This would continue throughout the long term (35 years).

WILDLIFE

INTRODUCTION

The primary wildlife species or group of species that would be affected by the proposed action is big game. There would be both short-term and long-term effects on big game as a group, but the various species would be effected to different degrees and in different manners, as will be discussed later. Short-term effects would result from the vegetation allocation process and the setting of periods-of-use. Long-term effects would result from the vegetation allocation process and from the implementation of grazing systems and land treatments. The effect of these short and long-term impacts would be an improvement in big game habitat, which would result in maintaining reasonable numbers in most allotments, for some species. Other species would not attain reasonable numbers.

Reasonable numbers of big game animals represent an average population level for which vegetation would be allocated. By agreement with the Nevada Department of Wildlife, this is the population level of big game that the Bureau of Land Management will manage habitat for. Reasonable numbers represent an average population level; it is recognized that natural and man caused factors affect big game populations, causing them to vary in size from year to year. Such variations can be of considerable dimensions. Under the proposed action, the goal would be to reach reasonable numbers of big game animals, and to maintain habitat for big game populations equal to reasonable numbers over the long term. Population variations above and below reasonable numbers would be expected, and would not be considered significant so long as average population levels remained at least at reasonable numbers.

Many other wildlife species would be affected by the proposed action. Some of these species are dependent only on upland range habitats; others are dependent on riparian, aspen, or meadow habitat for at least part of their life cycles. Impacts of the proposed action on these species would depend on each species habitat requirements.

The proposed action consists of a number of discrete parts, these being: (1) the allocation of vegetation to the major consumptive users, within the estimated carrying capacity of the range; (2) setting periods-of-use that take into account the physiological requirements of key plant species; (3) land treatments; (4) installation of livestock support facilities, and; (5) implementation or revision of AMPs on all but four allotments. The allocation of vegetation and setting of periods-of-use would be implemented immediately. (Reductions in livestock use would be phased in over a period of three years, but will be analyzed as though it occurred wholly within the first year.) Other parts of the proposed action (land treatments, support facilities, and AMP implementation) will be analyzed as separate actions, unrelated to one another, although they likely would occur together.

BIG GAME

Mule Deer

The various aspects of the proposed action would have different impacts on mule deer habitat in different allotments. Table 3-8 indicates the best estimate of the probable impacts of the various actions and treatments in the proposed action on mule deer habitats in each allotment. The following is a general analysis of the impacts of the components of the proposed action on mule deer.

The vegetation allocation program under the proposed action would have significantly beneficial impacts on both deer habitat quality and on deer populations. The vegetation allocation program would impact mule deer habitat in that implementation of the program would lower stocking rates of consumptive vegetation users from high levels down to moderate levels. This would be accomplished by removal of wild horses and burros, by reducing active livestock use, and by allocating vegetation for wildlife use. The result of this would be a significant increase in vegetation production (see Vegetation Section, Chapter 3, Proposed Action), which would increase both the amount and variety of forage and cover available for mule deer. This would be an improvement in deer habitat quality, and thus a significant beneficial impact.

The improved habitat quality resulting from implementation of the vegetation allocation program would be the major factor in reaching and/or maintaining reasonable number population levels in most allotments. In 23 allotments, such levels already exist, and would be maintained over the long term. In 13 allotments, some population growth must occur to reach reasonable numbers. Table 3-9 lists existing numbers and reasonable numbers by allotment. Except as affected by other factors in the proposed action (as will be discussed below), mule deer would be maintained at population levels which would average reasonable number levels in all allotments over the long-term. This would be a significant beneficial impact on deer populations.

An important facet of the proposed action would be the establishment of periods-of-use in all allotments. These proposed periods-of-use generally require that domestic livestock be off the public land during the early spring months which are coincident with the critical growing period of many key forage species. These periods-of-use (see Table 1-1) would be in effect, as proposed, until such time as allotment management plans were written or revised for each allotment. Under AMPs, the periods-of-use could be modified, allowing grazing use during any period, depending upon the management objectives determined for each allotment.

Having livestock off the range during the early spring would be beneficial to mule deer habitat, and thus to mule deer. Allowing grasses and forbs to make full growth in the spring would increase their vigor and production, increasing their availability in late spring and early summer. This represents a significant beneficial impact on deer habitat. The increased quantities of forbs present on spring and summer ranges should increase deer herd productivity (Pederson and Harper 1978), which would aid in reaching and/or maintaining reasonable numbers in all allotments. This would be a significant beneficial impact on deer population levels.

Implementation of the periods-of-use aspect of the proposed action would remove any possibility of mule deer having to compete with livestock for forage during the spring (until AMP implementation); it is during the early spring that competition for grass is most likely to occur between livestock and mule deer (Tueller 1979). This represents an improvement in habitat quality, since it means increased availability of deer forage, and would thus be a significant beneficial impact on deer habitat.

Carried on for a prolonged period, the period-of-use aspect of the proposed action would have detrimental effects on mule deer. The continued deferment of grazing in the spring gives perennial grasses a competitive edge over shrubs, increasing their production. Perennial grasses in good condition have been shown to reduce bitterbrush vigor and production (Valentine 1971); the same could be true for other browse species. In addition, spring rest followed by fall grazing has been shown to reduce shrub production (Laycock 1970). This would be a decrease in browse supplies, and would be a decrease in deer habitat quality. This would be a significantly adverse impact. There is very little chance of this adverse impact occurring, however, as the proposed periods-of-use would be modified in all but four allotments by implementation of allotment management plans. Three of these four allotments would have relatively small deer populations, which would be able to receive sufficient forage should this impact occur; the fourth allotment would be grazed yearlong by wild horses, preventing this impact from occurring.

Under the proposed action, some 244,864 acres of land would be treated to increase the livestock carrying capacity. These land treatments would include seeding burned areas, re-seeding old crested wheatgrass seedings (14,752 acres), and 230,112 acres of new seeding.

In most allotments, these land treatments would have no significant impact on mule deer because the treated areas lie adjacent to, or occupy only small portions of deer habitat areas. These treatments would have some small insignificant benefi-

TABLE 3-8

IMPACTS OF THE VARIOUS COMPONENTS
OF THE PROPOSED ACTION ON BIG GAME a/

Allotment	Species	Seasonal Use Area	Existing Big Game Numbers b/	Effect of Period-of-Use c/	Effect of Grazing Treatments b/ 1 2 3 4 5 6 7 d/	Effect of Support Facilities 1 2 3 4 5 6 e/	Effect of Vegetation Manipulation c/	Long-term Population Level Under Proposed Action f/
Blue Wing	Mule Deer	Summer	288	0	0 + + * 0 0 *	* * * * * *	*	234
		Yearlong		+	+ + + - - 0 0	* * * * 0 *	0	
	Antelope	Yearlong	0	+	+ + 0 - 0 0 0	+ * * + 0 *	+	(20)
	Bighorn Sheep	Yearlong	0	+	+ + 0 - 0 0 -	* * * * 0 *	*	(33)*
Buffalo Hills	Mule Deer	Summer	2,093	0	0 + + * 0 0 *	* * * * * *	*	2,086*
		Winter		-	+ + + - 0 - -	* * * * 0 *	0	
		Spring		+	+ + 0 - 0 0 0	* * * * * *	-	
		Yearlong		+	+ + + - 0 0 -	* * * * * *	0	
	Antelope	Winter	263	-	+ + + + - - -	* * * * * *	-	437*
		Yearlong	+	+	+ + 0 - 0 0 -	* * * * * *	-	
	Bighorn Sheep	Yearlong	6	+	+ + 0 - 0 0 -	* * * * * *	0	(357)*
Calico	Mule Deer	Yearlong	15	+	+ + + - 0 0 -	* * * * * *	0	15
	Antelope	Yearlong	9	+	+ + + - 0 0 0	* * * * 0 *	*	18
	Bighorn Sheep	Yearlong	0	+	+ + 0 - 0 0 -	* * * * * *	*	(27)*
Clear Creek	Mule Deer	Summer	17	0	0 + + * 0 0 *	* * * * * *	*	50*
		Winter		-	- + + + 0 0 -	* * * * * *	-	
	Bighorn Sheep	Summer	0	0	0 + + * - + *	* * * * * *	*	(6)*
		Winter		+	+ + + - - + +	* * * * * *	*	
Coal Canyon/Poker	Mule Deer	Summer	40	0	0 + + * 0 0 *	* * * * * *	*	32
		Yearlong		+	+ + + - 0 0 0	* * * * * *	0	
	Antelope	Yearlong	0	+	+ + + - 0 0 0	* * * * * *	*	-
	Bighorn Sheep	Summer	0	0	0 + + * 0 0 *	* * * * * *	*	(10)*
		Winter		+	+ + 0 - 0 0 -	* * * * * *	*	
		Yearlong		+	+ + + - 0 0 -	* * * * * *	*	
Cottonwood Canyon	Mule Deer	Yearlong	7	+	* * * * * * *	* * * * * *	*	6
Coyote	Mule Deer	Winter	12	-	- + + + 0 - -	* * * * * *	*	12
		Spring		+	+ + 0 - 0 0 0	* * * * * *	*	
	Antelope	Yearlong	98	+	+ + + - 0 0 0	* * * * * *	-	151*
	Bighorn Sheep	Yearlong	0	+	+ + 0 - - 0 -	* * * * * *	*	(2)*
Desert Queen	No Big Game							
Diamond S	Mule Deer	Summer	12	*	* * * * * * *	* * * * * *	*	43
		Winter		*	* * * * * * *	* * * * * *	*	
	Bighorn Sheep	Summer	0	*	* * * * * * *	* * * * * *	*	(12)*
		Winter		*	* * * * * * *	* * * * * *	*	
Dolly Haden	Mule Deer	Summer	28	0	0 + + * 0 0 *	* * * * * *	*	23
		Yearlong		+	+ + + - 0 0 0	* * * * * *	0	
	Bighorn Sheep	Summer	0	0	0 + + * - + *	* * * * * *	0	(6)*
		Yearlong		+	+ + 0 - - 0 -	* * * * * *	0	
Goldbanks	Mule Deer	Summer	38	0	0 + + * 0 0 *	* * * * * *	*	31
		Yearlong		+	+ + + - 0 0 0	* * * * * *	*	
	Bighorn Sheep	Summer	0	0	0 + + * - + *	* * * * * *	*	(6)*
		Winter		+	+ + 0 - 0 0 -	* * * * * *	*	

TABLE 3-8

IMPACTS OF THE VARIOUS COMPONENTS
OF THE PROPOSED ACTION ON BIG GAME a/

Allotment	Species	Seasonal Use Area	Existing Big Game Numbers b/	Effect of Period-of-Use c/	Effect of Grazing Treatments b/ 1 2 3 4 5 6 7 d/	Effect of Support Facilities 1 2 3 4 5 6 e/	Effect of Vegetation Manipulation c/	Long-term Population Level Under Proposed Action f/
Harmony	Mule Deer	Summer	9	+	0 + + * 0 0 *	* * * * * *	*	32
		Winter		-	- + + + 0 0 -	* * * * * *	*	
	Bighorn Sheep	Summer	0	0	0 + + * - 0 *	* * * * * *	*	(2)*
		Winter		+	+ + 0 - 0 0 -	* * * * * *	*	
Humboldt House	Mule Deer	Summer	28	0	0 + + * 0 0 *	* * * * * *	*	22
		Yearlong		+	+ + + - 0 0 -	* * * * * *	*	
	Bighorn Sheep	Summer	0	0	0 + + * - 0 *	* * * * * *	*	(8)*
		Winter		+	+ + 0 - 0 0 -	* * * * * *	*	
Humboldt Sink	Mule Deer	Yearlong	1	+	+ + + - 0 0 0	* * * * * *	*	1
	Bighorn Sheep	Yearlong	0	+	+ + + - - 0 -	* * * * * *	*	(0)*
Jersey Valley	Mule Deer	Yearlong	20	+	* * * * * * *	* * * * * *	*	16
	Bighorn Sheep	Yearlong	0	+	* * * * * * *	* * * * * *	*	(0)*
Klondike	Mule Deer	Summer	23	+	0 + + * 0 0 *	* * * * * *	*	19
		Yearlong		+	+ + + - 0 0 -	* * 0 * * *	*	
	Bighorn Sheep	Yearlong	0	+	+ + + - - 0 -	* * * * * *	*	(3)*
Leadville	Mule Deer	Winter	59	-	- + + + 0 0 -	* * * * * *	*	60
		Spring		+	+ + 0 - 0 0 0	* * * * * *	*	
		Yearlong		+	+ + + - 0 0 -	* * * * * *	0	
	Antelope	Yearlong	16	+	+ + + - 0 0 0	* * * * * *	-	25*
	Bighorn Sheep	Yearlong	0	+	+ + + - - 0 -	* * * * 0 *	*	(55)*
Licking	Mule Deer	Summer	4	0	0 + + * 0 0 *	* * * * * *	*	15
		Winter		-	- + + + 0 0 -	* * * * * *	*	
Majuba	Mule Deer	Yearlong	23	+	+ + + - 0 0 0	* * * * 0 *	0	19
	Antelope	Yearlong	9	+	+ + + - 0 0 0	* * * * 0 0	*	38
Melody	No Big Game							
North Buffalo	Mule Deer	Winter	1	-	- + + + 0 0 0	* * * * * *	*	5
Pleasant Valley	Mule Deer	Summer	146	0	0 + + * 0 0 *	* * * * * *	*	118
		Yearlong		+	+ + + - 0 0 0	* * * * * *	*	
	Bighorn Sheep	Summer	0	0	0 + + * - 0 *	* * * * * *	*	(30)*
		Winter		+	+ + 0 - 0 0 -	* * * * * *	*	
		Yearlong		+	+ + + - - 0 -	* * * * * *	*	
Pole Canyon	Mule Deer	Yearlong	5	+	+ + + - 0 0 -	* * * * * *	*	5
	Antelope	Yearlong	2	+	+ + + - 0 0 -	* * * * * *	*	3
	Bighorn Sheep	Yearlong	0	+	+ + 0 - - 0 -	* * * * * *	*	(11)*
Prince Royal	Mule Deer	Summer	19	0	0 + + * 0 0 *	* * * * * *	*	16
		Yearlong		+	+ + + - 0 0 -	* * * * * *	0	
	Bighorn Sheep	Summer	0	0	0 + + * - 0 *	* * * * * *	*	(4)*
		Winter		+	+ + 0 - 0 0 -	* * * * - *	0	
Pumpernickel	Mule Deer	Summer	35	0	0 + + * 0 0 *	* * * * * *	*	74
		Winter		-	+ + + - 0 0 -	* * * * * *	*	
		Yearlong		+	+ + + - 0 0 0	* * * * 0 *	*	
	Bighorn Sheep	Summer	0	0	0 + + * - + *	* * * * * *	*	(12)*
		Winter		+	+ + 0 - 0 0 -	* * * * * *	*	

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Allotment	Species	Seasonal Use Area	Existing Big Game Numbers b/	Effect of Period-of-Use c/	Effect of Grazing Treatments b/ 1 2 3 4 5 6 7 d/	Effect of Support Facilities 1 2 3 4 5 6 e/	Effect of Vegetation Manipulation c/	Long-term Population Level Under Proposed Action f/
Ragged Top	Mule Deer	Yearlong	30	+	* * * * * * *	+ * * * 0 0	0	24
Rawhide	Mule Deer	Yearlong	35	+	+ + + - 0 0 0	* * * * 0 *	*	28
	Bighorn Sheep	Summer	0	0	0 + + * - 0 *	* * * * * *	*	(14)*
		Winter		+	+ + + - 0 0 -	* * * * - *	*	
		Yearlong		+	+ + + - - 0 -	* * * * - *	*	
Rochester	Mule Deer	Yearlong	19	+	+ + + - 0 0 0	* * * * 0 *	*	15
	Bighorn Sheep	Summer	0	0	0 + + * - 0 *	* * * * * *	*	(5)*
		Winter		+	+ + + - 0 0 -	* * * * * *	*	
		Yearlong		+	+ + + - - 0 -	* * * * 0 *	*	
Rock Creek	Mule Deer	Summer	13	0	0 + + * 0 0 *	* * * * * *	*	45
		Winter		-	+ + + - 0 0 0	* * * * * *	0	
	Bighorn Sheep	Summer	0	0	0 + + * - 0 *	* * * * * *	*	(13)*
		Winter		+	+ + + - 0 0 -	* * * * * *	*	
Rodeo Creek	Mule Deer	Yearlong	58	+	+ + + - 0 0 -	* * * * 0 *	*	59
	Antelope	Yearlong	28	+	+ + + - 0 0 -	* * * * - *	0	57
	Bighorn Sheep	Yearlong	0	+	+ + + - - 0 -	* * * * - *	*	(47)*
Rye Patch	Mule Deer	Summer	27	0	0 + + * 0 0 *	* * * * * *	*	22
		Yearlong		+	+ + + - 0 0 -	* * * * * *	*	
	Bighorn Sheep	Summer	0	0	0 + + * - 0 *	* * * * * *	*	(8)*
		Winter		+	+ + + - 0 0 -	* * * * * *	*	
Seven Troughs	Mule Deer	Summer	204	0	0 + + * 0 0 *	* * * * * *	*	165
		Yearlong		+	+ + + - 0 0 0	* * * * 0 *	*	
	Antelope	Yearlong	1	+	+ + + - 0 0 0	+ * * 0 0 0	*	(12)
Soldier Meadows	Mule Deer	Summer	249	0	0 + + * 0 0 *	* * * * 0 *	*	262
		Winter		-	- + + + 0 0 -	* * * * 0 *	0	
		Yearlong		+	+ + + - 0 0 -	* * * * 0 *	0	
	Antelope	Summer	90	0	0 + + * 0 0 *	* * * * 0 *	*	179
		Yearlong		+	+ + + - 0 0 0	* * * * * *	*	
	Bighorn Sheep	Yearlong	0	+	+ + + - - 0 -	* * * * - *	0	(83)*
Sonoma	Mule Deer	Summer	13	0	0 + + * 0 0 *	* * * * * *	0	20*
		Winter		-	+ + + - 0 0 0	* * * * * *	-	
	Bighorn Sheep	Summer	0	0	0 + + * - 0 *	* * * * * *	*	(9)*
		Winter		+	+ + + - 0 0 -	* * * * * *	*	
South Buffalo	Mule Deer	Summer	157	0	0 + + * 0 0 *	* * * * * *	*	127
		Yearlong		+	+ + + - 0 0 0	* * * * * *	0	
	Bighorn Sheep	Summer	0	0	0 + + * 0 0 *	* * * * * *	*	(42)*
		Winter		+	+ + + - 0 0 -	* * * * * *	*	
		Yearlong		+	+ + + - 0 0 -	* * * * * *	*	
Star Peak	Mule Deer	Summer	179	0	0 + + * 0 0 *	* * * * * *	*	145
		Yearlong		+	+ + + - 0 0 0	* 0 0 * 0 *	0	
	Bighorn Sheep	Summer	0	0	0 + + * - 0 *	* * * * * *	*	(26)*
		Winter		+	+ + + - 0 0 -	* * * * - *	0	
		Yearlong		+	+ + + - 0 0 -	* * * * - *	*	

TABLE 3-8

IMPACTS OF THE VARIOUS COMPONENTS
OF THE PROPOSED ACTION ON BIG GAME a/

Allotment	Species	Seasonal Use Area	Existing Big Game Numbers b/	Effect of Period-of-Use c/	Effect of Grazing Treatments b/ 1 2 3 4 5 6 7 d/	Effect of Support Facilities 1 2 3 4 5 6 e/	Effect of Vegetation Manipulation c/	Long-term Population Level Under Proposed Action f/
Thomas Creek	Mule Deer	Summer	8	-	0 + + * 0 0 *	* * * * * * *	*	30
		Winter		0	+ + + - 0 0 0	* * * * * * *	0	
	Bighorn Sheep	Summer	0	-	0 + + * - 0 *	* * * * * * *	*	(12)*
		Winter		+	+ + + - 0 0 -	* * * * * * *	*	
White Horse	Mule Deer	Summer	14	0	0 + + * 0 0 *	* * * * * * *	*	12
		Yearlong		+	+ + + - 0 0 0	* * * * 0 *	0	
	Bighorn Sheep	Summer	0	0	0 + + * - 0 *	* * * * * * *	*	(2)*
		Yearlong		+	+ + + - - 0 -	* * * * * * *	*	

a/ Vegetation allocations were not included in the table because they were considered beneficial to big game in all cases. The allocations were taken into account in arriving at long-term population levels, as affected by the proposed action.

b/ Existing big game numbers were supplied by NDOW on their management unit basis. See Appendix A, Section 2 for methods used to apportion existing numbers by allotment. Existing deer numbers currently exceed the long-term population goals (reasonable numbers) in a number of allotments.

c/ + = beneficial impact on that seasonal use area in that allotment.
- = adverse impact on that seasonal use area in that allotment.
0 = no impact on that seasonal use area in that allotment.
* = that action or treatment would not be applied in that seasonal use area in that allotment.

d/ The following codes denote possible grazing treatments that could be used in developing AMPs. These are only the type or kind of treatments that could be used; what actually is used during AMP development may be quite different from any treatments listed here.
1 - rest early spring to early summer (3/15 to 6/15)
2 - rest 16 months, early spring to mid-summer (3/15 to 7/15)
3 - rest late spring to fall (6/15 to 9/30)
4 - graze early spring to late spring (3/15 to 6/15)
5 - graze early summer to late fall (6/15 to 10/30)
6 - graze mid-summer to late fall (7/16/ to 11/15)
7 - graze fall to winter (10/1 to 2/28)
Each treatment was considered without regard to what treatment preceeded or followed it, and without regard to kind of livestock, or kind of grazing system; the only considerations were the kind of seasonal range and kind of big game animal.

e/ The following codes denote the kinds of livestock support facilities listed in the proposed action.
1 - Wells, 2 - Springs, 3 - Pipelines, 4 - Troughs, 5 - Fences, 6 - Cattleguards

f/ This column gives the long term population levels for big game under the proposed action. Numbers in parentheses ( ) indicate that reintroductions must occur if the goals are to be reached. Numbers followed by an asterisk (*) indicate populations below the management goal of reasonable numbers.

TABLE 3-9

RELATIONSHIP BETWEEN EXISTING BIG GAME NUMBERS AND REASONABLE NUMBERS OF BIG GAME ON PUBLIC LAND IN THE SONOMA-GERLACH RESOURCE AREA

	MULE DEER			ANTELOPE d/			BIGHORN SHEEP e/		
Allotment	Existing Numbers a/	Reasonable Numbers b/	Difference c/	Existing Numbers	Reasonable Numbers	Difference	Existing Numbers	Reasonable Numbers	Difference
Blue Wing	288	234	+54	0	20	- 20	0	44	- 44
Buffalo Hills	2093	2098	+ 5	263	461	- 98	6	476	- 470
Calico	15	15	0	9	18	- 9	0	36	- 36
Clear Creek	17	59	-42	*	*	*	0	8	- 8
Coal Canyon/Poker	40	32	+ 8	*	* f/	*	0	13	- 13
Cottonwood Canyon	7	6	+ 1	*	*	*	*	*	*
Coyote	12	12	0	98	171	- 73	0	3	- 3
Desert Queen	*	*	*	*	*	*	*	*	*
Diamond S	12	43	-31	*	*	*	0	16	- 16
Dolly Haden	28	23	+ 5	*	*	*	0	8	- 8
Goldbanks	38	31	+ 7	*	*	*	0	7	- 7
Harmony	9	32	-23	*	*	*	0	3	- 3
Humboldt House	28	22	+ 6	*	*	*	0	10	- 10
Humboldt Sink	1	1	0	*	*	*	0	1	- 1
Jersey Valley	20	16	+ 4	*	*	*	0	1	- 1
Klondike	23	19	+ 4	*	*	*	0	4	- 4
Leadville	59	60	- 1	16	28	- 12	0	73	- 73
Licking	4	15	-11	*	*	*	*	*	*
Majuba	23	19	+ 4	9	38	- 29	*	*	*
Melody	*	*	*	*	*	*	*	*	*
North Buffalo	1	5	- 4	*	*	*	*	*	*
Pleasant Valley	146	118	+28	*	*	*	0	40	- 40
Pole Canyon	5	5	0	2	3	- 1	0	15	- 15
Prince Royal	19	16	+ 3	*	*	*	0	5	- 5
Pumpernickle	35	74	-39	*	*	*	0	16	- 16
Ragged Top	30	24	+ 6	*	*	*	*	*	*
Rawhide	35	28	+ 7	*	*	*	0	19	- 19
Rochester	19	15	+ 4	*	*	*	0	6	- 6
Rock Creek	13	45	-32	*	*	*	0	18	- 18
Rodeo Creek	58	59	- 1	28	57	- 29	0	63	- 63
Rye Patch	27	22	+ 5	*	*	*	0	10	- 10
Seven Troughs	204	165	+39	1	12	- 11	*	*	*
Soldier Meadows	249	262	-13	90	179	- 89	0	110	- 110
Sonoma	13	47	-34	*	*	*	0	12	- 12
South Buffalo	157	127	+30	*	*	*	0	56	- 56
Star Peak	179	145	+34	*	*	*	0	34	- 34
Thomas Creek	8	30	-22	*	*	*	0	16	- 16
White Horse	14	12	+ 2	*	*	*	0	3	- 3
TOTALS	3929	3936	- 7	516	987	-471	6	1126	-1120

a/ Existing numbers of big game animals were provided by Nevada Department of Wildlife on a planning unit basis. The procedure outlined in Appendix A, Section 2 was used to apportion existing numbers by allotment.

b/ Reasonable numbers represents the number of big game animals that vegetation would be allocated for. Reasonable numbers are the long term goals as far as big game numbers are concerned.

c/ Numbers preceded by a plus sign (+) indicate the number of animals present in an allotment in excess of reasonable numbers, and which exceed management goals. Numbers preceded by a minus sign (-) indicate the number of animals by which the population of an allotment could increase to reach reasonable numbers; forage would be allocated for these animals even though they do not exist. A zero (0) indicates that the population of an allotment is at reasonable numbers. An asterisk (*) indicates that there is no big game use in that allotment.

d/ Included in the figures for antelope are 20 animals in the Blue Wing allotment and 12 animals in the Seven Troughs allotment that would occur in use areas that presently have no antelope, and which have only potential to support antelope. Reintroduction would have to be made in the future in order to attain reasonable numbers.

e/ Only one bighorn sheep use area in the resource area presently has bighorn sheep; this area has 6 animals and would eventually support 180 animals. The remainder are potential only, dependent on reintroductions to reach reasonable numbers.

f/ There is one AUM of potential antelope use in Coal Canyon/Poker allotment.

Source: United States Department of Interior, Bureau of Land Management, Winnemucca District, Sonoma-Gerlach Unit Resource Analyses, 1980, and Management Framework Plan, 1980.

cial impact because such seedings could augment or complement the existing situation by providing late winter forage or by providing additional dietary variety (Cole 1968, BLM Manual 6601-6).

There are three allotments, however, where land treatments would have significant adverse impacts on mule deer habitat quality and deer numbers. In the Buffalo Hills Allotment, 1,557 acres of deer spring range is proposed for sagebrush removal and seeding, and a 7,900 acre block of deer winter range within the Clear Creek and Sonoma allotments is proposed for the same treatment. The area of spring range within the Buffalo Hills Allotment is presently in a sagebrush/grass community and is entirely usable by mule deer since shrubs provide cover over the entire area. Removal of the shrub cover and seeding to grass could render much of the area useless to deer (Cole 1968). The area of deer winter range in the Sonoma and Clear Creek allotments (approximately 7,900 acres) is also currently in a sagebrush/grass community. Shrub removal and seeding to grass would end this area's value as deer winter range, as deer make little or no use of grass seedings in winter (Cole 1968).

The effect of these treatments on the resource area deer herd would be a decline of 12 deer in the Buffalo Hills Allotment, since these deer would be deprived of spring forage, and a failure of the deer herd in the Sonoma/Clear Creek allotment area to expand to reasonable numbers. This expansion would not occur because of the loss of winter range. In the Buffalo Hills Allotment, this would result in a population of 2,086 deer rather than 2,098 (reasonable numbers). In Sonoma, the long-term population would be 20 deer, rather than 47, and in Clear Creek, 50 deer rather than 59. On a resource area basis, this means a population of 3,888 deer, rather than 3,936 deer.

Support facilities, as outlined in the proposed action, would have no significant impact on mule deer in the resource area (Table 3-8). There would be an unquantifiable amount of death or injury to mule deer due to entanglement in the fences outlined in the proposed action; however, this would not be enough to prevent reaching or maintaining reasonable numbers in any allotment, and would thus not be a significant impact.

The proposed action does not specify specific types of grazing systems, or specific treatments to be used in each allotment. It specifies only that certain allotments would have AMPs developed for them, those presently having AMPs would have them updated, and some allotments would have no AMPs.

Those allotments that would have new or updated AMPs (all but four) would have some combination of grazing and resting treatments applied to them, with the general objective being to provide adequate rest to meet the physiological needs of key vegetation species.

While no specific grazing or resting treatments have been proposed, the proposed action narrative (Chapter 1) does list a number of possible treatments that could be used individually or in various combinations. The impacts on mule deer of these various treatments are indicated in Table 3-8. It should be noted that the impacts listed in the table could vary, depending on what combination of treatments is applied to the area in question. For the purpose of this analysis, each treatment is treated as a discrete action, unrelated to events preceeding or following it. Beneficial impacts are usually associated with rest periods which would increase vegetation production and reduce forage competition. Adverse impacts are usually associated with treatments that encourage herbaceous vegetation on winter range at the expense of shrubs, or which would allow heavy livestock use on deer winter use areas. No impacts would occur where treatments would be applied to areas not normally used by cattle or deer during the treatment period (e.g., spring rest on high summer ranges), or where summer/fall grazing at proper use levels would occur on deer winter ranges.

Even without knowing what specific treatments or grazing system would be used in each allotment, some general statements concerning the effects of grazing systems on mule deer and their habitat can be made. There is little doubt that allowing vegetation to rest during its critical growing period through implementation of grazing systems would increase vegetation production (Van Poollen and Lacey 1979). This would be significantly beneficial to mule deer habitat because of the increased vegetation. However, some grazing treatments would place large numbers of livestock in deer winter ranges during the late summer and fall, very likely resulting in winter forage deficiencies for mule deer. Other treatments would allow livestock grazing on deer spring range during the early spring period, when both livestock and mule deer are seeking new green grass (green-up). This would likely result in competition for this type of forage (Tueller 1979).

In addition, the maximum rest period in the list of possible treatments in the proposed action would be 16 months, encompassing two growing seasons; most of the rest periods encompass a period of only 3 months. Such rest periods are beneficial to upland vegetation. However, they are insufficient to allow recuperation of condition of several deer habitat types (aspen, meadow, riparian). Under grazing systems, riparian areas would continue to decline in condition, while upland aspen would stabilize, or improve only slightly (see Vegetation Section, Chapter 3, Proposed Action).

Under allotment management plans, there would be significant improvements in upland deer habitat quality, but this would be offset by the increased density of livestock, increased human presence associated with intensive livestock management, and by declines in riparian habitat condition. Deer numbers would thus be unaffected by allotment management plan implementation in the resource area.

Summary for Mule Deer

Implementation of the proposed action would result in improvements in mule deer habitat quality, and would thus have a significantly beneficial impact on mule deer habitat. Various aspects of the proposed action would aid in reaching and/or maintaining reasonable numbers of deer in most allotments. The greatest benefits to mule deer habitat (and thus to mule deer) would accrue from the vegetation allocation program and from the setting of periods-of-use. Mule deer habitat would be significantly improved in all allotments by implementation of the proposed action. Reasonable numbers would be reached or maintained in all but three allotments, the exceptions being where land treatments eliminated portions of deer habitat. Such land treatments represent significant adverse impacts on mule deer populations in three allotments.

Mule deer populations would be maintained over the long term at an average level of 3,888 deer. Populations would rise above this level in some years and fall below it in others.

Antelope

Antelope habitat quality and antelope populations would be impacted by various components of the proposed action. Table 3-8 gives best estimates of effects of the various actions and treatments on antelope in the resource area. Following is a general analysis of the proposed action impacts.

The allocation of vegetation to antelope within the resource area would cover reasonable numbers fully. It would also cover antelope reintroductions in the Blue Wing and Seven Troughs allotments. The allocation of 2,369 AUMs would support 987 antelope yearlong. There is at present a yearlong average of 516 antelope in the resource area, meaning that under this allocation, antelope could increase by 471 animals.

The allocation of vegetation under the proposed action would be significantly beneficial to antelope habitat because it would mean reduced stocking rates on rangeland. Stocking rates would be reduced by removing wild horses and burros, by reducing active livestock use, and by allocating vegetation for wildlife use. Reduced stocking rates mean less intense utilization of vegetation and increased herbage production (Van Poollen and Lacey 1979). Increased herbage production can be interpreted as larger amounts of vegetation of a wider variety. These factors mean more forage would be available for all consumers, and that there would be less likelihood of competition for this forage (Stoddart et al. 1975). These factors can all be interpreted as improvements in habitat quality, and thus as significant beneficial impacts.

The improved habitat quality, brought about by the vegetation allocations, and the allocation of vegetation to reasonable numbers of antelope, would help assure that forage would be available for reasonable numbers of antelope. This would aid in reaching reasonable numbers in all allotments that contain antelope habitat, and would thus be a significant beneficial impact. Under the proposed vegetation allocation, reasonable numbers would be attained and then maintained in all allotments, except as affected by land treatments, as will be discussed below. Table 3-9 lists existing and reasonable numbers of antelope in all allotments.

The implementation of proposed periods-of-use would be beneficial to antelope habitat because it would improve rangeland vegetation, increasing grass and forb production (Laycock 1970). This would be an improvement in habitat quality, and thus a significant beneficial impact.

Increased forb availability during the spring would increase antelope productivity by helping to assure that antelope does have access to sufficient highly nutritious forage during the last three months of pregnancy (March, April, May). Having such forage available would enable female antelope to produce and maintain healthy fawns, increasing herd productivity (Yoakum 1978). The increased productivity in antelope herds would help attain reasonable numbers, and would thus be a significant beneficial impact.

Under the proposed action, many thousands of acres of land would undergo treatment to remove sagebrush and then would be reseeded to increase livestock carrying capacity. Such projects have little value for antelope when they create grass monocultures (Yoakum 1977). It is not known what type of seed mixtures would be used under the proposed action, so it is assumed that pure grass seed would be used, as has generally been the case in the past.

The above assumption was used in determining the impacts of land treatments on the various antelope use areas as noted in Table 3-8. Land treatments would be beneficial to antelope only where they would occupy small areas of antelope range, or lie adjacent to antelope range, or where range conditions are so poor that antelope no longer can exist. In the first two instances, they would be beneficial because they would add a new variety of forage to the habitat without replacing large segments of natural vegetation. Land treatments would be adverse to antelope in allotments where they would occupy large blocks of antelope habitat, replacing much natural vegetation. While such seedings (small areas or adjacent to antelope habitat) would benefit antelope, the impacts would not be significant.

In three allotments, large blocks of antelope habitat are proposed for seeding. This would be significantly adverse to antelope habitat, and thus to antelope. Because of this, the antelope herd in the Buffalo Hills Allotment would fall 24 head short of reaching reasonable numbers. In Coyote Allotment, the shortfall would be 20 head, and 3 head in Leadville Allotment.

As outlined in the proposed action, support facilities would have no significant impact on antelope habitat or antelope populations. What fencing that is proposed for construction in antelope habitat would be built to wildlife specifications, allowing big game passage.

There would be some antelope lost to entanglement in fences when newly constructed, but this impact would diminish as populations became accustomed to the fences' presence. This impact would not be significant, as it would not prevent reasonable numbers from being attained.

Under the proposed action, all allotments that contain antelope range, or potential antelope range, would have allotment management plans devised or revised. What type of grazing system, and what type and combination of grazing and resting treatments would be used in each allotment would be determined in the future. Thus, it is not possible to analyze the effects of specific systems or treatments on antelope. Grazing treatments listed in Table 3-8, and analyzed therein, represent only the types of treatments that could be used; what actually occurs could be quite different.

Implementation of grazing systems that account for the physiological needs of important antelope forage species, such as bitterbrush, would be significantly beneficial to antelope habitat because of the improvement in vegetation condition. Implementation of grazing systems would increase herbage production (Van Poollen and Lacey 1979), thus increasing the amount of vegetation available to antelope. The increased vegetation represents increased forage, and would thus aid in attaining reasonable numbers of antelope in all allotments. This would be a significant impact on antelope numbers.

Summary for Antelope

Implementation of the proposed action would have significant beneficial impacts on antelope habitat quality, and on antelope populations. Habitat quality would improve, and reasonable numbers would be achieved and then maintained in all but three allotments. The vegetation allocation program and setting of periods-of-use would have the greatest impacts on both habitat quality and population levels. Lesser beneficial impacts would result from implementation of allotment management plans. Land treatments would have significant adverse impacts on both antelope habitat and antelope numbers in allotments where they were located.

Adverse impacts from land treatments would result in the resource area population level failing to attain reasonable numbers. Antelope populations over the long term would average 940 head, assuming reintroductions were made in the two potential habitat areas. This population level is 3.2 percent below reasonable numbers. Of the 11 allotments which now contain antelope populations, or potential antelope habitat, all but 3 would reach reasonable numbers.

Bighorn Sheep

California bighorn sheep once occupied many of the mountain ranges within the resource area, but were extirpated during the first quarter of this century. Nevada Department of Wildlife has identified 12 areas within the resource area as being suitable or potentially suitable for reintroduction of bighorn sheep. One such reintroduction has occurred (Granite Range); there are presently six bighorn sheep in this use area.

The vegetation allocation program under the proposed action would be significantly beneficial to potential bighorn sheep habitat and to bighorn sheep populations. Bighorn sheep habitat would be improved because the reduced stocking rates, brought about by removing wild horses and burros, reducing livestock active use, and by allocating vegetation to wildlife use, would bring about increased herbage production (see Vegetation Section, Chapter 3, Proposed Action). The increased vegetation production would represent increased cover and forage for bighorn sheep use. This would be an improvement in habitat quality, and thus a significant benefical impact.

The allocation of vegetation specifically to bighorn sheep, even though they do not yet occur in most use areas, would be significantly beneficial to the bighorn sheep in that it would help assure that sufficient forage would be available for them once reintroductions occurred. It would greatly increase the chances for success of reintroductions. In the one use area where bighorn sheep now occur (within Buffalo Hills Allotment), the vegetation allocation would help the population in reaching reasonable numbers (except as affected by other factors in the proposed action) and would thus be a significant beneficial impact.

The lowered livestock stocking rates resulting from the vegetation allocation would also reduce competition (but not eliminate it) between livestock and bighorn sheep for space, which would also enhance the chances of success for reintroduced sheep. Studies cited in Wilson et al. (1978) indicate that bighorn sheep avoid areas used by livestock. Thus, by bringing about lower densities of livestock, the vegetation allocation would have a significant beneficial impact on the space aspect of sheep habitat, by lessening the amount of contact that would occur between the sheep and livestock. There would, however, continue to be contact between sheep and livestock.

The proposed periods-of-use would have a significant beneficial impact on bighorn sheep habitat because the effect of this action would be to promote or increase the density and production of perennial grasses and forbs (Laycock 1970). Any action which would increase the grassland characteristics of shrub stands would have beneficial effects on bighorn sheep (Wilson et al. 1978). This is because grasses are usually the major part of bighorn diets during all seasons (Dunaway 1972 as cited in Wilson et al. 1978).

Land treatments under the proposed action would occupy only small areas of several of the potential bighorn sheep ranges. These land treatments would be beneficial to bighorn sheep because they would change these small areas of brush to grassland. Bighorns are known to use reseeded areas (Wilson et al. 1978). Table 3-8 indicates which allotments and bighorn sheep areas would have land treatments. There would be no significant impacts, either adverse or beneficial derived from these treatments, because very little potential bighorn sheep habitat would be affected.

As listed in the proposed action, livestock support facilities would have no significant impact on bighorn sheep. The small amount of death loss or injury due to the few miles of fences proposed for construction in bighorn sheep range would not, in itself, be sufficient to prevent populations from reaching reasonable numbers.

Under the proposed action, all but three allotments that have potential bighorn sheep range would have Allotment Management Plans (AMPs) devised or revised for them. Though it is not known what types of grazing systems or what kind or combination of rest/grazing treatments would be used in each allotment, it is known that there would be both beneficial and adverse impacts to bighorn sheep resulting from implementation of AMPs. Beneficial impacts would result from increased herbage production resulting from grazing system implementation (Van Poollen and Lacey 1979). This increased herbage production would do much to assure satisfactory habitat conditions when bighorns are reintroduced. The increased herbage production would be an improvement in habitat conditions, and would be a significant beneficial impact. The increased forage would also be significantly beneficial to bighorn sheep populations, as it would aid in attaining reasonable numbers.

Significant adverse impacts to bighorn would arise from the increased livestock densities in use pastures, and from the increased human presence associated with intensive livestock grazing management systems. High concentrations of livestock would cause bighorn sheep to abandon, at least temporarily, those portions of their habitat where the livestock occurred (Wilson et al. 1978). The presence of livestock operators (and other people, as well) would have the same result. Under AMPs, at least part of every bighorn sheep range in every allotment would receive these impacts every year. This would be sufficient to prevent populations from attaining reasonable numbers in all allotments. The shortfall would vary from allotment to allotment, depending on stocking rate, grazing system design, treatments, support facilities, and class of livestock. For purposes of this impact statement it will be assumed that the impact would amount to 25 percent; that is, populations would attain only 75 percent of reasonable number levels.

Summary for Bighorn Sheep

Implementation of various aspects of the proposed action would have significant beneficial impacts on bighorn sheep habitat. Impacts resulting from the vegetation allocation program, the setting of periods-of-use, removal of wild horses and burros, and establishment of AMPs would bring about habitat improvements that would allow reintroduced populations to attain reasonable numbers in the long term. However, sheep populations would be deprived of various portions of their ranges during periods of livestock, wild horse and burro, or human occupancy, and would thus be unable to attain reasonable numbers, even though habitat would otherwise be suitable. It is estimated that this impact would amount to at least 25 percent of reasonable numbers. Table 3-8 lists long-term population levels by allotment. The one already established population would reach its ultimate population level (135) by 1991 (short term); assuming all other reintroductions were made, long-term populations would be approximately 845 head. This is 241 head fewer than reasonable numbers (in the long term).

UPLAND GAME

Sage Grouse

Sage grouse occur in most mountain ranges in the resource area, though many of the populations are small and concentrated within or around small areas of suitable habitat. Major populations occur mainly in the western third of the resource area, though all populations have the potential to expand. Various aspects of the proposed action would have significant beneficial impacts on sage grouse habitat (and thus on grouse populations), others would have no significant impact.

The vegetation allocation, as proposed, would have significant beneficial impacts on sage grouse habitat by bringing consumptive use of the non-riparian vegetation down to a level more consistent with proper range use. Patterson (1952, as cited in Savage 1969) indicated that a major reason for declines in grouse populations was habitat deterioration caused by man's activities, including overgrazing by domestic livestock. Savage (1969) and Robertson and Kennedy (1954) found significant changes in vegetation communities, due to overuse by domestic livestock, that were detrimental to sage grouse. These changes included declines in acreages of mountain meadows, decline of forbs in rangelands, increases in sagebrush densities, and drainage of wet meadows. The allocation of vegetation to all consumptive users, and in amounts within range carrying capacity, would greatly reduce the overuse of non-riparian areas. These areas would experience an increase in herbage production, which would mean improved sage grouse habitat.

However, the meadow habitat (riparian), on which sage grouse depend for summer forage (forbs) and brood rearing habitat, would continue to be significantly adversely impacted under the vegetation allocation. These sites are heavily used by livestock, regardless of the stocking rate (Hormay 1976), because they provide more nutritious forage in summer than do upland range sites, and because they often have water on them. This continued heavy use would cause this habitat to decline further in condition. The improvement in non-riparian habitat condition would lessen the impact of this riparian decline, but not eliminate it.

The proposed periods-of-use (deferment of spring grazing) would be significantly beneficial to sage grouse habitat because it would increase production of forbs and grasses in upland sagebrush areas. Savage (1969) found that when upland sagebrush areas have abundant succulent forbs, sage grouse were not dependent on meadows as sources of forbs. However, the periods-of-use as proposed would allow livestock use of meadow habitat during the late spring/summer period when grouse are most dependent on meadow habitat. The proposed periods-of-use would keep livestock off of the meadows during the early spring, allowing meadow vegetation to make some growth. However,the heavy summer-long grazing use which would begin with turnout would prevent significant recovery of condition, and would allow utilization of much of the vegetation needed by sage grouse broods for food and for cover.

Within three allotments (Buffalo Hills, Coyote, Leadville), proposed seeding projects would occur within the critical two mile radius of sage grouse strutting grounds. These projects would have significant adverse impacts on sage grouse populations if grouse make considerable use of the areas proposed for seeding. There is no information to indicate how much use grouse make of these areas. Grouse nesting seldom occurs in areas having five percent or less sage brush cover (Klebenow 1970), as is common in new seedings. Other proposed land treatments would occupy small areas of sage grouse range. The impact of these projects on the grouse would depend on what use grouse make of these areas. Over much of the sage grouse range within the resource area, strutting grounds, brood areas, and such have not been identified; therefore, the impact of some of the proposed land treatments cannot be fully analyzed. The *Western States Sage Grouse Committee Guidelines for Habitat Protection in Sage Grouse Range* will be adhered to in these areas.

There are no livestock support facilities that could impact sage grouse habitat proposed within sage grouse range; therefore, there would be no significant impacts from support facilities on grouse habitat.

Implementation of allotment management plans on all allotments containing sage grouse range would have significant beneficial impacts on sage grouse habitat. The degree of these impacts would depend upon the kind of grazing system, and on the combination of grazing treatments selected for each allotment, as these factors would influence the degree of increase of herbage production resulting from implementation of AMPs. AMPs would benefit grouse habitat because they would increase the density and production of forbs in upland sagebrush sites. Sage grouse make considerable use of such forbs before moving onto meadows, and can live on them throughout the summer if they happen to be available (Savage 1969).

However, the condition of riparian meadow habitat is often a much more limiting factor on sage grouse populations than is upland range condition or production, for sage grouse depend on meadow habitat for brooding habitat during the dry, hot months of summer. These habitats would continue to decline in condition, but at a slower rate than before. Sites in good condition would perhaps stabilize.

Generally, implementation of AMPs would have significant beneficial impacts for sage grouse. Improved upland range condition would provide additional forage and cover for sage grouse.

Summary for Sage Grouse

The combined impacts of the various aspects of the proposed action would be significantly beneficial for sage grouse habitat. Reduced consumptive use of the vegetation resource, allowance for vegetation growth during the critical growing periods, and periodic rest allowed by AMPs would improve upland sage grouse habitat significantly; the same cannot be said for meadows and riparian habitat. These critical habitats would at best be stabilized in their present condition, which is generally fair or poor. Thus, in normal or above normal precipitation years, the improved upland habitat condition would allow for grouse population increases, which could be as high as 100 percent. However, in dry years, when grouse would be much more dependent on meadows and riparian areas, population declines would occur. In effect, sage grouse would continue to be subject to climatic variation, much as they are now; the only difference being that, in the long term, there would be an average increase of perhaps 30 percent in the base population of sage grouse. This increase is an average because the population highs of good years would be offset by declines in poor years.

OTHER WILDLIFE

In addition to the four wildlife species previously addressed, there is a wide variety of other wildlife species within the resource area. These species have specific habitat requirements which could be impacted by the proposed action. These specific habitat requirements often involve the "special features" of the overall area. These features (aspen groves, meadows, riparian zones, springs, and the like) provide diversity of habitat in an otherwise monotypic shrub habitat. Other species are found only in upland range sites. Habitat diversity is the key to maintaining a diverse fauna. Within reason, the more diverse the habitat, the more diverse the fauna of an area. Several aspects of the proposed action would affect habitat diversity.

Grazing use in the resource area has greatly altered the natural vegetation community, and has thus very likely caused a shift in the bird community toward closer resemblance to bird communities of drier sites (Wiens and Dyer 1975). Several aspects of the proposed action (vegetation allocation, periods-of-use) would lessen the intensity of grazing pressure on upland range sites, thus allowing increased herbage production. This would represent a shift back toward the climax situation, and toward normal bird communities.

The increased herbage production would also benefit small mammals which generally depend on foliage and/or seeds for food. Reynolds and Trost (1980) found that grazing reduced the forbs and grass seeds needed by rodents for food, thereby reducing small rodent populations. Lizard populations would also benefit from the reduced grazing pressure (Jones 1979).

The proposed vegetation allocation and periods-of-use would not cause any significant improvement in riparian areas, meadows, and aspen groves. These sites would continue to be heavily used by livestock, and would not be expected to improve in condition; riparian areas would decline in condition. These sites are important to wildlife because of the habitat diversity they provide in otherwise monotypic shrubland. This decline in habitat diversity would be a significant adverse impact because it would be a decline in habitat quality.

Allotment management plans could have significant beneficial or adverse impacts on many wildlife species, depending on what combination of grazing treatments is used in each one. Grazing systems can increase herbage production (Van Poollen and Lacey 1979) and could thus significantly benefit wildlife, but such systems often concentrate livestock use in small areas. This would offset benefits arising from increased herbage production (Buttery and Shields 1975). In addition, most grazing systems are of little value in improving riparian vegetation (see Vegetation Section, Chapter 3, Proposed Action). Riparian habitat would continue to decline. This would be a loss of habitat condition and diversity, and thus would be a significant adverse impact.

All of the areas proposed for land treatments are presently occupied by small wildlife species of considerable diversity. These species would be impacted significantly by conversion of their shrubland habitats to grassland. Impacts would be beneficial to those species adapted to grasslands (e.g., western meadowlark, horned lark), and adverse to those species adapted to sagebrush habitats (e.g., Brewer's sparrow, sage thrasher). The edge effect created by land treatments would bring about higher bird densities in the ecotone between treated and untreated areas.

As outlined in the proposed action, and addressed in the Standard Operating Procedures, livestock support facilities would have no significant adverse impacts on these other wildlife species. Some would have no impact, others a significant beneficial impact. Fences and windmills would provide elevated perches for raptors, and some nest sites. Water developments could extend the range of some species. It is not likely, however, that there would be a measurable increase in population numbers resulting from these impacts, except perhaps in very localized areas where habitat conditions would be greatly improved.

The cumulative impact of the various aspects of the proposed action on these other wildlife species would vary. For those species totally associated with upland range sites, there would be a significant beneficial impact. These species would experience an increase in density, and perhaps a change in species dominance, coming to more closely resemble a normal sagebrush/grassland vertebrate community.

The proposed action would do little for those species dependent on riparian, meadow, and aspen habitat, or which make considerable use of such sites (288 of 363 vertebrate species in southeast Oregon's Great Basin are included here (Thomas et al. 1979)). Under almost any grazing system or intensity, meadows and riparian areas continue to be heavily used by livestock (Hormay 1976). Declines in riparian faunas, due to heavy grazing use, have been documented (Oakleaf and Klebenow 1975; Boeer and Schmidly 1977). Page et al. (1978) found that certain bird species occurred only in aspen groves which had a lush herbaceous understory (ungrazed). Under the proposed action, aspen habitats would at best stabilize in their present condition; riparian habitat would continue to decline. This would be a significant adverse impact on the habitat of the wildlife species dependent on, or which make use of, these habitat types; there would be a decline in both species diversity and density within the resource area.

CONCLUSION

Implementation of this alternative woud have significant beneficial impacts on most wildlife habitats. The vegetation allocation and other aspects of the proposed action would increase herbage production in all allotments, which would mean increased forage, cover, and habitat diversity in the resource area. Habitat quality would improve in all habitats except aspen and riparian. Non-riparian aspen would not be affected by the proposed action, and riparian habitat would continue to decline in condition, though the decline would be slowed somewhat.

Mule deer would maintain reasonable numbers over the long term in all but three allotments, where land treatments would eliminate portions of their habitat. Antelope would attain reasonable numbers in all allotments where they occur, except where land treatments eliminated portions of their habitat. Bighorn sheep, assuming all reintroductions were made, would increase to 845 head, failing to reach reasonable numbers only because of adverse effects of AMP implementation. See Table 3-10 for a summary of big game numbers.

AQUATIC HABITAT

Of the 29 rivers and streams that flow through the Sonoma-Gerlach EIS area, 26 streams or 203 stream miles occur in grazing allotments that would be affected by the proposed action. Currently 68 percent of the surveyed public stream miles are classified as poor or fair (Table 2-8). The condition trends are estimated by BLM to be static, or in some cases, downward.

GENERAL EFFECTS OF THE PROPOSED ACTION ON AQUATIC HABITAT

In general, the grazing treatments described in Chapter 1 would not improve stream habitat condition. The effectiveness of the Allotment Management Plans (AMPs) would depend on the combination of treatments used as well as the nature of the stream itself.

AMPs without some special protective measures for the stream and streambanks would not maintain or restore a healthy productive riparian-aquatic zone (Platts 1977). Grazing as proposed in Chapter 1 is based on the physical needs of key management species of plants. It is not likely that a 5,000 acre pasture would be managed on the basis of the condition of a riparian species such as willow when it is documented that the riparian zone is generally utilized first and hardest by livestock (Thomas et al. 1979, Johnson et al. 1978, Martin 1979).

The grazing treatments, if used properly, could provide the basis to maintain the riparian and aquatic habitat condition if it were improved. Improvement of the habitat condition requires an extended period of rest which is not provided for in the proposed action. Most of the streams in the Sonoma-Gerlach Resource Area do not have streambanks that are resistant to mechanical

TABLE 3-10

SUMMARY OF SHORT-TERM AND LONG-TERM BIG GAME NUMBERS UNDER THE VARIOUS ALTERNATIVES

Alternative		Existing Numbers (1979)	Short-term Numbers (1991)	Long-term Numbers (2024)
Proposed Action	Mule Deer	3,929	3,888	3,888
	Antelope	516	910	940
	Bighorn Sheep	6	135	845
No Action	Mule Deer	3,929	3,929	2,389
	Antelope	516	516	396
	Bighorn Sheep	6	100	100
No Grazing	Mule Deer	3,929	3,936	3,936
	Antelope	516	957	987
	Bighorn Sheep	6	180	1,126
Maximizing Livestock Use	Mule Deer	3,929	3,796	3,796
	Antelope	516	416	416
	Bighorn Sheep	6	50	50
Maximizing Wild Horses and Burros	Mule Deer	3,929	3,888	3,888
	Antelope	516	910	940
	Bighorn Sheep	6	135	845

Source: Chapter 3 Wildlife Impacts Narrative.

damage by livestock. Fragile streambanks could not be stabilized and the stream habitat or fishery would not benefit from AMPs as proposed. A major benefit of AMPs would arise from the revegetation of the watershed and accompanying increased infiltration of rainfall and snowmelt into the aquifer. This causes an increased and stabilized streamflow (Meehan and Platts 1978).

BLM policy requires compliance with BLM Manual 6740 Wetland-Riparian Area Protection and Management. This manual states, "Important fisheries (which include important, threatened, endangered, or sensitive aquatic or riparian species) will receive special management consideration...... Management will be adjusted to provide for recovery of riparian habitat to a Class II (Good) or greater level along shorelines or streambanks (1/2 mile or more segments) rated in Class III (Fair) or IV (Poor)." The scope of the term "important fishery" was intended to include sport fisheries, especially if they provide or have the potential to provide a major recreational resource in the area. (Paul Cuplin, BLM Fisheries Biologist and Co-author of the 6740 Manual).

The impacts of the proposed action and alternatives to the EIS area's aquatic habitat are analyzed in terms of expected changes in habitat condition over the long term (Table 3-11 and Appendix Q). The level at which the change becomes significant is fixed by the BLM Manual for Wetland-Riparian Area Protection and Management (6740). This manual requires that public stream habitat condition be maintained at good or excellent rating. It is considered a significant and adverse impact if the habitat condition rating of any fishable water is caused to drop to or is maintained at fair or poor. It is considered a significant and beneficial impact if the habitat condition rating of any fishable water is improved to or maintained at good or excellent.

STREAMS AND RESERVOIRS

Streams are analyzed by three categories: protectable, protectable through agreements with private landowners, and nonprotectable. Streams which are protectable only through agreements with landowners and nonprotectable streams are impacted primarily by the management practices of the landowners. For purposes of analysis, it is assumed that current management practices will continue and that stream habitat condition will remain the same (Appendix Q). This proposal would primarily impact only the remaining 9 streams which are classified as protectable.

A total of seven streams would remain in good or excellent condition. These streams are either largely inaccessible to cattle or were not grazed. One of these streams is protectable by BLM. Seventeen streams would remain in fair or poor condition. There are no survey data for an additional two streams which are also estimated by BLM to be in fair or poor condition and would remain so. Maintaining these nineteen streams in fair or poor condition is considered an adverse impact. Ten of these streams require private landowner cooperation to protect, i.e., are not protectable (see Glossary) by BLM (see Table 3-11 and Appendix Q). The remaining nine of these nineteen streams are protectable by BLM. None of the lakes or reservoirs would be impacted by the proposed action.

FISH POPULATIONS

The proposed action would have no effect on warm water fishes or lake and reservoir fish populations (Table 2-9). The proposed grazing systems would have no beneficial effect on cold water fish populations in the resource area streams. There would be a beneficial impact if the streams were fenced to exclude livestock. Seven separate studies reported an average 350 percent increase in trout populations in various streams by simply eliminating grazing from those streams (Kennedy 1977, Duff 1977, Platts 1979). It is also expected that there would be a corresponding increase in angler use.

There would be no impact on the Soldier Meadows Desert dace. The threatened Lahontan cutthroat trout would be adversely affected by continued grazing along the unfenced portions of Mahogany Creek and Summer Camp Creek. Summer Camp Creek is classified as being protectable only with cooperation of the private landowner along the stream since approximately 50 percent of the stream is privately owned. Since BLM cannot assume to control what happens on private land, an attempt to limit grazing on the scattered publicly owned portions of Summer Camp Creek would have limited value.

CONCLUSION

The proposed action would have little beneficial effect on the deteriorated stream habitat in the EIS area. It would maintain one protectable stream in good or excellent condition and nine streams in fair or poor condition. The overall impact would be significant and adverse.

UNAVOIDABLE ADVERSE IMPACTS

Under this alternative 90 percent of the protectable streams would be maintained in fair or poor

TABLE 3-11

STREAM HABITAT CONDITION AND PROTECTABILITY SUMMARY TABLE

Stream Condition		Proposed Action Streams/ Stream Miles	No Action Streams/ Stream Miles	No Grazing Streams/ Stream Miles	Maximizing Livestock Streams/ Stream Miles	Maximizing Wild Horses & Burros Streams/ Stream Miles
Fair	P b/	9/70	9/70	0/0	9/70	0/54
to	PW c/	8/50	8/50	8/50	8/50	8/50
Poor	MP d/	0/0	0/0	0/0	0/0	0/0
	Sub Total	17/120	17/120	8/50	17/120	16/104
Good	P b/	1/12	1/12	10/82	1/12	2/28
to	PW c/	6/45	6/45	6/45	6/45	6/45
Excellent	NP d/	0/0	0/0	0/0	0/0	0/0
	Sub Total	7/57	7/57	16/127	7/57	8/73
No	P b/	0/0	0/0	0/0	0/0	0/0
Data	PW c/	0/0	0/0	0/0	0/0	0/0
	NP d/	2/26 a/	2/26	2/26	2/26	2/26
	Sub Total	2/26	2/26	2/26	2/26	2/26
Total		26/203	26/203	26/203	26/203	26/203

a/ Does not include stream mileage for the Humboldt River.
b/ Protectable by BLM (see Appendix Q).
c/ Protectable through agreements with private landowners (see Appendix Q).
d/ Not protectable (see Appendix Q).

condition. This would be an unavoidable adverse impact.

WILD HORSES AND BURROS

Under this alternative wild horse and burro use would initially decrease from the existing 66,012 AUMs (5,372 horses and 129 burros) to 13,415 AUMs (1,068 horses and 50 burros), and eventually over the long term (2024) would increase to 20,014 AUMs (1,593 horses and 75 burros). This compares with an estimated 3,100 horses and 43 burros in the area on December 15, 1971 when the Wild and Free Roaming Horse and Burro Act was passed (see Table 3-12).

The removal of the excess wild horses and burros to optimum numbers would require that the animals be captured in the most humane and cost effective way. Water trapping and winged corrals are the methods presently used.

In a gathering, a number of horses and burros may die during and after the gathering operation. Based upon the discussion in Chapter 2 it, is assumed that a number of horses, slightly under eight percent, would die as a result of the total gathering and adoption operations. Of that eight percent, one percent would die as a direct result of capture. The overall loss of eight percent of the horses gathered would be a significant adverse impact.

With the exception of this mortality, the proposed removal of 4,304 horses and 79 burros would have a significantly beneficial impact on the individual animals through the Bureau's adopt-a-horse program. They would experience an increase in health resulting from a steady and adequate supply of food, and the increased health would result in an estimated increase in survival over the long term. However, the animals would no longer enjoy their present lifestyle as wild and free-roaming animals.

The complete removal of wild horses from 19 areas and burros from 6 areas would have a significantly adverse impact on the individual herds due to the total removal of those populations. The entire resource area's wild horse population would be concentrated in three areas and the wild burro population in one area.

There are presently four Bureau of Land Management administered areas statewide that have been proposed for the removal of wild horses and/or burros in published documents. These areas and proposed reductions are described in the Caliente, Tonopah, Paradise-Denio, and Sonoma-Gerlach Environmental Impact Statements. Table 3-13 shows the existing numbers, proposed removals, and the percent reductions of the wild horses and burros statewide.

In the Sonoma-Gerlach Resource Area there would be an 80 percent overall reduction in wild horses and burros. In the Winnemucca District this proposed removal coupled with removals from the Paradise-Denio Resource Area would amount to an 81 percent reduction of the District's population. When Winnemucca's reductions are combined with those in the Tonopah and Caliente Environmental Impact Statement Areas there would be a cumulative 23 to 24 percent reduction statewide.

Present data do not indicate this, but there may be certain traits, such as color, occurring in the present wild horse and burro populations that may be lost when animals are removed. In the worst case, these traits would be irretrievably lost.

Wild horses are presently found in 22 areas and burros in 7 of these areas. Under the proposed action, the horses would be removed from all but three areas -- Buffalo Hills, Button Point, and Lava Beds -- and burros would be removed from all areas except the Lava Beds (refer to Wild Horse and Burro Use Area Map). All available vegetation within these three management areas would be allocated to big game, wild horses, and burros.

The reduction of wild horses and burros in the Buffalo Hills, Button Point and Lava Beds areas to estimated carrying capacity would be a beneficial impact on the health of the horses and burros remaining in these areas. If horse and burro numbers were reduced to estimated carrying capacity, actual use of the vegetation would approach proper use (see Glossary) and therefore the condition and vigor of the vegetation should increase (refer to Chapter 3 Vegetation). As the condition and the amount of vegetation increases, the health, condition, and survival of the horses and burros using the vegetation should also increase.

Over the long term (35 years) the amount of vegetation available to wild horses and burros on the Buffalo Hills, Button Point, and Lava Beds Herd Management Areas would increase from 13,415 AUMs (1,118 animals) to 20,014 AUMs (1,668 animals) due to proper use of the vegetation as mentioned above. As the amount of vegetation increased, the annual rate of increase of the horses and burros would increase. There would be a 550-horse increase in maximum numbers allowed on the three herd management areas.

The viability of the individual horse herds could be questioned. Data from the roundups in the Winnemucca District have shown that the present capture techniques are biased since greater numbers of females are captured. Without corrective measures this could adversely affect the viability of the

TABLE 3-12

NUMBERS OF WILD HORSES AND BURROS AND THEIR RESPECTIVE USE AREAS FROM PASSAGE OF THE WILD HORSE AND BURRO ACT THROUGH THE LONG TERM SONOMA-GERLACH RESOURCE AREA

Year	Number of Horses	Number of Use Areas	Number of Burros	Number of Use Areas
1971	3,100	15	43	1
1979	5,372	22	129	7
1982	1,068	3	50	1
2024	1,593	3	75	1

Source: U.S. Department of Interior, Bureau of Land Management, Winnemucca District, Sonoma-Gerlach Resource Area, Sonoma, Blue Wing, and Buffalo Hills Unit Resource Analyses 1979.

TABLE 3-13

CUMULATIVE WILD HORSE AND BURRO REMOVALS STATEWIDE AND SONOMA-GERLACH RESOURCE AREA

Area	Existing Numbers a/	Proposed Number To Be Removed a/	Percent Reduction
Caliente	1,052	556	53
Tonopah	2,268	1,647	73
Paradise-Denio	2,495	2,109	85
Sonoma-Gerlach	5,501	4,383	80
Winnemucca District	7,996	6,492	81
State of Nevada	36,542-37,871 b/	8,695 b/	23-24

a/ Wild horse and burro numbers have been combined. These numbers are estimates from the Management Framework Plans of the respective areas and are not final decisions.

b/ Methods for determining the statewide population are outlined in Appendix K, Section 2.

Source: U.S. Department of the Interior, Bureau of Land Management, Caliente, Tonopah and Paradise-Denio Environmental Impact Statements, Winnemucca District, Sonoma-Gerlach Resource Area, Management Framework Plan 1980.

herd over a period of time. In the worst case, roundups could reduce the female population to a point that mortality exceeded fecundity thereby eliminating an entire population. However, simultaneously with implementation of the proposed action intensive management would be planned in combination with reduction of wild horses and burros to estimated carrying capacity in the three herd management areas. This management would include control of capture operations to maintain optimum sex ratios, further study on mortality and natality, and collaring of horses and burros to determine seasonal use and behavioral patterns. This would have a beneficial impact to the viability of the herds in the herd management areas, due to the increased amount of high quality habitat and the increased opportunity to intensively manage the three herds.

CONCLUSION

The initial reduction from 5,501 horses and burros to 1,118 horses and burros would have a significantly adverse impact since this is greater than a 50 percent reduction, and horses would be completely removed from 19 areas and burros would be removed from 6 areas in the resource area on a permanent basis. Reductions of wild horses and burros to estimated carrying capacity would result in a significant adverse impact to the removed animals due to death losses associated with present capture techniques, but would be a significant beneficial impact to the health and condition of the remaining animals.

VISUAL RESOURCES

Range improvements recommended in the proposed action could cause significantly adverse impacts, depending on what the improvements were and where they were located. The degree of impact cannot be determined until an on-site investigation is made for each range improvement. A contrast rating (found in BLM Manual 8431) would be used to determine whether or not the impact is significant. Appendix L, Section 2 gives an indication of the most restrictive visual class area in which a project could be placed yet not create a significant impact. It must be stressed that this table is an approximation since every location has so many variables.

A mile of fence is proposed for a Class I area (Mahogany Creek Natural Area of the Soldier Meadow Allotment) and 24 miles are proposed for various Class II areas. Fences normally do not exceed the contrast standards for these classes. However, some actions can cause a lowering of the visual class. Two examples that would cause sharp changes in color and texture are: (1) a maintenance road along a fenceline and (2) a heavily grazed pasture adjacent to one that is lightly grazed. The visual effects of fences could be modified by keeping them away from ridgelines, where they are conspicuous.

Water pipelines, wells, water troughs, and cattleguards would normally not cause scenic disturbances if procedures were followed (the Visual Contrast Rating Process -- BLM Manual 8431) to reduce any visual clash with the landscape. Such procedures should exclude access road construction and painting range improvements with colors that would clash with the background.

Seedings could have a very disruptive effect on the landscape. If the boundaries of the seedings were straight and sharp angled, the visual class would be poor. This could be prevented by following the contour of the land where possible and by feathering the area's edge so there are no straight lines. On the average, the seedings listed in Table 3-14 would probably exceed the VRM contrast rating. On those allotments where seedings are proposed in Class II or III areas, the visual impacts would be significantly adverse. Seedings in Class IV areas would not create significant adverse impacts.

CONCLUSION

While all of the proposed improvements could have adverse impacts on the visual resources, only seedings (15,490 acres in a Class II area and 18,004 acres in a Class III area) would have the potential to exceed the visual resource contrast ratings.

CULTURAL RESOURCES

LIVESTOCK AND WILD HORSES

Under the proposed action, adverse impacts to cultural resource sites due to livestock trampling and rubbing would increase on a cumulative basis (see Appendix M, Section 2). However, increased distribution of grazing animals brought about by water development would lessen the intensity of these adverse impacts to sites in the vicinity of current permanent water sources. Trampling damage due to wild horses would decrease in most of the Sonoma-Gerlach Resource Area with some increase in three herd management areas. Increased vegetation cover resulting from grazing management would reduce adverse impacts to cultural resource sites resulting from erosion.

TABLE 3-14

VISUAL RESOURCE MANAGEMENT CLASSES
FOR PROPOSED RANGE IMPROVEMENTS
(BY ALLOTMENT)

Allotment	Range Improvements b/	VRM Classes II	VRM Classes III c/
Blue Wing	Sagebrush Control Then Seed	1900 d/	1600
Buffalo Hills	Sagebrush Control Then Seed	1500	e/1110
	Seed and Reseed	2600	e/ 480
	Seed and Reseed		
Coal Canyon-Poker	Sagebrush Control Then Seed		3800
Diamond S	Sagebrush Control Then Seed	560 e/	320 e/
Dolly Hayden	Sagebrush Control Then Seed	320	1600
	Reseed		2100
Harmony	Sagebrush Control Then Seed	320	2700
Melody	Reseed		3500
Prince Royal	Sagebrush Control Then Seed	2400	300
Rock Creek	Sagebrush Control Then Seed		1284
Rye Patch	Sagebrush Control Then Seed		1120
Soldier Meadow	Sagebrush Control Then Seed	5600	
Star Peak	Sagebrush Control Then Seed	2400	
Thomas Creek	Sagebrush Control Then Seed		300
White Horse	Sagebrush Control Then Seed	300	960

a/ See Appendix L for definitions of VRM Classes.

b/ Range improvements are for the Proposed Action, the Maximize Livestock Alternative, and the Maximize Wild Horses and Burros Alternative unless otherwise noted.

c/ The remaineder of the proposed seedings are located in Class IV areas.

d/ Figures listed in acres.

That portion of the Applegate-Lassen Trail (a National Register property) on the playa of the Black Rock Desert would receive little or no impact from the proposed action due to the complete lack of water and vegetation. However, under both short and long-term periods, increased grazing would result north of the Black Rock Desert, thus increasing the impacts of trampling on the northern course of the Applegate-Lassen Trail. The physical impacts of cattle on the trail may include continued or increased erosion due to cattle trailing along the remnants of the trail, but no documentation has been done to actually substantiate this.

From a historic point of view it could be argued that cattle and an overgrazed terrain would be typical of the conditions of the trail as many of the emmigrants would have viewed it. This point of view is consistent with the integrity of setting which qualifies the trail as a National Register property.

No other cultural resource sites listed on the National Register would be adversely impacted by the proposed action. In summary, adverse impacts to cultural resources from livestock trampling and rubbing would continue on a cumulative basis, but improvement of the range may help ease the adverse impacts resulting from erosion due to concentrated trampling.

RANGE DEVELOPMENTS

Although many of the potential adverse impacts to cultural resources from range developments would be avoided through adherence to the Standard Operating Procedures outlined in Chapter 1, some indirect (adverse) impacts (see Appendix M, Section 2), as well as adverse impacts to sites not discovered during Class III inventories, would be likely to occur. Some adverse impacts also would be expected to occur as the result of management decisions to salvage or otherwise mitigate adverse impacts to cultural resource sites.

Due to the absence of any extensive random sampling of the cultural resources in the EIS area and the minimal inventory data existing for this area, it is not possible to make quantified predictive statements concerning expected occurrence rates of archeological sites with any useful degree of accuracy. Archeologically sensitivity areas already identified (see Chapter 2 and Appendix M, Section 2) will be used to estimate cultural resource areas which might be impacted by the proposed range developments. The percentage of each range project lying within archeologically sensitive areas is also listed on Table 3-15. This information has been included in order to give a general idea of the potential magnitude of these impacts on a worst case basis. For a more thorough description of potential impacts to cultural resources, refer to Appendix M, Section 2.

The effects of most impacts would be cumulative. Consequently, although the occurrence of an impact may decrease, unless totally eliminated, the damage to cultural resource sites would continue to increase. No cultural resource sites listed on the *National Register of Historic Places* would be impacted by these range developments. In summary, most potential adverse impacts from range developments could be mitigated by adherence to the Standard Operating Procedures.

However, salvage of a cultural resource site also constitutes a significant adverse impact. Once excavated, a site is effectively destroyed and removed from future research considerations which may utilize new techniques. A data gap in the history of an area could result as a consequence. Consequently, Table 3-15 represents the 97 known sites which would under worse case analysis be impacted by construction of the proposed livestock support facilities. These are listed by BLM cultural resource site management categories.

RECREATION

Recreation activities in the resource area are generally light and scattered. The Black Rock Desert and the mountain ranges that adjoin it receive the most recreation use, but since it is such an extensive area, large numbers can use it without making the area seem crowded. Most activities such as off-road vehicle use, rock hounding, hiking, backpacking, horseback riding, photography, and the searching and observation of relics, cultural and historical resources, wildlife and plant life would not be affected by the proposed action.

Since the deer population is expected to remain about the same (they would be managed for reasonable numbers), hunter days would also remain approximately the same. Big game tags are allocated according to available numbers of deer. This would have a significant adverse impact since the demand greatly exceeds the resource. In 1979, approximately 25 percent of the people who applied for deer tags did not receive one. In 1980 between 30 and 40 thousand people applied for 24,000 available tags. According to the Nevada State Comprehensive Outdoor Recreation Plan (NSCORP--1979), the average increase for recreation activity is 10 percent every five years. This demand would not be met.

The antelope population can be expected to nearly double but since the present population is so low (present population 516) it is expected that the

TABLE 3-15
IMPACTS OF PROPOSED ACTION RANGE PROJECTS ON KNOWN CULTURAL RESOURCE SITES AND ARCHEOLOGICALLY SENSITIVE AREAS SONOMA-GERLACH RESOURCE AREA

	Known Cultural Resource Sites						Archeologically Sensitive Areas		
Range Project Type	Open Aboriginal	Isolated Finds and Small Sites	Historic	Historic Trails	Rock Shelters	Antiquity Observations	Percent of Project in Archeologically Sensitive Areas	Miles, Acres or Numbers of Sites in Archeologically Sensitive Areas	Total Project Miles, Acres or Number
Fences	9	5	2	6	3	1	5.55%	22.18 miles	399.0 miles
Cattleguards	0	0	1	3	0	0	22.22%	4	18 ea.
Spring Developments	0	0	0	0	0	0	100.00%	8	8 ea.
Pipelines	0	0	0	0	0	0	9.67%	1.5 miles	15.5 miles
Water Troughs	0	0	0	0	0	0	0	0	102 ea.
Wells and Windmills	0	1	0	1	0	0	0	0	42 ea.
Sagebrush Control and Seed	39	12	6	1	2	3	7.4%	16,970 acres	230,112 acres
Seed & Reseed	1	1	0	0	0	0	4.1%	600 acres	14,752 acres
TOTALS	49	19	9	11	5	4			

Source: U.S. Department of the Interior, Bureau of Land Management, Winnemucca District, Sonoma-Gerlach Unit Resource Analyses, 1979, and Sonoma-Gerlach Management Framework Plan, 1980.

demand for antelope licenses would greatly exceed the number of animals available. This is especially true since less than half of the animals present are available for hunting. This is also true for deer.

The availability of sage grouse for upland game hunting is expected to rise by 20 percent. A corresponding increase of 215 hunter days would also occur. This would be actual usage. However, according to the NSCORP, hunting demand is expected to increase at a rate of 10 percent every five years. Using a present figure of approximately 700 hunter days a year, the number of days that would be needed to fulfill the demand would be 850 and 1,650 in 1991 and 2024 respectively. Therefore, in the short term, the proposed action would not affect sage grouse hunting since the supply would be greater than the demand. However, in the long term this type of hunting would be affected since the demand (1,650 hunter days) would be far greater than what would be available (915 hunter days). This would be a significantly adverse impact.

Although no actual use figures are available, it is estimated that 400 visitor days a year are spent in the resource area viewing wild horses and burros. This involves actually seeking the horses out, not just a happenstance meeting along a road. Using 14 percent every five years as the maximum increase for any recreation activity, it is predicted that in the year 2024, 1,300 people would actively view wild horses (NSCORP). The Bureau estimates that this number would be approximately the same under this action except for one area, the Diamond S Allotment. Since the threshold level would be met, there would be no impact except for this area.

Under the proposed action, three herd management areas would be established. The two located at the Lava Beds and in the Buffalo Hills would not significantly impact or be impacted by the recreation activity of viewing wild horses. The Diamond S Allotment (also known as Button Point) adjoins Interstate Highway 80. In 1979, an average of 3,900 vehicles a day drove past the proposed HMA (1979 Annual Traffic Report, Nevada Department of Transportation). If proper facilities to receive a percentage of these travelers are established, this would have a highly significant beneficial impact on recreation. Wild horses are closely entwined with the mystique of the Old West and many visitors enjoy seeing them. The figures listed above for projected visitor use would not be applicable here.

Of the 26 streams affected by the proposed action, 19 are in a fair or poor condition (see Aquatic Habitat Section). This would have an adverse detrimental effect on recreation since fishing is a popular sport and the demand for fishable streams increases every year at a rate of 13 to 14 percent, every five years. However, seven streams would remain in good or excellent condition.

CONCLUSION

Viewing of wild horses and burros would not be impacted except at the Diamond S Allotment. Big game hunting would be significantly adversely impacted due to inability to meet the demand, as would stream fishing. Sage grouse hunting would not be affected in the short term, but would be significantly adversely impacted in the long term.

WILDERNESS POTENTIAL

Range improvements recommended in the proposed action could cause significantly adverse effects depending on what the improvements are and where they are located. See Chapter 1, Range Facilities and Land Treatments - Proposed Action Map, Chapter 2, Wilderness Inventory Table, and Proposed Wilderness Study Area Map.

Within a Wilderness Study Area (WSA), existing grazing uses may continue in the same manner and degree in which they were conducted on October 21, 1976, according to the Interim Management Policy and Procedures Guideline (IMP). However, these uses must cause no unnecessary or undue degradation of the lands or their resources, and they must include environmental protection.

New range improvements needed to support and facilitate grazing use and management may be installed and maintained if the activities and structures meet the nonimpairment criteria described in the Interim Management Policy and Procedures Guidelines. Some range improvements (such as fences, well or spring developments and small earthen reservoirs) would be allowed in WSAs, but only under careful controls that would prevent changes in the area's wilderness suitability. In some cases, these improvements would not be allowed if a determination were made that wilderness suitability would be impaired by their presence.

In order to best qualify and analyze the effects of the proposed range projects upon a WSA, a case-by-case analysis would be performed to determine whether or not an area's wilderness suitability would be impaired by the activity associated with each project. Refer to Appendix R, Section 1 for a listing of range improvement projects that may or may not be permitted in WSAs and Section 2 for a breakdown of the proposed range projects for each WSA.

As recommended in the proposed action, vegetation manipulations of seeding and sagebrush control would create visual impacts upon the proposed wilderness study areas (Table 3-16). Line, color, form and texture changes caused by seedings and sagebrush control would create maximum contrasts in relation to the surrounding landscape of the areas. Such contrasts would be substantially noticeable, distracting from the naturalness of the areas and indicating a permanent presence of man. Both types of land treatments would be so apparent that the proposed WSAs wilderness suitability would be impaired.

SUMMARY

Land treatments would significantly adversely impact 7 of the 11 proposed WSAs under the proposed action (Table 3-16). The six WSAs are located within seven grazing allotments: Blue Wing, Buffalo Hills, Goldbanks, Leadville, Rodeo Creek, Soldier Meadows, and South Buffalo.

MITIGATING MEASURES

Compliance with the Interim Management Policy and Guidelines Regulations for Lands Under Wilderness Review prevents the proposed land treatments from occurring within the potential Wilderness Study Areas. Such action prevents the impairment of a WSAs wilderness suitability.

CONCLUSION

As no land treatments would be permitted, no adverse impacts would occur to the WSAs to impair their wilderness suitability.

ECONOMICS

This section analyzes the economic impacts of the proposed action. The analysis will discuss direct impacts on ranch output, income, employment and wealth; construction income and employment; government income and employment; wildlife-related income and employment; and local government revenues. Indirect impacts affecting the EIS area economy as a whole will also be discussed.

The economics discussion will analyze impacts in terms of three time periods: those that would occur after full implementation of the proposed AUM adjustments (1985), those that would occur in the short term (1991), and those that would occur by the long term (2024). The long-term ranch output, income and employment analysis represents a worst case type of analysis due to the shortage of long-term information. The lack of information stems from the inability to predict the adjustments ranchers would make to their operations in response to the proposed action. In the long term, ranch productivity would be determined by the resources of land and capital upon which a rancher is able to draw and upon the individual ranchers managerial skill (see Appendix S for the assumptions made for the long-term analysis).

IMPACTS TO RANCH OUTPUT

The proposed action would impact EIS area permittees by introducing three changes in existing livestock grazing patterns: (1) adjustments in the number of BLM AUMs available, (2) alteration of the periods-of-use on BLM administered range by eliminating spring grazing while permitting winter grazing, (3) preparaton or revision of allotment management plans (AMPs) for all but four of the allotments in the resource area. The economic discussion will focus on the adjustment in AUMs and alteration in period-of-use because AMPs would be prepared or revised during the period before 1991 and their contents are currently unknown.

The first change, the reduction in AUMs, would result in a decline in BLM AUMs from three to five year average licensed use for 32 of 48 EIS area permittees in the first time period (initial implementation). Permitted use would be reduced by 25.4 percent from active preference and 2.4 percent from three to five year average licensed use for the resource area as a whole. Active preference is 152,447 AUMs while licensed use has averaged 116,551 AUMs for the past three years. The proposal is to initially allocate 113,705 AUMs to livestock. The average percent adjustment in BLM AUMs from three to five year average licensed use for each ranch class is indicated in Table 3-17.

The second change, the change in period of use would eliminate grazing on public range during the spring but permit grazing during the winter. As AMPs are prepared or revised for each allotment the periods-of-use indicated in Table 1-1 may change. However, because the periods-of-use which would be permitted in the AMPs are currently unknown, this analysis will be based on the assumption that the periods proposed in Table 1-1 would be the allowed periods-of-use. The average alterations in periods-of use for each ranch type are indicated in Table 3-17.

Although initial implementation of the proposed action would result in an increase in BLM AUMs for some ranch types, herd size, gross revenue and net income would decline for all ranch types (see Table 3-18). A reduction in AUMs is responsible for

TABLE 3-16
ADVERSE IMPACTS OF ALTERNATIVE LAND TREATMENTS ON WILDNERNESS STUDY AREAS
SONOMA-GERLACH RESOURCE AREA

Improvements-Alternatives	East Fork High Rock Canyon Unit 006A		High Rock Lake Unit 007		Little High Rock Canyon Unit 008		Poodle Mountain Unit 012		Fox Mountain Range Unit 014		Calico Mountains Unit 019		Selenite Mountains Unit 200		Mt. Limbo Unit 201		Mt. Tobin Unit 406		North Black Rock Range Unit 622		Pahute Peak Unit 621	
	#	Acres Affected	#	Acres Affected	#	Acres Affected	#	Acres Affected	#	Acres Affected	#	Acres Affected	#	Acres Affected	#	Acres Affected	#	Acres Affected	#	Acres Affected	#	Acres Affected
Proposed Action																						
Sagebrush Control/ Then Seed		0	1	4,940	1	1,200		0	1	122		0	1	2,231	1	2,833	2	1,180	1	6,000		0
No Action		0		0		0		0		0		0		0		0		0		0		0
No Livestock Grazing		0		0		0		0		0		0		0		0		0		0		0
Maximizing Livestock																						
Sagebrush Control	1	3,559		0		0		0	1	0		0		0		0		0		0		
Sagebrush Control/ Then Seed		0	1	4,940	1	1,200	1	10,859	1	122		0	1	2,231	1	2,833	1	1,180	1	6,000		0
Seed and or Reseed		0		0		0	1	1,751		0		0	1	0		0		0		0		0
Livestock Reduction/ Maximizing Wild Horses and Burros																						
Sagebrush Control/ Then Seed		0	1	4,940	1	1,200		0	1	122		0	1	2,231	1	2,833	1	1,180	1	6,000		0

Source: U. S. Department of the Interior, Bureau of Land Management, Winnemucca District Wilderness Files, 1980, Sonoma-Gerlach Management Framework Plan, 1979.

Refer to: EIS Wilderness Map, Chapter 2, and Land Treatments Maps, Chapter 2, for locations.

TABLE 3-17

AVERAGE PERCENT ADJUSTMENT IN BLM AUMs AND IN PERIOD-OF-USE FOR SONOMA-GERLACH RANCH MODELS FROM INITIAL IMPLEMENTATION OF THE PROPOSED ACTION

Ranch Class	3-5 Year Average Licensed Use	Percent Adjustment a/	Existing Period-of-Use	Proposed Period-of-Use
Small	14,125	- 20.1	04/01-09/30	06/01-12/31
Medium Summer	20,211	- 14.0	04/01-11/31	06/01-02/28
Medium Winter	11,734	- 9.5	11/01-03/31	06/01-02/28
Large	59,372	+ 6.2	Yearround	06/01-02/28
Sheep	9,154	+ 25.1	12/01-03/31	06/01-02/28

a/ The changes indicated in this column represent an average for all ranches falling within the classification. The percent adjustment to BLM AUMs would vary for individual ranches.

Source: U.S. Department of the Interior, Bureau of Land Management, Winnemucca District Office files 1980.

this decline in some instances, while the alteration of period-of-use is responsible in the others.

The small ranch class would be impacted by both changes. The elimination of livestock grazing on BLM administered range in April and May would leave them with the options to either substitute private range or hay for the lost BLM AUMs. However, the reduction in BLM AUMs during the period from July to September (a period when BLM AUMs would be available but at a reduced level from existing conditions) would place the greatest constraint on livestock production by these ranches. As illustrated in Table 3- 18, the impact of the initial implementation of the proposed action on this ranch class would be a reduction in herd size of 22 cows, a $5,600 annual decrease in gross revenue and a decline in net ranch income of $2,800 per year (24 percent of existing income per ranch in the small ranch class). This impact would be significant and adverse to proprietors of ranches characterized by this ranch type.

The medium summer ranch class would be adversely impacted by both the period-of-use adjustment and a 14 percent reduction in BLM AUMs. The loss of April and May grazing privileges would cause the typical ranch in the class to rely on a limited amount of private range supplemented with purchased hay. The reduction in AUMs would also require hay supplement. Even with the purchase of approximately 130 tons of hay (indicated by the computer model developed by the ESCS for the ranch economic analysis), initial implementation of the proposed action would cause these ranches to reduce herd size by 10 percent, resulting in a reduction in gross revenue and consequently a decline in income. Net ranch income would decline by approximately $15,000 per year, 46 percent of current income. This impact would be significant and adverse to the proprietors of these ranches.

The change in period-of-use would be a greater impact on the medium winter ranch type than the reduction in AUMs. The computer model indicates that the loss of BLM AUMs in March would cause this ranch type to substitute purchased hay in order to support the cow herd. While herd size and consequently gross revenue would not change, the additional cost of purchasing hay would reduce net ranch income by approximately $10,000 per year (26 percent below existing income). Under the proposed action's initial implementation this would represent a significant adverse impact to the proprietors of ranches within this class.

While the large ranch class would receive an overall increase in BLM AUMs in the initial implementation of the proposed action, it would lose BLM AUMs during March, April and May because of the period-of-use proposals. This ranch type has a greater dependency on BLM AUMs (approximately 70 percent) for its annual forage requirements than the other ranch types, consequently its private forage resources are much more limited than those of the other ranch types. Elimination of spring grazing on public land would force these ranches to support their livestock on private forage resources. Because these resources are so limited the herd size they could support would be severely restricted. Table 3-18 indicates that herd size would be reduced by 54 percent even with the purchase of hay used to supplement other resources. The reduction in herd size would reduce gross revenue and net income. Initial implementation of the proposed action would result in a negative net income for large ranches of approximately $9,000. It would be difficult to foresee how these ranches could remain in the livestock business if ranching was the sole or major source of income for the proprietors. Several of the proprietors, however (and particularly those with ranches based within the EIS area), have substantial income derived from nonranching sources. The impact to the net income of the typical ranch within this class (108 percent reduction) would represent a significant adverse impact.

The typical ranch represented by the sheep model (developed by the ESCS) would receive a substantial increase in BLM AUMs (25 percent) from three to five year average licensed use but not be allowed on the public range during March. According to the computer results the typical sheep ranch would offset the loss of public range in March by purchasing hay. The additional hay expense would cause a reduction in net income of $3,700 per year (4.6 percent). The typical sheep ranch would be unable to take advantage of the additional BLM AUMs available from the proposed action because its other resources are already fully utilized under existing conditions. Herd size, therefore, would be constrained by the quantity of private feed (particularly private hayland) available. Due to this constraint, only a fixed number of BLM AUMs could be used irregardless of the number available. Because the annual reduction in net revenue would not exceed the threshold defined in Determination of Significant Impacts section, Chapter 3, this impact would not be considered significant.

In general, ranches in the EIS area would be faced with two options to respond to the recommendations of the proposed action in its initial implementation. These would be reduction in herd size and purchase of hay to offset the loss of BLM AUMs. The results of computer simulation indicate that the optimal mix of these options includes the purchase of approximately 8,500 tons of hay, with a concurrent reduction in herd size of approximately 7,000 cows (35 percent) from the current cow herd

TABLE 3-18

COMPARISON OF ALTERNATIVE WITH EXISTING CONDITIONS
SONOMA-GERLACH RESOURCE AREA

	Change in Herd Size		Change in Gross Revenue		Change in Net Income		
Proposed Action	Per Ranch	Total	Per Ranch	Total	Per Ranch	Total	Percent Change
Initial Implementation							
Small	- 22	- 418	- 5,584	- 106,096	- 2,763	- 52,497	- 24.2
Medium Summer	- 45	- 360	- 11,098	- 88,784	- 14,789	- 118,312	- 42.6
Medium Winter	0	0	0	0	- 9,894	- 49,470	- 26.4
Large	-772	-6,176	- 143,860	-1,150,880	-110,084	- 880,672	-108.8
Subtotal		-6,954		-1,345,760		-1,100,951	
Sheep	0	0	0	0	- 3,671	- 25,697	- 4.6
Total		-6,954		-1,345,760		-1,126,648	- 54.9
Short Term							
Small	32	608	8,479	161,101	723	13,737	6.4
Medium Summer	11	88	1,966	15,728	- 11,667	- 93,336	- 33.6
Medium Winter	0	0	0	0	- 9,057	- 45,285	- 24.2
Large	-772	-6,176	- 143,860	-1,150,880	-110,084	- 880,672	-108.8
Subtotal		-5,480		- 974,051		-1,005,536	
Sheep	0	0	0	0	- 3,671	- 25,697	- 4.6
Total		-5,480	-	- 974,051		-1,031,253	- 30.3
Long Term							
Small	56	1,064	17,908	340,252	5,286	100,434	46.8
Medium Summer	100	800	35,965	287,720	6,322	50,576	18.2
Medium Winter	0	0	10,366	51,830	1,309	6,545	3.5
Large a/	202	1,619	63,253	506,014	20,237	161,899	19.9
Subtotal		3,483		1,185,826		319,454	
Sheep	0	0	18,792	131,544	15,121	105,847	18.8
Total		3,483		1,317,370		425,301	20.7

a/ Based on comparable net returns, see narrative for discussion.

Source: Computer runs, based on ESCS ranch budget information and BLM proposals for this alternative 1980.

maintained by EIS area permittees. This reduction is dominated by the large ranch class which would be responsible for 89 percent (6,200 cows) of the decline.

The cumulative impact of initial implementation of the proposed action to the EIS area ranching sector would include a reduction in gross revenue of $1.3 million per year and a decline in net ranch income of $1.1 million per year, 11.1 percent of income in the EIS area's agricultural sector for 1978. These changes would result in the loss of 32 Full Time Equivalents (FTEs) in employment (a full time equivalent is a 2,000 hour work year), which represents 5.0 percent of 1978 employment in the agricultural sector. The reductions would represent significant adverse impacts to the EIS area's ranching sector.

In the short term the Vegetation Section, Chapter 3 Proposed Action predicts that AUMs available for livestock would increase by 65 percent over three to five year average licensed use. Although AMPs would be prepared or revised by 1991, the turnout and turnoff dates which would be permitted in them are unknown, consequently the periods-of-use recommended in Table 1-1 are those which were used for the short term analysis of the impacts of the proposed action. In the short-term the effect of the adjustment to the permitted period-of-use would dominate that of the change in AUMs. While the increase in AUMs would allow two of the ranch classes (small and medium summer) to increase their herd size above the existing condition, net ranch income would remain below the 1978 level for all ranch classes because the loss of spring grazing would require ranchers to offset the loss of BLM AUMs with alternative, more expensive sources of forage which would result in an increase in cash costs. By 1991 ranchers would have had a longer period to adjust their operations in response to the period-of-use changes. While the computer models continue to allow only a reduction in herd size and/or purchase of supplemental hay, other options available to individual ranchers to augment their private forage resources or reduce their forage requirements during the spring include:

1. Increased inputs of land - ranchers with the opportunity to profitably purchase or lease additional pasture or range would be able to supplement their feed supply. This option would be limited by the supply of land. Approximately 75 percent of the EIS area is in public ownership. A large portion of the private land is owned by the Southern Pacific Company which leases its land for grazing, but is managed by the BLM through exchange of use agreements. The remaining private land may be more valuable for uses other than grazing.

2. Increased inputs of capital - more intensive cultivation of existing hayland or irrigated pasture or the development of additional private land for these purposes could increase the forage resources of private lands owned by EIS area permittees by approximately 20 percent (personal communication Dick Mellis, SCS representative for Pershing County 1980). This option is limited by the amount and cost of land, capital, and water accessible to an individual rancher.

3. Reduced dependence on spring vegetation in the annual feeding cycle - a shift from the dominant cow-calf type of operation to a yearling or stocker operation - might offset the loss in sales to some ranchers. This option is limited by the supply of calves or yearlings available and represents a higher risk than a cow-calf operation.

In the short term the computer models indicate that the only ranch class which would benefit significantly from the proposed action, in terms of net income, would be the small ranch type. The typical medium summer and medium winter ranches would experience a slight improvement from the initial implementation, but would continue to experience a significant adverse impact in terms of the 1978 conditions. The typical sheep ranch type would remain slightly below its 1978 net income position, but the reduction would not exceed the threshold level and would therefore not be significant. The short term impacts to the large ranch type would continue to dominate the impacts to the ranching sector as a whole and would continue to impose a significant adverse impact on this ranch type.

Cumulative short-term impacts to the EIS area ranch sector as a whole represent only a slight improvement from the impacts of the initial implementation. Although the BLM AUMs available to the ranching sector would increase by 65 percent over three to five year average licensed use, ranch adjustment to the period-of-use impact would impose additional costs that would result in a decline to net ranch income from the existing level. The overall impact would be a reduction in herd size of 5,480 cows (28 percent of the existing herd size maintained by EIS area permittees), a decrease in gross revenue of $1 million per year, and a decline in net income of $1.03 million per year (10.2 percent of income in the agricultural sector for 1978). The large ranch class would continue to dominate the sectoral impacts. In its absence herd size and gross revenue would actually increase for the remaining ranch classes while net ranch income would decline by $151,000 (1.5 percent of the 1978 agriculture sectoral income) rather than $1.03 million. The cumulative reductions in revenue and income would result in a decline in sectoral employment of 23 positions (3.6 percent of 1978 employment). The short-term impacts would not be significant at the sectoral level because they would not exceed the five percent threshold levels previously defined, but would remain significant at the individual level.

In the long term (2024) AUMs available for livestock would be projected to increase 96 percent above three to five year average licensed use (see Vegetation Section, Chapter 3 Proposed Action). The period-of-use, however, is assumed to remain unchanged from that in the original proposals in Table 1-1 due to the inability to predict changes that would be authorized in the AMPs which would be prepared for all but four allotments. Improvement in vegetation condition of the range would be predicted to result in improved weaning rates and calf weights for cattle and improved lamb crops and lamb weights for sheep operations (see the Livestock Grazing Section, Chapter 3 Proposed Action for a detailed discussion).

The increases in AUMs and improvement in weaning rates and lamb and calf weights would combine to generate additional revenue and income above the existing levels for all the ranch classes (see Table 3-18).

The typical small and medium summer ranches would reap benefits from all three of the characteristics selected to illustrate impacts to ranches. Gross revenue and net income would increase significantly from existing conditions. Net income would increase by $5,000 per year (47 percent) for the small ranch type and $6,000 per year (18 percent) for the typical medium summer ranch from the 1978 levels. The increase in weaning rate and calf weight, and the expansion in herd size would contribute to the improvement in the income position of these ranches. The 47 percent and 18 percent increases in income would exceed the five percent threshold level defined previously, consequently the long-term impact of the proposed action would be significant and beneficial to the proprietors of these ranch classes.

The medium winter and sheep ranch classes would also benefit from the proposed action in the long term. Neither ranch class is able to expand herd size because of limited base property forage resources. However, the increase in calf and lamb weaning rates and calf and lamb weights predicted in the livestock grazing section would enable these ranch types to increase the gross revenue and net income earned per cow. The long-term impact on the net income of the typical medium winter ranch would be an increase of $1,000 per year (3.5 percent) over the existing level and an increase of $10,000 per year (40 percent) over the short-term impact. The 3.5 percent increase in net income would not exceed the five percent threshold level, therefore the increase would not represent a significant impact. The long-term impact on the net income of the typical sheep ranch would be an increase of $15,000 per year (19 percent) over the existing conditions. The 19 percent increase in net revenue represents a significant beneficial impact to the proprietors of sheep ranches.

Long-term impacts on large ranches are more difficult to quantify. This difficulty may be attributed to the severity of the initial impacts on this ranch class, and to the static production function relationships (except for calf and lamb crops and weaning weights) assumed in the computer model (see Appendix S for discussion of model validation and reliability). Initially large ranches would reduce herd size by over 50 percent due to the period-of-use restrictions which would require these ranchers to support their herds on inadequate base property resources. While herd size would be reduced to match the feed production of base property resources, the effect would be to reduce revenues more than costs because many costs are fixed in the short term. The resultant decline in gross revenues would result in net annual losses. While these losses could force some large operators from the industry these operators generally have the greatest capital resources of the ranchers in the EIS area and would probably be the most likely to invest the capital necessary to develop additional base property resources. The computer model used, however, does not account for these possibilities, as it allows only herd size reduction and hay purchases as options for responding to the period-of-use restrictions. In the long term the results of the computer runs indicate a sudden alteration from the initial and short-term impacts. Herd size would increase dramatically, 352 percent from the short-term herd size and 108 percent from the existing herd size. This build up in herd size would be accomplished only by massive hay purchases (approximately 6,000 tons above the existing level) for feeding during the spring. It is questionable whether those ranches would have the facilities to handle such large quantities and whether those quantities would be available from the area's hay producers. When hay prices are increased from the 1978 level assumed in the model to the average hay prices obtained in the EIS area in 1979 (approximately $80/ton) the model indicates that very little hay is purchased and impacts would be similar to those in the initial implementation and short term. For the purposes of the long-term analysis it was assumed that the large ranches remaining in the livestock business would have made the adjustments necessary to support their cow herd on their base property and that they would earn a return comparable to that earned by the other ranch classes. This would allow large ranchers to earn additional net income of approximately 20 percent ($20,000 per year) above the existing conditions, a significant beneficial impact to this ranch class.

Cumulative long-term impacts to the ranch sector as a whole would include an increase in net income of $425,000 per year, 4.2 percent of income earned in the agricultural sector for 1978, and the potential to increase employment by 31 FTE positions, 4.8 percent of total employment in the agricultural sector for 1978. These increases would not represent significant impacts at the sectoral level.

IMPACTS ON RANCHER WEALTH

The Bureau of Land Management does not recognize a capitalized value for grazing preferences. However, the willingness to pay more than the BLM fee for the opportunity to graze on public range has resulted in a capitalized value for BLM AUMs. This capitalized value means that AUMs contribute to the wealth of EIS area ranchers. Grazing preference can be used as collateral for loans, increase the market value of the ranch to which they are attached, and have a certain value if sold separately from a ranch. (BLM AUMs may only be sold to a qualified buyer, i.e., one who owns or controls the required private base property.)

This section will reference AUMs based on active preference, rather than three to five year average licensed use, as used in other sections (Vegetation, Livestock, etc.). This was done because rancher wealth is determined by the total number of AUMs which a rancher could license, rather than the amount actually used. This accounts for the apparent magnification of impacts as compared to the other sections, which are based on actual use.

Initially, the proposed action would reduce authorized livestock use in the Sonoma-Gerlach Resource Area by 38,742 AUMs below current active preference. An average market value of $50 per AUM for Northern Nevada ranches (Falk 1980) means that this decline would reduce the wealth of EIS area ranchers by $1,937,000, 25 percent of the total value contributed by grazing preferences to rancher wealth.

This adverse impact would be negated in the short term (by 1991, but sooner in most cases) by the projected rapidity of range improvement. Over the short term, the allocation of AUMs to livestck would be expected to increase to 192,247 AUMs, 39,800 AUMs above existing active preference and 78,542 AUMs above the initial allocation under the proposed action. At $50 per AUM, this increase would improve rancher wealth by $1,990,000, 26 percent above the existing value contributed by BLM AUMs to rancher wealth. Whether the increase in AUMs would increase the production capacity of EIS area ranches is unknown, however, because it is not known whether the base property of EIS area ranches is already developed to its maximum or not. Proposed period-of-use restrictions could actually reduce the animal unit capacity of EIS area ranchers, since livestock would have to be supported on base property for a longer period than at present.

In the long term, the number of AUMs allocated to livestock would be expected to increase to 228,880 AUMs, 76,433 AUMs above existing active preference. This increase would improve rancher wealth by $3,822,000, 50 percent above the current value contributed by BLM AUMs to rancher wealth. The adverse impact of the proposed action on rancher wealth at the time of implementation would thus be transformed into a significant beneficial impact over the short term, and a larger beneficial impact on rancher wealth over the long term.

IMPACTS ON THE CONSTRUCTION SECTOR

Implementation of the proposed action would involve construction of support facilities in order to make additional AUMs available for livestock. All support facilities, with the exception of spring developments, pipelines, and troughs would be constructed by private contractors via a competitive bidding process. Total cost of the facilities is estimated at $15,949,000 as detailed in Table 1-5. If past trends continue, approximately 15 percent of the construction would be awarded to firms based within the EIS area (personal communication, Bob Carroll, Chief, Division of Operations, BLM Winnemucca District Office 1980).

Assuming that funding and manpower are available support facilities would be constructed during the seven year period from 1982 to 1989. If construction activity is distributed evenly through the period, additional revenue of approximately $282,000 per year (in terms of 1978 dollars) would accrue to local construction firms. This increase in revenue would produce additional income to proprietors and employees of local construction firms of $115,000 per year (2.3 percent of 1978 construction sectoral income). On the basis of an employment coefficient of 21.39, the additional revenue to the construction sector would provide employment for six additional workers (2.4 percent of 1978 employment in the industry). These impacts represent a significant beneficial impact at the individual level, but not at the sectoral level, as previously defined in the discussion of economic thresholds.

Since the proposed construction of support facilities would be completed by 1989, no long-term variation in revenue, income or employment is anticipated. While this implies the layoff of the additional construction workers, it is likely that natural growth within the construction sector would have incorporated some or all of them into the permanent labor force by 1989.

IMPACTS ON THE GOVERNMENT SECTOR

Implementation of the proposed action would require additional BLM personnel to design and implement AMPs, as well as supervise and administer range improvement projects. Additional personnel would also be required to round-up wild horses and burros. Initial and short-term requirements would average approximately 70 work months per year for eight years. These additional work months would necessitate the recruitment of seven additional BLM personnel (3.6 percent of 1978 federal civilian employment), with a combined annual income estimated at $105,000 (4.4 percent of 1978 federal civilian income in the EIS area). These impacts would be significant, beneficial impacts at the individual but not at the sectoral levels. It should be recognized that federal hiring restrictions may make these additional personnel unavailable to implement this alternative.

Long-term government manpower needs due to implementation of the proposed action are currently unknown; consequently, employment and income impacts to the government sector over this time frame cannot be determined.

IMPACTS ON WILDLIFE AND RECREATION

Implementation of the proposed action would have no immediate impacts on wildlife and recreation, since wildlife populations would not have had sufficient time to adjust to specific elements of the proposed action.

Over the short term, the proposed action is anticipated to result in a slight reduction in the population of mule deer, while at the same time allowing the numbers of pronghorn antelope and sage grouse to proliferate considerably (refer to Wildlife Section, Chapter 3 Proposed Action). The cumulative effect of these adjustments is projected to be an increase of 465 hunter days per year spent in the EIS area. On the basis of an average expenditure per hunter day of $17 (refer to Appendix S for derivation), this increase would augment EIS area revenues by approximately $8,000 per year. These additional revenues would result in a slight improvement in overall EIS area income (about $5,000 annually), and one additional FTE of employment. The impact of the proposed action on wildlife and recreation thus would be significant only at the individual level.

This situation is projected to continue over the long term (2024), where an additional 487 hunter days more than existing conditions would be spent in the EIS area. One additional employee would result, and the impact would be significant only at the individual level.

CUMULATIVE IMPACTS OF THE PROPOSED ACTION

At initial implementation, the proposed action would reduce ranch revenue by $1.3 million per year, with a resultant decline in ranch income of $1.1 million per year. These adverse impacts would be counteracted to a slight degree by beneficial impacts to the construction and government sectors. However, the dominating effect of the ranch sector would result in overall declines within the EIS area economy. Multiplier effects radiating from the directly impacted sectors through the remainder of the economy would generate cumulative impacts which include a decline in income of $2.1 million per year (3.2 percent of the total income earned within the economy in 1978) and a potential loss of 38 jobs, 0.7 percent of total employment in the economy for 1978. These impacts do not exceed the one percent threshold level set for employment, consequently they would not represent a significant impact to the economy as a whole.

In the short term the adverse impact to the ranching sector would continue to dominate beneficial impacts to the construction, government and trade and service sections. Cumulative impacts from direct and indirect effects would include declines in income of $1.9 million per year and in employment of 20 positions, 0.4 percent of total 1978 employment in the economy. These impacts would not be significant at the level of the economy considered as a whole.

In the long term impacts to the ranching sector would be beneficial, while the construction and government sectors would no longer be impacted. Cumulative impacts generated from the ranching sector, with negligible changes derived from hunting, would include an increase in income of $0.9 million per year and additional employment of 57 persons, 1.1 percent of total 1978 employment. These impacts would be significant and beneficial at the economy wide level.

IMPACT ON TAX REVENUES

Implementation of the proposed action would directly impact county tax revenues in two ways. The first of these involves the revenue which is derived from grazing fee receipts. Existing regulations require that 12.5 percent of the grazing fees collected by the BLM be paid to the state. This sum is to be expended or returned, as the state legislature sees fit, for the benefit of the county or counties in which the fees were collected (Sec. 10 (A) Taylor Grazing Act, as Amended and supplemented, 1954). The proposed action would result in an initial allocation of 2,846 AUMs below three to five year average licensed use. Period-of-use restrictions however result in an even greater reduction in the number of AUMs that could actually be used. The computer result indicates that only 47 percent (53,441 AUMs) could actually be used. This reduction would cause a decline in grazing fee receipts of $119,000 per year which would reduce county government revenues by $14,875 per year.

Tax revenues would also be impacted by a sales tax effect. Both Humboldt and Pershing counties collect an 0.5 percent option tax on sales other than foodstuffs. Because livestock sales are classified as foodstuffs it was assumed that indirect sales would be taxed. The initial change in indirect sales of $887,000 per year would reduce tax revenues by $4,435 per year. When combined with the reduction due to a decline in grazing fees the overall reduction would be $19,310 per year which represents 0.2 percent of total resources in the two counties. This impact would not result in the loss of any jobs and consequently would not be significant.

Short-term impacts would be similar to those of the initial implementation, consequently would remain insignificant at all levels. Long-term impacts would also not be significant.

CONCLUSION

At initial implementation the proposed action would increase income in the construction sector by $115,000 per year (2.3 percent) and employment in the sector by six positions, 2.9 percent of the 1978 level. Income in the government sector would increase by $105,000 per year (4.2 percent) and employment in the sector would increase by seven positions or 3.6 percent. Income earned in the ranching sector would decline by $1.1 million (11.1 percent) and employment would decline by 32 positions or 5.0 percent. Revenue income and employment are summarized in Table 3-19. Ranchers would also be impacted by the decline in wealth of $1.9 million, 25 percent of the value contributed by BLM AUMs to rancher wealth. County tax revenues would decline by $19,000 per year, 0.2 percent of total resources available to Humboldt and Pershing County governments in fiscal year 1979. The overall impact on the EIS area economy would be a decline in income of $2.1 million per year, 3.2 percent of the 1978 total, and a decline in employment of 38 positions, 0.7 percent of the 1978 total. Significant beneficial impacts would occur at the individual level in the construction and government sectors. Significant adverse impacts would occur at the individual and sectoral levels of the livestock industry and the overall impact on the EIS area economy as a whole, while adverse, would not be significantly so.

In the short term the impacts of the proposed action would be identical to the initial implementation for the construction and government sectors. The short-term impact to the ranching sector would be a slight improvement from the initial implementation but income would remain $1.0 million per year (10.2 percent) below the 1978 levels while employment would remain 23 positions or 3.6 percent below the 1978 level. Rancher wealth would increase by $2.0 million, 26 percent above the 1978 level. There would also be a slight increase in income to the trade and service sectors of $5,000 per year (0.3 percent) due to an increase in hunting in the EIS area. The increase would result in the additional employment of one person. The overall impact on the EIS area economy would be a decline in income of $1.9 million per year (2.8 percent) and a decline in employment of 20 positions, 0.4 percent of the 1978 level. Significant beneficial impacts would occur at the individual level in the construction, government, and trade and service sectors while significant adverse impacts would occur at the individual level within the livestock industry. The overall impact to the economy, while adverse, does not exceed the one percent change in employment previously defined in the thresholds section.

In the long term the construction sector would no longer be affected, while impacts to the government sector are unknown. Impacts to the trade and service sector wold be similar to the short-term impacts. Impacts to the ranching sector would represent substantial improvements from both the short term and existing levels. Income in the ranch sector would increase by $425,000 per year (4.2 percent) while employment would increase by 31 positions, 4.8 percent over the 1978 level. Rancher wealth would increase by $3.8 million, 50 percent of the value contributed by BLM AUMs. The overall impacts to the EIS area economy would include an increase in income of $0.9 million per year, 1.4 percent, and an increase in employment of 57 positions, 1.1 percent of the 1978 level. In the long term there would be no significant adverse impacts, while significant beneficial impacts would occur at the individual level to the trade and services sector and at the individual level to the ranching industry. The overall impact to the EIS area economy would also be significantly beneficial.

TABLE 3-19

SUMMARY OF IMPACTS RESULTING FROM THE PROPOSED ACTION
SONOMA-GERLACH RESOURCE AREA

	REVENUE IMPACTS			INCOME IMPACTS					EMPLOYMENT IMPACTS				
	Direct	Indirect	Total	Direct	Percentage of 1978 Sectoral Total	Indirect	Total	Percentage of 1978 Economy Total	Direct	Percentage of 1978 Sectoral Total	Indirect	Total	Percentage of 1978 Economy Total
Initial Implementation													
Ranch	-1,346,000	- 932,000	-2,278,000	-1,127,000	11.1	-1,242,000	2,369,000	3.6	- 32	- 5.0	- 26	- 58	- 1.1
Construction	282,000	45,000	327,000	115,000	2.3	29,000	144,000	0.2	6	2.4	2	8	0.2
Government				105,000	4.2	37,000	142,000	0.2	7	3.6	2	12	0.2
Hunting & Recreation	0	0	0	0		0	0		0		0	0	
Total	-1,064,000	- 887,000	-1,951,000	- 907,000		-1,176,000	-2,083,000	3.2	- 19		- 19	- 38	- 0.7
Short Term													
Ranch	- 974,000	- 675,000	-1,649,000	-1,031,000	-10.2	-1,136,000	-2,167,000	-3.3	- 23	- 3.6	- 18	- 41	- 0.8
Construction	282,000	45,000	327,000	115,000	2.3	29,000	144,000	0.2	6	2.4	3	8	0.2
Government				105,000	4.2	27,000	142,000	0.2	7	3.6	5	12	0.2
Hunting & Recreation	8,000	1,000	9,000	5,000	.03	1,000	6,000	.01	1	.06	0	1	.02
Total	- 684,000	- 629,000	-1,313,000	- 806,000		-1,069,000	-1,875,000	-2.8	- 9		- 11	- 20	- 0.4
Long Term													
Ranch a/	1,317,000	912,000	2,229,000	425,000	4.2	468,000	893,000	1.4	31	4.8	25	56	1.0
Construction	0	0	0	0		0	0		0		0	0	
Government	0	0	0	0		0	0		0		0	0	
Hunting & Recreation	8,000	1,000	9,000	5,000	.03	1,000	6,000	.01	1	.06	0	1	.02
Total	1,325,000	913,000	2,238,000	430,000		469,000	899,000	1.4	32		25	57	1.1

a/ Ranch totals based on the assumption of comparative net returns for the large ranch class - see narrative for discussion.

Source: U.S. Department of the Interior, Bureau of Land Management, Winnemucca District Office 1980.

SOCIAL CONDITIONS

RANCHING COMMUNITY IMPACTS

Initial implementation of the proposed action (1982) would result in a reduction of AUMs from three to five year average licensed use for 32 of the 48 permittees in the EIS area. These reductions would vary from 10 to 100 percent. Sixteen permittees would experience increases in AUMs from average licensed use upon initial implementation of the proposed action. One hundred percent of the permittees are scheduled for changes in periods-of-use. Due to individual variances in circumstances such as dependency on public lands, outside sources of income, degree of indebtedness, and exclusiveness of experience in the livestock industry, it is difficult to assess the quantity and severity of impacts to livestock operators. However, the economic analysis indicates that all ranch classes except the sheep class would suffer significant adverse impacts after initial implementation of the proposed action. In the short term (1991), all ranch classes are predicted to experience significant adverse impacts except the sheep and the small ranch classes. The small ranch class is predicted to experience significant beneficial impacts in the short term. All ranch classes are projected to experience significant beneficial impacts in the long term (2024) (see Economics Chapter 3, Proposed Action). Also, the Livestock Grazing Section (Chapter 2, Proposed Action) predicts that many permittees would experience beneficial impacts from short and long-term increases in AUMs as well as long-term increases in percent calf crop weaned, calf weaning weights, percent lamb crop and lamb weights. Despite these projected beneficial impacts, most ranchers interviewed felt that initial adverse impacts would be too severe to recover from in order for them to appreciate predicted short and long-term benefits.

Periods-of-Use Impacts

Adverse impacts from proposed changes in periods-of-use were anticipated to be the most significant impacts of the proposed action by the majority of ranchers consulted. Cattle ranchers suggested that the delayed release date would make it necessary for them to either buy more hay or buy (or lease) more land to grow more hay. Most ranchers suggested that they could not afford this additional expense. In addition, ranchers oppose proposed changes in periods-of-use because according to them, the grass is greening up and attractive to livestock at the time of their present release dates in the spring, whereas the grass is dried up and unpalatable at the time of the proposed release dates.

Contrary to the predictions of the Economics Section (Chapter 3), two of the three sheep ranchers interviewed suggested that the proposed changes in periods-of-use would cause them to go out of business. One sheep rancher suggested that the proposed change in periods-of-use would create a gap in the cycle he moves his sheep in unless the BLM compensates him with some range in close proximity to that which he would lose. He stated that grazing preference in another area would do him no good as it would be too expensive to truck his herd there. He maintained that if he loses part of his cycle he loses everything and added that even his private land would be practically worthless as it is merely small parcels here and there amidst large expanses of public land. The second sheep rancher said he could not afford to lose his lambing grounds in April and that the proposed change in periods-of-use would not allow him enough time to feed. Also, it was maintained that it takes years to change range-fed sheep to corral-fed sheep and that many would be likely to starve to death or suffer poor health initially. The third sheep rancher agreed with the preceeding objections but suggested that if the proposed change were implemented he would try to deal with it by feeding his herd hay which he currently sells.

Livestock AUM Reduction Impacts

Ranchers interviewed for whom the proposed reductions from three to five year average use were 14 percent or less considered this loss to be a bearable hardship if not accompanied by a change in period-of-use. Reductions larger than this were perceived as being unbearable in themselves. It was maintained that the ranchers' income would be reduced by the same percentage as the proposed reductions and that this loss would be sufficient to put them out of business.

Although short-term and long-term increases in AUMs are predicted which would beneficially impact permittees, most ranchers are pessimistic concerning these. Primarily they were skeptical that these increases would indeed occur since they maintain that they have been promised increases for years by the BLM in return for their cooperation, but all they have ever received is more decreases. Secondly, most maintained that they would go out of business before the predicted increases were put into effect and some would be too old by then to appreciate the benefits of improved range. However, the heirs of ranchers who are able to compensate for the initial changes in periods-of-use and reductions could receive beneficial impacts in the short and long term (see Livestock Grazing and Economics sections, Chapter 2, Proposed Action).

Cumulative Impacts of Periods-of-Use and AUM Reductions

Most ranchers interviewed ruled out the options suggested as possibilities for coping with recommendations of the proposed action in the Economics and Livestock Grazing Sections (Chapter 2, Proposed Action). Reduced herd size, moving to rented pasture, buying more hay and hiring a larger work force were generally considered to involve too much expense or reduction in income to be feasible. More intensive cultivation of alfalfa also was rejected because of the prohibitive cost of buying more land, the exorbitant expense of the fuel required to power water pumps, the expense and uncertainty involved in drilling for water, and low water tables in some areas. Conversion to hay operations was dismissed for reasons similar to the above as well as because of the expense involved in purchasing new equipment to grow and harvest hay and the cost of transporting hay from isolated areas.

Concerning more intensive management strategies, ranchers interviewed felt that they are already operating at maximum efficiency and are obtaining the highest calf crop yields and weaning weights possible. (This conflicts with estimates made in the Livestock Grazing Section, Chapter 3 which suggests that calf crop weaned would increase from 68 percent currently to between 70 and 75 percent in the long term and that calf weaning weights would improve from the existing situation an estimated mean increase of 13 pounds in the long term.) Operators who have employed other techniques in livestock operations in other parts of the United States maintain that many of these techniques are not effective in this arid environment. Feedlots were considered to be an unfeasible alternative because they would require a large operation with a constant turnover and would call for an outlay of money which most ranchers do not have available to them.

Twenty-four percent (4) of the ranchers interviewed indicated that they would try to keep their ranches in operation if the proposed action were implemented, though they suggested it would be a struggle to do so. By ranch class these included one (17 percent) of those interviewed in the small class, one (20 percent) of those interviewed in the medium summer class, one (50 percent) of those interviewed in the medium winter class, none in the large class, and one (33 percent) of those interviewed in the sheep class. Advantageous circumstances which they suggested might help them cope with the effects of the proposed action included having access to fairly large amounts of private and railroad owned land; hay being grown for sale which could be used to feed livestock in the spring; and ownership of ranch which would permit the possibility of mortgaging. In addition, it was suggested that second jobs could be taken by family members to help support the ranch.

Seventy-six percent (13) of the ranchers interviewed indicated that implementation of the proposed action would put them out of business. By ranch class this included 83 percent (5) of those interviewed in the small class; 80 percent (4) of those interviewed in the medium summer class; 50 percent (1) of those interviewed in the medium winter class, 100 percent (1) of those interviewed in the large class and 67 percent (1) of those interviewed in the sheep class. Because of inflation and low beef prices and fluctuations in forage supplies, most ranchers say they are just barely breaking even. Ranchers who are still paying off their ranches or who have other debts suggest that the resulting reductions in income would make it impossible for them to make their payments and consequently the banks would foreclose on them. Also, some ranchers who own their operations indicate that the proposed action would cause their operation to become economically unfeasible. If they decide to sell, the value of their ranch would be diminished as a result of the reductions in AUMs. Also, those who decide to stay in the business and tough it out would experience increased difficulty in obtaining loans because of AUM reductions. Those ranchers who have plans for expansion of their operation would be inhibited by reductions in active preference.

Lifestyle Impacts

Though some ranchers suggested half-heartedly that they could start a dude ranch, go on welfare, go into early retirement or perhaps take supplemental jobs, most saw no real options open to them. Some threatened court battles and refusal to comply if the proposed action were implemented. Others expressed hope that through the Coordinated Resource Management and Planning (CRMP) process ranchers could work with the BLM to improve the range on their allotments without drastic AUM reductions or alterations in periods-of-use.

Subdivision was considered to be an unrealistic alternative by those interviewed. Private land was considered unsuitable for this purpose because it was either too isolated, too rugged, located in flood plains, or because it consisted of small parcels in isolated areas surrounded by public land. Also the expense involved with developing was considered a prohibitive factor. However it is possible that some ranches belonging to ranchers not interviewed would be suitable for subdivision. Even if subdivision were feasible, this option may be chosen only as a last resort, since some ranchers expressed opinions that good farmland should not be subdivided and that the isolated, rural atmosphere of the area would be adversely impacted if this were to occur.

The perception of many ranchers is that present economic conditions and high land prices region-wide would mean only larger corporate interests could afford to buy land sold by the smaller family operations. The presence of large agribusinesses in the district, with their absentee landlords and often-times nontraditional motives for being in the business, are viewed as a threat to the existence of the historic rural community, where neighbors share common values and attitudes, common backgrounds and common commitments.

If the above occurs, it is possible that some ranchers who sell out to corporate interests would become employees of the agribusinesses which buy them out. While this would be an attractive option from the point of view that the cohesive family unit could be maintained and the rancher could continue in the occupation he has spent most life in, there would be disadvantages. Loss of independence, pride of ownership, and satisfaction of working for oneself would be major concessions which would have to be made. In addition, ranchers suggest that corporately owned ranches change hands frequently and that everytime a ranch manager gets an operation in top-notch shape, the ranch is sold and the new owner wants everything changed around. Consequently, they feel that this position would prove frustrating. In addition, these positions are not considered to be extremely secure.

If ranchers do find it necessary to sell out and leave the ranching business altogether, the social consequences would be significantly adverse. Most of the ranchers and their wives have worked all their lives to build up their operations to the point they are at today and the prospect of losing it all is very disheartening to them. It would not only be a monetary loss, but also all the knowledge they have built up through a lifetime in ranching would become virtually useless. Other intangible things such as their independence, the satisfaction of working for themselves, and doing what they do best would also be adversely impacted as would the lifestyle which they find fulfilling.

If ranching families are no longer able to stay in the livestock business, traditional family living situations (families composed of two or even three generations living and working together) would be threatened. The cohesiveness of the family unit is likely to be adversely impacted and an environment which is considered to be extremely advantageous for rearing children in would be lost as well. Besides the disruption of the family, close circles of friends and associates would also be threatened.

Ranchers interviewed would experience serious problems in finding non-agricultural jobs due to their generally advanced age and lack of experience or training in other fields of work. Wives of ranchers interviewed would be slightly more competitive in the job market, in general, due to their age, higher education and more diverse job experience. However, some have been out of the job market for so long that their education and job experience may not be very advantageous to them. Depending on the jobs they find, women may have to forfeit the coequal status many presently enjoy in ranching. Children of ranchers living on ranches would probably experience the least difficulty in obtaining other jobs because of their youth and more recent other job experience.

Ranch hands, many of them minorities or older, and seasonal workers who are experienced in specialized agricultural work, would be the first to lose their jobs as ranchers began making adjustments. They would also face the most difficulties contending with a more competitive job market.

New skills would need to be learned and relocation may be necessary even in the cases of some who retain their ranches and take on jobs to supplement their income because of the isolated nature of many ranches. Even some of the youth who have spent all their lives on ranches in isolated areas express anxieties about trying to adapt to a new environment and developing new skills. One ranchers daughter said she would, "be a misfit" in another environment or line of work.

It is possible that the mining industry which is currently expanding in the Winnmucca area would be able to absorb some displaced members of the ranching communities. Lovelock would probably not be able to provide many jobs since it is currently in an economic depression and what few jobs do become available generally require specialized skills which ranchers would not have.

Ranchers or heirs of ranchers who are able to compensate for initial reductions and changes in periods-of-use are predicted to accrue beneficial economic impacts in the short term in the small class and in the long term in all other classes. Also, many of the variables impacted initially such as loss of AUMs and lowered base property values would be restored and improved. Beneficial social impacts to these ranchers would consequently occur in terms of preservation and enhancement of their preferred lifestyle and improvements in their quality of life. Ranchers would still likely feel, however, as if their historic independence were weakened. Opposition to the proposed action is rooted as much in aversion to government interference in ranch management as it is to any specific impacts from the proposed action. Economic benefits in the long term would not likely alter the opinion of operators in this regard.

Range Improvement, Wild Horse and Burro, and Wildlife Impacts

Responses to the proposed range improvements are mixed. While most ranchers would whole-heartedly endorse additional range improvements, they are skeptical of these proposals really materializing based on past unfulfilled promises on the part of the BLM. Ideally, though, they would like to work with the BLM, assisting with installation and maintenance if the BLM provides the necessary materials.

The removal of wild horses and burros from all but three areas in the resource area would have beneficial impacts on most permittees since it would put an end to the problems they have experienced with them in the past. However, two operators would suffer significant adverse impacts as the result of this action. One operator who runs cattle in the Button Point area would have his grazing preferences in the resource area completely eliminated. Also, one sheep operator would lose his grazing preferences in the Lava Beds area. This would have a significant adverse impact on his operation as it would create a gap in his trailing patterns and he would have nowhere else to graze his sheep during this period.

Though most operators favor the removal of horses from their allotments, they oppose the establishment of Herd Management Areas (HMAs) unless those operators losing grazing preferences are compensated with grazing preferences in close proximity to those which are being lost. In addition, some ranchers expressed doubts that the horses would stay within the HMAs unless those areas are fenced. They are concerned that the horses would wander into adjoining allotments resulting in overgrazing in these areas.

Ranchers would continue to have problems with wildlife consuming grain and alfalfa from their fields and preying on livestock and they would remain firm in their contention that they should be credited in livestock AUMs for the forage consumed by wildlife. Ranchers do not object to introduction of bighorn sheep except for the loss of livestock AUMs which would adversely impact the operations of some ranchers. Ranchers would continue to experience problems with hunters and other recreationalists with some slight increases possibly occurring as the result of increases in sage grouse and antelope populations.

REGIONAL IMPACTS

Planning area residents are generally opposed to the proposed livestock AUM reductions and changes in periods-of-use. They feel that these changes are unnecessary and harmful to the individual ranchers as well as to their communities and the area. Lovelock residents in particular expressed their belief that loss of any rancher business would have significant adverse impacts on local businesses, many of which are agriculturally oriented. Since Lovelock is currently in a state of economic depression, suggestion of loss of any rancher revenue results in anxious and angry responses. Winnemucca is in a less fragile economic position due to a more diversified economy and more favorable geographic location. However, with mining being a mercurial industry, the potato industry being on the decline and tourism being seasonal and influenced by fuel prices, ranching is valued for its relative stability. Most of the smaller towns in the planning area have fewer economic ties to the ranching industry and consequently manifest less concern regarding their future economic well-being as a result of the proposed action.

Although local attitudes are pessimistic concerning the effects of the proposed action on the regional economy, the economic analysis indicates that initial and short-term impacts to the EIS area income and employment while adverse, would not be significantly so. In the long term, the overall impact to the EIS area economy is predicted to be significantly beneficial. Significant beneficial impacts were also predicted to occur at the individual levels in the construction and government sectors after initial implementation and in the short term (see Economics Section, Chapter 3, Proposed Action). Those individuals affected by these economic beneficial impacts could experience additional beneficial impacts in terms of improved quality of life. Those individuals adversely impacted could, conversely, experience decreases in quality of life or possibly be subjected to the stresses involved with unemployment or relocation.

Community cohesion could be adversely impacted initially and in the short term. Members of ranching families hold local leadership roles and are active in service organizations. If ranchers go out of business and/or have to relocate, a void in the community would be left which would not be filled by the absentee owners of agribusinesses who may purchase some small ranches. (Ranch managers could partially fill the void, but since they are not owners, they would not be likely to have the same commitment to the area or to speak from the same position ranchers who own their own ranches would.) Due to the isolated nature of most of the ranches and the lack of jobs in close proximity to these, if residential subdivision of ranches does take place, older retired persons would be the most likely residents of these. An influx of elderly retired persons with no generational links to the area could change the area's social and political character and cause a shift away from the predominately agricultural society. Such a turnover in community membership could leave present-day residents feeling estranged from the emerging community character. Influxes of retirees would adversely impact the ruralness and sparse population of the area which the majority of residents find attractive. Additional geriatric medical facilities would probably also be required. In addition, residents value ranches for the rural atmosphere they provide and indicated that the context of the area would be lost with the demise of the small rancher. Ranching is considered important to the diversity and integrity of the community. Increased antagonism toward the BLM and federal control would also occur in the short and long term.

STATE AND NATIONAL IMPACTS

Wild horse and burro group representatives interviewed expressed unanimous disapproval of the proposed action. Although the intensity of comments differed, the concern of these groups overall is to see wild horses and burros protected in their natural environment.

Confinement of wild horses to three herd management areas (HMAs) and burros to one of these was viewed as inhibiting the wild and free roaming status of the animals. Beyond this, specific objections were registered concerning each of the three chosen areas: Buffalo Hills because this area recently experienced a large horse die-off; the Lava Beds because of its small size and sparseness of forage; and Button Point because of its proximity to Interstate 80. The last objection is based on their feeling that the further the horses are from mankind the safer they are. They see no reason to put the horses where the public has easy access to them. They prefer to take the trouble to travel to isolated areas to see them. Opposition to HMAs was also voiced concerning the proposed introduction of bighorn sheep in the Buffalo Hills and Button Point HMAs. They feel that the necessity of the horses sharing these areas with bighorn sheep constitutes an additional disadvantage.

The need for a reduction in horse numbers is agreed upon by two of the four groups but all groups thought the proposed reductions were too great.

Although too intangible to measure, members of these groups experience beneficial impacts simply from knowing the animals are out there, where it is felt they have a right to be. People receive pleasure from riding rough backcountry roads with the expectation of seeing wild horses and burros in their natural environment. The effect of viewing horses retained on small parcels of land, designated by someone else, would effectively ruin this viewing experience for many people.

All groups anticipated beneficial impacts from fence removals in the proposed action and from priority withdrawal of horses from checkerboard ownership land. Proposed water developments which are located so as to benefit wild horses and burros were also sanctioned. Improved health and condition of animals under the proposed action would beneficially impact group members as well.

Representatives of conservation and wildlife groups contacted expressed dissatisfaction concerning the proposed action. In their opinion, too little attention has been addressed to non-game wildlife. In addition, they do not feel the proposed action does enough to improve the condition of the range, wildlife habitat and riparian zones. Dissatisfaction was also expressed concerning the projected short and long-term deterioration in water quality and the slight decline in mule deer numbers. Representatives of these groups expressed their conviction that overgrazing has caused deterioration of the range and that the BLM, as a steward of the public lands, is responsible for the present poor condition of these lands. They believe, therefore, that the BLM should undertake measures such as fencing and repairing all riparian zones and eliminating all grazing and off road vehicle use in badly deteriorated or very fragile areas in order to improve the range for the benefit of wildlife and plant diversity rather than for the benefit of livestock as they believe the proposed action does.

They do not advocate elimination of livestock grazing but they feel that livestock AUMs are projected to increase far more in the long term than they need to. Range improvements are approved in those instances where they benefit wildlife as well as livestock. Fence removals are favored by these groups also. The introduction of bighorn sheep is supported by group members as well as control of wild horse and burro numbers. However, herd management areas are opposed for reasons similar to those given by wild horse and burro protection groups.

Beneficial impacts are provided to the membership of conservation, wildlife, and recreation groups through increased viewing, recreational, or educational experience or through satisfying peoples' need to know that land, plant diversity and wildlife are being preserved for future generations. Under the proposed action in the short and the long term these groups would experience some beneficial impacts as the result of some improvement in range condition and non-riparian wildlife habitat even though representatives interviewed felt that these improvements were insufficient. Beneficial impacts would also be experienced as a result of slight increases in antelope and sage grouse populations, the introduction of bighorn sheep and fence removals. Adverse impacts would be experienced by members of these groups due to deterioration of water quality and riparian zones, slight decreases in mule deer numbers establishment of HMAs and deteriorated condition of aquatic habitat (see Wildlife and Vegetation sections, Chapter 3, Proposed Action).

CONCLUSION

Beneficial economic impacts are predicted in the short term for the small ranch class and in the long term for all ranch classes. Increases in AUMs in the short term and long term and improved condition of herds in the long term also predicted for many operators. Ranchers or ranch heirs who are able to compensate for the initial changes in periods-of-use and AUM reductions would receive beneficial social impacts in the short and/or long term in terms of enhancement of their preferred lifestyle and improved quality of life. However, 76 percent of those ranchers interviewed indicated that initial implementation would cause them to go out of business due primarily to economic hardships caused by changes in periods-of-use and AUM reductions. If this occurred, ranch consolidation may accelerate and ranchers may become employees of agribusiness which buys them out. Adverse social impacts which could occur to ranch community members are loss of autonomy, pride of ownership, and satisfaction of working for oneself. Those for whom this is not an option could experience additional adverse impacts including the stress and difficulties involved with finding new jobs, learning new skills and relocating as well as the loss of non-monetary values associated with ranching. Those who are able to cope with the proposed changes in periods-of-use and reductions would suffer temporarily adverse impacts in terms of decreased property values, increased difficulties in obtaining loans, reduced income and (depending on the degree of dependency on ranching) decreased quality of life.

Regional economic impacts are predicted to be significantly beneficial in the long term and adverse, but not significantly adverse initially and in the short term. However, residents attach social, cultural and economic importance to ranchers and loss of ranchers and rancher business is perceived by many residents as significantly adversely impacting the area. Community cohesion and context could also be adversely impacted initially and in the short term.

On the state and national level, confinement of wild horses and burros to HMAs would cause perceptual impacts to wild horse and burro advocates who feel these animals should be preserved and protected in their natural environment. Reductions in wild horse and burro numbers are considered excessive by those groups. Beneficial impacts would be experienced as the result of fence removals is water developments, and improved health of animals.

In the short and long term, conservation, recreation, and wildlife groups would experience beneficial impacts to their perceptual, recreational, and educational experiences on the public lands due to some improvements in range condition and non-riparian wildlife habitat, slight increases in sage grouse and antelope populations, bighorn sheep introductions, and fence removals. Adverse impacts would be suffered by members of these groups due to deterioration of water quality and riparian zones, slight decreases in mule deer numbers and establishment of HMAs and deteriorated condition of aquatic habitat.

NO ACTION ALTERNATIVE

SOILS

The long-term impact of this alternative would be an increase in sediment yield from 1.00 to 1.04 tons/acre/year (Table 3-1). Sediment yields were calculated from Phase I Inventory data of the Watershed Conservation and Development System and the Pacific Southwest Inter-Agency Committee method for estimating sediment yield (Appendix H). Based on Soil Conservation Service tolerable yield of three to five tons/acre/year (Grant 1973), the impact of the no action alternative on the soil resource would be insignificant.

WATER RESOURCES

Under the no action alternative total water consumption by livestock and big game would be about 107 acre feet annually (see Table 3-2) which is .1 percent of the total runoff from the resource area.

Therefore, no significant impact would occur under this alternative. The effects of the no action alternative on water quality would approximate those of the proposed action.

UNAVOIDABLE ADVERSE IMPACTS

The continued grazing along the EIS area streams is expected to cause nine streams to exceed turbidity criteria for cold water aquatic life. Three streams would exceed temperature criteria for coldwater aquatic life and four streams would exceed fecal coliform criteria for bathing and water contact sports.

VEGETATION

ECOLOGICAL RANGE CONDITION AND TREND OF VEGETATION COMMUNITIES

The no action alternative is expected to result in a significantly adverse impact on ecological range condition and trend of vegetation communities in the resource area. This alternative is expected to decrease ecological range condition an overall 13 percent and decrease ecological range trend an overall 7 percent in the resource area. Existing management actions that can be attributed to bringing about these adverse impacts include the current overuse of the vegetation resource (heavy grazing intensity), historical periods-of-use and the lack of AMPs (grazing systems). The resultant adverse impacts to ecological range condition and trend of vegetation communities from the above existing management actions are discussed below.

The adverse impacts to ecological range condition and trend in the long term would result from the existing use of the vegetation resource by livestock, big game, wild horses and burros over the estimated carrying capacity (available vegetation). Table 1-8 shows the amount of overused vegetation to be 75,150 AUMs. This overuse of the vegetation resource denotes the existing heavy livestock grazing occurring in the resource area. The adverse impacts on vegetation from heavy stocking rates are clearly cited in the ecological range condition and trend portion of the proposed action. In summary, overgrazing of the vegetation resource would result in deterioration of vigor and compostion of key management species, which would result in reduced range condition and/or could result in extinction of species. Cook et al. (1964), indicated in relation to effect of intensity of harvesting, without exception, the more of the herbage that was removed, the more plants died and the smaller were the remaining plants. Cook and Stoddart (1963) expressed the harmful effects of increased grazing intensity when they stated; "Percent plants killed and reduction in crown cover increased with increased intensity of forage removal."

Based on the above discussion it was anticiapted that the continued overgrazing of the vegetation resource would cause further degradation of the ecological range condition and trend of vegetation communities, thus, heavy grazing intensity (overuse) would contribute to the significantly adverse impact on ecological range condition and trend of vegetation communities in the resource area.

This deterioration would also be caused by the existing periods-of-use which allow early livestock turnouts (March and April) in most allotments. In addition, the majority of livestock permittees in the resource area are licensed for various periods of winter use, thus resulting in yearlong livestock grazing (see Table 2-6). The following cited references are indicative of how the existing periods-of-use in the resource area would adversely impact the vigor of key management species in the Sonoma-Gerlach Resource Area. Trlica et al. (1971), indicated that depletion of carbohydrate reserves is believed to be a primary factor for loss in plant vigor and subsequent range deterioration. Pearson (1964) indicated, "In the grasses this critical period begins with the boot stage and closes with complete maturation of the fruit." Also, Pearson suggested root reserves are depleted, thus plants are highly susceptible to injury. The present periods-of-use would result in further losses of root reserves which would cause a continued decline in vigor. Declining vigor would result in further degradation of vegetation communities which would lower the range condition.

Based on the above cited references and discussion the existing periods-of-use would contribute to the overall significantly adverse impact of a declining ecological range condtion and trend in vegetation communities of the resource area.

Currently there are eight allotments in AMPs, however the majority of these AMPs are not meeting the desired objectives for which they were established (e.g., increased ecological range condition by improving species composition, density, cover and vigor). The remaining allotments would stay as they currently are without Allotment Management Plans and associated grazing systems. These allotments currently are overused and have early spring turnouts of livestock which typifies heavy continuous livestock use. Kothmann et al. (1969) indicated from vegetation records kept on his study that heavy continuous grazing has resulted in a deterioration of the vigor and species composition of the vegetation resource. Laycock (1961) expressed that range condition remained essentially unchanged where grazing was continued in the same season as formerly. This would continue the present trend of downward ecological range condition. Based on the above discussion, methodology for determining change in ecological range condition of the no action alternative was developed (see Appendix N, Section 1).

A significant long-term adverse impact on vegetation communities as a result of the no action alternative would be the continued decline in ecological range condition. The following changes are projected (Table 3-4):

Excellent range condition - decrease by 17,731 acres (less than one percent).

Good range condition - decrease by 142,147 acres (4 percent)

Fair range condition - decrese by 388,801 acres (9 percent).

Poor range condition - increase by 548,679 acres (13 percent).

This represents an overall 13 percent decline in ecological range condition of vegetation communities in the resource area. See Appendix N, Section 7, for changes in ecological range condition classes by allotments.

Based on the above discussions of impacts to ecological range trend; methodology for determining change in ecological range trend was developed for the no action alternative (see Appendix N, Section 2). The trend summary (Table 3-3) indicates the significantly adverse decline in ecological range trend by year 2024 with the no action alternative. Trend in the upward category would decrease from 296,753 acres (seven percent) presently to 2,953 acres (less than one percent) in the long term. Trend in the stable category would decrease from 1,062,280 acres (25 percent) in the long term. Trend in the downward category would increase from 2,897,026 acres (68 percent) presently to 3,196,847 acres (75 percent) in the long term. This would result in an overall seven percent decline in ecological range trend of vegetation communities in the Sonoma-Gerlach Resource Area. See Appendix N, Section 8, for changes in ecological range trend by allotments. The decline in ecological range condition and trend would be a cumulative result of the above discussed management actions and would continue through year 2024.

OTHER IMPORTANT VEGETATION COMMUNITIES

Riparian areas would continue to be degraded by livestock grazing and remain in a deteriorated condition as discussed under the proposed action, other important vegetation communities. No improvement in the condition of the riparian communities would be anticipated under this alternative.

The serious overgrazing documented above also indicates the extent to which livestock are impacting the riparian vegetation. The following cited reference indicates the adverse impacts from livestock grazing on riparian vegetation communities in the resource area. Davis (1977) summarized the effects of livestock on riparian communities as follows:

> Overgrazing by domestic livestock is probably the major factor contributing to the failure of riparian communities to propagate themselves. Continued overuse of riparian bottoms eliminates essentially all reproduction as soon as it becomes established. Overstocking and the consequent loss of vegetative cover on the adjacent watersheds is probably the main reason for the frequency of high intensity floods resulting in drastic changes in the density and composition of riparian bottoms.

Based on the above discussions of the overuse of the vegetation resource, it was assumed that riparian vegetation would continue to be significantly adversely impacted by livestock in the no action alternative.

Aspen communities in the resource area would not improve under the no action alternative. Livestock grazing appears to be the primary impact on aspen and cottonwood, resulting in many stands being in poor to fair condition. These stands are composed largely of mature trees with little or no seedlings or suckers present. As the mature trees die and resulting regeneration is suppressed, stands would deteriorate and be lost (Sonoma-Gerlach Forestry MFP Step 1 1979). The heavy continuous livestock use currently in practice would continue the decline in aspen communities by overutilization of the reproductive root suckers. Coles (1965) indicated that aspen reproduction which is grazed over 45 percent fails to become successfully established. As explained in the vegetation production portion of this alternative, it is believed that this alternative would reduce vegetation production by decreased vigor and composition of key management species. Coles (1965) reported that, "As herbs and palatable browse are depleted by overgrazing, damage to aspen reproduction increases. With very heavy browsing, aspen reproduction does not survive beyond the age of about five years."

Since aspen stands reach maturity in 80 to 100 years and then begin to undergo a natural deterioration (Schenbeck and Dahlem 1977), a reduction in the size of stands would be expected in the long term with most stands eventually lost or markedly reduced in size due to the elimination of aspen reproduction by livestock. The reduction or loss of aspen communities would be significant, due to their importance in providing desirable habitat for all livestock and numerous wildlife species.

VEGETATION PRODUCTION

As stated in the ecological range condition and trend portion, the predominantly downward trend (68 percent of the resource area) would continue in a downward direction (75 percent in the long term 2024). The downward trend in ecological range condition would result in a decrease in vegetation production in the long term. Anderson (1962) illustrated the projected decrease or increase in forage yield as related to either deterioration or improvement as measured by range condition class (see Figure 3-1 in the Vegetation Production portion of the Proposed Action). This clearly indicates that as ecological range condition class declines, then vegetation production also declines (depending on vegetation community).

Currently, there are eight allotments in the resource area that are underused by a total of 21,138 AUMs (Table 1-8). This light use would result in improved vigor of key management species and increased production (13,185 AUMs) over the long term (Table 1-8). However this increase in production is nine percent of the available vegetation and is not considered a significant increase.

The remaining 30 allotments in the resource area are currently being overused by 75,150 AUMs (52 percent overuse of the available vegetation). The effects of overgrazing on the vegetation resource are explained in the preceeding portion on ecological range condition and trend. This would result in lowered vigor and/or less vegetation, which would reduce vegetation production in the long term. The current overuse of the vegetation resource would result in an overall 29,194 AUM decrease in available vegetation, which represents a 20 percent decline in vegetation production in the long term. This would be a significant adverse impact on vegetation production in the long term (2024).

SENSITIVE PLANTS

See Chapter 2 for a listing of sensitive plants in the Sonoma-Gerlach Resource Area. In this alternative impacts to these species are assumed to continue as they are now; however, due to lack of field data on these plants (i.e., location and condition) these impacts are not known. As specified in the ecological range condition and trend of vegetation communities and the vegetation production sections of this alternative, the present heavy stocking rates, extensive overgrazing, earlier periods-of-use, and lack of AMPs with grazing systems would probably result in greater adverse impacts to these sensitive plants. However, there are no data available to indicate the significance of these adverse impacts.

CONCLUSION

The overall decline in ecological range condition and trend over the long term would be a significantly adverse impact to the vegetation resource under the no action alternative. This would result in a 13 percent decline in ecological range condition and a 7 percent decline in ecological range trend in the long term.

Vegetation production would also have a significantly adverse impact, as overuse of the vegetation resource in 30 allotments would reduce available vegetation from 143,231 AUMs presently to 114,037 AUMs in the long term. This represents a 20 percent decrease in vegetation production.

Other important vegetation communities (riparian and aspen communities) in the resource area would remain in a deteriorated condition or continue to decline in condition. This may result in a complete loss of the capability of these communities to reach the original climax vegetation, and result in a significantly adverse impact on these vegetation communities. Sensitive plants would continue to be impacted as they currently are at this time. The significance of these impacts cannot be determined.

SHORT-TERM USE VERSUS LONG-TERM PRODUCTIVITY

The continued overuse of the vegetation resource would result in a short-term gain in livestock productivity but the long-term impact to both vegetation production and livestock production would be a severe loss.

UNAVOIDABLE ADVERSE IMPACTS

All of the above impacts in this conclusion are considered unavoidable adverse impacts.

LIVESTOCK GRAZING

Under this alternative, livestock use (1982) would continue at the level shown (average last three to five year livestock licensed use) in Table 1-8 (see Table 3-7). In the short term (1991), operations would remain much as they are at the present time.

Calf crop, weaning weights, and death loss would be the same as described in the Livestock Grazing Section of Chapter 2. Over the long term (2024), a decrease of 29,194 AUMs (143,231 AUMs to 114,037 AUMs) in available vegetation would result (see Chapter 3 Vegetation Section for this alternative) from continuation of the current heavy continuous overuse in the resource area (Table 1-8). Kothmann et al. (1969) reported that yearly vegetation records obtained from the studied pastures have indicated that heavy continuous grazing has resulted in a deterioration of the vigor and species composition of the vegetation. Thus the high level of production obtained from heavy stocking was, in effect, reducing the potential of future production (Kothmann et al. 1969). Lowered productivity may express itself in a lower percentage calf or lamb crop, less wool produced, or less gain on market animals (Stoddart, Smith, and Box 1975).

The severity of the impacts to the calf or lamb crops, weaning weights, and death loss are difficult to predict. It is assumed under the current grazing use that lowered range productivity would result in a decrease in percent calf or lamb crops and in weaning weights, and that death loss would increase. Any decrease in calf or lamb crops, and/or weaning weights would adversely impact livestock production. A decline in livestock production of any amount would be considered a significantly adverse impact to ranching operations. Refer to Economics Section for a discussion of impacts to ranching sector. This would have an adverse impact on ranching operations. Although in the short term a ranching operation may gain in livestock production by overgrazing, the long-term impact to both rangeland vegetation and livestock production would be a severe loss.

CONCLUSION

Vegetation allocations would remain at approximately 116,551 AUMs (three to five-year average livestock licensed use) throughout the long term (2024). This would result in overuse of the vegetation resource, which would cause a decline in vegetation production (Table 1-8). Lowered vegetation production (see Chapter 3, Vegetation Production for the No Action Alternative) would result in a decline in livestock production. Any loss in livestock production would be considered a significantly adverse impact on the ranching sector.

SHORT-TERM USE VERSUS LONG-TERM PRODUCTIVITY

Short-term livestock use would remain as stated in Chapter 2, Livestock. This would result in overgrazing of the vegetation resource by 75,150 AUMs (Table 1-8), which could result in livestock production increases from overgrazing in the short term. However, the long-term impact to both livestock production and the vegetation resource would be a severe loss due to overgrazing.

UNAVOIDABLE ADVERSE IMPACTS

The overgrazing of the vegetation resource would result in a decline in calf or lamb crops, and/or weaning weights which would cause a loss in livestock production in the long term (2024).

WILDLIFE

Under the no action alternative the livestock grazing program currently in existence within the resource area would continue unchanged. The existing overobligation of the vegetation resource would continue (Table 1-8). Allocations of vegetation to big game would satisfy existing numbers in only one allotment. Special habitats (riparian, meadow, aspen, browse stands) would decline in condition, with many disappearing in the long term.

BIG GAME

Mule Deer

Under the no action alternative, there would continue to be heavy overuse of the vegetation resource by livestock, wild horses and burros, and wildlife in most allotments. This would lead to declines in herbage production, and thus to decreased habitat quality.

Within all allotments, continued heavy season-long use of important deer habitat types (riparian, meadows, aspen, browse stands) would lead to continued downward trend for most sites. Many of these sites, especially riparian, would eventually disappear, with resulting adverse impacts on deer populations. Mule deer would continue to inhabit these areas, but in reduced numbers, due to reduced habitat quality. Impacts to deer habitat quality under this alternative would be significantly adverse.

Mule deer populations could be expected to maintain existing numbers under this alternative, and perhaps even expand somewhat, as long as favorable climatic conditions occur. However, habitat conditions would be declining during this period because consumptive use of the vegetation resource would be in excess of carrying capacity in most allotments. Within a few years, habitat conditions would decline to the point where the habitat would be unable to sustain existing populations, expecially during adverse climatic conditions, and population declines would occur.

Where reasonable numbers currently exist, numbers would fall well below that level; reasonable numbers would not be attained where they do not now exist. These would be significant adverse impacts.

Based on the lowered future vegetation production (Table 1-8) and the decreased quality of deer habitat due to loss of riparian, meadow, aspen and browse sites, the estimated long-term (2024) mule deer population for the resource area would be 2,389 deer. This represents a decline of 1,540 (39.2 percent) deer from existing numbers, and is 1,499 (38.6 percent) deer fewer than would occur under the proposed action.

Antelope

Antelope would not be as severely impacted by adoption of the no action alternative as would mule deer. This is because most of the resource area's antelope (83 percent) occur in allotments that would experience vegetation production increases under this alternative. However, while general rangeland production would increase under this alternative, habitat sites preferred by antelope for quality forage would decline because of continued heavy livestock and wild horse and burro use and early spring grazing. These sites include riparian and upland meadows, and browse stands. In addition, there would continue to be competition for spring forage on many sites. This would be a significant adverse impact on habitat quality.

In response to increased vegetation production in several allotments, antelope would be expected to maintain existing numbers in the short term (1991). However, in the long term (2024), in response to lowered habitat quality, populations would decline to approximately 396 head, a 23.3 percent decline from existing numbers, and 57.8 percent fewer than would occur under the proposed action. Reasonable numbers would not be attained in any allotment, which would be a significant adverse impact.

Bighorn Sheep

Under the no action alternative, no additional bighorn sheep transplants would occur. The existing population in the Granite Range would be expected to expand somewhat from existing numbers (six), but it would not reach reasonable numbers because of habitat decline. Much of the bighorn habitat in this area is relatively inaccessible to cattle, but domestic sheep, if permitted into the area, would adversely impact bighorn habitat. In addition, the meadows in this area would continue to be heavily used by livestock and wild horses and burros, reducing bighorn habitat quality. There would be significant adverse impacts on both habitat quality and population levels, as habitat would decline in condition, and population levels would fail to reach reasonable numbers. Because of decreased habitat quality, bighorn sheep populations probably would not exceed 100 animals.

UPLAND GAME

Sage Grouse

Sage grouse habitat and populations would experience significant adverse impacts under this alternative. While much of the habitat would undergo slight increases in upland vegetation production, the riparian and dry meadows on which these birds are dependent would decline in condition, some becoming worthless as grouse habitat. Grouse populations would be even more subject to climatic variations than they are now, and base populations would be expected to decline by as much as 50 percent.

Even more detrimental than population declines would be the loss of a number of small isolated populations such as those in the Trinity and East ranges. The small amounts of meadow habitat on which these depleted sage grouse populations depend would disappear, and the grouse would soon follow.

OTHER WILDLIFE

Very few wildlife species' habitat would be benefited under this alternative. Those species adapted to depleted range conditions (e.g., blacktailed jackrabbit, certain ground squirrels) would see improved habitat conditions, but the great majority of species would experience significant adverse impacts in terms of habitat quality. The no action alternative would inevitably lead to decreases in habitat quality and diversity, both within and among habitat sites, with resultant decreases in diversity of the resource area's fauna. Species dependent on riparian, meadow, and aspen habitat would be most severely impacted; many could be expected to become extinct within the resource area. Those species which make only some use of such habitats, but are not dependent on them, would be less severely impacted but would still experience significant adverse impacts in habitat quality.

CONCLUSION

The no action alternative would result in declines in big game habitat quality, and in declines in big game populations. Most other wildlife species would also experience significant adverse impacts in the form of declines in habitat quality. Table 3-10 summarizes the impacts of this alternative on big game numbers.

AQUATIC HABITAT

The no action alternative would result in a continued stable or downward trend on 90 percent of the resource area's protectable streams which are in fair or poor condition (Table 3-11 and Appendix Q). The impacts would be the same as those caused by the proposed action.

UNAVOIDABLE ADVERSE IMPACTS

Under this alternative 90 percent or nine protectable streams would be maintained in fair or poor condition. This would be an unavoidable adverse impact.

WILD HORSES AND BURROS

Under this alternative the wild horse and burro numbers (5,501) would remain relatively constant through periodic gatherings in the resource area, as is the case presently. If future horse and burro removals continue at the same rate (about 2,200 in the last four years) then the net rate of increase (assumed at 11 percent) would just about match the annual removals. Gatherings would probably concentrate in allotments with checkerboard land patterns (Table 2-11) because of the priority given to wild horse and burro removal from private lands, and the requests received from the private landowners. Wild horses and burros, under this alternative, would not be allocated any vegetation and livestock use would continue at present levels.

In the 32 allotments where there is a combination of wild horse or burro and cattle use, the total AUMs used would continue to be in excess of the available vegetation (Table 1-8). Overuse of the range would result in an adverse impact to range condition (reference Chapter 3, Vegetation). In cases of extreme deterioration of range resource, animals would be removed to prevent further damage. In areas where the vegetation resource has been overused the condition and health of the wild horses and burros would be adversely affected, making them more susceptible to adverse environmental factors. This could result in mass die-offs as in the Buffalo Hills (Sonoma-Gerlach) in 1977 where 300 horses died of starvation (reference Winnemucca District Wild Horse and Burro files).

CONCLUSION

Under this alternative the number of horses and burros would remain relatively constant since gatherings would be made periodically on the resource area. The significance of this alternative would be the adverse impact on the health and condition of the wild horses and burros that would result from the overuse of vegetation by a combination of cattle, wild horses, burros, and big game.

VISUAL RESOURCES

The situation would remain as it is presently. The grazing techniques would not impact the visual resources.

CULTURAL RESOURCES

Damage to cultural resource sites due to livestock and wild horse trampling and rubbing would continue at its present rate. With the continuing deterioration in vegetation cover and the resulting erosion, cultural resource sites would receive increasing amounts of disturbance. An increasing number of artifacts would also be exposed to vandalism and trampling damage. The cumulative long-term impacts to cultural resources would be significant.

As no livestock support facilities are proposed under this alternative, no impacts to cultural resources would result from these. No cultural resource sites listed on the *National Register of Historic Places* would be adversely impacted by this alternative.

RECREATION

With the continuation of the present grazing program, several recreation activities could expect significantly adverse impacts. In 1979 and 1980 approximately 25 percent and 50 percent, respectively, of the people who applied for big game hunting tags did not receive one. The demand greatly exceeds the available resource since big game numbers would decline under this alternative, this would have a significantly detrimental effect on recreation.

Ninety percent of the resource area's protectable streams would continue being stable or proceed in a downward trend (see Aquatic Habitat Section). This would have a significantly detrimental impact on recreation. The viewing of wild horses would continue as before. Usage would rise approximately at the same rate as the population rises. There would be no impact.

The sage grouse population would be reduced by approximately one-half. This would have a significant adverse impact on hunting, since the resource would not meet the demand.

CONCLUSION

Big game hunting, sage grouse hunting, and fishing would be adversely impacted since the projected demand would greatly exceed the available supply.

WILDERNESS POTENTIAL

Under this alternative the range management program in the Sonoma-Gerlach Resource Area would remain as is at the time the EIS is being prepared. As no land treatments exist within any of the proposed WSAs, their wilderness suitability would not be impaired (Refer to Table 3-16).

ECONOMICS

The no action alternative would cause no changes in the administration of livestock grazing on public lands, so that livestock grazing would continue at its present level. Although this would have no immediate or short-term impacts on area ranchers, the continuation of current grazing levels would result in a decline in available vegetation of 29,194 AUMs over the long term (refer to Vegetation Section). This decline in available vegetation could result in decreased calf crops, lower weaning weights, and reduced calf weight at the point of sale. These reductions would in turn lower gross ranch livestock sales and revenues, although these impacts are unquantifiable at this time. These impacts could be significantly adverse to EIS area ranchers individually, but probably would not be significant at the sectoral or area-wide levels.

It must be noted that the impacts resulting from slowly declining available vegetation would occur over a 35 year period of time. Adjustment to these changing conditions by area ranchers, perhaps taking the form of incorporation of improved technologies or other production function relationships, could mitigate some portion of this adversity.

The no action alternative would also have an adverse impact on wildlife and recreation, since declining habitat quality would act to reduce wildlife populations below existing numbers. Over the short term a decline of 358 hunter days below existing levels has been projected. This would result in a reduction of direct expenditures by $6,000, leading to an overall decline in total area income of $5,000. This impact would result in the reduction of one FTE in area employment, and would be considered a significant impact only at the individual level.

Over the long term, however, the no action alternative would have a more detrimental impact in terms of wildlife and recreation. The continued decrease in wildlife numbers would lead to concurrent declines in hunting pressure, with an estimated 1,415 hunter days per year fewer spent in the resource area. The resultant decline in direct expenditures of $24,000 annually would effect a reduction of total area income of $18,000, thereby causing the potential loss of three jobs within the area. This represents a significant adverse impact at the individual level, as previously defined.

SOCIAL CONDITIONS

IMPACTS TO RANCHING COMMUNITY

Of the alternatives being considered, this alternative would be the most preferred by area ranchers. Because periods-of-use would remain the same and livestock AUMs would not be reduced from average three to five year licensed use, ranchers could continue to earn their living in the manner they are accustomed to, and could maintain their accustomed lifestyle and quality of life. Most of the adverse impacts addressed under the proposed action would be averted except that problems with wild horses and hunters would continue to be experienced. No additional range improvements would be undertaken under this alternative. While range improvements are very desireable from the ranchers' point of view, and ideally they would like to assist BLM in installation of range support facilities, they feel that lack of range improvements is something they have had to live with for a long time anyway.

In the long term overgrazing of the vegetation resource is predicted to result in the decline in calf or lamb crops, and/or weaning weights which would cause a severe loss in livestock production. Adverse social impacts similar to those described as occurring after initial implementation of the proposed action would be expected to occur in the long term though they would be likely to occur at a more gradual rate. Most, if not all, of the ranchers who are in the business today would not, by virtue of their present age, be affected by these projected adverse impacts. However, children or grandchildren who inherit these ranches would be affected. The majority of ranchers do not give credence to the assertion that overgrazing is causing the range to become progressively more deteriorated and therefore do not believe that these adverse impacts would actually occur.

REGIONAL IMPACTS

Impacts to residents and communities of the planning area are not expected to be significant. This alternative would be the one most favored by the majority of regional residents because economic, social and cultural adverse impacts which would occur under other alternatives would be avoided. Although the predicted deterioration of range condition in the long term would lead to the decline of the livestock industry in the area with adverse impacts similar to those described under the proposed action (initial implementation) occuring at a more gradual rate, most residents express disbelief concerning this prognosis (see Economics Section, Chapter 3 for details of economic impact).

STATE AND NATIONAL IMPACTS

A primary concern of recreation and wild horse groups is rehabilitation and protection of rangelands. None of the representatives interviewed felt they could endorse an alternative that would do nothing to reverse the deteriorating condition of the range. They also expressed concerns about the numbers of grazing animals on the public land, especially the disproportionate number of livestock. Members of wildlife and preservation groups expressed concern that without a reduction in wild horse numbers, the condition of the range could continue to deteriorate to a point where competition between wild horses and wildlife could increase. This condition would in turn affect the wildlife viewing and hunting and fishing experiences of recreationalists. The reduced health and condition of horses that would occur would adversely impact many wild horse group advocates.

CONCLUSION

Initial adverse impacts to planning area permittees would be fewer under this alternative than under any other due to lack of changes in periods-of-use or AUM reductions, the major adverse impact being lack of additional range improvements.

In the long term and possibly in the short term rancher lifestyle and quality of life would be adversely impacted in ways similar to those which would occur under the proposed action. However, these impacts are likely to occur at a more gradual rate. Consequently, they may be easier to adapt to.

Initial regional impacts would be insignificant. Long-term and possibly short-term impacts would be similar to those which would occur under the proposed action. Impacts to wild horse and environmental groups would be adverse as nothing would be done to reduce the deteriorating condition of the range and due to the reduced health of the animals.

NO LIVESTOCK GRAZING ALTERNATIVE

SOILS

This alternative includes no range treatments or range improvements. Proper utilization of the vegetation resource would be achieved which would decrease sediment yield from 1.00 to 0.90 tons/acre/year over the long term (Table 3-1). Yields were calculated using data from Phase I Inventory of the Watershed Conservation and Development System and methodology based on the Pacific Southwest Inter-Agency Committee for estimating sediment yield (Appendix H). The alternative would have an insignificant impact on the soil resource since the sediment yields are below the tolerance level established by the Soil Conservation Service of three to five tons/acre/year (Grant 1973).

WATER RESOURCES

Under this alternative 39.5 acre feet of water would be consumed annually by wild horses and big game (see Table 3-2). This quantity amounts to less than .04 percent of the area's total runoff and is not considered to be significant. This action would improve the turbidity levels in nine streams, temperature levels in three streams, and fecal coliform levels in four streams.

VEGETATION

ECOLOGICAL RANGE CONDITION AND TREND OF VEGETATION COMMUNITIES

A significant beneficial impact on vegetation communities is anticipated from the increase in ecological range condition towards climax. This is expected to occur from a reversal of a predominantly downward trend (presently 68 percent) to an upward (28 percent) and predominantly stable (60 percent) trend in the long term (2024).

Management actions that can be attributed to bringing about these improvements in vegetation communities towards climax include the complete removal of livestock grazing and the allocation of the vegetation resource to big game and wild horses and burros at the estimated carrying capacity (available vegetation) shown on Table 1-9.

Those areas where livestock grazing would be removed and are not utilized by wild horses or burros would have big game use in some portions. The substantial reduction in grazing intensity (only seasonal use by big game) with periodic and/or complete rest periods would improve ecological range condition. This would allow key management species to complete growth cycles with little or no grazing pressure. Plants which have been relieved of grazing pressure (rest) would increase carbohydrate reserves which would result in increased vigor and reproductive parts that would promote seedling establishment. Vigor would be restored, usually within one to eight years (Hormay 1970, Trlica et al. 1977, and Duff 1979). The rate of recovery within a species was proportional to the state of vigor, the lower the vigor the less rapid the recovery (Cook and Child 1971).

The vegetation communities would then begin to move toward climax because, "Partial or complete protection from grazing on deteriorated rangeland release the vegetation from disclimax status, and secondary succession follows." (Tueller 1973). This would be true in most vegetation communities. Exceptions might be the salt desert type and deteriorated big sagebrush stands with little understory vegetation. These communities would probably remain in a subclimax status until some natural catalyst changed the seral (see glossary) state of the community. Holmgren and Hutchings (1972) found that extended drought is the necessary catalyst for change in the salt desert community. The big sagebrush stands, on the other hand, would require fire or a serious insect outbreak to produce a change in their seral state.

No livestock grazing would have a beneficial impact on the improvement of ecological range condition and trend of vegetation communities within the resource area. Thus, no livestock grazing would contribute to the significantly beneficial impact of an overall 10 percent improvement in ecological range condition and the 56 percent improvement in ecological range trend of vegetation communities.

Wild horse and burro populations would be maintained at levels consistent with the allocatable vegetation for yearlong use in four herd management areas and populations in the 10 herd use areas would be maintained at numbers proposed in the Sonoma-Gerlach MFP-I. This would result in reduced grazing pressure on the vegetation resource from heavy to moderate and/or light grazing intensities. The ecological range condition and trend portion of the vegetation section in the proposed action clearly states the benefits to climax vegetation communities expected from reductions in grazing intensity. In summary, a reduction in grazing intensity would promote improved range condition and trend, through increased composition, cover, density, and vigor of key management species.

However, the improvement to ecological range condition would not be as great as expected in the proposed action because these areas would continue to be grazed year-round with rest periods based solely on seasonal use of areas by big game, wild horses and burros.

The reduction in grazing intensity (heavy to moderate) from the allocation of vegetation to big game, wild horses and burros to the estimated carrying capacity would be a beneficial impact to the ecological range condition and trend of vegetation communities in the resource area. The reduction in grazing intensity would contribute to the significantly beneficial impact of an overall 10 percent improvement in ecological range condition and the overall 56 percent improvement in ecological range trend of vegetation communities.

Based on the above discussions of the impacts to ecological range condition from the proposed management actions, a methodology was developed to project future changes in ecological range condition (see Appendix N, Section 1). Projected summary changes (Table 3-4) from this alternative are:

Excellent range condition areas would increase by 18,745 acres or one percent.

Good range condition areas would increase by 419,737 acres or nine percent.

Fair range condition areas would decrease by 100,111 acres or two percent.

Poor range condition areas would decrease by 338,371 acres or eight percent.

Therefore, ecological range condition would significantly improve an overall 10 percent in the resource area. See Appendix N, Section 5, for anticipated changes in ecological range conditon by allotment.

Also, based on the above discussions of the impacts to ecological range trend from the proposed managment actions, a methodology was developed to project future changes in ecological range trend (see Appendix N, Section 2). The trend summary (Table 3-3) indicates anticipated improvements by year 2024 in ecological range trend of vegetation communities from this alternative. Trend in the upward category would increase from 296,753 acres (7 percent) presently to 1,204,143 acres (28 percent) in the long term. Trend in the stable category would increase from 1,062,301 acres (25 percent) presently to 2,560,404 acres (60 percent) in the long term. Trend in the downward category would decrease from 2,897,026 acres (68 percent) presently to 491,533 acres (12 percent) in the long term. Therefore, ecological range trend would improve an overall 56 percent in the resource area. Appendix N, Section 6, shows anticipated changes in trend by allotment. The improvement in ecological range condition and trend of vegetation communities would be a cumulative result of the above discussed management actions and would continue through year 2024.

OTHER IMPORTANT VEGETATION COMMUNITIES

Riparian vegetation communities are considered to improve significantly under this alternative. The proposed action discussion on studies in Utah and the Winnemucca District, where livestock grazing was eliminated on riparian zones, clearly indicates the expected increases in riparian vegetation towards original climax plant communities.

Due to the availability of water, riparian vegetation has the potential for substantial improvements. The rate of recovery of these areas would be proportional to state of vigor, the lower the vigor the less rapid the recovery (Cook and Child 1971). However, in the long term, riparian vegetation is expected to improve beyond the results of studies above mentioned. Any improvement in riparian vegetation condition over 5 percent would be a significantly beneficial impact and very few areas would fail to meet the 5 percent improvement by the long term (2024).

Grazing use in wild horse and burro areas would decrease from the present heavy use by livestock to moderate use. Horse use of riparian areas is expected to be moderate to light as horses are not known to congregate and loiter in these areas as cattle do (based on field observations by District personnel). This decrease in riparian area use is expected to result in a significantly beneficial impact that would exceed the 5 percent change in vegetation condition.

Aspen communities in the resource area are presently deteriorated and show little reproduction as a result of livestock grazing (see Chapter 2). Under this alternative, livestock grazing of aspen root suckers would cease and aspen stand condition would improve substantially. Also, the size of many stands would increase to their former limits. Based on observations by District personnel, horse use would not be a problem as horses generally avoid aspen stands. Not all stands are capable of successfully regenerating themselves because above-ground stems of some deteriorating stands produce plant hormones that override the growth-initiating factors and inhibit sucker production (see Chapter 2). Special disturbance treatments (burning, clear-cutting, or herbicide spraying) would be necessary to stimulate regeneration in these stands (Schenbeck and Dahlem 1977).

The decrease in livestock use of aspen communities is expected to result in a significantly beneficial impact to stand condition and reproduction that would exceed the 5 percent change in condition of aspen communities.

VEGETATION PRODUCTION

This alternative is expected to significantly increase vegetation production in the long term (2024). The increase in production would result from a reduction in grazing intensity from heavy to moderate and/or light with no grazing pressures in some areas. Van Poollen and Laceys' (1979) review of pertinent literature on the effect of manipulating management variables, such as grazing intensities, was used to estimate this anticipated increase in available vegetation. From the use of Van Poollen and Laceys' results it was projected that vegetation production would increase by 21 percent in the long term from reductions in grazing intensity of heavy to moderate. The 21 precent was used for the entire resource area, even where it was believed that no grazing pressures would occur. This was done because, "Vegetation in ungrazed or natural areas does not respond like areas which are grazed to some extent. The specific vegetation association may actually deteriorate after an extended period of deferment," (Reardon and Merrill 1976). This could be due to stagnation of particular vegetation species, which would lessen their vegetative growth and result in less production. However, this would not occur in all vegetation species, thus, the 21 percent increase in production was used.

Projected future increases (2024) in vegetation production for this alternative included areas potentially suitable for allocation which are now (1982) unsuitable for allocation due to the suitability criteria. It was assumed that these areas would also increase in vegetation production with a reduction in grazing intensity.

Based on the above projected increases, vegetation production would increase from the present 143,989 AUMs to 183,976 AUMs over the long term (Table 3-6). This represents a 28 percent (39,987 AUM) increase in vegetation production over the presently available vegetation. This would be a significantly beneficial impact to vegetation production from the no livestock grazing alternative.

IMPACTS ON SENSITIVE PLANTS

The reduction in grazing intensity, plus periodic and/or complete rest from grazing pressures and trampling would have a beneficial impact on sensitive plants within the resource area. No information is available on the impacts that wild horses and burros would have on sensitive plants. The assumption was made that they would be similar to livestock grazing, thus the reduction in grazing intensity from heavy to moderate and/or light would be beneficial to the existence of these sensitive plants. The significance of these beneficial impacts is unknown (Mike Yoder-Williams, BLM Botanist, Winnemucca, personal communication 1980).

CONCLUSION

In the long term ecological range condition of vegetation communities would increase towards climax, an overall 10 percent in the resource area. This would be accomplished by reversing a predominately downward trend (68 percent presently) to an upward trend (28 percent) and predominately stable trend (60 percent) in the long term. This would result in an overall 56 percent improvement in ecological range trend of vegetation communities in the resource area. Improvement in vegetation production would provide an additional 39,987 AUMs or a 28 percent increase by the year 2024.

In the long term, riparian and aspen vegetation communities are expected to significantly increase in condition towards climax. Sensitive plants are anticipated to have a beneficial impact from this alternative.

LIVESTOCK GRAZING

Under this alternative there would be no livestock grazing preference and therefore no livestock grazing on public rangeland. This would be a significant adverse impact to livestock grazing on all allotments in the Sonoma-Gerlach Resource Area (see Table 3-7). The degree of adverse impact to each permittee would correspond with their dependence on public rangeland for livestock feed (see Table 2-6). The greater the dependence on public rangeland, the greater the adverse impact to their livestock operation. It was determined that any permittee with more than 10 percent dependence on the Sonoma-Gerlach Resource Area would be significantly impacted as a result of the loss of their grazing preference. As shown on Table 2-6 in Chapter 2, 40 of the 48 livestock permittees in the Sonoma-Gerlach Resource Area have 10 or more percent dependence on the public rangelands. These livestock permittees could be forced to reduce their livestock numbers to a size that could be maintained on their base property and/or other private lands within their control, or graze public lands outside the resource area, buy feed, rent private pasture, or go out of the livestock business. These adverse impacts would be unavoidable. The remaining eight livestock permittees have less than 10 percent dependence on the Sonoma-Gerlach Resource Area and therefore would not be significantly impacted. Refer to the Economics Section for a more detailed discussion of impacts.

CONCLUSION

Under this alternative livestock grazing would be significantly adversely impacted on all allotments. Of the 48 livestock permittees in the Sonoma-Gerlach Resource Area, 40 would be significantly impacted by this alternative. These livestock permittees could be forced to reduce their livestock numbers to a size that could be maintained on their base property and/or other private lands within their control, or graze public lands outside the resource area, buy feed, rent private pasture, or go out of the livestock business.

WILDLIFE

Under this alternative, all normally licensed domestic livestock use of public lands in the resource area would end; all grazing preference would be cancelled. Wild horses and burros would continue to occupy all non-checkerboard areas in which they currently exist. Vegetation would be allocated to reasonable numbers of all big game animals, and to maximum numbers of wild horses and burros in the non- checkerboard areas. Some 275 miles of fence would be removed from big game habitat (Table 1-11).

BIG GAME

The vegetation allocation program under this alternative would have essentially the same impacts on big game habitat, and big game species, as it would have under the proposed action. In areas used by both wild horses and burros and big game, consumptive use of the vegetation would be reduced to moderate levels under the allocation, and vegetation would respond by increasing production and maintaining that production over the long term (see Vegetation Section, Chapter 3, Proposed Action). This would be a significant beneficial impact on big game habitat because of the increased forage and cover provided by the increased vegetation production.

Where only big game use would occur, because of the removal of wild horses and burros (checkerboard land areas, mainly), consumptive use of the vegetation would be reduced to light levels. This could result in vegetation stagnation (Tower 1970) which would reduce browse production. However there would still be sufficient browse production to support big game population levels averaging reasonable numbers, especially in light of the fact that increased grass and forb production would lessen the degree of reliance on browse by big game. The increased herbage production in these areas would be a significant beneficial impact on big game habitat, since there would be additional forage and cover available.

The removal of some 275 miles of fence from big game habitat would remove this possible source of animal loss, and thus aid in maintaining reasonable numbers.

Wild horses and burros would continue to make use of meadows and riparian areas. However, with the possible exception of some upland meadows, wild horses and burros make considerably less use of these areas than do livestock (Zarn et al. 1977). These critical habitats would improve in condition, which would be a significant beneficial impact on big game habitats. Those upland meadows used by wild horses would still receive less use than at present, and would be expected to improve in condition. Under this alternative, mule deer would be expected to maintain population levels averaging at least reasonable numbers (3,936) in the long-term. Antelope would increase from the existing 516 head to 957 head in the short-term. Improved habitat conditions in the potential antelope areas would allow increases to 987 head in the long term. Bighorn sheep numbers would expand to 180 head in the short term, and, assuming that all potential reintroductions were made, to 1,126 head in the long term. Since reasonable numbers would be attained and maintained, this alternative would have significant beneficial impacts on big game populations in all allotments.

UPLAND GAME

Sage Grouse

The no livestock grazing alternative would be significantly beneficial to sage grouse habitat. The increased production of vegetation on upland range sites, and the improved condition of wet and dry meadows and riparian zones, would lessen the fluctuation in grouse populations caused by climatic extremes or variation. Wild horse use, where it occurred, would keep meadow vegetation from becoming rank (and thus less valuable to grouse), while still allowing some condition recovery on the meadows. Where wild horses and burros would not occur, meadows would improve tremendously in condition, but due to the growing rankness of the vegetation, would decline in value as sage grouse habitat (Oakleaf 1971). Increased forb production in ungrazed upland areas would offset this decline in meadow value to some degree.

Habitat conditions for sage grouse within the resource area under this alternative would allow for considerable increase in grouse populations. Populations could increase by better than 100 percent in some areas, but because climatic factors would still affect populations, the long-term average increase would probably approach only 50 percent.

OTHER WILDLIFE

The no livestock grazing alternative would improve habitat quality for most wildlife species in the resource area. Vegetation condition improvements and increased herbage production would represent beneficial changes in upland range habitats, and the improvements in riparian, meadow, and aspen condition under this alternative would also be beneficial to wildlife habitat. These changes would represent increases in habitat diversity, since denser understory and midstory vegetation would result. This would be a significant beneficial impact on wildlife habitat.

Because this alternative would promote habitat diversity, it would also promote wildlife species diversity in the resource area. As vegetation production increased on upland sites, and other habitats (aspen, meadows, riparian) improved in condition, the vegetation community would come to more closely resemble a climax condition, and wildlife species dominance would shift from the present disclimax condition to one more closely resembling normal wildlife populations.

CONCLUSION

This alternative would be significantly beneficial to all affected wildlife habitats, as all affected wildlife habitats would improve in condition. Big game species would attain and then maintain population levels equal to reasonable numbers in all allotments, in response to improved habitat conditions. This would be a significantly beneficial impact. Big game populations would vary in size, being above reasonable numbers in some years, and below in others, responding to climatic and management influences, but maintain a long-term average of reasonable numbers. Table 3-10 summarizes population levels for big game species under this alternative.

AQUATIC HABITAT

There would be a beneficial impact on 15 (62 percent) of the Sonoma-Gerlach Resource Area streams which would improve to or remain in good or excellent condition (Table 3-11, and Appendix Q). It was assumed that ten (38 percent) of the streams which also require private landowner protection would remain in fair or poor condition.

WILD HORSES AND BURROS

Under this alternative, wild horses and burros would be removed from areas of checkerboard land and areas where wild horse and/or burro numbers exceed estimated carrying capacity. Management of wild horses and burros on intermingled private and public land is not feasible. Also a majority of the operators involved have requested that the animals be removed from their private land (reference Winnemucca District files). Wild horses and burros on the remaining 15 areas would be reduced to estimated carrying capacity. The Kamma Mountains herd use area presently has no estimated grazing capacity for livestock, wild horses, or burros. As a result, wild horses would be totally removed from this area in addition to the checkerboard use areas. The impacts to wild horses and burros would be the same as in the proposed action with respect to capture, removal of an entire herd, and herd viability.

CONCLUSION

Wild horse and burro numbers would be reduced to estimated carrying capacity on four Herd Management Areas and ten Herd Use Areas. Reduction of numbers and numbers of Herd Use Areas would be significantly adverse, but would beneficially impact the remaining horses and burros by increasing their health and condition. Increased vegetation from reduced grazing pressure over the long term would allow horse and burro numbers to rise from 1,232 to 3,431--a significantly beneficial impact.

VISUAL RESOURCES

Under this alternative the visual resource would improve slightly with the removal of livestock, but the impact would not be significant.

CULTURAL RESOURCES

Elimination of grazing would be beneficial to cultural resources. Vegetation cover would improve with the removal of livestock, reducing impacts to archeological sites due to erosion and vandalism. Impacts to cultural resource sites caused by livestock trampling would be eliminated, although adverse impacts due to wild horse trampling would continue to be sustained. However, wild horse trampling damage would occur at rates reduced from present.

As no livestock support facilities are proposed under this alternative, no impacts to cultural resources would result from these. No cultural resource sites listed on the *National Register of Historic Places* would be adversely impacted by this alternative.

RECREATION

The impacts of this alternative would be similar to those listed in the proposed action, except for fishing. Fifteen streams on public lands would improve to good or excellent condition (see Aquatic Habitat Section). This would be a beneficial significant impact for recreationists to have additional fishable water bodies. However, the demand would still not be met.

Since big game would be maintained at reasonable numbers, the amount of hunter use would be at the level mentioned in the proposed action. It would have a significantly adverse impact, since the demand would not be met.

The number of sage grouse is expected to increase by 50 percent. Over the short term this alternative would have no effect on this activity since the number of grouse available could support more hunter days (1,060) than the projected demand would be (850 hunter days--NSCORP 1979). Over the long term, this alternative would have a significant adverse impact on sage grouse hunting since the demand, as projected in the NSCORP, would be greater than the resource (1,650 hunter days versus 1,060 hunter days).

Visitors would be attracted to the proposed wild horse and burro Herd Use Areas, but there would be no impact. The Diamond S Allotment would be an exception. Visitor use there would be high and recreation would be impacted beneficially and significantly. Refer to the Proposed Action-Recreation, Chapter 3 for details.

CONCLUSION

Viewing wild horses would be beneficially impacted at the Diamond S Allotment if facilities to receive visitors were constructed. Hunting would be adversely impacted since available supply would not meet the projected demand. Fishing would have both beneficial impacts (better quality streams) and adverse impacts (inability to meet projected demand). In this area, the beneficial impacts would be greater than the adverse impacts.

WILDERNESS POTENTIAL

Under this alternative elimination of land treatments would be beneficial to the naturalness of the proposed WSAs (Refer to Table 3-16).

ECONOMICS

IMPACT ON THE RANCH SECTOR

The elimination of livestock grazing on public lands would have an immediate adverse impact on the EIS area, one which would continue over the long term. This analysis will focus on the direct impacts of this alternative on the ranch sector, and then will examine the resultant repercussions experienced throughout the remainder of the EIS area economy.

The loss of 152,447 AUMs would leave area permittees remaining in the livestock business with the options of either reducing herd size, or acquiring additional forage. Additional forage could be acquired via the purchase of hay, purchase or lease of additional private acreage, or the intensification of production on currently owned acreage (assuming excess capacity currently exists). Private lands presently owned, leased, or available for leasing would generally not be adequate for maintaining existing herd sizes on a yearlong basis, however, due to the high percentage of land in the EIS area which is under public ownership. Consequently, herd size reduction and/or purchase of additional hay are probably the only feasible options available to most EIS area permittees.

Due to the costs imposed by either of these options, some area operators could be forced out of the livestock industry. No quantification of this group is possible due to the myriad of variables involved. It is likely, however, that those ranches which have employed the most debt financing, exhibit the highest degree of dependency on BLM vegetation, and command the smallest reserves of capital would be most severely affected by this alternative. Many EIS area ranchers have stayed in the livestock business despite relatively low rates of return due to the lifestyle involved. This alternative would force reevaluation of the tradeoff between lifestyle retention and further income reductions (refer to Social Section, Chapter 2). The no grazing alternative would undoubtedly cause some operators to halt their livestock operations, and could cause others to cease their reliance on ranching as a primary source of income.

Results of the computer runs indicate that EIS area herd size (sheep and cattle) would be reduced by 24,750 head, even with the purchase of supplemental hay. The resultant decline in gross livestock sales of $3,648,000 per year would reduce net ranch income by $2,206,000 annually. The reduction as it would impact selected economic characteristics for each ranch class is evidenced in Table 3-20. This reduction in ranch returns would severely reduce area agricultural employment. The decreased returns would lead to a reduction in sectoral employment of 85 persons, 13.3 percent of 1978 agricultural employment.

The elimination of livestock grazing on public lands would seriously affect what had been the most stable element of the Sonoma-Gerlach area economic base. It represents a significant adverse impact to individuals, to the ranching sector, and to the entire EIS area economy.

IMPACT ON RANCHER WEALTH

The elimination of livestock grazing on public lands would remove the full active preference of 152,447 AUMs from current rancher wealth. An average market value of $50 per AUM for Northern Nevada ranches (Falk 1980) means that the wealth of EIS area ranchers would decline by $7,622,350. Although this decline in wealth would occur at implementation it would not be translated into an exchange of dollars until a rancher attempted to borrow money or sell his ranch.

It should be noted, however, that the elimination of all grazing on public lands could provide incentive to borrow, in order to maximize base property productivity (in cases where the rancher is not presently utilizing base property to the fullest extent possible). The no grazing alternative thus may encourage area permittees to borrow, while at the same time inhibiting their ability to do so. These impacts would occur at the time of implementation, and would continue through the long term, representing a significant adverse impact at the individual level.

IMPACT ON THE CONSTRUCTION SECTOR

The elimination of livestock grazing on public lands would carry as a corollary the removal of 275.1 miles of fence. This would facilitate the movements of wildlife, and give greater mobility to wild horse and burro populations as well. At an estimated cost of removal of $3,600 per mile, the total cost of the project would amount to $990,360 (see Table 1-11). Of this, it is estimated that approximately 15 percent would be awarded to EIS area construction firms, so that the total annual increase to construction industry revenue would amount to $18,000 (in terms of 1978 dollars). This figure represents only about half a percent of current construction revenue and would not be large enough stimulus to induce any additional employment.

Adoption of the no grazing alternative would also encourage some fence construction by area ranchers. These fences would be constructed to prevent livestock trespass onto public lands, and to prevent the incursion of wildlife, wild horses and burros onto private land. No estimate of the amount of fence construction that would occur is available, consequently the impacts on the construction industry and local economy are unknown. Although the cost of this fence construction would be borne by private operators, this expense would be offset to some extent by the elimination of the cost of maintenance of livestock support facilities on public lands.

IMPACT ON THE GOVERNMENT SECTOR

The no livestock grazing alternative would result in the loss of six positions within the federal government (estimated by BLM, Winnemucca District Office 1980). This loss, which represents a reduction of three percent of 1978 federal civilian employment in the EIS area, would be a significant adverse impact at the individual level. If the actual loss in government employment exceeded eight employees, this would also be a significantly adverse impact at the sectoral level as previously defined.

IMPACT ON WILDLIFE AND RECREATION

Implementation of the no grazing alternative would have no immediate impacts on wildlife and recreation, since wildlife habitat and populations would not have sufficient time to adjust to specific elements of this alternative.

Over the short term, this alternative would lead to increased numbers of mule deer, antelope, and sage grouse. These increases are expected to induce an additional 673 hunter days to be spent in

TABLE 3-20

CHANGES IN SELECTED RANCH ECONOMIC CHARACTERISTICS
RESULTING FROM THE NO LIVESTOCK GRAZING ALTERNATIVE
SONOMA-GERLACH RESOURCE AREA

Ranch Class/ Time Frame	Change in Herd Size		Change in Gross Revenue		Change in Net Ranch Income		
	Per Ranch	Total	Per Ranch	Total	Per Ranch	Total	Percent Change
Initial thru Long Term							
Small	- 106	- 2,014	- 27,329	- 519,251	- 14,373	- 273,087	-127.2%
Medium - Summer	- 320	- 2,560	- 75,778	- 606,224	- 42,709	- 341,672	-123.1%
Medium - Winter	- 187	- 935	- 37,730	- 188,650	- 30,890	- 154,450	- 82.7%
Large	-1,114	- 8,912	-207,634	-1,661,072	-124,650	- 997,200	-123.2%
Subtotal		-14,421		-2,975,197		-1,766,409	- 86.1%
Sheep	-1,476	-10,332	- 96,137	- 672,959	- 62,780	- 439,460	- 78.1%
Total		-24,753		-3,648,156		-2,205,869	-107.5%

Source: Computer runs, based on ESCS ranch budget information and BLM proposals for this alternative. Ranchers are allowed to buy hay to the point where it becomes economically unprofitable 1980.

the resource area each year. The resultant increase of direct hunter-related expenditures of $11,441 annually would eventually result in total direct and indirect income to EIS area proprietors of $8,724. This increase in income could support the employment of one additional worker, a significant beneficial impact at the individual level.

This situation is projected to continue over the long term (2024), where 695 additional hunter days per year would be spent in the resource area. Direct expenditures of $11,815 (calculated using $17 per hunter day) would result in an annual increase in EIS area income of $9,008. This would continue to support the employment of one additional employee, so that the beneficial impact at the individual level would continue.

IMPACT ON TAX REVENUE

Implementation of the no grazing alternative would eliminate all grazing fee receipts, resulting in a reduction in county tax revenues of $27,535 each year. The reduction of annual indirect area sales would result in an additional reduction in option tax collections of $12,170, so that EIS area tax revenues would decline by a total of $39,705, as evidenced in Table 3-21. Over the short and long terms, the very slight increase in option tax collections due to increased hunting would lead to an overall net reduction of $39,694 per year. This reduction would result in the possible loss of one job from county government, and two overall, a significant adverse impact at the individual level.

The no livestock grazing alternative could also impact tax revenues by initiating changes in land use patterns. Land conversion to uses which are taxed at a higher rate, such as private rangeland converted to alfalfa hay land, would have a beneficial impact on county tax revenues. Conversely, private cropland which was allowed to revert to range would have an adverse impact on EIS area tax revenue.

CUMULATIVE IMPACTS OF THE NO GRAZING ALTERNATIVE

Implementation of the no grazing alternative would reduce direct ranch income by $2,205,869, and would result in the loss of 85 ranch-related jobs. The government sector would experience an income reduction of $90,000 due to the loss of six civil service positions. The slight increase in construction activity would generate no additional positions, so that total area income would decline by about $4.7 million, and total area employment would decline by 164 jobs, 3.1 percent of total 1978 EIS area employment.

This situation would continue pretty much unchanged over the long term. Additional hunting and recreation activity would increase only enough to support one additional position, so that a net short and long-term loss of over 160 jobs would continue. Total area income would be reduced by more than $4.5 million annually. (Refer to Table 3-21 for a summary of cumulative impacts). The no grazing alternative would have a significant adverse impact to individuals, the ranch sector, and the EIS area economy as a whole. This impact would be experienced immediately, and would continue over the long term.

CONCLUSION

At initial implementation this alternative would increase income in the construction sector by $7,330 per year. Income in the government sector would decrease by $90,000 per year (four percent) and employment in the sector would decrease by six positions (three percent). Income earned in the ranching sector would decline by $2.2 million (22 percent) and employment would decline by 85 positions (13.3 percent). Ranchers would also be impacted by the decline in wealth of $5.8 million, 100 percent of the value contributed by BLM AUMs to rancher wealth. County tax revenues would decline by $39,700 per year. The overall impact on the EIS area economy would be a decline in income of $4.7 million per year, seven percent of the 1978 total, and a decline in employment of 164 positions, 3.1 percent of the 1978 total. Significant adverse impacts would occur at the individual and sectoral levels of the livestock industry and the overall impact on the EIS area economy as a whole would be significantly adverse.

These impacts would continue unchanged throughout the long term. Increased hunting and recreational activities would contribute an additional $9,008 to total EIS area income by 2024, offsetting to a very small degree the negative impacts to the other sectors of the economy. One additional position would result from this increase.

SOCIAL CONDITIONS

IMPACTS TO RANCHING COMMUNITY

Impacts from the no livestock grazing alternative would be significantly adverse, with 100 percent of area operators affected by complete loss of BLM grazing privileges. The degree of adverse impact to each permittee would correspond with their dependence on public rangeland for livestock feed. Those operators with grazing privileges in more

TABLE 3-21

SUMMARY OF IMPACTS RESULTING FROM THE NO LIVESTOCK GRAZING ALTERNATIVE SONOMA-GERLACH RESOURCE AREA

	REVENUE			INCOME					EMPLOYMENT				
Affected Interest	Direct	Indirect	Total	Direct	Percentage of 1978 Sectoral Total	Indirect a/	Total	Percentage of 1978 Area Total	Direct	Percent of 1978 Sectoral Total	Indirect	Total	Percent of 1978 Area Total
INITIAL													
Ranch	-3,648,156	-2,526,734	-6,174,890	-2,205,869	-22%	-2,431,088	-4,636,957	- 7%	- 85	-13.3%	-69	-154	- 2.9%
Construction	+ 18,000	+ 2,860	+ 20,860	+ 7,330	< 1%	+ 1,164	+ 8,494	< 1%	0	0	0	0	0
Government	0	0	0	- 90,000	- 4%	- 31,527	- 121,527	< 1%	- 6	- 3%	- 4	- 10	< 1%
Hunting & Recreation	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	-3,630,156	-2,523,874	-6,154,030	-2,288,539		-2,461,451	-4,749,990	- 7%	- 91		-73	-164	- 4.1%
SHORT TERM													
Ranch	-3,648,156	-2,526,734	-6,174,890	-2,205,869	-22%	-2,431,088	-4,636,957	- 7%	- 85	-13,3%	-69	-154	- 2.9%
Construction	+ 18,000	+ 2,860	+ 20,860	+ 7,330	< 1%	+ 1,164	+ 8,494	< 1%	0	0	0	0	0
Government	0	0	0	- 90,000	- 4%	- 31,527	- 121,527	< 1%	- 6	- 3%	- 4	- 10	< 1%
Hunting & Recreation	+ 11,441	+ 2,198	+ 13,639	+ 7,315	< 1%	+ 1,409	+ 8,724	< 1%	+ 1	< 1%	0	+ 1	< 1%
Total	-3,618,715	-2,521,676	-6,140,391	-2,281,224		-2,460,042	-4,741,266	- 7%	- 90		-73	-163	- 3.1%
LONG TERM													
Ranch	-3,648,156	-2,526,734	-6,174,890	-2,205,869	-22%	-2,431,088	-4,636,957	- 7%	- 85	-13.3%	-69	-154	- 2.9%
Construction	0	0	0	0	0	0	0	0	0	0	0	0	0
Government	?	?	?	?	?	?	?	?	?	?	?	?	?
Hunting & Recreation	+ 11,815	+ 2,269	+ 14,084	+ 7,554	< 1%	+ 1,454	+ 9,008	< 1%	+ 1	< 1%	0	+ 1	< 1%
Total	-3,636,341	-2,524,465	-6,160,806	-2,198,315		-2,429,634	-4,627,949	- 7%	- 84		-69	-153	- 2.9%

a/ Sectoral and Area totals were derived from Table 2-15. The impact on the ranch sector is diluted by comparing it to overall agricultural income.

Source: U.S. Department of the Interior, Bureau of Land Management, Winnemucca District, 1980.

than one BLM district may also suffer cumulative losses in AUMs that would affect them more adversely than others. Forty of the 48 livestock operators in the Sonoma-Gerlach Resource Area have more than 10 percent dependence on public rangelands and their operations would be significantly adversely impacted. Possible options include reducing herd size, buying hay, or buying or renting additional pasture. Most ranchers interviewed suggested that because of inflationary prices, low returns on their product, or previously incurred debts, they could not afford to undertake any of these options and they would go out of business.

Adverse social impacts to the ranching community would be similar to those which would occur under the proposed action, though probably more ranchers and their families would be affected. In addition, none of the short or long-term beneficial impacts of the proposed action would be enjoyed by those who are able to survive the proposed reduction in livestock AUMs.

REGIONAL IMPACTS

Since many of planning area operators could find it necessary to go out of business this alternative would have adverse impacts on communities and residents of the area. Social and cultural impacts as well as local antagonisms toward the BLM and excessive government regulations would be similar to those which would occur under the proposed action although these probably would be somewhat more adverse in character. According to the economic analysis the overall impact on the EIS area economy as a whole would be significantly adverse (see Economics Section, Chapter 2) and would continue through the long term.

STATE AND NATIONAL IMPACTS

Of all recreation and wild horse groups interviewed, only one espoused the complete elimination of livestock grazing from public lands. The concern of the remaining groups is improvement of the range conditions to permit multiple use of the public lands. However, improvement in range conditions, water quality, wildlife numbers and habitats as well as fence removals would provide beneficial impacts to conservation, wildlife, and recreation groups by improving aesthetic and recreational experiences on the land. Wild horse and burro protection groups would experience beneficial impacts from horses remaining in their natural environment, fence removals, and improved health and condition of animals. However reductions in animal numbers are considered excessive.

CONCLUSION

Complete loss of BLM grazing privileges by area permittees would result in adverse impacts similar to those which would occur under the proposed action, except more ranchers would be likely to go out of business. Also, no short or long-term beneficial impacts would occur. Regional impacts would also be similar to those which would occur under the proposed action, though more adverse in character.

Wild horse and burro advocates would receive beneficial impacts from horses not being removed from their natural environment, fence removals, and improved condition of animals. However, most group members feel reductions in numbers are too great. Improvements of range conditions, water quality, and wildlife numbers as well as fence removals would provide beneficial impacts to conservation, wildlife and recreation groups.

MAXIMIZING LIVESTOCK ALTERNATIVE

SOILS

This alternative would involve 281,246 acres (5.1 percent of the resource area) of range treatments, which would include seeding, reseeding, sagebrush control, and sagebrush control followed by seeding. Yields on specific treatment sites would increase from the present 0.94 to 1.03 tons/acre/year in the period between initial disturbance and revegetation, normally three to four years. Over the long term and for the last five to six years of the short-term period the sediment yield would decrease to 0.75 tons/acre/year. Sediment yields were determined using Phase I Inventory data of the Watershed Conservation and Development System and the Pacific Southwest Inter-Agency Committee method for estimating sediment yield (Appendix H).

These treatments would result in an average change in sediment yield over the last five to six years of the short-term period and over the long-term period from 1.00 to 0.73 tons/acre/year over the entire resource area (Table 3-1). No yield value exceeds the three to five tons/acre/year tolerable yield set by the Soil Conservation Service (Grant 1973), thus this alternative would have no significant impact on the soil resource.

WATER RESOURCES

Total water consumed annually by livestock, wild horses, and big game under this alternative would be about 237 acre feet (see Table 3-2). Since this amounts to .3 percent of the area's total runoff, the impact of this alternative on the water quantity would be insignificant. Impacts to water quality under this alternative would approximate those outlined for the proposed action.

UNAVOIDABLE ADVERSE IMPACTS

The continued grazing along EIS area streams is expected to cause nine streams to exceed turbidity criteria for cold water aquatic life. Three streams would exceed temperature criteria for cold water aquatic life and four streams would exceed fecal coliform criteria for bathing and water contact sports.

VEGETATION

This alternative differs from the proposed action in the following ways:

1. increase in the amount of acres to be seeded,
2. sagebrush control treatments are proposed,
3. allocation to big game would be to existing numbers,
4. there would be no allocation to wild horses and burros, and
5. all allotments are proposed for intensive management with AMPs and/or revision of existing AMPs (Table 1-14).

ECOLOGICAL RANGE CONDITION AND TREND VEGETATION COMMUNITIES

Projected changes in ecological range condition and trend of vegetation communities in this alternative would be attributed to the same management actions as specified in the proposed action (e.g., implementation of periods-of-use, AMPs, removal of wild horses and burros, allocation of available vegetation to the estimated carrying capacity and range improvements). Refer to this same section in the proposed action for the anticipated beneficial impacts in composition, density, cover, and vigor of rangeland vegetation for this alternative. These management actions woud contribute to a cumulative overall significantly beneficial impact on ecological range condition and trend of vegetation communities in the Sonoma-Gerlach Resource Area. This would result in an overall 11 percent improvement in ecological range condition and an overall 64 percent improvement in ecological range trend.

Land treatments would be carried out on a total of 281,246 acres; 21,290 acres are proposed for sagebrush control, 16,172 acres are proposed for seeding and/or reseeding and 243,784 acres are proposed for sagebrush control then seed. The impacts to ecological range condition from rangeland seedings are anticipated to be the same as those stated in the proposed action. The rangeland seedings would result in a vegetation aspect conversion of approximately six percent (259,956 acres) over the resource area. This would result in a significantly adverse impact on vegetation aspect, ecological range condition, and trend of vegetation communities within the resource area. There are some proposed land treatments within Wilderness Study Areas (WSAs), thus, no construction of these proposed land treatments (see Appendix D, Section 3) could be done until these WSAs are released from wilderness consideration by an Act of Congress. If Congress designates these WSAs (Table 3-16) as wilderness areas then these land treatments could not be accomplished. There are 34,675 acres of proposed land treatments within WSAs. The exclusion of these acres (34,675) within WSAs would result in a total of 246,571 acres proposed for land treatments. The amount of rangeland seedings within WSAs (not including sagebrush controls) are 31,116 acres. The total rangeland seedings proposed represents a vegetation aspect conversion of approximately five percent (228,840 acres) over the resource area. This would result in a significantly adverse impact on vegetation aspect, ecological range condition, and trend of plant communities within the resource area with the exclusion of proposed land treatments within WSAs.

Sagebrush control treatments could facilitate and/or act as an artificial catalyst for secondary succession towards climax vegetation communities, if the species being released by sagebrush removal were the original climax plants. An example would be when sagebrush controls release understory bunchgrasses, and these were the original climax plants, then sagebrush controls would allow these species the opportunity to again achieve climax dominance. Thus, sagebrush controls would benefit ecological range condition only when the species being released were the original climax species. These land treatments (sagebrush control) would act as an artificial catalyst to stimulate vegetation communities held in disclimax status. This would initiate secondary succession to produce a change in the current seral state.

Big sagebrush can be controlled by several different techniques. Spraying herbicides has been the most commonly used practice and is likely to continue as such due to its low cost, predictability, effectiveness, and due to the vast amount of experience gained from the use of spraying in the past.

The herbicide 2,4-D is preferred for sagebrush control, and is thought to have no direct detrimental effect on mammals, birds, and fish in the amounts normally applied on rangelands. However, under certain conditions there can be definite problems.

Pimentel (1971) summarized the research of others on 2,4-D and its adverse impacts on the environment. The research discussed below is from his publication. Keith et al. (1959) found that 2,4-D spraying of mountain rangeland reduced the production of perennial forbs 83 percent and reduced the pocket gopher population 87 percent in one year. The reduction in gopher numbers, however, may have been caused by the depletion of forbs and by nitrate poisoning.

Some plants have been found to develop toxic levels of potassium nitrate after treatment with 2,4-D, even when the dosage was not high enough to kill the plants. Plants found to have levels toxic to cattle include pigweed and lambsquarter (*Chenopodium*), smartweed (*Polygonum*), sugar beets, mustard, Canada thistle, and Russian pigweed (Olson and Whitehead 1940; Stahler and Whitehead 1950; Berg and McElroy 1953; Whitehead et al. 1956). It would be advisable to exclude herbivores from sprayed areas for a time to avoid the possibility of nitrate poisoning.

Forbs are an important part of the diet of certain wildlife species such as antelope, sage grouse, deer (during spring), and cottontail rabbits. This major reduction in forbs, as noted above, can have a considerable impact on these animals, and especially their young when they are dependent upon herbaceous plants as a food source in spring and summer. Laycock (1979), however, reported forbs usually return to former abundance, and sometimes in greater numbers, in 5 to 19 years after spraying. Forbs are most abundant around meadows and water sources which, under Bureau guidelines, would not be sprayed (see Appendix F).

Lundholm (1970), in a rather unusual incident, reported the death of 40 percent of a reindeer herd of 600 head that fed on coniferous vegetation ten months after it was treated in July, 1969 with 2 parts 2,4-D and 1 part 2,4,5-T at a rate of 2.5 pounds per acre. The coniferous leaves were found to contain 25 ppm of 2,4-D and 10 ppm of 2,4,5-T. In addition, the fetuses of 40 of the surviving reindeer were aborted. Perhaps herbicides can be concentrated and stored in plant tissue under certain circumstances.

The 2,4-D does not normally persist in soil, air, and water. Under normal use and at the rates normally applied to rangelands, it lasts in the soil about one month with little or no leaching (Klingman 1961; Sheets and Harris 1965). House et al. (1967) found 2,4-D persisted in water for about the same period as in soil, but significant concentrations (58.8 ppm) were recorded by Smith and Isom (1967) in reservoir sediment samples ten months after treatment. The impact on air quality is expected to be very short term (one day) and very localized when applied in accordance with Bureau guidelines.

Other research (other than than reported by Pimentel 1971, above) reflects the beneficial results that can be expected from brush control with 2,4-D. Control of big sagebrush using 2,4-D, followed by two growing seasons of rest from grazing and proper grazing management thereafter, usually provides beneficial long-term impacts to the livestock, vegetation, and soil resources. Sneva (1972) found a spray project in southeastern Oregon to be productive after 17 years and did not anticipate the need for repeated spraying in the near future. He foresees a long life expectancy for brush control projects in the Great Basin due to the summer droughts which slow brush reestablishment. This contrasts with the more rapid brush invasion in spray areas under the more favorable climatic conditions found in Wyoming by Johnson (1969), where the benefits of spraying were nullified within 14 years of treatment.

Spraying quarter-mile-wide strips and leaving similar unsprayed strips in mule deer use areas may not reduce the treatments' life expectancy as a result of sagebrush invasion from the adjacent untreated strips. Sneva (1972) found seedling sagebrush plants to be the progeny of plants missed at the time of treatment and not the result of invasion from the treatment borders.

Sagebrush invasion of seedings and sprayed areas can be slowed by livestock management. Cattle grazing, even under a rest-rotation system, favors the sagebrush invading the treated area. Dual use (sheep and cattle) or occasional heavy fall or winter use by sheep after spring rest, can be useful in maintaining sagebrush in a state of low vigor and density (Laycock 1979).

In summary, spraying can reduce the number of forbs available to wildlife, produce toxic nitrate concentrations in certain plants, and persist for a short time in water, soil, and air. Persistence is not likely to be a problem due to 2,4-D's short-term nature, especially if the treatment follows Bureau guidelines. The possibility of problems with potassium nitrate poisoning can be avoided by restricting use of sprayed areas by large herbivores, if plants known to accumulate nitrates are present. In any event, spray project areas would be rested two growing seasons to allow key management species the opportunity to fill the niche left by the dead brush. Subsequent use would require management that would maintain grass vigor and production, while reducing re-invasion by sagebrush. The loss of forbs important to certain wildlife species would not be serious in deer use areas where quarter-mile-wide strips are left unsprayed. In addition, forbs may return to their former abundance in a few years.

Vegetation aspect on approximately 470 acres in the short term and 55 acres in the long term would be adversely impacted, due to the construction of livestock support facilities (e.g., springs, wells, pipelines, fences and troughs). These range improvements would adversely impact vegetation aspect, ecological range condition, and trend of plant communities on a small amount of acreage and are not considered significant impacts.

Since the proposed management actions recommended in the proposed action and maximizing livestock use alternative are very similar, projected changes in ecological range condition and trend are very similar. For methodology used in determining changes in ecological range condition see Appendix N, Section 1. Projected summary changes (Table 3-4) in ecological range condition are:

Excellent range condition areas would increase from 226,444 acres presently to 243,264 acres in the long term or a 1 percent increase.

Good range condition areas would increase from 6,061 acres presently to 1,188,854 acres in the long term or a 10 percent increase.

Fair range condition areas would decrease from 1,323,765 acres presently to 1,289,617 acres in the long term or 1 percent decrease.

Poor range condition areas would decrease from 1,959,810 acres presently to 1,534,345 acres in the long term or 10 percent decrease.

Therefore, ecological range condition would significantly improve an overall 11 percent in the resource area. See Appendix N, Section 9, for projected changes in ecological range condition by allotment.

Another significant beneficial impact on vegetation communities would result from the anticipated improvement in ecological range trend. Trend in the upward category would increase from 296,753 acres (7 percent) presently to 828,765 acres (19 percent) in the long term (2024). Trend in the stable category would increase from 1,062,301 acres (25 percent) presently to 3,286,158 acres (77 percent) in the long term. Trend in the downward category would decrease from 2,897,026 acres (68 percent) presently to 141,157 acres (4 percent) in the long term. This would result in an overall 64 percent improvement in ecological range trend of vegetation communities in the Sonoma-Gerlach Resource Area. For methodology used to determine changes in ecological range trend in the long term see Appendix N, Section 2. Appendix N, Section 10, shows expected trend changes by allotment. Table 3-3 summarizes the expected improvement in ecological range trend for this alternative as compared with the current situation.

OTHER IMPORTANT VEGETATION COMMUNITIES

Management actions proposed under this alternative would produce the same impacts to riparian and aspen vegetation communities as discussed under the proposed action. Refer to this section under the proposed action for impacts to riparian and aspen vegetation communities.

VEGETATION PRODUCTION

The impacts and resultant increases in vegetation production from management actions in this alternative are anticipated to be slightly greater than the proposed action due to the increase in intensive management of allotments (Tables 1-2 and 1-15). Refer to the same section in the proposed action for a discussion of anticipated beneficial impacts to vegetation production from the proposed management actions. The projected increases in vegetation production by each management action in this alternative would be as follows (land treatments are discussed in more detail later):

1. reductions in grazing intensity from heavy to moderate, which would increase production by 16,598 AUMs,

2. improvement in vegetation production from implementation and/or revision of existing AMPs for an increase of 5,915 AUMs,

3. improvement of areas currently unsuitable with potential to be suitable through management for an increase in vegetation production of 12,207 AUMs, and

4. development of water sources where the present lack of water makes these areas unsuitable for grazing would increase production by 12,408 AUMs.

These anticipated increases in vegetation production from the management actions would together make a significantly beneficial impact on production, although most individually would be beneficial impacts, but not significant.

Projected future increases would be in part from the proposed development of land treatments in 24 allotments. Present production on the proposed treatment areas varies considerably, ranging from 6 to 50 acres per AUM. It was estimated that production on seeded areas would increase to approximately 3 acres per AUM and production on sagebrush control areas would increase to approximately 7 acres per AUM (based on current surveys of seedings and sagebrush control treatments in the Paradise-Denio Resource Area, Winnemucca District and professional judgement of Sonoma-Gerlach EIS Team Range Conservationist). The proposed land treatments would treat 281,246 acres for an anticipated 74,142 AUM increase in production (Table 1-15). The projected increases by treatment method are:

Sagebrush control (21,290 acres) for a 745 AUM increase in production,

Seed and/or reseed (16,172 acres) for a 3,999 AUM increase in production, and

Sagebrush control then seed (243,784 acres) for a 69,398 AUM increase in production.

The projected increases in vegetation production from the development of land treatments would be a significantly beneficial impact. However, some land treatments are proposed within Wilderness Study Areas (WSAs), thus, no construction of these proposed land treatments (see Appendix D, Section 3) could be done until these WSAs are released from wilderness consideration, by an Act of Congress. If Congress designates these WSAs (Table 3-16) as wilderness areas, then the proposed land treatments could not be accomplished. There are 34,675 acres of proposed land treatments within WSAs that would amount to a projected 8,218 AUM increase in production. This would result in a total of 246,571 acres proposed for land treatments with a projected increase in production of 65,924 AUMs over the current available vegetation. This would represent a 46 percent increase in vegetation production (excluding land treatments within WSAs) in the short term. This would be a significant increase in production. Based on the above discussions, vegetation production would significantly increase an overall 85 percent (121,270 AUMs) in the resource area over the long term.

Vegetation production on approximately 470 acres in the short term would be adversely impacted, due to the construction of livestock support facilities (e.g., springs, wells, pipelines, fences and troughs). In the long term these acres would eventually rehabilitate naturally with exception of approximately 55 acres which would remain in an adverse impact status on vegetation production. Due to the small amount of acres adversely impacted in the short term and long term this is not considered a significant impact on the resource area. Refer to Table 3-6 for changes in allocatable vegetation production for this alternative as compared to other alternatives.

SENSITIVE PLANTS

Management actions proposed under this alternative would produce the same impacts to sensitive plants as discussed under the proposed action. Refer to this same section under the proposed action for details.

CONCLUSION

The most significant long-term impact to the vegetation resource in the Sonoma-Gerlach Resource Area would be the overall 11 percent improvement in ecological range condition. This is anticipated to occur by reversal of a predominately downward trend presently (68 percent) to upward (19 percent) and predominately stable (77 percent) trend in the long term. This would result in an overall 64 percent improvement in ecological range trend.

The increase in vegetation production as a result of this alternative would also be a significantly beneficial impact. The projected increase in vegetation production from land treatments in this alternative (with or without land treatments proposed within Wilderness Study Areas) would be a significantly beneficial impact. Management actions that would increase the available vegetation from the present 143,232 AUMs to 265,673 AUMs (consult Appendix J to balance these figures) include:

1. land treatments on 281,246 acres for an increase in production of 74,142 AUMs (exclusion of land treatments within WSAs wold result in a total of 246,571 acres treated for a projected increase of 65,924 AUMs),

2. reductions in grazing intensity from heavy to moderate, which would increase production by 16,598 AUMs,

3. improvement in vegetation production from implementation and/or revision of existing AMPs for an increase of 5,915 AUMs,

4. improvement of areas currently unsuitable with potential to be suitable through management for an increase in vegetation production of 11,830 AUMs, and

5. development of water sources where the present lack of water makes these areas unsuitable for grazing would increase production by 12,207 AUMs.

Land treatments (sagebrush control then seed) totalling 243,784 acres would cause a conversion of the existing predominately sagebrush types to artifically maintained plant communities of predominately grassland species. Also, 16,172 acres of land treatments (seed and/or reseed) would be converted to artifically maintained plant communities. This represents a vegetation aspect conversion of approximately six percent over the resource area. This would result in a significantly adverse impact on vegetation aspect, ecological range condition, and trend of vegetation communities within the resource area. However, the exclusion of proposed land treatments within WSAs would result in a vegetation aspect conversion on 228,840 acres (five percent) within the resource area. This would result in a significantly adverse impact on vegetation aspect, ecological range condition and trend of plant communities within the resource area with the exclusion of proposed land treatments within WSAs. In addition, 21,290 acres of land treatments (sagebrush control) would have sagebrush overstory reduced and/or eliminated to release desirable understory species. Depending on the vegetation community this may or may not benefit ecological range condition and trend in the resource area.

Approximately 2,000 acres of riparian vegetation would continue to be adversely impacted by livestock grazing. However, the continued degradation would not result in a significant change to vegetation aspect, ecological condition and/or trend of riparian communities. The proposed action would also result in a beneficial impact to vegetation aspect, ecological condition and trend of aspen communities. The improvement to aspen communities would not result in a significant change in vegetation aspect, ecological condition and/or trend of these communities throughout the long-term.

SHORT-TERM USE VERSUS LONG-TERM PRODUCTIVITY

Some short-term declines and long-term benefits in the vegetation resource would be expected to result from this alternative. Reductions in livestock, wild horses and burros in the first five yers after the final grazing decision is issued, and implementing periods-of-use, would reduce grazing pressures on many allotments. A further temporary grazing reduction would result in allotments that have land treatments proposed, due to the required two full years growing season rest. The temporary reduction would result in allotments that have land treatments proposed, due to the required two full years growing season rest. The temporary reduction would result through cooperative nonuse agreements with livestock operators before land treatments would be implemented. After allotment management plans have been implemented and have been in operation for several cycles and vegetation has reached full production in land treatments and rehabilitated around management facilities, then vegetation diversity, quality, vigor, and density of key management species would be expected to increase. Productivity is projected to increase in the long term (2024) by 120,893 AUMs, or 84 percent of the present available vegetation.

UNAVOIDABLE ADVERSE IMPACTS

The continued non-significant degradation of 2,000 acres of riparian vegetation adversely impacted by grazing, even though it might be minimized by grazing systems providing rest periods, is considered an unavoidable adverse impact. This direct impact would continue as long as grazing is allowed on riparian areas. A short-term disturbance of the vegetation aspect on 281,246 acres, as a result of land treatments would be another unavoidable adverse impact. Another unavoidable adverse impact would be a short-term disturbance of vegetation aspect and vegetation production on 470 acres from implementation of livestock support facilities which would result in 55 acres remaining disturbed in the long term. A long-term loss of regaining ecological climax in the 259,956 acres proposed for artificial seeding treatments and/or with the exclusion of proposed land treatments within WSAs, would result in 228,840 acres lost in regaining ecological climax.

LIVESTOCK GRAZING

In this alternative the initial allocation (1982) would adjust the livestock AUMs upward from the three to five-year average livestock licensed use for a net increase of 13,645 AUMs (116,551 to 130,196 AUMs). This represents a 12 percent increase of available livestock AUMs in the initial allocation over the three to five-year average livestock licensed use. This adjustment would result from an increase of 34,097 AUMs on 11 allotments and a decrease of 20,452 AUMs on 27 allotments (Table 1-14). The adjustment would be a significantly beneficial impact on livestock grazing in the resource area as a whole (see Table 3-7). However, the downward adjustments would have a significant adverse impact on livestock grazing in 23 allotments. This is because the downward adjustments in these allotments would be significantly below the three to five-year average livestock licensed use. The initial allocation would result in a significantly beneficial impact to livestock grazing in 11 allotments from upward adjustments to the average livestock licensed use.

The short term (1991) would adjust the livestock AUMs upward from the three to five-year average livestock licensed use for a net estimated increase of 100,195 AUMs (116,551 to 216,746 AUMs). Refer to Chapter 3, Vegetation Production for AUM increases in this alternative. This represents an 86 percent estimated increase of available livestock AUMs in the short term over the three to five-year average livestock licensed use. This adjustment would result from an estimated increase of 106,929 AUMs on 25 allotments and an estimated decrease of 6,734 AUMs on 13 allotments (Table 1-15). This estimated adjustment would be a significant beneficial impact on livestock grazing in the resource area as a whole. The downward adjustments would have a significant adverse impact on livestock grazing in 11 allotments. These adverse impacts would result from significant downward adjustments below the three to five-year average livestock licensed use. The short term adjustment in AUMs would result in a significantly beneficial impact to livestock grazing in 23 allotments from upward adjustments to the average livestock licensed use.

The anticipated increases in vegetation production (AUMs) are projected using land treatments proposed within WSAs. As specified in the Vegetation Production Section of the Maximizing Livestock Use Alternative (Chapter 3), these land treatments (Appendix D, Section 3) would not be constructed until Congress acts on the designation or release of the proposed WSAs. This would result in 8,218 AUMs projected increase unavailable to livestock grazing. Thus, the adjusted increase in AUMs would be 91,977 AUMs (79 percent increase over the three to five-year average livestock licensed use). The adjusted increase in available livestock AUMs would also be a significantly beneficial impact to livestock grazing in the resource area.

The long term (2024) would adjust the livestock AUMs upward from the three to five-year average livestock licensed use for a net estimated increase of 134,915 AUMs (116,551 to 251,466 AUMs). Refer to Chapter 3, Vegetation Production for AUM increases in this alternative. This represents a 116 percent increase of 137,239 AUMs on 31 allotments and an estimated decrease of 2,324 AUMs on 7 allotments (Table 1-15). This estimated adjustment would be a significant beneficial impact on livestock grazing in the resource area as a whole. However, the estimated downward adjustments would have a significant adverse impact on livestock grazing in five allotments. These adverse impacts would result from significant downward adjustments below the average use. However, the long-term adjustments in AUMs would result in a significantly beneficial impact to livestock grazing in 31 allotments from upward adjustments to the average livestock licensed used. Refer to the Economics and Social Conditions sections of this chapter for a more detailed discussion of impacts to the ranching sector from this alternative.

Establishment of the proposed periods-of-use would result in significant adverse impacts to livestock grazing throughout the short term (1991), however, these adverse impacts would not be considered significant after the short term. Refer to the proposed action for discussion of these adverse impacts on livestock grazing. The exception would be that in this alternative all allotments would be designated for implementation of AMPs, thus the adverse impacts from the establishment of proposed periods-of-use would be reduced when AMPs were implemented.

It is assumed that upon final implementation of AMPs and the increased amount of land treatments proposed in this alternative the calf or lamb crop, weaning weights, and wool production would increase with the increase in vegetation production. This increase in vegetation production would result from low producing range being seeded and/or control of brush to create higher producing rangeland which would provide more nutritious forage for livestock consumption. Refer to Chapter 3, proposed action for projected increase and discussion of impacts to livestock production.

The adverse impact from an increased workload on livestock permittees from implementation of AMPs and associated livestock support facilities and land treatments would slightly increase over the proposed action. This would be due to the increased amount of AMPs, livestock support facilities, and land treatments. Refer to the Economics Section for a more detailed discussion of impacts on the ranching sector for this alternative.

CONCLUSION

In summary the initial, short-term, and long-term livestock use adjustments would result in a significantly beneficial impact on livestock grazing in the Sonoma-Gerlach Resource Area (with or without projected AUM increases in land treatments proposed within WSAs). However, the downward adjustments would result in a significantly adverse impact on livestock grazing in 23 allotments for the initial allocation, 11 allotments in the short term, and 5 allotments in the long term. The upward adjustments would result in a significantly beneficial impact on livestock grazing in 11 allotments for the initial allocation, 23 allotments in the short term, and 31 allotments in the long term. All other impacts to livestock grazing would be the same as those described under the proposed action.

SHORT-TERM USE VERSUS LONG-TERM PRODUCTIVITY

Refer to the proposed action for a discussion on short-term use versus long-term productivity.

UNAVOIDABLE ADVERSE IMPACTS

These adverse impacts would be the same as those described under the proposed action.

WILDLIFE

Impacts to wildlife under this alternative would be similar to those which would occur under the proposed action, with the exception of those listed below.

BIG GAME

Mule Deer

The vegetation allocation under this alternative would have similar impacts on mule deer habitat as it would under the proposed action. Reduction in grazing use from high to moderate levels would bring about increases in total herbage production, meaning improved habitat conditions. This would be a significant beneficial impact on mule deer habitat. Mule deer populations would be affected somewhat differently under this alternative, as compared to the proposed action. The vegetation allocation under this alternative would be to existing mule deer numbers in each allotment, rather than to reasonable deer numbers, as under the proposed action. The effect of this allocation would be to cause mule deer populations to stabilize at existing levels (except as affected by land treatments) rather than at reasonable number levels.

Table 3-9 lists existing deer populations in each allotment. Improved habitat conditions and the allocation to existing numbers would result in long-term populations that would average those listed levels, with the following exceptions, caused by land treatments.

Land treatments under this alternative would be more extensive than under the proposed action. Additional acreages of deer habitat in the Soldier Meadows and Buffalo Hills allotments would be treated. The impacts of such treatments were discussed under the proposed action. Because of land treatments, the deer population level in Soldiers Meadows Allotment would decline from 249 head to 199 head; in Buffalo Hills Allotment, from 2,093 head to 2,020 head; in Sonoma Allotment, from 13 head to 6 head; and in Clear Creek Allotment, from 17 head to 14 head. This would result in a long-term average population level of 3,796 deer in the resource area, as opposed to a long-term population level of 3,888 under the proposed action. Populations would average at or about reasonable number levels over the long term in 23 allotments (significant beneficial impact) and below that level in 13 allotments (significant adverse impact).

Antelope

Antelope habitat would improve in condition under the vegetation allocation program under this alternative. Consumptive use of the vegetation resource would be reduced to moderate levels, resulting in increased herbage production, which would be increased forage and cover for antelope. This would be a significant beneficial impact on antelope habitat.

While antelope habitat would improve significantly under this alternative, vegetation would be allocated only to existing antelope populations, rather than to reasonable numbers. Existing populations (516) are only 53 percent of reasonable number levels (971). This allocation would inhibit future population growth, causing antelope populations to maintain average population sizes at existing levels (Table 3-9), except as affected by other aspects of this alternative, specifically land treatments. This would be a significant adverse impact since reasonable number levels would not be attained, either in the resource area or in any allotment.

Land treatments would have significantly greater adverse impacts on antelope under this alternative than under the proposed action. Additional acreages treated in Soldier Meadows and Buffalo Hills allotments would result in loss of habitat for 53 additional antelope (19 in Soldier Meadows, 34 in Buffalo Hills). This would bring to 100 the number of antelope lost to land treatments under this alternative, as opposed to 47 under the proposed action. This would be a significant adverse impact, since it would increase the amount by which populations would fail to reach reasonable numbers.

Implementation of this alternative would result in long-term antelope populations averaging 416 head, as opposed to 940 under the proposed action.

Bighorn Sheep

The reduced grazing pressure which would exist under this alternative would allow vegetation production increases which would improve bighorn sheep habitat. This would be a significant beneficial impact. However, allocation of vegetation to existing rather than reasonable numbers would prevent future reintroductions of bighorn sheep, and would prevent the existing population from reaching reasonable numbers. This population consists of 6 animals, and would not expand beyond perhaps 50 animals in the long term. This expansion would occur only because this habitat area is in good condition, and because much of it is inaccessible to livestock. This would be a significant adverse impact because of the failure to attain reasonable numbers in any allotment.

UPLAND GAME

Sage Grouse

The upland range improvements that would result from implementation of this alternative would represent improvements in upland sage grouse habitat, and would be a significant beneficial impact. However, riparian meadows would continue to decline in condition, which would be a significant adverse impact. The improved upland habitat condition would lessen the degree of reliance on meadows by sage grouse, but there would still be a strong dependence on meadows which would lessen the degree of population expansion under this alternative.

Additional land treatments would occur under this alternative. These additional treatments would occur within sage grouse range, and while there are no known strutting grounds within these areas, the treatments would reduce the quality of the grouse habitat in the areas, a significantly adverse impact, and thus reduce grouse populations somewhat. The sage grouse population in the resource area would increase an average of only 20 percent under this alternative, as opposed to 30 percent under the proposed action.

OTHER WILDLIFE

Impacts to other wildlife under this alternative would be similar to those described under the proposed action, except that the treatment of additional acreages of land would have significant adverse impacts on wildlife populations in the additional areas.

CONCLUSION

Big game habitat would improve significantly under this alternative, but the vegetation allocation and land treatments would have significant adverse impacts on big game populations, preventing them from reaching reasonable numbers. Mule deer would reach and maintain population levels at or above reasonable numbers in 23 allotments, but would be below reasonable numbers in the resource area, as would antelope and bighorn sheep. Table 3-10 gives short and long-term population levels for all alternatives. Sage grouse habitat and populations would improve significantly under this alternative.

AQUATIC HABITAT

The maximizing livestock alternative would result in a continued stable or downward trend on 90 percent or 9 protectable streams in the EIS area which are in fair or poor condition (Table 3-11 and Appendix Q). The impacts would be the same as those outlined under the proposed action.

Unavoidable Adverse Impacts

Under this alternative 90 percent or 9 protectable streams would be maintained in fair or poor condition. This would be an unavoidable adverse impact.

WILD HORSES AND BURROS

Under this alternative wild horses and burros would be totally removed. The impacts to wild horses and burros would be significantly adverse, as there would be no wild horses or burros in the resource area. Refer to the proposed action, Chapter 3, for a detailed description of the impacts to wild horses and burros with respect to capture, removal of an entire herd, and herd viability.

CONCLUSION

Wild horses and burros would be significantly adversely impacted due to their total removal from the resource area.

VISUAL RESOURCES

This alternative would be similar to the proposed action except that an additional four water troughs, 12 miles of fence, and a cattleguard are proposed. Additional proposals are 13,672 acres for sagebrush control and seed, 21,290 acres for sagebrush control, and 1,420 acres for seeding and reseeding.

While the troughs, fences and cattleguards would not normally affect the visual resources, the amount of impact, if any, can only be determined by site specific examinations. Reference to Chapter 3 Proposed Action, Visual Resources Section, may be made for a more detailed discussion.

All of the 21,290 acres proposed for sagebrush control are in a Class IV area and would probably not have an adverse impact on the visual resources. Five hundred and sixty acres of the proposed sagebrush control and seeding are in a Class II area and 1,430 acres are in a Class III area. These have the potential to create adverse impacts, as do the 480 acres of seed and reseed that are located in a Class III area.

CONCLUSION

Impacts would be similar to the proposed action. Five hundred and sixty acres of Class II land and 1,910 acres of Class III land have the potential to be impacted by seedings and sagebrush control. These acreages could exceed the visual resource contrast ratings, thus causing an adverse impact.

CULTURAL RESOURCES

Adverse impacts would be the same as under the proposed action, except that long-term livestock trampling damage would occur at an increased rate. Also, there would be additional potential impacts from fencelines, burning, spraying, and seeding (see Table 3-22 and Appendix M, Section 2). A total of 105 known sites could be impacted by these support facilities. No cultural resource sites listed on the *National Register of Historic Places* would be adversely impacted by this alternative.

RECREATION

This alternative would have severely detrimental impacts on hunting, wild horse viewing, and fishing. A decrease in wild animal allocations can be expected to cause a decrease in animal numbers in this case. The demand for hunting tags already exceeds the resource by approximately 2 to 1 (see Proposed Action-Chapter 3, Recreation). This would be highly detrimental to the hunters.

Sage grouse hunting would increase by approximately 20 percent. There would be no short term impacts and a significant adverse impact in the long term. The rationale is the same as that in the proposed action, even though the percentages would be different.

People who enjoy the viewing of wild horses and burros would not be able to see any. By dropping to no use at all, this activity would be significantly adversely impacted. Fishing would be detrimentally impacted in the same manner as was mentioned in the Proposed Action-Chapter 3, Recreation Section.

CONCLUSION

Hunting, due to inadequate habitat, would be adversely impacted. Since wild horses would be removed, the activity of viewing them would be adversely impacted. The quality of a number of fishable streams would be downgraded, having a detrimental effect on fishing.

WILDERNESS POTENTIAL

Of the land treatments proposed under this alternative, those vegetation manipulations of seeding, sagebrush control, and burnings would create visual impacts upon the proposed Wilderness Study Areas (WSAs). Line, color, form and texture changes caused by seedings, sagebrush control and burning create maximum contrasts in relation to the surrounding landscape of the areas. Such contrasts are substantially noticeable, distracting from the naturalness of the areas and indicating the permanent presence of man. All three types of land treatments would be so apparent that the proposed WSAs wilderness suitability would be adversely impaired.

SUMMARY

Land treatments would significantly adversely impact 9 of the 11 areas recommended for WSAs (Table 3-16). The nine WSAs are located within seven grazing allotments: Blue Wing, Buffalo Hills, Goldbanks, Leadville, Rodeo Creek, Soldier Meadows and South Buffalo (see Chapter 1, Range Facilities and Land Treatments Map and Chapter 2, Proposed Wilderness Study Area Map for locations).

MITIGATING MEASURES

Compliance with the Interim Management Policy and Guidelines Regulations for Lands Under Wilderness Review prevents the proposed land treatments from occurring within the potential Wilderness Study Areas. Such action prevents the impairment of a WSAs wilderness suitability.

CONCLUSION

As no land treatments would be permitted, no adverse impacts would occur to the WSAs to impair their wilderness suitability.

TABLE 3-22

IMPACTS OF MAXIMIZING LIVESTOCK ALTERNATIVE RANGE PROJECTS
ON KNOWN CULTURAL RESOURCE SITES AND ARCHEOLOGICALLY SENSITIVE AREAS
SONOMA-GERLACH RESOURCE AREA

Range Project Type	Known Cultural Resource Sites						Archeologically Sensitive Areas		
	Open Aboriginal	Isolated Finds and Small Sites	Historic	Historic Trails	Rock Shelters	Antiquity Observations	Percent of Project in Archeologically Sensitive Areas	Miles, Acres or Numbers of Sites in Archeologically Sensitive Areas	Total Project Miles, Acres or Number
Fences	9	5	3	6	3	1	5.55%	22.18 miles	411.0 miles
Cattleguards	0	0	2	3	0	0	22.22%	4	19
Spring Developments	0	0	0	0	0	0	100.00%	8	8
Pipelines	0	0	0	0	0	0	9.67%	1.5 miles	15.5 miles
Water Troughs	0	0	0	0	0	0	0%	0	106
Wells and Windmills	0	1	0	1	0	0	0%	0	44
Sagebrush Control	2	0	0	0	2	0	6.8%	1,453 acres	21,290 acres
Sagebrush Control Then Seed	41	12	6	1	2	4	8.1%	19,855 acres	243,784 acres
Seed and/or Reseed	0	1	0	0	0	0	4.95%	800 acres	16,172 acres
TOTALS	52	19	11	11	7	5			

Source: U.S. Department of Interior, Bureau of Land Management, Winnemucca District, Sonoma-Gerlach Unit Resource Analysis, 1979 and Sonoma-Gerlach Management Framework Plan, 1980

ECONOMICS

IMPACT ON THE RANCH SECTOR

Economic impacts of the maximizing livestock alternative would be similar to the proposed action. Although the initial allocation to livestock would be 13,645 AUMs (12 percent) above current three to five year average licensed use, period-of-use restrictions would result in adverse economic impacts to the ranching sector (refer to the proposed action for a detailed discussion of the effects of proposed period-of-use changes). Results of the computer runs indicate that current base property forage sources would be insufficient to support existing herds during periods when public range would be closed to grazing. The computer model allowed area ranchers the options of responding to this alternative with herd size reduction and/or purchase of hay, both of which act to reduce net ranch income (see Table 3-23).

At the time of implementation, net ranch income would decline by approximately $1.1 million, causing a job loss in the agricultural sector of 31 positions, 4.9 percent of 1978 sectoral employment. These declines would indirectly effect a decline in total area income of $2.3 million, and would ultimately result in the loss of 56 positions within the EIS area economy, 1.1 percent of total area employment (see Table 3-24). This alternative would thus have a significant adverse economic impact at the individual and sectoral levels at the point of implementation.

Over the short term (1991), this situation would remain much the same. Increasing AUM allocations (100,195 AUMs, 86 percent above current licensed use) would moderate the loss in net ranch income somewhat, but the negative impact of period-of-use restrictions would continue to constrain herd size (and therefore gross livestock sales). Net ranch income would remain only 51 percent of current levels, with a loss of 21 ranch-related jobs (3.3 percent of 1978 sectoral employment). Overall impacts on the area economy would be a decline from current net income of $2.1 million, and a corresponding job loss of 38 positions. These impacts would be significant and adverse at the individual level.

By 2024, increased calf and lamb crops and weaning weights would combine with additional AUM allocations to generate additional revenue within the ranching sector. Four of the five ranch classes (all except the large class, which is discussed below) would experience increases in net income totalling $245,714 annually. This income would derive from increased gross livestock sales totalling $843,367, an impact which could generate additional employment for as many as 20 additional workers within these ranch classes. Over the long term, then, the adverse impacts at the time of implementation would be transformed into beneficial impacts which would be significant at the individual level for these four ranch classes.

Long-term impacts on large ranches are much more difficult to quantify. This difficulty may be attributed to the severity of the initial impacts on large ranchers, and to the static production function relationships assumed in the computer model. Initially, large ranches are forced to reduce herd size by over 50 percent in response to period-of-use restrictions. The resultant decline in gross revenue results in net annual losses. While these losses could force some large operators from the industry, it is likely that other large operators would have the resources available to undertake an immediate expansion and intensification of base property forage sources. By 2024, large EIS area ranches would doubtless have introduced major alterations into their operations.

These alternations cannot be accounted for in the computer model. The only option which it allowed area ranchers to take in response to period-of-use restrictions was hay purchase. Results of the computer runs indicate that large ranches would expand herd size dramatically over the long-term (1,949 head), utilizing large hay purchases during periods when livestock would be supported on base property. While net ranch income increased slightly over initial and short-term levels, it remained more than 90 percent below current levels. The inability of the model to predict alterations in large ranch operations thus leads to results which would probably never be realized.

It is more likely that those large ranches which remain in the industry would have incorporated alterations which by 2024 would allow them to earn rates of return at least comparable to other ranches in the EIS area. This would mean that net ranch income would exceed current levels by about 20 percent or $20,000 annually. Overall, ranch sector income would be $408,000 per year above current levels. An increase in gross livestock sales of $1.3 million would create 32 direct employment opportunities within the sector, 5.0 percent of 1978 sectoral employment. Total impacts on the EIS area economy would be an increase in gross revenue of $2.3 million, resulting in a total income increase of $858,000 annually. Additional employment opportunities totalling 57 jobs would be created in the area economy (see Table 3-24). This would represent a significant beneficial impact at the individual and sectoral levels.

TABLE 3-23

CHANGE IN SELECTED RANCH ECONOMIC CHARACTERISTICS
MAXIMIZE LIVESTOCK ALTERNATIVE
SONOMA-GERLACH RESOURCE AREA

	Change in Herd Size		Change in Gross Revenue		Change in Net Ranch Income		
	Per Ranch	Total	Per Ranch	Total	Per Ranch	Total	Percent Change
Initial Implementation							
Small	- 19	- 361	- 4,799	- 91,181	- 2,392	- 45,448	- 21.2%
Medium-Summer	- 32	- 256	- 8,142	- 65,136	- 14,060	- 112,480	- 40.5%
Medium-Winter	0	0	0	0	- 9,574	- 47,870	- 25.6%
Large	-772	-6,176	-143,860	-1,150,880	- 110,084	- 880,672	-108.8%
Subtotal		-6,793		-1,291,197		-1,086,510	- 52.9%
Sheep	0	0	0	0	- 3,671	- 25,697	- 4.6%
Total		-6,793		-1,307,197		-1,112,207	- 54.2%
Short Term							
Small	+ 31	+ 589	+ 7,983	+ 151,677	+ 641	+ 12,179	+ 5.6%
Medium-Summer	+ 59	+ 472	+ 13,219	+ 105,752	- 8,986	- 71,888	- 25.9%
Medium-Winter	0	0	0	0	- 9,057	- 45,285	- 24.2%
Large	-772	-6,176	-143,860	-1,150,880	- 110,084	- 880,672	-108.8%
Subtotal		-5,115		- 893,451		- 985,666	- 48.0%
Sheep	0	0	0	0	- 3,671	- 25,697	- 4.6%
Total		-5,115		- 893,451		-1,011,363	- 49.0%
Long Term							
Small	+ 47	+ 893	+ 15,387	+ 292,353	+ 4,734	+ 89,946	+ 41.9%
Medium-Summer	+139	+1,112	+ 45,955	+ 367,640	+ 5,422	+ 43,376	+ 15.6%
Medium-Winter	0	0	+ 10,366	+ 51,830	+ 1,309	+ 6,545	+ 3.5%
Large	+317	+2,535	+ 64,000	+ 512,000	+ 20,238	+ 161,899	+ 20.0%
Subtotal		+4,540		+1,223,823		+ 301,766	+ 14.7%
Sheep	0	0	+ 18,792	+ 131,544	+ 15,121	+ 105,847	+ 18.8%
Total		+4,540		+1,355,367		+ 407,613	+ 19.9%

Source: U.S. Department of the Interior, Bureau of Land Mangement, Winnemucca District Office 1980.

TABLE 3-24

SUMMARY OF IMPACTS RESULTING FROM THE MAXIMIZE LIVESTOCK ALTERNATIVE SONOMA-GERLACH RESOURCE AREA

	REVENUE			INCOME					EMPLOYMENT				
Affected Interest	Direct	Indirect	Total	Direct	Percentage of 1978 Sectoral Total a/	Indirect	Total	Percentage of 1978 Area Total	Direct	Percent of 1978 Sectoral Total	Indirect	Total	Percent of 1978 Area Total
Initial Implementation													
Ranching	-1,307,000	- 905,000	-2,212,000	-1,112,000	-10.9%	-1,226,000	-2,338,000	- 3.6%	- 31	- 4.9%	- 25	- 56	- 1.1%
Construction	+ 310,000	+ 60,000	+ 370,000	+ 126,000	+ 2.5%	+ 32,000	+ 158,000	< 1%	+ 7	+ 2.7%	+ 2	+ 9	+ .2%
Government	-	-	-	+ 105,000	+ 4.2%	+ 37,000	+ 142,000	< 1%	+ 7	+ 3.6%	+ 5	+ 12	+ .2%
Hunting & Recreation	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	- 997,000	- 845,000	-1,842,000	- 881,000		-1,157,000	-2,038,000	- 3.1%	- 17		- 18	- 35	- .7%
Short Term													
Ranching	- 893,000	- 618,000	-1,511,000	-1,011,000	- 9.9%	-1,114,000	-2,125,000	- 3.2%	- 21	- 3.3%	- 17	- 38	- .7%
Construction	+ 310,000	+ 60,000	+ 370,000	+ 126,000	+ 2.5%	+ 32,000	+ 158,000	< 1%	+ 7	+ 2.7%	+ 2	+ 9	+ .2%
Government	0	0	0	+ 105,000	+ 4.2%	+ 37,000	+ 142,000	< 1%	+ 7	+ 3.6%	+ 5	+ 12	+ .2%
Hunting & Recreation	0	0	0	0	0	0	0	0	0	0	0	0	
TOTAL	- 583,000	- 558,000	-1,141,000	- 780,000		-1,045,000	-1,825,000	- 2.8%	- 7		- 10	- 17	- .3%
Long Term													
Ranching b/	+1,355,000	+ 938,000	+2,293,000	+ 408,000	+ 4.0%	+ 450,000	+ 858,000	+ 1.3%	+ 32	+ 5.0%	+ 25	+ 57	+ 1.1%
Construction	0	0	0	0	0	0	0	0	0	0	0	0	0
Government	?	?	?	?	?	?	?	0	?	?	?	?	0
Hunting & Recreation	+ 1,000	0	+ 1,000	+ 1,000	< 1%	0	+ 1,000	< 1%	0	0	0	0	0
TOTAL	+1,356,000	+ 938,000	+2,294,000	+ 409,000		+ 450,000	+ 859,000	+ 1.3%	+ 32		+ 25	+ 57	+ 1.1%

a/ Sectoral and Area totals derived from Table 2-15. Percentage Impact on the ranch sector appears small due to the use of overall agricultural income as a base.

b/ Long term ranching impacts include projections, rather than computer run results, for the large ranch class.

Source: U.S. Department of the Interior, Bureau of Land Management, Winnemucca District Office 1980.

IMPACTS ON RANCHER WEALTH

At the time of implementation, the maximizing livestock alternative would allocate 130,196 AUMs to livestock. This represents a reduction of 22,251 AUMs below current active preference, and would result in a reduction in rancher wealth of $1,112,550 (assuming a market value of $50 per AUM). The decreased allocation thus constitutes a significant adverse impact.

Over the short term, the projected range recovery would allow an allocation to livestock of 216,746 AUMs. This represents an increase of 64,299 AUMs above current active preference, an occurrence which would increase rancher wealth above the existing level by $3,214,950. By 2024, the increase of 99,019 AUMs would increase rancher wealth by an additional $1,736,000, so that the total rancher wealth would rise $4,950,950 above existing levels. The adverse impact at the time of implementation would thus be transformed into a significant beneficial impact over the long term. These fluctuations in rancher wealth would not be experienced as actual monetary losses or gains, however, unless a rancher attempted to borrow money, or lease or sell the ranch.

It must be noted that the foregoing analysis may overstate the magnitude of this impact to a degree. Review of local realtors indicates that the resale value of area ranches is based to some extent on animal unit carrying capacity. This carrying capacity may be constrained by limited base property or other privately-owned resources, particularly in light of proposed period-of-use restrictions. In cases where area ranchers already operate near capacity during periods when livestock must be supported on base property, the allocation of additional AUMs may be superfluous. This effect could moderate to some unknown degree the beneficial impacts on rancher wealth discussed previously.

IMPACTS ON THE CONSTRUCTION SECTOR

The AMPs recommended by the maximizing livestock alternative would require the construction of additional livestock support facilities. These facilities, with the exception of spring developments, pipelines and troughs, would be built primarily by private contractors via a competitive bidding process. The total cost of these facilities, excluding the water developments mentioned above, is estimated at $17,522,620 as detailed in Table 1-13. If current trends continue, approximately 15 percent of this construction would be awarded to firms based within the EIS area (personal communication, Bob Carroll, Chief, Division of Operations, BLM Winnemucca District Office 1980).

Assuming that funding and manpower would be available support facilities would be constructed during the seven year period from 1982 to 1989. If the construction activity is distributed evenly through the period, additional revenue amounting to $310,150 per year (in terms of 1978 dollars) would accrue to local construction firms. This increase in direct revenue would produce additional total income to proprietors and employees of construction firms of $126,000 annually, 2.5 percent of 1978 construction sectoral income. This additional income to the construction sector would provide employment for seven additional workers, 2.7 percent of 1978 employment within the industry. This impact represents a significant beneficial impact at the individual level.

Since the proposed construction of support facilities would be completed by 1989, no long-term variation in revenue, income or employment is anticipated. While this implies the layoff of the additional construction workers, it is likely that continued growth within the construction sector would have incorporated some or all of them into the labor force permanently by 1989.

IMPACTS ON THE GOVERNMENT SECTOR

The impacts on the government sector would be identical to the proposed action for the maximizing livestock alternative. The 3.6 percent increase required in federal civilian employment would be a significant beneficial economic impact at the individual level.

IMPACTS ON WILDLIFE AND RECREATION

Wildlife populations (particularly mule deer and antelope) would be maintained at or near existing numbers under the maximizing livestock alternative. This minimizes any impacts on hunting and recreation generally throughout the resource area. Over the short term, for example, a decline of only 10 hunter days per year is projected. This would result in only minimal impacts to the area economy; it would not affect current employment levels, and would not be considered a significant impact.

Over the long term, hunter days spent in the resource area are anticipated to increase by approximately 41 days per year due to the 20 percent rise in sage grouse numbers. The increased expenditures of $697 per year would act to increase total area income by roughly $500 annually, an insignificant impact at the levels previously defined.

IMPACTS ON TAX REVENUE

Initially, this alternative would allocate 17,279 AUMs more than the three to five year average licensed use, however period-of-use impacts would reduce the AUMs used by ranchers to 59,000 AUMs less than the three to five year average use. This reduction would reduce county government revenues by $14,000 per year. Option tax receipts would decline by $4,525 annually. When the two impacts are combined they result in an overall reduction to government revenues of about $19,000 per year, 0.2 percent of the total resources available to EIS area county governments in 1979. This change would not cause any reduction in employment and therefore would not be considered significant. Neither the short or long-term impacts to tax revenues would result in a change in employment and therefore would also not be significant.

CUMULATIVE IMPACTS OF THE MAXIMIZING LIVESTOCK ALTERNATIVE

At the time of implementation, this alternative would result in a decline in net ranch income of $1,112,000. This decline would be partially offset by increased activity within the construction and government sectors, so that direct area income would decline by $881,000. Overall area income would decline by approximately $2 million (3.6 percent), resulting in the loss of 35 jobs within the EIS area economy, or 0.7 percent. When implemented, this alternative would have a significant adverse impact at the individual and sectoral levels.

Over the short term, these impacts would be slightly mitigated by improved range condition. Total area income is still projected to be reduced by $1.8 million, however, with a continued loss of 17 jobs. While the impacts would be less severely felt within the EIS area economy, they still represent significant adverse impacts at the individual level.

Over the long term, increased ranch sector activity would be augmented by a slight increase in hunting and recreational activity, so that total EIS area revenue would rise by $2,294,000. Total area income would rise by $859,000 annually, 1.3 percent of 1978 EIS area income, and 67 additional employment opportunities would result. The adverse impacts which would occur through the short term would be negated, so that this alternative would have a significant beneficial impact at individual, sectoral and areawide levels by 2024.

CONCLUSION

At initial implementation this alternative would increase income in the construction sector by $126,000 per year (2.5 percent) and employment in the sector by seven positions, 2.7 percent of the 1978 level. Income in the government sector would increase by $105,000 per year (4.2 percent) and employment in the sector would increase by seven positions or 3.6 percent. Income earned in the ranching sector would decline by $1.1 million (10.9 percent) and employment would decline by 31 positions or 4.9 percent. Ranchers would also be impacted by the decline in wealth of $1,112,550, 19 percent of the value contributed by BLM AUMs to rancher wealth. County tax revenues would decline by $19,000 per year, .2 percent of total resources available to Humboldt and Pershing County governments in fiscal year 1979. The overall impact on the EIS area economy would be a decline in income of $2.1 million per year, 3.2 percent of the 1978 total, and a decline in employment of 35 positions, roughly one percent of the 1978 total. Significant beneficial impacts would occur at the individual level in the construction and government sectors. Significant adverse impacts would occur at the individual and sectoral levels of the livestock industry and the overall impact on the EIS area economy as a whole would be significantly adverse.

In the short term the impacts of this alternative would be identical to the initial implementation for the construction and government sectors. The short-term impact to the ranching sector would be a slight improvement from the initial implementation, but income would remain $1.0 million per year (10.2 percent) below the 1978 levels, while employment would remain 21 positions (3.3 percent) below the 1978 level. Rancher wealth would increase by $3.2 million, 54.9 percent above the 1978 level. The overall impact on the EIS area economy would be a decline in income of $1.8 million per year (2.6 percent) and a decline in employment of 17 positions, 0.3 percent of the 1978 level. Significant beneficial impacts would occur at the individual level in the construction, and government sectors, while significant adverse impacts would occur at the individual level within the livestock industry. The overall impact to the economy, while adverse, does not exceed the one percent change in employment previously defined in the thresholds section.

In the long term the construction sector would no longer be affected, while impacts to the government sector are unknown. Income within the trade and service sector would rise by only $1,000. Impacts to the ranching sector would represent substantial improvements from both the short term and existing levels. Income in the ranch sector would increase by $408,000 per year (4.0 percent) while employment would increase by 32 positions, 5.0 percent of the 1978 level. Rancher wealth would increase by $4.9 million, 85 percent of the value currently contributed by BLM AUMs. The overall impacts to the EIS area economy would include an increase in income of $0.9 million per year, 1.4 percent, and an increase in employment of 67 positions, 1.3 percent of the 1978 level. In the long term there would be no significant adverse impacts, while significant beneficial impacts would occur at the individual level to the trade and services sectors and at the individual and sectoral level to the ranching industry. The overall impact to the EIS area economy would also be significantly beneficial.

SOCIAL CONDITIONS

IMPACTS TO RANCHING COMMUNITY

Although short and long-term increases in livestock AUMs would have beneficial impacts on ranchers, they would experience the same difficulties in coping with the initial changes in periods-of-use as they would under the proposed action. Also, although there would be an overall initial increase in livestock AUMs from average three to five year use, many ranchers would receive reductions. However, these reductions would be fewer and less drastic than those which would occur under the proposed action. Those ranchers who are able to compensate for the proposed changes in periods-of-use and cope with reductions if they have them, would receive beneficial impacts from enhancement of their quality of life and the satisfaction of being able to continue to pursue their accustomed occupation and lifestyle. Also, the complete removal of wild horses would beneficially impact these ranchers as it would eliminate the problems they currently have with them. Ranchers who could not financially bear these changes in period-of-use and/or reductions would suffer adverse impacts similar to those which would occur under the proposed action. Maximum development of range improvements would be favored by all ranchers if not accompanied by changes in periods-of-use or reductions.

REGIONAL IMPACTS

Impacts to communities and the residents of area would be similar to those which would occur under the proposed action. Intensity of impacts would be somewhat less due to slightly fewer reductions in livestock AUMs. According to economic analysis the overall impact to the EIS area would be significantly adverse initially, adverse in the short term and significantly beneficial in the long term (Economics Section, Chapter 3).

STATE AND NATIONAL IMPACTS

This alternative is considered completely unacceptable (as well as illegal) by wild horse and burro protection associations because it would entail the complete removal of all wild horses and burros from the public lands. Adverse impacts would be suffered by the members of these groups through the loss of the satisfaction they experience from knowing that these animals are running free in their natural environment, from the loss of opportunities to view these animals in their natural environment, and the deprivation of the pleasure they experience from knowing that what they consider to be a part of our heritage is being preserved for future generations.

Impacts to conservation, wildlife, and recreation groups would be similar to those which would occur under the proposed action, although slightly more adverse in character. Perceptual, recreational, and viewing experiences would be more adversely impacted due to greater reductions in mule deer, antelope, and bighorn sheep, cancellations of reintroductions of bighorn sheep and elimination of wild horses and burros. In addition, representatives of these groups oppose this alternative because they do not believe that livestock should be given priority in land use planning.

Conclusion

Impacts to the ranching community would be similar to those which would occur under the proposed action except that initial livestock AUM reductions would be fewer and less drastic and short and long-term benefits to ranchers' operations and quality of life would be greater. Also, problems with wild horses would be eliminated. Regional impacts would be similar to those identified in the proposed action. Impacts to wild horse groups would be extremely adverse as all horses would be removed from public lands. Impacts to conservation, recreation, and wildlife groups would be similar to those which would occur under the proposed action, only more adverse.

MAXIMIZING WILD HORSES AND BURROS ALTERNATIVE

SOILS

This impact would be similar to the no livestock grazing alternative with the exception that 244,864 acres (4 percent of the resource area) would be reseeded. Sediment yield on this treatment would increase from the present 0.94 to 1.03 tons/acre/year over the period between the initial disturbance and revegetation, normally three to four years. Sediment yield on the treatment site would be reduced to 0.74 tons/acre/year approximately four to five years after implementation. Sediment yields were determined using Phase I Inventory data of the Watershed Conservation and Development System and the Pacific Southwest Inter-Agency Committee method for estimating sediment yield (Appendix H).

The sediment yield over the entire resource area would decrease over the last five to six years of the short-term period and over the long-term period from 1.00 to 0.90 tons/acre/year (Table 3-1). All sediment yield values would be less than the tolerable three to five tons/acre/year sediment yield as established by the Soil Conservation Service (Grant 1973). This alternative therefore would have no significant impact on the soil resource.

WATER RESOURCES

This alternative would result in the consumption of about 167 acre feet of water annually by livestock, wild horses, and big game (see Table 3-2). This would amount to .02 percent of the total runoff from the resource area, which is not considered a significant impact on the water quantity. This action would approximate the water quality effects of the proposed action.

UNAVOIDABLE ADVERSE IMPACTS

The continued grazing along the EIS area streams is expected to cause nine streams to exceed turbidity criteria for cold water aquatic life. Three streams would exceed temperature criteria for cold water aquatic life and four streams would exceed fecal coliform criteria for bathing and water contact sports.

VEGETATION

This alternative would be a combination of portions of the proposed action and the no livestock grazing alternative. The wild horse and burro allocations in herd use and herd management areas would be similar to those found in the no livestock grazing alternative. Allocations to livestock, on the other hand, would parallel those in the proposed action, except in allotments used by wild horses and burros. Big game allocations would be the same as found in the proposed action.

In this alternative there are allotments not recommended for wild horse or burro use. The proposed management actions for these allotments are the same as the proposed action, thus all impacts to the vegetation resource are considered the same as the proposed action. Refer to the Vegetation Section of the Proposed Action, Chapter 3 for impacts on the vegetation resource for the following 21 allotments: Clear Creek, Coal Canyon - Poker, Coyote, Desert Queen, Dolly Hayden, Harmony, Humboldt House, Humboldt Sink, Licking, Majuba, Melody, North Buffalo, Prince Royal, Ragged Top, Rawhide, Rock Creek, Rye Patch, Sonoma, Star Peak, Thomas Creek, White Horse.

The following impact analysis concerns only those allotments not listed above. However, all acreage summaries include all the allotments in the resource area, so comparison of alternatives can be accomplished.

ECOLOGICAL RANGE CONDITION AND TREND OF VEGETATION COMMUNITIES

Changes in ecological range condition and trend of vegetation communities, as a result of this alternative would be attributed to changes in composition, density, cover, and vigor of rangeland vegetation. Management actions that would bring about improvements in ecological range condition and trend of vegetation communities would be the allocation of the vegetation resource at the estimated carrying capacity and in some allotments management through Allotment Management Plans (AMPs) with grazing systems. These management actions would result in a beneficial overall four percent improvement in ecological range condition and a significant overall 55 percent improvement in ecological range trend of vegetation communities in the Sonoma-Gerlach Resource Area. These management actions and their resultant impacts to ecological range condition and trend of vegetation communities are discussed below by herd management areas and herd use areas.

There are four wild horse and burro herd management areas (see Chapter 1) proposed in this alternative. Wild horse and burro populations would be maintained in combination with big game at levels consistent with and/or below the estimated carrying capacity (available vegetation, Table 1-18).

Three allotments (Pole Canyon, Rodeo Creek and Diamond S) would not have AMPs, but would be managed under herd management areas without livestock grazing. However, the Buffalo Hills Allotment would have two separate herd management areas where there would be no livestock grazing, and the remaining portions of the allotment managed under an AMP for livestock and big game grazing.

Reduction in numbers in herd management areas would result in reduced grazing pressure on the vegetation resource from a heavy to moderate grazing intensity. Refer to the ecological range condition and trend portion of the proposed action for the anticipated benefits to climax vegetation communities expected from reductions in grazing intensity. To recapitulate, a reduction in grazing intensity would promote improved range condition, through increased compositon, cover, density, and vigor of key management species. However, the improvement to ecological range condition would not be as great as expected in the proposed action because these areas would continue to be grazed year-round with rest periods based solely on seasonal use of areas by big game, wild horses and burros.

Based on the above discussion the reduction in grazing intensity from heavy to moderate would facilitate an increase in plant vigor, which would result in an increase in the percent composition of desirable species in plant communities. This would have a beneficial impact on ecological range condition and trend of vegetation communities within the resource area. Thus, the reduction in grazing intensity would contribute to the beneficial impact of an overall 4 percent improvement in ecological range condition and an overall significantly beneficial impact of a 55 percent improvement in ecological range trend of vegetation communities in the resource area.

In addition, there are 10 wild horse and burro herd use areas (see Chapter 1) proposed in this alternative. Livestock and big game would graze the herd use areas in numbers that, together with wild horse and burro numbers, would equal the estimated carrying capacity (available vegetation, Table 1-18). In this recommendation 11 allotments would be managed through implementation of new Allotment Management Plans and/or revision of existing Allotment Management Plans (Blue Wing, Seven Troughs, Calico, Goldbanks, Klondike, Leadville, Pleasant Valley, Pumpernickel, Rochester, Soldier Meadows and South Buffalo). These areas would have a reduction in grazing intensity from heavy to moderate, thus benefiting ecological range condition and trend of vegetation communities as stated in the previous paragraph. Also, these allotments would be managed with AMPs and associated grazing systems that would normally benefit ecological range condition and trend. Refer to ecological range condition and trend portion of the proposed action for benefits to ecological range condition and trend from grazing systems. However, the anticipated beneficial impacts would not fully be realized from grazing systems because of the year-round wild horse and burro grazing. Year-round wild horse and burro grazing would prevent key management species from receiving periodic rest from grazing pressure. This would defeat the primary purpose of a grazing system, by allowing continuous grazing throughout the critical growing period of key management species.

The improvement in vigor and percent composition of desirable species resulting from grazing systems would facilitate the dominance of these species in plant communities, thus aiding the secondary succession towards climax. The anticipated beneficial impacts to ecological range condition and trend of vegetation communities from grazing systems would contribute to the beneficial impact of an overall 4 percent improvement in ecological range condition and the significantly beneficial improvement of 55 percent in ecological range trend of vegetation communities within the resource area.

Within the herd use areas two allotments (Cottonwood Canyon and Jersey Valley) are recommended for no AMPs, with allocations of the vegetation resource made to big game, livestock, wild horses and burros. The only benefit to ecological range condition and trend would be from the reduction in grazing intensity as stated above. Beneficial impacts from grazing systems and periodic rest during the critical growth period would not be realized by vegetation in these allotments, due to the year-round grazing use by wild horses and burros. Refer to the proposed action (ecological range condition and trend) for a discussion of the impacts from land treatments on ecological range condition and trend. Since the land treatments in this alternative would be the same recommended in the proposed action (MFP Step 2), this would result in a vegetation aspect conversion of approximately six percent (the exclusion of proposed land treatments within WSAs would result in a five percent conversion of the vegetation aspect) over the resource area. This would result in a significantly adverse impact on ecological range condition and trend of vegetation communities within the resource area.

Ecological range condition and trend of vegetation communities on approximately 749 acres in the short term would be adversely impacted, due to the construction of livestock support facilities (e.g., springs, wells, pipelines, fences, and troughs). In the long term these acres would eventually rehabilitate naturally with exception of approximately 70 acres, which would remain in an adverse impact status to ecological range condition and trend of vegetation communities. However, due to the small amount of acres adversely impacted in the short and long term this was not considered a significant impact on vegetation communities.

Projected summary changes (Table 3-4) in ecological range condition are:

Excellent range condition areas would increase from 226,444 acres presently to 232,876 acres in the long term or less than 1 percent increase,

Good range condition areas would increase from 746,061 acres presently to 940,095 acres in the long term or a 4 percent increase,

Fair range condition areas would decrease from 1,323,765 acres presently to 1,313,352 acres in the long term or less than 1 percent decrease,

Poor range condition areas would decrease from 1,959,810 acres presently to 1,769,757 acres in the long term or a 4 percent decrease.

Therefore, ecological range condition would improve an overall four percent in the resource area which would be a beneficial impact but not a significant improvement. For methodology used in determining changes in ecological range condition see Appendix N, Section 1. For changes in ecological range condition by allotment see Appendix N, Section 11.

A significant long-term beneficial impact would result to ecological range trend from the implementation of this alternative. The trend summary (Table 3-3) indicates improvements anticipated by year 2024. Trend in the upward category would increase from 296,753 acres (7 percent) presently to 384,021 acres (9 percent) in the long term. Trend in the stable category would increase from 1,062,301 acres (25 percent) presently to 3,333,985 acres (78 percent) in the long term. Trend in the downward category would decrease from 2,897,026 acres (68 percent) presently to 538,074 acres (13 percent) in the long term. This represents an overall significant improvement of 55 percent in ecological range trend. For methodology used to determine changes in ecological range trend in the long term see Appendix N, Section 2. Appendix N, Section 12, shows expected trend changes by allotment.

OTHER IMPORTANT VEGETATION COMMUNITIES

Impacts on the riparian and aspen communities would be similar to those discussed under the proposed action for allotments where livestock or livestock, wild horse and burro use occurs (herd use areas). Refer to the proposed action for a discussion of impacts to riparian and aspen vegetation communities. In general, livestock would continue to impact riparian areas by congregating in and overgrazing these areas. In allotments with AMPs the adverse impact from the livestock grazing on riparian areas would not be as severe as the allotments where no AMPs are proposed. Livestock grazing would continue to adversely impact aspen communities in non-AMP allotments, however in those allotments proposed for AMPs, the aspen communities would be maintained and/or slightly improved from the benefits of grazing systems.

Based on the above discussion it was assumed that where livestock grazing continues, riparian vegetation would continue to be adversely impacted, because these animals would congregate on riparian zones. Aspen communities in allotments managed under AMPs would be maintained and/or slightly improved; however, in non-AMP allotments aspen communities would continue to degrade in condition.

Impacts on riparian and aspen communities would be similar to those discussed in the no livestock grazing alternative for wild horse and burro use in herd management areas. Refer to the no livestock grazing alternative for a discussion of impacts to riparian and aspen vegetation communities in herd management areas. In general, wild horse and burro grazing in herd management areas would result in beneficial impacts, since these animals do not concentrate in riparian and aspen communities, as do livestock. The adverse and/or beneficial impacts discussed above on riparian and aspen communities would not result in a significant change to the vegetation aspect, ecological range condition and trend of these communities throughout the long term. This improvement or degradation would not reach the threshold (five percent) change in vegetation aspect, ecological condition and/or trend, hence, these impacts would not be considered significant.

VEGETATION PRODUCTION

Improvements in vegetation production would be similar to those expected for the proposed action. Refer to the vegetation production portion of the proposed action for details on anticipated increases. The increase in vegetation production would result from water developments (12,408 AUMs), land treatments on 244,864 acres (69,612 AUMs) (refer to the proposed action for a discussion of the impacts from land treatments proposed within wilderness study areas), improvement through management systems (5,825 AUMs), improvement through reduction in grazing intensity (22,483 AUMs), and from areas unsuitable with potential to be suitable through management (12,207 AUMs), for an overall increase in vegetation production of 122,535 AUMs or an 85 percent increase. This would result in a significantly beneficial impact on vegetation production in the resource area.

Vegetation on approximately 749 acres in the short term would be adversely impacted, due to the construction of livestock support facilities (e.g., springs, wells, pipelines, fences, and troughs). In the long term these acres would eventually rehabilitate naturally with exception of approximately 70 acres which would remain in an adverse impact status on vegetation production. Due to the small amount of acres adversely impacted in the short term and long term this is not considered a significant impact on the resource area. Table 3-6 compares changes in allocable vegetation production (AUMs) for each alternative and for each time period.

SENSITIVE PLANTS

Refer to the proposed action and no livestock grazing alternative for a discussion of possible impacts to sensitive plants.

CONCLUSION

Ecological range condition would improve an overall four percent in the resource area, which would not be considered significant however, it would be a beneficial impact on vegetation communities. The most significant long-term impact to the vegetation resource in the Sonoma-Gerlach Resource Area would be the reversal of a predominately downward trend (68 percent presently) to predominately stable (78 percent) and upward (9 percent) trend. This would result in an overall 55 percent change in the vegetation resource towards a stable and upward ecological range trend.

Vegetation production would improve significantly, due to an anticipated increase of 85 percent (122,535 AUMs) over the available vegetation. Refer to the proposed action for a discussion of the impact of land treatments proposed within wilderness study areas. In summary, the management actions that would increase the available vegetation from the present 143,989 AUMs to 265,763 AUMs (consult Appendix J, to balance these figures) include:

1. land treatments on 244,864 acres for an increase in production of 69,612 AUMs (exclusion of land treatments within WSAs would result in a total of 226,358 acres treated for a projected increase of 64,603 AUMs);

2. reductions in grazing intensity from heavy to moderate, which would increase production by 22,483 AUMs,

3. improvement in vegetation production from implementation and/or revision of existing AMPs for an increase of 5,825 AUMs,

4. improvement of areas currently unsuitable with potential to be suitable through management for an increase in vegetation production of 12,207 AUMs,

5. development of water sources where the present lack of water makes these areas unsuitable for grazing would increase production by 12,408 AUMs.

Riparian vegetation would continue to be adversely impacted where livestock grazing is continued. Aspen communities would benefit in allotments managed under AMPs and continue to degrade in allotments not managed with AMPs that have livestock grazing. Herd management areas would benefit both riparian and aspen communities because wild horse and burros do not concentrate in these communities (field observations by District personnel). The adverse and/or beneficial impacts discussed above on riparian and aspen communities would not result in a significant change to the vegetation aspect, ecological condition and/or trend of these communities in the long term. Sensitive plants would benefit in herd management areas and in allotments managed under AMPs.

SHORT-TERM USE VERSUS LONG-TERM PRODUCTIVITY

See the proposed action for a discussion of short-term use and long-term productivity. It is anticipated that the reduction in short-term use would facilitate the improvement in long-term productivity by increasing vegetation production an 85 percent or 122,535 AUMs.

UNAVOIDABLE ADVERSE IMPACTS

The non-significant degradation of the riparian communities would continue where livestock graze, due to concentration in, and overgrazing of riparian zones. Aspen communities in non-AMP allotments would continue to degrade but not significantly from livestock overgrazing of reproductive root suckers.

The short-term disturbance of vegetation aspect on 244,864 acres from implementation of land treatments and 749 acres from construction of support facilities would be unavoidable in order to obtain the desired increase in vegetation production. In the long term 70 acres would remain in a disturbed state as a result of the support facilities. A long-term loss of regaining ecological climax would occur on the 244,864 acres proposed for artificial seeding treatments; however, with the exclusion of proposed land treatments within WSAs, a total of 226,358 acres would be lost in regaining ecological climax.

LIVESTOCK GRAZING

This alternative would initially (1982) adjust the livestock AUMs downward from the three to five year average livestock licensed use for a net decrease of 21,544 AUMs (116,551 to 95,007 AUMs). This represents an 18 percent decrease of available livestock AUMs from the three to five year average livestock licensed use. Refer to Chapter 3, Vegetation Production section for this alternative. This adjustment would result from an increase of 16,229 AUMs on 9 allotments, a decrease of 37,773 AUMs on 28 allotments, and no change in livestock AUMs in 1 allotment (Table 1-18).

This allocation would be a significantly adverse impact on livestock grazing in the resource area as a whole (see Table 3-7). Livestock grazing in 25 allotments would be directly impacted because of the downward adjustments in these allotments. However, the initial allocation would result in a significantly beneficial impact to livestock grazing in seven allotments from upward adjustments to the average livestock licensed use.

The long term (2024) would adjust the livestock AUMs upward from the three to five-year average livestock licensed use for a net estimated increase of 65,541 AUMs (116,551 to 182,092 AUMs). This represents a 56 percent estimated increase in available livestock AUMs in the long term over the three to five year average livestock licensed use. Refer to Chapter 3, Vegetation Production section for this alternative. This adjustment would result from an estimated increase of 78,824 AUMs on 23 allotments and an estimated decrease of 13,283 AUMs on 15 allotments (Table 1-19).

This adjustment would be a significantly beneficial impact on livestock grazing in the resource area. However, the downward adjustments would have a significant adverse impact on livestock grazing in 13 allotments. The long-term adjustment in AUMs would result in a significantly beneficial impact to livestock grazing in 21 allotments from upward adjustments to the average livestock licensed use.

The anticipated increase in vegetation production (AUMs) are projected using land treatments proposed within WSAs. As specified in the vegetation production section of the proposed action (Chapter 3), these land treatments (Appendix C, Section 3) could not be constructed until Congress acts on the designation or release of the proposed WSAs. This would result in 5,009 AUMs projected increase unavailable to livestock grazing. Thus, the adjusted increase in AUMs would be 60,532 AUMs (52 percent increase over the three to five year average livestock licensed use). The adjusted increase in available livestock AUMs would also be a significantly beneficial impact to livestock grazing in the resource area.

In the initial allocation (1982) this alternative would completely eliminate livestock grazing in three allotments. In the long term (2024) this alternative would completely eliminate livestock grazing in four allotments. This would be a significant adverse impact to livestock grazing in these allotments. These permittees could be forced to find alternate sources of livestock feed, reduce their herd size to capacity of their private land, and/or go out of the livestock business.

Establishment of the proposed periods-of-use would result in significant adverse impacts to the livestock grazing throughout the short term (1991), however, these adverse impacts would not be considered significant after the short term. Refer to the proposed action for a discussion of these adverse impacts on livestock grazing. Percent calf and lamb crop, weaning weights, and increased workload would be the same as the proposed action. The elimination and/or minimization of administrative problems would be the same as the proposed action. Refer to the Economics Section of this chapter for a more detailed discussion of impacts from this alternative.

CONCLUSION

The initial allocation (1982) would have a significantly adverse impact on livestock grazing in the resource area due to an 18 percent decrease in available livestock AUMs. This would have a significant adverse impact on livestock grazing in 25 allotments with downward adjustments. However, the initial allocation would result in a significantly beneficial impact to livestock grazing in seven allotments from upward adjustments to the average livestock licensed use. The long-term allocation (2024) would have a significantly beneficial impact on livestock grazing in the resource area due to the 56 percent increase in available livestock AUMs (eliminating proposed land treatments within WSAs would result in a 52 percent increase in available livestock AUMs). However, the downward adjustments in 13 allotments would have a significantly adverse impact on livestock grazing in these allotments. The long-term adjustments in AUMs would result in a significantly beneficial impact to livestock grazing in 21 allotments from upward adjustments to the average livestock licensed use.

SHORT-TERM USE VERSUS LONG-TERM PRODUCTIVITY

A reduction in livestock use in the short term would benefit increased long-term livestock productivity. Refer to the proposed action for a more detailed discussion.

UNAVOIDABLE ADVERSE IMPACTS

Those livestock permittees that graze livestock in allotments that would be adjusted downward by greater than 10 percent and/or graze livestock in allotments that have been totally designated as wild horse and burro herd management areas, could be forced to either sell out, find additional sources of feed, or reduce their livestock operations.

WILDLIFE

Under this alternative, wild horses and burros would be removed from checkerboard land areas, would share the range with livestock and big game in 10 herd use areas (HUAs), and would have 4 herd management areas (HMAs) established for them wherein there would be no livestock grazing, but big game would be present.

BIG GAME

Vegetation allocations under this alternative would cover full reasonable numbers of big game animals, including proposed reintroductions of bighorn sheep and antelope. Proposed periods-of-use would apply to livestock, but wild horses and burros would continue to use the vegetation resource yearlong.

Overall vegetation production in the resource area would increase under this alternative, because consumptive use of vegetation would be reduced to a moderate level (see Vegetation Section, Chapter 3). However, livestock and wild horses and burros would continue to make use of aspen groves, riparian sites, and upland meadows. As under the proposed action, these sites would stabilize or perhaps improve slightly in condition, but riparian areas would continue to decline in condition.

Land treatments as described in the proposed action would be implemented under this alternative and would have the same impacts on big game habitat and population.

The allocation of vegetation to reasonable numbers of big game animals, and the reduction of grazing use to moderate levels would allow habitat improvements to occur that would represent significant beneficial impacts. This habitat improvement would allow big game populations to attain and then maintain population levels equivalent to reasonable numbers except as affected by other aspects of the alternative. These other aspects would affect big game populations in the same manner as they would under the proposed action. Long term populations of deer and antelope would average 3,888 and 940 head respectively, because of land treatments in their habitat; bighorn sheep would be held to a long-term population level not exceeding 845 head because of adverse influences of allotment management plans (increased livestock densities, increased human presence, fences).

UPLAND GAME

Sage Grouse

Sage grouse habitat would be significantly beneficially impacted by the increased upland herbage production brought about by reduced stocking rates, as this would mean increased amounts of forbs for spring and summer forage. This would also benefit grouse populations.

However, riparian meadow habitat, needed for brood rearing during hot summer months, would not improve significantly. This would offset some of the benefits derived from improved upland herbage production. Overall, sage grouse populations would undergo average population increases of perhaps 30 percent under this alternative.

OTHER WILDLIFE

Impacts to other game and nongame wildlife habitat in the HUAs would be mixed. Those habitats in upland areas would be significantly beneficially impacted by the increased herbage production. This is because the increased production would mean increased habitat diversity.

There would be little or no impact on aspen groves or meadows, as these habitats would remain in their existing condition. Riparian habitats would be adversely impacted, as many riparian sites could continue to decline due to continued livestock use.

CONCLUSION

Implementation of this alternative would impact wildlife habitats and species in the same manner as would the proposed action. Table 3-10 indicates short and long-term big game species populations under this alternative. The habitat improvements allowed by the vegetation allocation program would allow significant big game habitat improvements, which would allow big game species to attain and then maintain average population levels equivalent to reasonable numbers in all allotments except as indicated in Table 3-8. Sage grouse would undergo average population increases of 30 percent due to habitat improvements.

AQUATIC HABITAT

The effects of the maximizing wild horse and burro alternative would approximate the proposed action in every way except that the habitat condition of Red Mountain Creek which is located in the Granite Range Herd Management Area would improve. Wild horses do not linger along the stream and cause damage as do cattle (Table 3-11 and Appendix Q).

UNAVOIDABLE ADVERSE IMPACTS

Under this alternative 80 percent or 8 protectable streams would be maintained in fair or poor condition. This would be an unavoidable adverse impact.

WILD HORSES AND BURROS

Under this alternative wild horses and burros would be removed from areas of checkerboard land and areas where wild horse and burro numbers exceed estimated carrying capacity. Management of horses and burros on intermingled private and public land is not feasible. Also a majority of the operators involved have requested that the horses and burros be removed from their private land (reference Winnemucca District files). Wild horse and burro numbers on the remaining 15 areas would be reduced to estimated carrying capacity (2,044) (reference Wild Horse and Burro Use Area Map). The Kamma Mountains herd use area would have the animals totally removed since there is not grazing capacity for livestock, wild horses or burros. This reduction would increase the health and condition of the remaining animals and result in a healthier population, and would therefore be a beneficial impact on the herds (see Chapter 3 Proposed Action for Wild Horse Section). It is assumed that the impacts to wild horses and burros with respect to capture, removal of an entire herd, and herd viability would be the same as those described in the proposed action.

Over the long term, vegetation available to horses and burros would increase to 66,802 AUMs (5,566 horses and burros), a significantly beneficial increase over the long term when considering total horse and burro numbers. Refer to Table 1-19 for increase in vegetation available to wild horses and burros by allotment.

On the 15 areas where horses and burros would be reduced to estimated carrying capacity, four are Herd Management Areas where no livestock grazing would be allowed. These areas are Buffalo Hills, Button Point, Granite Mountains and Rodeo Creek. The remaining Herd Use Areas -- Augusta Mountains, Black Rock West, Blue Wing Mountains, Calico Mountains, Kamma Mountains, Lava Beds, Nightingale Mountains, Selenite Range, Stillwater Range, Tobin Range, and Warm Springs Cănyon -- would not have an allocation to livestock, but livestock would not be excluded from the areas. Refer to Table 2-12 for the allotments involved with these areas. Fences within the Herd Management Areas would be removed to allow unrestricted movement within the area.

CONCLUSION

Horse and burro numbers would be reduced to estimated carrying capacity on four Herd Management Areas and ten Herd Use Areas. This would beneficially impact the remaining horses and burros by increasing their health and condition. Increased vegetation over the long term would allow horse and burro numbers to rise from 2,044 to 5,566--a significantly beneficial impact. The threshold for changes is a measure of the horse numbers to be removed in order to reach carrying capacity of the range. If it is necessary to reduce horses by more than 50 percent to reach estimated carrying capacity there is an adverse impact. If a necessary reduction is 50 percent or less there is a beneficial impact.

VISUAL RESOURCES

This alternative would be similar to the proposed action except that an additional 293 miles of fence would be built and 32 miles of fence would be removed. While this range improvement (new fences) would not normally affect the visual resources, the amount of impact, if any, can only be determined by site specific examinations. Reference to the Chapter 3, Proposed Action, Visual Resources Section, may be made for a more detailed discussion. The removal of 32 miles of fence would be expected to have a beneficial impact on the visual resources.

CONCLUSION

Impacts would be similar to the proposed action; new fences are not expected to create an impact and the removal of fences would be beneficial.

CULTURAL RESOURCES

The impacts of trampling to cultural resource sites would be reduced initially under this alternative due to the reduction of both cattle and wild horses. As vegetation cover increased, the livestock and wild horses and burros would be allowed to expand according to the carrying capacity and impacts on cultural resource sites would increase. This would be a cumulative effect. Increased vegetation cover resulting from grazing management would reduce erosion impacts to cultural resource sites. Impacts from range facilities would be the same as under the proposed action, except that there would be reduced impacts from spraying, plowing and seeding. Miles of fencelines would be increased however (see Table 3-25). A total of 125 known cultural resource sites could be affected by range facilities. No cultural resource sites listed on the *National Register of Historic Places* would be adversely impacted by this alternative.

RECREATION

The impacts of this alternative would be varied, depending on the recreation activity. For viewing wild horses they would be beneficial and for hunting and fishing they would be detrimental. With the emphasis on an increase in horse numbers, an increase in visitor use to the HMAs and HUAs could be expected. It is estimated that 1,500 visitor days a year would be actively spent viewing wild horses throughout the resource area except for the Diamond S Allotment. Recreation in this allotment would be very benefically impacted. Thousands of visitor days a year could be spent there if the proper facilities and interpretative devices were built. Refer to the Proposed Action-Chapter 3-Recreation Section for additional discussion.

Big game would be managed for reasonable numbers and this would preclude a large number of people from obtaining a big game tag. This impact would be significantly adverse. Further discussion can be found in the Proposed Action-Chapter 3-Recreation Section.

The change in the sage grouse numbers would be the same as that listed in the proposed action. The impacts would also be the same. There would be no impact in the short term and a significant adverse impact in the long term.

Fishing would be significantly detrimentally impacted. The Proposed Action-Chapter 3-Recreation Section contains a discussion of it.

CONCLUSION

Viewing wild horses would be beneficially impacted with the construction of recreation facilities at the Diamond S Allotment. Hunting and fishing would be adversely impacted because the projected demand would greatly exceed the available supply.

WILDERNESS POTENTIAL

The land treatments with vegetation manipulations of sagebrush control proposed under this alternative would create visual impacts upon the proposed Wilderness Study Areas (WSAs). Line, color, form, and texture changes caused by sagebrush control creates maximum contrasts in relation to the surrounding landscape of the areas. Such contrasts are substantially noticeable, distracting from the naturalness of the areas and indicating the permanent presence of man. The proposed land treatments would be so apparent that the recommended WSAs wilderness suitability would be adversely impaired.

SUMMARY

Land treatments would significantly adversely impact 7 of the 11 areas recommended for WSAs (Table 3-16). The seven WSAs are located within seven grazing allotments: Blue Wing, Buffalo Hills, Goldbanks, Leadville, Rodeo Creek, Soldier Meadows and South Buffalo (see Chapter 1, Range Facilities and Land Treatments Map and Chapter 2, Proposed Wilderness Study Area Map for locations).

MITIGATING MEASURES

Compliance of the Interim Management Policy and Guidelines Regulations for Lands Under Wilderness Review prevents the proposed land treatments from occurring within the potential Wilderness Study Areas. Such action prevents the impairment of a WSAs wilderness suitability.

TABLE 3-25
IMPACTS OF MAXIMIZING WILD HORSE AND BURRO RANGE PROJECTS ON KNOWN CULTURAL RESOURCE SITES AND ARCHEOLOGICALLY SENSITIVE AREAS SONOMA-GERLACH RESOURCE AREA

Range Project Type	Known Cultural Resource Sites						Archeologically Sensitive Areas		
	Open Aboriginal	Isolated Finds and Small Sites	Historic	Historic Trails	Rock Shelters	Antiquity Observations	Percent of Project in Archeologically Sensitive Areas	Miles, Acres, or Numbers of Sites in Archeologically Sensitive Areas	Total Projects Miles, Acres, or Number
Fences	20	17	4	8	3	2	1.08%	7.5 miles	692.0 miles
Fence Removal	0	0	0	0	0	0	0%	0	31.9 miles
Cattleguards	0	0	1	3	0	0	22.22%	4	18
Spring Developments	0	0	0	0	0	0	100.00%	8.0	8.0
Pipelines	0	0	0	0	0	0	9.67%	1.5 miles	15.5 miles
Water Troughs	0	0	0	0	0	0	0%	0	102
Wells and Windmills	0	1	0	1	0	0	0%	0	42
Sagebrush Control and Seed	39	12	6	1	2	3	7.4%	16,970 acres	230,112 acres
Seed and/or Reseed	1	1	0	0	0	0	4.01%	600 acres	14,752 acres
TOTALS	60	31	11	13	5				

Source: U.S. Department of Interior, Bureau of Land Management, Winnemucca District, Sonoma-Gerlach Unit Resource Analysis, 1979 and Sonoma-Gerlach Management Framework Plan, 1980

CONCLUSION

As no land treatments would be permitted, no adverse impacts would occur to the WSAs to impair their wilderness suitability.

ECONOMICS

IMPACT ON THE RANCH SECTOR

Implementation of the maximizing wild horse and burro alternative would impact EIS area permittees in two ways, both of which would have output, income and employment ramifications on EIS area ranchers. The first of these involves changes in the amount of vegetation allocated to livestock, while the second involves alterations in the periods when area permittees would be allowed to graze on public lands. The effects of these adjustments will be examined during two chronological periods: immediate economic impacts resulting from initial implementation, and long-term (2024) economic effects.

This alternative would initially allocate 95,007 AUMs to livestock use. This is a reduction of 21,544 AUMs below current three to five year average licensed use, and represents a decline in the amount of vegetation supplied to area permittees by the BLM of 18.4 percent. In addition, period-of-use adjustments would delay turnout onto the public range by two months during the spring while permitting livestock to remain on the public range an additional two to three months during the winter (see Proposed Action, Chapter 1). The combined effect of these two actions would cause EIS area ranchers to either acquire additional forage or reduce herd size.

Results of the computer runs indicate that even if area ranchers utilize the optimal mix of these two options, the economic impact of this alternative would be adverse. As Table 3-26 illustrates, three of the ranch classes (Small, Medium-Summer, and Large) would reduce herd size, resulting in reduced gross livestock sales and concurrent declines in net ranch income. In addition, all ranch classes would purchase additional hay during periods when livestock must be supported on base property. This purchase of hay would increase cash costs and decrease net ranch income, as evidenced by the winter and sheep ranches, which would experience net income reductions while supporting current herd sizes. Overall, net ranch income could decline by as much as $1.1 million dollars. Hardest hit would be the large ranch class, which would experience net losses due to their inability to support current herd sizes on existing base property.

It is likely that implementation of this alternative could force some EIS area operators out of the livestock business. The $1.1 million dollar reduction in net ranch income implies a direct employment loss of 32 positions, 5.0 percent of 1978 agricultural employment within the EIS area. Implementation of the maximize wild horses and burros alternative would thus have a significant adverse impact at the individual and sectoral levels.

Over the long term, the reversal of many of these adverse impacts could be anticipated. Improvement in range condition would lead to an allocation to livestock of 182,092 AUMs, 35.9 percent above current three to five year average licensed use. Overall EIS area herd size would increase by 2,555 head, and increased weaning weights and calf crops would be anticipated (refer to Livestock Grazing Section), so that gross livestock sales would exceed current levels by $888,000. Net income would rise from the reduced implementation levels to exceed current net ranch income for most ranch classes.

Long-term impacts on large ranches are difficult to quantify. This difficulty may be attributed to the severity of the initial impacts on large ranchers, and to the static production function relationships assumed in the computer model. Initially, large ranches could be forced to reduce herd size by over 50 percent in response to period-of-use restrictions. The resultant decline in gross revenue would result in net annual losses. While these losses could force some large operators from the industry, it is likely that other large operators would have the resources available to undertake an immediate expansion or intensification of base property forage sources. By 2024, large EIS area ranches would doubtless have introduced major alterations into their operations.

These alterations cannot be accounted for in the computer model. The only option which it allowed area ranchers to take in response to period-of-use restrictions was hay purchase and/or herd size reduction. Results of the computer runs indicate that large ranches would expand herd size dramatically over the long term, utilizing large hay purchases during periods when livestock would be supported on base property. While net ranch income increased slightly over initial and short-term levels, it remained more than 90 percent below current levels. The inability of the model to predict alterations in large ranch operations thus leads to results which would probably never be realized.

It is more likely that those large ranches which remain in the industry would have incorporated alterations which by 2024 would allow them to earn rates of return at least comparable to other ranches in the EIS area. This would mean that net ranch

TABLE 3-26

CHANGE IN SELECTED RANCH ECONOMIC CHARACTERISTICS
MAXIMIZE WILD HORSES AND BURROS ALTERNATIVE
SONOMA-GERLACH RESOURCE AREA

Ranch Class/ Time Period	Change in Herd Size		Change in Gross Revenue		Change in Net Ranch Income		
	Per Ranch	Total	Per Ranch	Total	Per Ranch	Total	Percent Change
Initial Implementation							
Small	- 24	- 456	- 6,218	- 118,142	- 3,065	- 58,235	- 27.1%
Medium-Summer	- 56	- 448	- 13,199	- 105,592	- 15,283	- 122,264	- 44.0%
Medium-Winter	0	0	0	0	- 12,125	- 60,625	- 32.4%
Large	-772	-6,176	- 143,860	-1,150,880	- 110,084	- 880,672	-108.8%
Subtotal		-7,080		-1,374,614		-1,047,540	- 51.1%
Sheep	0	0	0	0	- 3,671	- 25,697	- 4.6%
TOTAL		-7,080		-1,374,614		-1,147,493	55.9%
Long Term							
Small	+ 25	+ 475	+ 9,355	+ 177,745	+ 3,415	+ 64,885	+ 30.2%
Medium-Summer	+ 61	+ 488	+ 25,765	+ 206,120	+ 3,171	+ 25,368	+ 9.1%
Medium-Winter	0	0	+ 10,366	+ 51,830	+ 1,309	+ 6,545	+ 3.5%
Large	+199	+1,592	+ 40,198	+ 321,584	+ 14,166	+ 113,329	+ 14.0%
Subtotal		+2,555		+ 757,279		+ 210,127	10.2%
Sheep	0	0	+ 18,792	+ 131,544	+ 15,121	+ 105,847	18.8%
TOTAL		+2,555		+ 888,823		+ 315,974	15[illegible]

Source: U.S. Department of the Interior, Bureau of Land Management, Winnemucca District Office 1980.

income would exceed current levels by about 14 percent or $15,000 annually. Overall, ranch sector income would be $316,000 per year above current levels. An increase of gross livestock sales of $889,000 would create 21 direct employment opportunities within the sector.

Overall, the increased level of ranching activity would create employment opportunities for 21 workers, a 3.3 percent increase above 1978 agricultural employment. EIS areawide revenue would increase by $1,505,000, resulting in a total area employment increase of 38 persons (see Table 3-27). The adverse impact at the time of implementation would be negated over the long term, when a significant beneficial impact on individuals, and most EIS area ranches would result.

IMPACTS ON RANCHER WEALTH

At the time of implementation, the maximizing wild horses and burros alternative would allocate 95,007 AUMs to livestock use. This represents a reduction of 57,440 AUMs below current active preference. An average market value of $50 per AUM for northern Nevada ranches (Falk 1980) means that this reduction would reduce the wealth of EIS area permittees by $2,872,000, 37 percent of the total value contributed by grazing preferences to rancher wealth. It must be noted, however, that although this impact would be felt immediately, it would not be translated into an actual monetary loss unless a rancher attempted to borrow money, sell his ranch, or sell his BLM AUMs.

This impact would be gradually negated by the projected improvement in range condition. By 2024, this improvement is expected to lead to an AUM allocation of 182,092 AUMs, 29,645 above existing active preference and 87,085 AUMs above the initial allocation under this alternative. At an estimated market value of $50 per AUM, rancher wealth would increase above existing levels by $1,482,250, 19.4 percent above the existing value contributed by BLM AUMs to rancher wealth. The adverse impact of this alternative at the time of implementation would thus be transformed into a beneficial impact on rancher wealth by 2024.

IMPACTS ON THE CONSTRUCTION SECTOR

Implementation of the maximizing wild horses and burros alternative would involve construction of support facilities in order to make additional AUMs available for livestock. All support facilities, with the exception of spring developments, pipelines, and troughs, would be constructed by private contractors via a competitive bidding process. Total cost of these facilities is estimated at $9,463,274, as detailed in Table 1-20. It is estimated that approximately 15 percent of this construction would be awarded to firms based within the EIS area (personal communication, Bob Carroll, Chief, Division of Operations, BLM Winnemucca District Office 1980).

Assuming that funding and manpower would be available support facilities would be constructed during the seven year period from 1982 to 1989. If construction activity is distributed evenly through the period, additional revenue of approximately $167,500 per year (in terms of 1978 dollars) would accrue to local construction firms. This increase in revenue would produce additional income to proprietors and employees of local construction firms of about $68,000 per year, 1.3 percent of 1978 construction sectoral income. This additional income to the construction sector could provide employment for four additional workers in the sector, and five overall. This represents a significant beneficial impact at the individual level.

Since the proposed construction of support facilities would be completed by 1989, no long-term variation in revenue, income or employment is anticipated. Although this implies the layoff of the additional construction workers, it is likely that natural growth within the sector would incorporate them into the permanent labor force by 1989.

IMPACTS ON THE GOVERNMENT SECTOR

Impacts to the government sector under this alternative would be identical to those enumerated for the proposed action. Seven additional personnel would be required, with a combined annual income of $105,000, 3.6 percent of 1978 federal civilian income in the EIS area. This represents a significant beneficial impact at the individual level.

IMPACTS ON WILDLIFE AND RECREATION

Impacts to wildlife and recreation under this alternative would also be identical to those listed under the proposed action. Over the short term, the increase of 465 hunter days per year would result in one position being created in the area economy. Over the long term, the total increase of 487 hunter days could continue to support the employment of one person, a significant impact at the individual level.

IMPACT ON TAX REVENUES

This alternative would allocate 95,007 AUMs to livestock, 21,544 AUMs below current licensed use. However the impact of the period-of-use restrictions reduces the number of AUMs that can actual-

TABLE 3-27

SUMMARY OF IMPACTS RESULTING FROM THE MAXIMIZE WILD HORSES AND BURROS ALTERNATIVE SONOMA-GERLACH RESOURCE AREA

	REVENUE			INCOME					EMPLOYMENT				
Affected Interest	Direct	Indirect	Total	Direct	Percent of 1978 Sectoral Total a/	Indirect	Total	Percentage of 1978 Area Total	Direct	Percentage of 1978 Sectoral Total	Indirect	Total	Percentage of 1978 Area Total
Initial Implementation													
Ranching	-1,375,000	- 952,000	-2,327,000	-1,147,000	-11.3%	-1,264,000	-2,411,000	- 3.7%	- 32	- 5.0%	- 26	- 58	- 1.1%
Construction	+ 168,000	+ 26,000	+ 195,000	+ 68,000	+ 1.3%	+ 18,000	+ 86,000	< 1%	+ 4	+ 1.6%	+ 1	+ 5	< 1%
Government	-	-	-	+ 105,000	+ 4.2%	+ 37,000	+ 142,000	< 1%	+ 7	+ 3.6%	+ 5	+ 12	< 1%
Hunting & Recreation	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	-1,207,000	- 926,000	-2,132,000	- 974,000		-1,209,000	-2,183,000	- 3.3%	- 21		- 20	- 46	- 0.9%
Long Term													
Ranch	+ 889,000	+ 616,000	+1,505,000	+ 316,000	+ 3.1%	+ 348,000	+ 664,000	+ 1.0%	+ 21	+ 3.4%	+ 17	+ 38	+ 0.7%
Construction	0	0	0	0	0	0	0	0	0	0	0	0	0
Governnment	?	?	?	?	?	?	?	?	?	?	?	?	?
Hunting & Recreation	+ 8,000	+ 2,000	+ 10,000	+ 5,000	< 1%	+ 1,000	+ 6,000	< 1%	+ 1	< 1%	0	+ 1	< 1%
TOTAL	+ 897,000	+ 618,000	+1,515,000	+ 321,000		+ 349,000	+ 670,000	+ 1.0%	+ 22		+ 17	+ 39	+ 0.7%

a/ Sectoral and area totals were derived from Table 2-15. The percentage impact on the ranch sector is diluted by using overall agricultural income as a base for comparison.

Source: U.S. Department of the Interior, Bureau of Land Management, Winnemucca District Office 1980.

ly be used to 51 percent of the initial allocation. This use would be 68,097 AUMs less than three to five year average licensed use and would result in a reduction to county government revenues of $16,000 per year. This reduction must be supplemented by the decrease in option tax receipts of $5,000 due to a reduction in indirect area sales, so that total tax revenues would decline by $21,000 annually, 0.2 percent of total county government resources for fiscal year 1979. This impact would not effect a change in EIS area employment, and would not be considered significant at the levels previously defined. Long term impacts would also not be significant.

CUMULATIVE IMPACTS OF THE MAXIMIZING WILD HORSES AND BURROS ALTERNATIVE

Implementation of this alternative would reduce ranch output, with a resultant decline in net ranch income of $1,147,000 per year and rancher employment by 32 positions. These losses would be offset to a limited degree by increased activity within the construction and government sectors, where 11 additional employees would account for increases in direct sectoral income of $68,000 and $105,000 per year, respectively. Overall EIS area income would decline $2,183,000 annually, resulting in a loss of 46 jobs, 0.9 percent of EIS area employment in 1978.

Over the long term, increased revenue in the ranch sector and a slight increase in hunting and recreational activity would effect an increase in EIS area revenues of $1,515,000. Overall area employment would increase by 39 persons, 0.7 percent of the 1978 areawide employment.

At implementation, this alternative would constitute a significant adverse impact to individuals, to the ranching sector, and to the economy as a whole. A beneficial impact would occur to certain individuals due to the additional construction and governmental activity. Over the long term, the projected increases in area revenue and employment would constitute a significant beneficial impact at the individual and sectoral levels, as previously defined. The adverse impact at the time of implementation would thus be reversed over the long term, when a beneficial impact on the EIS area economy would result. This impact is not projected to be of sufficient magnitude to be considered significant at previously defined levels.

CONCLUSION

At initial implementation, this alternative would increase income in the construction sector by $68,000 per year (1.3 percent) and employment in the sector by four positions, 1.6 percent of the 1978 level. Income in the government sector would increase by $105,000 per year (4.2 percent) and employment in the sector would increase by seven positions or 3.6 percent. Income earned in the ranching sector would decline by $1.1 million (11.3 percent) and employment would decline by 32 positions (5.0 percent). Ranchers would also be impacted by the decline in wealth of $2.8 million, 37 percent of the value contributed by BLM AUMs to rancher wealth. County tax revenues would decline by $21,000 per year, 0.2 percent of total resources available to Humboldt and Pershing County governments in fiscal year 1979. The overall impact on the EIS area economy would be a decline in income of $2.2 million per year, 3.3 percent of the 1978 total, and a decline in employment of 46 positions, 0.9 percent of the 1978 total. Significant beneficial impacts would occur at the individual level in the construction and government sectors. Significant adverse impacts would occur at the individual and sectoral levels of the livestock industry and the overall impact on the EIS area economy as a whole would be adverse.

In the long term the construction sector would no longer be affected, while impacts to the government sector are unknown. Impacts to the trade and service sector would be negligible. Impacts to the ranching sector would represent substantial improvements from the existing levels. Income in the ranch sector would increase by $316,000 per year (3.1 percent) while employment would increase by 21 positions, 3.3 percent of the 1978 level. Rancher wealth would increase by $1.5 million, 19.4 percent of the value contributed by BLM AUMs. The overall impacts to the EIS area economy would include an increase in employment of 39 positions, 0.7 percent of the 1978 level. In the long term there would be no significant adverse impacts, while significant beneficial impacts would occur at the individual level to the ranching industry. The overall impact to the EIS area economy while beneficial does not exceed the previously defined threshold level for significance.

SOCIAL CONDITIONS

IMPACTS TO RANCHING COMMUNITY

This alternative would have adverse impacts similar to those which would occur under the proposed action. Adverse impacts resulting from changes in periods-of-use would be the same. Reductions in AUMs would be even greater than under the proposed action, including 100 percent of the grazing preference being eliminated in the four herd management areas.

REGIONAL IMPACTS

Impacts would be similar to those which would occur under the proposed action except they may be slightly more intense due to more reductions in livestock AUMs (see Economics Section, Chapter 3 for details of economic impacts). Residents of the area are sympathetic to ranchers' problems with wild horses and would oppose implementation of this alternative.

STATE AND NATIONAL IMPACTS

This alternative is considered most acceptable by members of wild horse and burro protection associations because it would allow more wild horses and burros to remain in their natural environment than any of the alternatives. Removal of fences in herd management areas which would enable the horses to move more freely and eliminate the danger of them being cut off from food and water sources and removal from checkerboard areas to facilitate management would also be approved of as well as the increased vigor and productivity of horses and burros which would occur under this alternative. Although group members would experience beneficial impacts from knowing the welfare of these animals had been enhanced, they believe that reductions in horse and burro numbers are greater than necessary.

Impacts to members of conservation, recreation, and wildlife groups would be similar to those which would occur under the proposed action except in regards to wild horses and burros. Although members of these groups would experience beneficial impacts from knowing that more wild horses and burros are running free in their natural environment, most do not feel that wild horses and burros should be given priority over native wildlife species.

CONCLUSION

Impacts to the ranching community and regional impacts would be similar to those which would occur under the proposed action, though slightly more adverse initially. Impacts to wild horse and burro protection associations would be beneficial for the most part, although reductions are considered to be too great. Impacts to members of conservation, recreation and wildlife groups would be similar to those which would occur under the proposed action.

CHAPTER 4

LIST OF PREPARERS

CHAPTER 4

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CHAPTER 5

PUBLIC PARTICIPATION

CHAPTER 5

PUBLIC PARTICIPATION

CONSULTATION AND COORDINATION IN DEVELOPMENT OF THE PROPOSAL AND ALTERNATIVES

Consultation and coordination with all interested parties have been important components in the development of the Sonoma-Gerlach planning/MFP/EIS process, and will continue to play a vital role as the process moves into the final EIS, MFP Step III, decision document, and implementation stages. Each of these stages contains provisions for consultation and coordination through such means as comment periods, informational meetings, news releases, and Coordinated Resource Management and Planning.

In October 1978, a state-wide news release announced the due dates for several EISs, including the Sonoma-Gerlach, and explained why the EISs were being prepared. A public meeting was held in February 1979, to explain the planning process and to discuss the need for and the avenues for public participation during each step of the planning and EIS Process.

In June and July, 1980, notice of intent to prepare the Sonoma-Gerlach EIS was published in the *Federal Register* and through news releases to the local and regional media. The notices, as well as individual letters, invited interested parties to take part in the EIS process. In July, briefings were held for the Washoe, Humboldt, and Pershing county commissioners and a formal meeting was held with the Nevada State Clearinghouse.

SCOPING

During late July, public scoping meetings for the EIS were held in Gerlach, Lovelock, and Winnemucca. Also, during June through October, consultations were scheduled by appointment with interested individuals and agencies, including livestock permittees in the resource area. Letters of appreciation were sent to persons who responded with information, and all information gathered during the scoping process was considered in developing the alternatives and the EIS.

INTERAGENCY CONTACTS

Professional contacts have been made with the Nevada Department of Wildlife, the U. S. Fish and Wildlife Service, and the USDA Soil Conservation Service.

Coordination will be initiated with the Nevada Department of Highways should fencing of pasture and allotment boundaries occur along highway rights-of-way. Also applications for water rights will be filed with the Nevada State Water Engineer for water projects.

Informal consultation on the possible existence of threatened or endangered plants is scheduled with the U.S. Fish and Wildlife Service. The State Historic Preservation Officer was consulted on possible impacts to cultural resources.

The Economics, Statistics, and Cooperatives Service, U.S. Department of Agriculture, provided economic data for use in the EIS. These data were based on meetings with area ranchers and budget information gathered by the ESCS as part of a nation-wide study.

AGENCIES, ORGANIZATIONS, AND PERSONS TO WHOM COPIES OF THE DRAFT EIS WILL BE SENT

CONGRESSIONAL
Senator Howard Cannon
Senator Paul Laxalt
Congressman James Santini
FEDERAL AGENCIES
Advisory Council on Historic Preservation
Department of Agriculture
  Agricultural Stabilization and Conservation Service
  Farmers Home Administration
  Forest Service
  Soil Conservation Service
Department of Defense
  Department of the Air Force
Department of Energy
Department ot the Interior
  Bureau of Indian Affairs
  Bureau of Mines
  Water and Power Resources Service
  Geological Survey

Fish and Wildlife Service
Heritage Conservation and Recreation Service
Environmental Protection Agency
STATE AGENCIES
Office of the Governor, Nevada
Nevada State Planning Coordinator
Nevada State Clearinghouse - 25 copies - distributes copies to State Agencies
Nevada Department of Wildlife
Legislative Counsel Bureau
STATEWIDE COMMITTEES AND GROUPS
Grazing Board
League of Cities
Multiple Use Advisory Council on Federal Lands for the Governor
Predatory Animals and Rodent Control
Sheep Commission
LOCAL AGENCIES
Mayor of Winnemucca
Mayor of Lovelock
Humboldt County Commissioners
Humboldt Planning Commission
Pershing County Commissioners
Churchill County Commissioners
Lyon County Commissioners
Washoe County Commissioners
Big Meadow Conservation District
Sonoma Conservation District
UNIVERSITY OF NEVADA
Max C. Fleischmann College of Agriculture
Division of Agricultural and Resource Economics
Division of Animal Science
Division of Renewable Natural Resources
Desert Research Institute, Las Vegas and Reno
Mackay School of Mines
EXTENSION AGENTS
Humboldt County
Pershing County
Churchill County
Lyon County
Washoe County
NEVADA STATE LEGISLATORS
Assemblyman R. Douglas Bremner
Assemblyman John Marvel
Assemblyman Thomas J. Hickey
Senator Carl F. Dodge
Senator Eugene V. Echols
Senator Thomas R. Wilson
Senator Norman D. Glaser
OTHERS
Ada County Fish and Game League, Idaho
American Fisheries Society
American Horse Protection Association, Inc.
American Humane Association
Animal Protection Institute
Audubon Society, Lahontan Chapter
Department of Biological Services, Northern Illinois University
Desert Bighorn Council
Enviro Techics, Inc.
Exploration Geologists of Nevada
Foresta Institute
Friends of Nevada Wilderness
Friends of the Earth
Grazing permit holders within Sonoma-Gerlach Resource Area
National Council of Public Land Users, Colorado
National Rifle Association
Nationwide Forest Planning Clearinghouse
Natural Resources Defense Council
Nevada Cattlemen's Association
Nevada Outdoor Recreation Association/National Public Lands Task Force
Nevada Woolgrower's Association
Northern Nevada Native Plant Society
Oregon Environmental Council
Pacific Legal Foundation
Pennsylvania Cooperative Wildlife Research Unit
Private citizens who have requested a copy of the DEIS
Public Lands Council
Sage County Alliance for a Good Environment
Society for Range Management
Sierra Club, Northwest Office
Sterns-Roger Engineering
Toiyabe Chapter of the Sierra Club
Wilderness Soceity
Wild Horse Organized Assistance
Wildlife Management Institute

AVAILABILITY OF DRAFT ENVIRONMENTAL IMPACT STATEMENT

The Draft Environmental Impact Statement (DEIS) will be sent to everyone who requests a copy and their substantive comments will be treated in a comments and responses section of the FEIS. Others identified in the Preparation Plan for this EIS will be sent letters of notification regarding availability of the Draft and Hearings. A news release will be issued statewide concerning availability of the EIS.

Copies of the DEIS and FEIS will be available for review at all BLM District and State Offices including the following locations: (* indicates address to write for copies of the EIS).

BUREAU OF LAND MANAGEMENT OFFICES

Office of Public Affairs, BLM

18th and C Streets
Washington, D.C. 20240

Nevada State Office
300 Booth Street
P.O. Box 12000
Reno, Nevada 89520

Battle Mountain District Office
North 2nd and South Scott Streets
Battle Mountain, Nevada 89820

Carson City District Office
1050 E. Williams Street
Carson City, Nevada 89701

Elko District Office
2002 Idaho Street
Elko, Nevada 89801

Ely District Office
Star Route 5, Box 1
Ely, Nevada 89301

Las Vegas District Office
4765 West Vegas Drive
Las Vegas, Nevada 89102

Winnemucca District Office *
705 East 4th Street
Winnemucca, Nevada 89445

PUBLIC LIBRARIES

Churchill Public Library
553 South Main Street
Fallon, Nevada 89406

Humboldt County Library
85 East 5th Street
Winnemucca, Nevada 89445

Lander County Library
Battle Mountain, Nevada 89820

Nevada State Library
Library Building
Carson City, Nevada 89710

Pershing County Library
1125 Central Avenue
Lovelock, Nevada 89419

University of Nevada, Las Vegas
James R. Dickinson Library
4505 Maryland Parkway
Las Vegas, Nevada 89154

University of Nevada, Reno
Getchall Library
Reno, Nevada 89507

Washoe County Library
301 S. Center Street
Reno, Nevada 89505

HEARINGS

A public hearing or hearings will be held on this Draft Environmental Impact Statement. Notice for dates and times for public hearing will be announced in advance to the public news media and in the *Federal Register* .

APPENDICES

APPENDIX A

SECTION 1
Methodology for Determining Vegetation Production and Allocations for the Alternatives Including the Proposed Action

SECTION 2
Methodology for Calculating Reasonable and Existing Numbers of Big Game Animals by Allotment

SECTION 3
Big Game Allocations

APPENDIX A

SECTION 1

METHODOLOGY FOR DETERMINING VEGETATION PRODUCTION AND ALLOCATIONS FOR THE ALTERNATIVES INCLUDING THE PROPOSED ACTION SONOMA-GERLACH RESOURCE AREA

VEGETATION INITIAL ALLOCATION PROCEDURES

The Sonoma-Gerlach vegetation allocation program is based on occular reconnaissance range surveys that were completed during the summers of 1947 and 1961-66 (BLM Manual 4412.11A). The following rangeland suitability criteria were applied for initial vegetation allocations in the Sonoma-Gerlach Resource Area (Refer to Appendix I for suitability acreage by allotment).

1. No vegetation on slopes greater than 50 percent was allocated to livestock or wild horses.

2. No vegetation was allocated to livestock or wild horses in areas that produced less than 25 pounds of forage per acre (greater than 32 acres/AUM).

3. No vegetation greater than four miles from a dependable water source was allocated to livestock or wild horses.

The Nevada State Office (NSO) Cartography Section prepared 7.5 minute orthophoto quadrangles (base maps) showing land status, allotment boundaries, and range survey write-up areas (vegetation cummunities). An electronic planimeter was used to compute an acreage figure for each section, township and quandrangle. Overlays were constructed for each quandrangle depicting each of the rangeland suitability criteria used in the Sonoma-Gerlach Resource Area as well as overlays showing big game and wild horse and burro use areas. Winnemucca District personnel then determined acreages for each vegetation community and the unsuitable areas in each vegetation type for each 7.5 minute orthophoto quadrangle, and entered this data into a computer.

The Proper Use Factors (PUFs) and Forage Acre Requirements (FARs) used in the 1947 and 1960s range surveys were used to compute acres/AUM for each vegetation community. All of these figures remain unchanged for the proposed vegetation allocation.

Animal Unit Months (AUMs) were computed by dividing the total number of acres in a vegetation community (provided by the computer) by the acres/AUM figure for that type. The acreages and AUMs for each category of the suitability criteria (slope, production, production/water, water) were subtracted from the totals in each community to determine the acres and AUMs suitable for livestock, wild horse, and burro use.

Example 1

Allotment	:	Dolly Hayden
Vegetation community	:	13 (saltbrush) ATCO-ARSP (Atriplex confertifolia - Artemisia spinescens)
Total acres in vegetation community	:	2000
Total suitable acres	:	2000
Total unsuitable acres	:	0
Acres/AUM	:	12
Total suitable AUMs	:	167

Example 2

Allotment	:	Blue Wing
Vegetation community	:	4 (sagebrush) ARAR-ARSP (Artemisia arbuscula - Artemisia spinescens)
Total acres in vegetation community	:	29,630
Total suitable acres	:	22,315
Total unsuitable acres	:	7,318
due to: slope	:	2,587
distance from water	:	4,731
Acres/AUM	:	32
Total suitable AUMs	:	697

Big game use areas for antelope, bighorn sheep, and mule deer were provided by the Nevada Department of Wildlife (NDOW). A reasonable number of big game animals cooperatively agreed upon by NDOW and BLM was assigned to each use area along with periods-of-use.

When allocating vegetation to meet big game demand, it was assumed that big game species are equally distributed throughout all vegetation types within those use areas. The following formula was used to derive AUM demand by vegetation community for each big game species:

$$\text{Big game AUM demand in vegetation community} = \text{AUM demand in big game use area} \times \frac{(\text{acres in vegetation community})}{(\text{acres in big game use area})}$$

AUMs were allocated to big game species, livestock, wild horses, and burros to the extent of the AUMs produced by the vegetation community. Some AUMs were allocated to big game that were not available to livestock, wild horses, and burros and were labelled non-competitive AUMs. AUMs allocated to big game that were suitable and hereby available to livestock, wild horses, and burros were labelled competitive AUMs. Table A-1 shows the competitive and non-competitive proposed initial and future allocations for all alternatives for all species of big game combined.

In all alternatives, including the proposed action, except the no action alternative the methodology for initial allocation and estimating future production was the same, as described below. The methodology used in the no action alternative will follow.

Outside of big game and wild horse use areas all available AUMs were allocated to livestock, however, where big game and wild horse use does occur, the use was recognized and AUMs were allocated for each use.

Methodology for Estimating Future Production

In estimating future production over the long-term (35 years) it was assumed that low productive land (land producing less than one AUM over 32 acres of land) could improve through: reducing grazing intensity, implementing grazing systems, or a combination of both. It was assumed that by reducing grazing intensity, the estimated production would increase by 21 percent, and by implementing a grazing system the production would increase by 5 percent over the long term (Van Poolen and Lacey July 1979). If a combination of the lower grazing intensity and the grazing systems were used, then an estimated increase over the long term would be 26 percent.

Following these assumptions:

1) Land producing 33.68 acres per AUM would become suitable land by implementing grazing system.

33.68	acres/AUM	33.68 acres/AUM
5%	increase from grazing systems	1.68 increase
1.6840	increase	32.00 acres/AUM

2) Land producing 40.50 acres per AUM would become suitable land by reducing the grazing intensity from heavy to moderate.

40.50	acres/AUM	40.50 acres/AUM
21%	increase from reduction of grazing	8.50 increase
8.5050	intensity	32.00 acres/AUM

APPENDIX A
TABLE A-1
BIG GAME COMPETITIVE AND NONCOMPETITIVE VEGETATION BY ALLOTMENT FOR ALTERNATIVES INCLUDING PROPOSED ACTION (AUMs)

	Proposed Action				No Action				No Livestock				Maximizing Livestock				Maximizing Wild Horses and Burros			
	Present (1982)		Future (2024)		Present (1982)		Future (2024)		Present (1982)		Future (2024)		Present (1982)		Future (2024)		Present (1982)		Future (2024)	
Allotment	C a/	NC a/	C	NC	C	NC	C	NC	C	NC	C	NC	C	NC	C	NC	C	NC	C	NC
Blue Wing	244	612	322	534	400	0	400	0	244	612	322	534	264	601	264	601	244	612	322	534
Buffalo Hills	7,363	1,179	7,464	1,078	480	0	480	0	7,363	1,179	7,464	1,078	5,975	949	5,975	949	7,363	1,179	7,464	1,078
Caliso	141	35	141	35	0	0	0	0	141	35	141	35	51	15	51	15	141	35	141	35
Clear Creek	123	73	132	64	0	0	0	0	123	73	132	64	32	18	32	18	123	73	132	64
Coal Canyon-Poker	88	41	90	39	15	0	15	0	88	41	90	39	84	36	84	36	88	41	90	39
Cottonwood Canyon	7	11	7	11	0	0	0	0	7	11	7	11	9	13	9	13	7	11	7	11
Coyote	448	5	449	4	0	0	0	0	448	5	449	4	266	3	266	3	448	5	449	4
Desert Queen	0	0	0	0	0	50	0	50	0	0	0	0	0	0	0	0	0	0	0	0
Diamond S	124	43	125	42	0	0	0	0	124	43	125	42	28	8	28	8	124	43	125	42
Dolly Hayden	68	18	68	18	0	0	0	0	68	18	68	18	67	17	67	17	68	18	68	18
Goldbanks	76	34	84	26	0	0	0	0	76	34	84	26	82	32	82	32	76	34	84	26
Harmony	77	25	77	25	0	0	0	0	77	25	77	25	21	6	21	6	77	25	77	25
Humboldt House	0	90	90	0	0	0	0	0	0	90	90	0	0	83	0	83	0	90	90	0
Humboldt Sink	0	5	0	5	46	0	46	0	0	5	0	5	0	3	0	3	0	5	0	5
Jersey Valley	1	48	28	21	0	0	0	0	1	48	28	21	1	58	1	58	1	48	28	21
Klondike	43	24	43	24	0	0	0	0	43	24	43	24	43	27	43	27	43	24	43	24
Leadville	377	45	389	33	0	0	0	0	377	45	389	33	197	19	197	19	377	45	389	33
Licking	5	40	41	4	0	0	0	0	5	40	41	4	1	12	1	12	5	40	41	4
Majuba	137	12	143	6	0	0	0	0	137	12	143	6	83	8	83	8	137	12	143	6
Melody	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
North Buffalo	15	0	15	0	0	0	0	0	15	0	15	0	4	0	4	0	15	0	15	0
Pleasant Valley	277	174	308	143	0	0	0	0	277	174	308	143	269	169	269	169	277	174	308	143
Pole Canyon	27	32	59	0	0	0	0	0	27	32	59	0	9	9	9	9	27	32	59	0
Prince Royal	0	60	60	0	0	0	0	0	0	60	60	0	0	58	0	58	0	60	60	0
Pumpernickel	175	85	227	33	0	0	0	0	175	85	227	33	84	22	84	22	175	85	227	33
Ragged Top	7	65	45	27	0	0	0	0	7	65	45	27	9	80	9	80	7	65	45	27
Rawhide	88	42	94	36	41	0	41	0	88	42	94	36	67	37	67	37	88	42	94	36
Rochester	14	46	54	6	168	0	168	0	14	46	54	6	11	45	11	45	14	46	54	6
Rock Creek	145	32	145	32	0	0	0	0	145	32	145	32	31	7	31	7	145	32	145	32
Rodeo Creek	355	109	355	109	0	0	0	0	355	109	355	109	186	57	186	57	355	109	355	109
Rye Patch	37	53	37	53	5	0	5	0	37	53	37	53	34	47	34	47	37	53	37	53
Seven Troughs	392	129	521	0	0	0	0	0	392	129	521	0	473	139	473	139	392	129	521	0
Soldier Meadows	1,382	97	1,382	97	5,066	0	5,066	0	1,382	97	1,382	97	907	56	907	56	1,382	97	1,382	97
Sonoma	94	76	94	76	0	0	0	0	94	76	94	76	22	17	22	17	94	76	94	76
South Buffalo	360	156	360	156	0	150	0	150	360	156	360	156	334	137	334	137	360	156	360	156
Star Peak	352	164	354	162	209	0	209	0	352	164	354	162	371	165	371	165	352	164	354	162
Thomas Creek	63	62	63	62	0	0	0	0	63	62	63	62	13	12	13	12	63	62	63	62
White Horse	35	7	35	7	0	0	0	0	35	7	35	7	36	7	36	7	35	7	35	7
TOTAL	13,140	3,729	13,901	2,968	6,430	200	6,430	200	13,140	3,729	13,901	2,968	10,064	2,972	10,064	2,972	13,140	3,729	13,901	2,968

a/ C = Competitive AUMs
NC = Noncompetitive AUMs

Source: U.S. Department of the Interior, Bureau of Land Management, Winnemucca District, Sonoma-Gerlach Resource Area, Sonoma, Blue Wing, and Buffalo Hills Unit Resource Analyses and District files.

3) Land producing 43.24 acres per AUM would become suiutable land by a combination of grazing systems and reduction of grazing intensity.

43.24 acres/AUM		43.24 acres/AUM
26%	increase for grazing intensity	11.24 increase
11.2424	and grazing systems	32.00 acres/AUM

The acreages which improved due to the assumptions above were taken from the Sonoma, Blue Wing and Buffalo Hills Unit Resource Analyses.

NO ACTION ALTERNATIVE - FUTURE AVAILABLE VEGETATION METHODOLOGY

In the no action alternative (existing use) there are a specific number of AUMs being used by livestock, big game, and wild horses in each allotment. Surplus AUMs are carried into the Unusued Vegetation Column (Table 1-8). A deficit in AUMs is shown in the Overused Vegetation Column. To determine the total future available vegetation for the year 2024 it is necessary to project the AUMs from current use to future use based on the percentage of unused or overused vegetation against the total available. To do this the following percentages were used:

Available Vegetation Unused or Overused (1979)	Change in available vegetation (2024) to projected future
0- 5 percent	No Change
5.1- 15 percent	6 percent
15.1- 45 percent	17 percent
45.1- 75 percent	40 percent
75.1-100 percent	63 percent
100.1-125 percent	76 percent
125.1-150 percent	86 percent
150.1-200 percent	95 percent
200.1 plus	100 percent

Source: U.S. Department of the Interior, Bureau of Land Management, Winnemucca District, Sonoma-Gerlach EIS Team.

Estimated future vegetation (AUMs)

Example 1

Allotment	:	Blue Wing
Available vegetation (1979)	:	19,816 AUMs
Actual use	:	43,645 AUMs
Overused vegetation	:	23,829 AUMs
Percent overused	:	120 percent
Future available vegetation (2024)	:	4,756 AUMs

The percent overused (120 percent) falls within the 100.1 to 125 percent range which means there would be a 76 percent decrease (15,060 AUMs) in available vegetation by year 2024 for a total estimated future production of 4,756 AUMs.

Example 2

Allotment	:	Majuba
Available vegetation (1979)	:	3,320 AUMs
Actual use	:	2,274 AUMs
Underused vegetation	:	1,046 AUMs
Percent underused	:	31.5 percent
Future available vegetation (2024)	:	3,884 AUMs

The percent underused (31.5 percent) falls within the 15.1 to 45 percent range which means there would be a 17 percent increase (564 AUMs) in available vegetation by year 2024 for a total estimated future production of 3,884 AUMs.

APPENDIX A

SECTION 2

METHODOLOGY FOR CALCULATING REASONABLE AND EXISTING NUMBERS OF BIG GAME ANIMALS BY ALLOTMENT

1. NDOW provided BLM with reasonable numbers of mule deer by allotment; no further calculation was necessary.

2. NDOW provided BLM with reasonable numbers of antelope and bighorn sheep by use area; the following method was used to apportion these numbers by allotment:

   a/ Percentage of use area within the allotment was calculated based on acreages calculated from NDOW maps and BLM allocated boundaries;

EXAMPLE: Buffalo Hills Allotment

Antelope Use Area Within Allotment	Percent of Use Areas in Allotment
AW-1	100
AW-2	100
AW-3	22.5
AW-4	100
AW-6	35
AW-7	100
AW-8	93.2

   b/ The percent of reasonable numbers within each allotment was then calculated. Reasonable numbers for each use area were supplied by NDOW, who used methods agreed upon by BLM to arrive at the numbers.

EXAMPLE: Buffalo Hills Allotment

Use Areas	Percentage in Allotment		Total Reasonable Average Numbers in Use Areas		Reasonable Numbers In Use Areas In Allotment
AW-1	100.0	x	20	=	20
AW-2	100.0	x	46	=	46
AW-3	22.5	x	209	=	47
AW-4	100.0	x	111	=	111
AW-6	35.0	x	40	=	14
AW-7	100.0	x	119	=	119
AW-8	93.2	x	1471	=	137

Total Reasonable Number of Antelopes in Allotment 494

3. **Existing numbers of big game animals was provided by NDOW for their management units. These existing numbers were apportioned by allotments based on the percentage of reasonable numbers in each allotment. The following formula was used.**

$$\frac{\text{Total Reasonable Number in Allotment}}{\text{Total Reasonable Number in NDOW Management Unit}} = \frac{\text{Existing Number In Allotment}}{\text{Total Existing Number in NDOW Management Unit}}$$

APPENDIX A

SECTION 3

BIG GAME ALLOCATIONS

Big game allocation resulting from the 1947 and 1960s range surveys are shown in the following table.

Allotment	Mule Deer AUMs	Antelope AUMs
Blue Wing	400	
Buffalo Hills		480
Coal Canyon-Poker	20	
Humboldt Sink	46	
Rawhide	41	
Rochester	168	
Soldier Meadows	2,666	2,400
Star Peak	209	
	3,550	2,880

APPENDIX B

MAXIMIZING LIVESTOCK USE ALTERNATIVE (AND PROPOSED ACTION) RECOMMENDED PERIODS-OF-USE AND KEY MANAGEMENT SPECIES

APPENDIX B

MAXIMIZING LIVESTOCK USE ALTERNATIVE (AND PROPOSED ACTION)
RECOMMENDED PERIODS-OF-USE AND KEY MANAGEMENT SPECIES
SONOMA-GERLACH RESOURCE AREA a/

Allotment	Period-of-Use	Key Management Species b/
Blue Wing	6/1 to 2/28	Key species in salt desert shrub: (1) ORHY, (2) SIHY, (3) GRSP, (4) CELA In sagebrushgrass: (1) STTH, (2) AGSP, (3) SIHY, (4) PUTR
Buffalo Hills	6/1 to 2/28	Key species in salt desert shrub: (1) ORHY, (2) SIHY, (3) GRSP, (4) CELA In sagebrush grass: (1) STTH, (2) AGSP, (3) SIHY, (4) PUTR
Calico	6/1 to 2/28	Key species in salt desert shrub: (1) ORHY, (2) SIHY, (3) GRSP, (4) CELA In sagebrush grass: (1) STTH, (2) AGSP, (3) SIHY, (4) PUTR
Clear Creek	6/1 to 2/28	In salt desert shrub: (1) SIHY, (2) CELA, (3) GRSP In sagebrush grass: (1) STTH, (2) AGSP, (3) SIHY
Coal Canyon-Poker	5/1 to 2/28	In salt desert shrub: (1) SIHY, (2) CELA, (3) GRSP In sagebrush grass: (1) STTH, (2) AGSP, (3) SIHY
Cottonwood Canyon	6/15 to 10/1	In pinyon-juniper sagebrush grass: (1) AGSP, (2) STTH
Coyote	5/1 to 12/1	(1) AGSP, (2) STTH
Desert Queen	7/1 to 2/28	In salt desert shrub: (1) ORHY, (2) CELA, (3) STCO In sagebrush grass: (1) STTH, (2) AGSP, (3) SIHY
Diamond S	7/1 to 2/28	In salt desert shrub: (1) SIHY, (2) CELA In sagebrush grass: (1) STTH, (2) AGSP, (3) SIHY On seeding: (1) AGCR

Dolly Hayden	6/1 to 2/28	In salt desert shrub: (1) SIHY, (2) CELA, (3) GRSP In sagebrush grass: (1) STTH, (2) AGSP, (3) SIHY
Goldbanks	5/1 to 2/28	In salt desert shrub: (1) SIHY, (2) CELA, (3) GRSP In sagebrush grass: (1) STTH, (2) AGSP, (3) SIHY
Harmony	7/1 to 10/30	(1) STTH, (2) AGSP, (3) FEID
Humboldt House		
North of Freeway	10/1 to 2/28	(1) CELA, (2) ORHY, (3) STCO
South of Freeway	6/1 to 9/30	(1) ORHY, (2) STTH, (3) SIHY, (4) FEID
Humboldt Sink	6/1 to 2/28	Adjacent to sink: (1) SPAI, (2) ELCI North of Freeway: (1) ORHY, (2) GRSP, (3) STCO
Jersey Valley	10/1 to 2/28	(1) SIHY, (2) CELA
Klondike	6/15 to 2/28	In salt desert shrub: (1) SIHY, (2) CELA, (3) GRSP In sagebrush grass: (1) STTH, (2) AGSP, (3) SIHY
Leadville	5/1 to 11/30	(1) AGSP, (2) STTH, (3) FEID
Licking	7/15 to 9/30	(1) AGSP, (2) STTH, (3) FEID
Majuba	6/1 to 2/28	(1) ORHY, (2) STTH, (3) CELA, (4) STCO
Melody	5/1 to 9/30	(1) AGCR
North Buffalo	6/1 to 2/28	(1) ORHY, (2) CELA Trailing Permitted Year-Round
Pleasant Valley	6/1 to 2/28	In salt desert shrub: (1) SIHY, (2) CELA, (3) GRSP In sagebrush grass: (1) STTH, (2) AGSP, (3) SIHY
Pole Canyon	6/15 to 9/30	(1) AGSP, (2) STTH
Prince Royal	6/1 to 2/28	In salt desert shrub: (1) SIHY, (2) CELA, (3) GRSP In sagebrush grass: (1) STTH, (2) AGSP, (3) SIHY

Pumpernickel	6/1 to 2/28	In salt desert shrub: (1) SIHY, (2) CELA, (3) GRSP In sagebrush grass: (1) STTH, (2) AGSP, (3) SIHY
Ragged Top	12/1 to 2/28	(1) ORHY, (2) GRSP, (3) CELA, (4) STCO
Rochester	6/1 to 2/28	In salt desert shrub: (1) SIHY, (2) CELA, (3) GRSP In sagebrush grass: (1) STTH, (2) STTH, (2) AGSP, (3) SIHY
Rawhide	6/1 to 2/28	In salt desert shrub: (1) SIHY, (2) CELA, (3) GRSP In sagebrush grass: (1) STTH, (2) AGSP, (3) SIHY
Rock Creek	6/15 to 11/30	In salt desert shrub: (1) SIHY, (2) CELA, (3) GRSP In sagebrush grass: (1) STTH, (2) AGSP, (3) SIHY, (4) FEID
Rodeo Creek	6/1 to 2/28	In salt desert shrub: (1) SIHY, (2) CELA, (3) GRSP In sagebrush grass: (1) STTH, (2) AGSP, (3) SIHY, (4) PUTR
Rye Patch	5/1 to 2/28	In salt desert shrub: (1) ORHY, (2) CELA, (3) STCO In sagebrush grass: (1) AGSP, (2) FEID, (3) STTH
Seven Troughs	6/1 to 2/28	In salt desert shrub: (1) ORHY, (2) SIHY, (3) GRSP, (4) CELA In sagebrush grass: (1) STTH, (2) AGSP, (3) SIHY, (4) PUTR, (5) FEID
Soldier Meadows	6/1 to 2/28	In salt desert shrub: (1) SIHY, (2) CELA, (3) GRSP In sagebrush grass: (1) STTH, (2) AGSP, (3) SIHY, (4) FEID
Sonoma	7/1 to 10/30	(1) AGSP, (2) STTH, (3) SIHY
South Buffalo	5/1 to 2/28	In salt desert shrub: (1) SIHY, (2) CELA, (3) GRSP In sagebrush grass: (1) STTH, (2) AGSP, (3) SIHY

Star Peak	6/1 to 2/28	In salt desert shrub: (1) SIHY, (2) CELA, (3) GRSP In sagebrush grass: (1) STTH, (2)AGSP, (3)SIHY
Thomas Creek	6/1 to 9/30	(1) STTH, (2) AGSP, (3) STCO
White Horse	5/1 to 11/30 6/1 to 11/30	On the seeding: (1) AGCR, Native: (1) AGSP, (2) STTH, (3) FEID

a/ Use same table for Proposed Action. The only change is the Diamond S Allotment period-of-use. Change to 3/1 to 2/28.

b/

Abbreviation	Scientific Name	Common Name
AGCR	*Agropyron cristatum*	Crested wheatgrass
AGSP	*Agropyron spitatum*	Bluebunch wheatgrass
ELCI	*Elymus cinereus*	Basin wildrye
CELA	*Ceratoides lanata*	Winterfat
FEID	*Festuca idahoensis*	Idaho fescue
GRSP	*Grayia spinosa*	Spiny hopsage
ORHY	*Oryzopsis hymenoides*	Indian ricegrass
PUTR	*Purshia tridentata*	Bitterbrush
SIHY	*Sitanion hystrix*	Bottlebrush squirreltail
SPAI	*Sporobolus airoides*	Alkali sacaton
STCO	*Stipa comata*	Needle-and-thread
STTH	*Stipa thurberiana*	Thurber needlegrass

Source: U.S. Department of the Interior, Bureau of Land Management, Winnemucca District, Sonoma-Gerlach Management Framework Plan.

APPENDIX C

SECTION 1
Livestock Support Facilities
Proposed Action

SECTION 2
Proposed Action Recommended
Vegetation Treatment per Allotment

SECTION 3
Proposed Action Land Treatments Within
Wilderness Study Areas

APPENDIX C
SECTION 1

LIVESTOCK SUPPORT FACILITIES
PROPOSED ACTION
SONOMA-GERLACH RESOURCE AREA

Allotment	Fences (miles)	Cattleguards	Wells	Pipelines (miles)	Troughs	Springs
Blue Wing	94	3	17	3	38	1
Buffalo Hills	25	1	0	0	0	0
Calico	0	0	0	0	0	0
Clear Creek	7	1	0	0	0	0
Coal Canyon-Poker	0	0	1	0	2	0
Cottonwood Canyon	0	0	0	0	0	0
Coyote	0	0	0	0	0	0
Desert Queen	11	0	6	0	12	0
Diamond S	6	0	0	0	0	0
Dolly Hayden	6	0	0	0	0	0
Goldbanks	0	0	1	1-1/2	4	1
Harmony	0	0	0	0	0	0
Humboldt House	0	0	0	0	0	0
Humboldt Sink	7	0	1	0	2	0
Jersey Valley	0	0	0	1-1/2	2	1
Klondike	9	1	0	1-1/2	1	0
Leadville	0	0	0	0	0	0
Licking	0	0	0	0	0	0
Majuba	17	2	1	0	2	0
Melody	0	0	0	0	0	0
North Buffalo	0	0	0	0	0	0
Pleasant Valley	22	0	1	0	2	0
Pole Canyon	6	0	1	2	4	1
Prince Royal	0	0	0	0	0	0
Pumpernickel	18	0	0	0	0	0
Ragged Top	0	0	0	0	0	0
Rawhide	11	2	0	0	0	0
Rochester	18	2	5	2	12	1
Rock Creek	0	0	0	0	0	0
Rodeo Creek	30	0	4	0	8	0
Rye Patch	0	0	0	0	0	0
Seven Troughs	37	2	3	2	8	1
Soldier Meadows	46	4	0	0	0	0
Sonoma	0	0	0	0	0	0
South Buffalo	0	0	0	0	0	0
Star Peak	26	0	0	2	3	2
Thomas Creek	0	0	0	0	0	0
White Horse	3	0	1	0	2	0
Total	399	18	42	15.5	102	8

Source: Sonoma-Gerlach Management Framework Plan 1980.

APPENDIX C
SECTION 2

PROPOSED ACTION RECOMMENDED VEGETATION TREATMENT PER ALLOTMENT a/
SONOMA-GERLACH RESOURCE AREA

Allotment	Treatment Method (Ref.#)	Acres to be Treated	Anticipated Increase in AUMs	Estimated Cost ($)			Current Production (Acres/AUM)	Estimated Production (Acres/AUM)
				Total	Per Acre	Per AUM		
Blue Wing	Sagebrush Control Then Seed(1)	15,296	4,621	917,760	60	199	32	3
	Sagebrush Control Then Seed(2)	2,841	663	170,460	60	257	10	3
	Sagebrush Control Then Seed(3)	16,892	5,049	1,013,520	60	201	29	3
	Sagebrush Control Then Seed(4)	3,580	1,030	214,800	60	209	22	3
	Sagebrush Control Then Seed(5)	17,554	5,015	1,053,240	60	210	21	3
	Sagebrush Control Then Seed(6)	58,110	17,495	3,486,600	60	199	31	3
	Sagebrush Control Then Seed(7)	6,072	1,879	364,320	60	194	42	3
	SUBTOTAL	120,345	35,752	7,220,700				
Buffalo Hills	Sagebrush Control Then Seed(1)	1,557	459	93,420	60	204	26	3
	Reseed (2)	2,608	739	78,240	30	106	20	3
	Sagebrush Control Then Seed(7)	7,590	1,946	455,400	60	234	13	3
	Sagebrush Control Then Seed(8)	4,943	1,401	296,580	60	212	20	3
	SUBTOTAL	16,698	4,545	923,640				
Clear Creek	Sagebrush Control Then Seed(1)	700	183	42,000	60	230	14	3
	Sagebrush Control Then Seed(2)	9,964	2,657	597,840	60	225	15	3
	SUBTOTAL	10,664	2,840	639,840				
Coal Canyon-Poker	Sagebrush Control Then Seed	4,865	1,401	291,900	60	208	22	3
Coyote	Sagebrush Control Then Seed	4,204	1,233	252,240	60	205	25	3
Diamond S	Reseed (2)	3,036	1,012	91,080	30	90	0	3
Dolly Hayden	Reseed (1)	2,102	539	63,060	30	117	13	3
	Sagebrush Control Then Seed(2)	960	280	57,600	60	206	24	3
	SUBTOTAL	3,062	819	120,660				
Goldbanks	Sagebrush Control Then Seed	6,539	1,744	392,340	60	225	15	3
Harmony	Sagebrush Control Then Seed(1)	934	292	56,040	60	192	50	3
	Sagebrush Control Then Seed(2)	2,180	559	130,800	60	234	13	3
	SUBTOTAL	3,114	851	186,840				
Leadville	Sagebrush Control Then Seed(1)	3,814	1,080	228,840	60	212	20	3
	Sagebrush Control Then Seed(2)	2,240	645	134,400	60	208	22	3
	SUBTOTAL	6,054	1,725	363,240				
Majuba	Sagebrush Control Then Seed(1)	5,626	1,667	337,560	60	202	27	3
	Sagebrush Control Then Seed(2)	2,257	627	135,420	60	216	18	3
	SUBTOTAL	7,883	2,294	472,980				
Melody	Reseed	3,737	623	112,110	30	180	6	3
North Buffalo	Sagebrush Control Then Seed(1)	2,919	801	175,140	60	219	17	3
	Sagebrush Control Then Seed(2)	2,257	501	135,420	60	270	9	3
	SUBTOTAL	5,176	1,302	310,560				
Prince Royal	Sagebrush Control Then Seed	2,491	759	149,460	60	197	35	3
Rock Creek	Sagebrush Control Then Seed(1)	1,284	352	77,040	60	219	17	3
	Seed (2)	1,479	345	44,370	30	129	10	3
	SUBTOTAL	2,763	697	121,410				
Rodeo Creek	Sagebrush Control Then Seed(1)	1,012	313	60,720	60	194	42	3
	Sagebrush Control Then Seed(2)	1,207	363	72,420	60	200	31	3
	SUBTOTAL	2,219	676	133,140				
Rye Patch	Sagebrush Control Then Seed	6,072	1,748	364,320	60	208	22	3
Seven Troughs	Sagebrush Control Then Seed(1)	640	184	38,400	60	209	22	3
	Sagebrush Control Then Seed(2)	2,608	745	156,480	60	210	21	3
	SUBTOTAL	3,248	929	194,880				
Soldier Meadows	Sagebrush Control Then Seed(3)	6,150	1,537	369,000	60	240	12	3
	Sagebrush Control Then Seed(4)	3,853	899	231,180	60	257	10	3
	SUBTOTAL	10,003	2,436	600,180				
Sonoma	Sagebrush Control Then Seed	6,228	1,631	373,680	60	229	14	3
South Buffalo	Reseed (1)	1,790	398	53,700	30	135	9	3
	Sagebrush Control Then Seed(2)	5,254	1,459	315,240	60	216	18	3
	Sagebrush Control Then Seed(3)	1,479	415	88,740	60	214	19	3
	SUBTOTAL	8,523	2,272	457,680				
Star Peak	Sagebrush Control Then Seed(1)	856	244	51,360	60	210	21	3
	Sagebrush Control Then Seed(2)	740	220	44,400	60	202	27	3
	Sagebrush Control Then Seed(3)	5,137	1,514	308,220	60	204	26	3
	SUBTOTAL	6,733	1,978	403,980				
White Horse	Sagebrush Control Then Seed	1,207	345	72,420	60	210	21	3
Total		244,864	69,612	14,249,280				

a/ Use same table for Maximizing Wild Horse and Burro Alternative

Source: U.S. Department of the Interior, Bureau of Land Management, Winnemucca District, Sonoma-Gerlach Management Framework Plan, 1980.

APPENDIX C
Section 3

PROPOSED ACTION LAND TREATMENTS THAT ARE WITHIN WILDERNESS STUDY AREAS a/ SONOMA-GERLACH RESOURCE AREA

Allotment	Treatment Method (Ref. #)		Treatment Acres Within WSA	Projected AUM Increase Within WSA
Blue Wing	Sagebrush control then Seed	(2)	2,231	521
	Sagebrush control then Seed	(7)	2,833	877
Buffalo Hills	Sagebrush control then Seed	(8)	2,900	822
Leadville	Sagebrush control then Seed	(1)	2,040	578
	Sagebrush control then Seed	(2)	1,200	345
Rodeo Creek	Sagebrush control then Seed	(1)	122	38
Soldier Meadows	Sagebrush control then Seed	(3)	6,000	1,500
South Buffalo	Sagebrush control then Seed	(2)	1,180	328
TOTAL			18,506	5,009

a/ Use same table for Maximizing Wild Horse and Burro Alternative.

Source U.S. Department of the Interior, Bureau of Land Management, Winnemucca District, Sonoma-Gerlach EIS Team, 1980.

APPENDIX D

SECTION 1
Livestock Support Facilities
Maximizing Livestock Alternative

SECTION 2
Maximizing Livestock Use
Alternative Recommended Vegetation
Treatment per Allotment

SECTION 3
Maximizing Livestock Use Land
Treatments Within Wilderness Study Areas

APPENDIX D
SECTION 1

LIVESTOCK SUPPORT FACILITIES
MAXIMIZING LIVESTOCK ALTERNATIVE
SONOMA-GERLACH RESOURCE AREA

Allotment	Fences (miles)	Cattleguards	Wells	Pipelines (miles)	Troughs	Springs
Blue Wing	94	3	17	3	38	1
Buffalo Hills	25	1	0	0	0	0
Calico	0	0	0	0	0	0
Clear Creek	7	1	0	0	0	0
Coal Canyon-Poker	0	0	1	0	2	0
Cottonwood Canyon	0	0	0	0	0	0
Coyote	0	0	0	0	0	0
Desert Queen	11	0	6	0	12	0
Diamond S	6	0	0	0	0	0
Dolly Hayden	6	0	0	0	0	0
Goldbanks	0	0	1	1-1/2	4	1
Harmony	0	0	0	0	0	0
Humboldt House	0	0	0	0	0	0
Humboldt Sink	7	0	1	0	2	0
Jersey Valley	0	0	0	1-1/2	2	1
Klondike	9	1	0	1-1/2	1	0
Leadville	0	0	0	0	0	0
Licking	0	0	0	0	0	0
Majuba	17	2	1	0	2	0
Melody	0	0	0	0	0	0
North Buffalo	0	0	0	0	0	0
Pleasant Valley	22	0	1	0	2	0
Pole Canyon	6	0	1	2	4	1
Prince Royal	0	0	0	0	0	0
Pumpernickel	18	0	0	0	0	0
Ragged Top	12	1	2	0	4	0
Rawhide	11	2	0	0	0	0
Rochester	18	2	5	2	12	1
Rock Creek	0	0	0	0	0	0
Rodeo Creek	30	0	4	0	8	0
Rye Patch	0	0	0	0	0	0
Seven Troughs	37	2	3	2	8	1
Soldier Meadows	46	4	0	0	0	0
Sonoma	0	0	0	0	0	0
South Buffalo	0	0	0	0	0	0
Star Peak	26	0	0	2	3	2
Thomas Creek	0	0	0	0	0	0
White Horse	3	0	1	0	2	0
Total	411	19	44	15.5	106	8

Source: Sonoma-Gerlach Management Framework Plan, 1980.

APPENDIX D
SECTION 2
MAXIMIZING LIVESTOCK USE ALTERNATIVE RECOMMENDED VEGETATION TREATMENT PER ALLOTMENT

SONOMA-GERLACH RESOURCE AREA

Allotment	Treatment Method (Ref.#)	Acres to be Treated	Anticipated Increase in AUMs	Estimated Cost ($) Total	Per Acre	Per AUM	Current Production (Acres/AUM)	Estimated Production (Acres/AUM)
Blue Wing	Sagebrush Control Then Seed(1)	15,296	4,621	917,760	60	199	32	3
	Sagebrush Control Then Seed(2)	2,841	663	170,460	60	257	10	3
	Sagebrush Control Then Seed(3)	16,892	5,049	1,013,520	60	201	29	3
	Sagebrush Control Then Seed(4)	3,580	1,030	214,800	60	209	22	3
	Sagebrush Control Then Seed(5)	17,554	5,015	1,053,240	60	210	21	3
	Sagebrush Control Then Seed(6)	58,110	17,495	3,486,600	60	199	31	3
	Sagebrush Control Then Seed(7)	6,072	1,879	364,320	60	194	42	3
	SUBTOTAL	120,345	35,752	7,220,700				
Buffalo Hills	Sagebrush Control Then Seed(1)	1,557	459	93,420	60	204	26	3
	Reseed (2)	2,608	739	78,240	30	106	20	3
	Seed (3)	1,751	425	52,530	30	124	11	3
	Sagebrush Control Then Seed(4)	10,859	2,633	651,540	60	247	11	3
	Seed (5)	117	22	3,510	30	160	7	3
	Sagebrush Control Then Seed(6)	5,897	1,512	353,826	60	234	13	3
	Sagebrush Control Then Seed(7)	4,943	1,401	296,580	60	212	20	3
	SUBTOTAL	27,732	7,191	1,529,640				
Clear Creek	Sagebrush Control Then Seed(1)	700	183	42,000	60	230	14	3
	Sagebrush Control Then Seed(2)	9,964	2,657	597,840	60	225	15	3
	SUBTOTAL	10,664	2,840	639,840				
Coal Canyon-Poker	Sagebrush Control Then Seed	4,865	1,401	291,900	60	208	22	3
Coyote	Sagebrush Control Then Seed	3,542	1,039	212,520	60	205	25	3
Diamond S	Sagebrush Control Then Seed(1)	1,920	527	115,200	60	219	17	3
	Reseed (2)	3,036	1,012	91,080	30	90	0	3
	SUBTOTAL	4,956	1,539	206,280				
Dolly Hayden	Reseed (1)	2,102	539	63,060	30	117	13	3
	Sagebrush Control Then Seed(2)	960	280	57,600	60	206	24	3
	SUBTOTAL	3,062	819	120,660				
Goldbanks	Sagebrush Control Then Seed	6,539	1,744	392,340	60	225	15	3
Harmony	Sagebrush Control Then Seed(1)	934	292	56,040	60	192	50	3
	Sagebrush Control Then Seed(2)	2,180	559	130,800	60	234	13	3
	SUBTOTAL	3,114	851	186,840				
Leadville	Sagebrush Control Then Seed(1)	3,814	1,080	228,840	60	212	20	3
	Sagebrush Control Then Seed(2)	2,608	750	156,480	60	209	22	3
	SUBTOTAL	6,422	1,830	385,320				
Majuba	Sagebrush Control Then Seed(1)	5,626	1,667	337,560	60	202	27	3
	Sagebrush Control Then Seed(2)	2,257	627	135,420	60	216	18	3
	SUBTOTAL	7,883	2,294	472,980				
Melody	Reseed	3,737	623	112,110	30	180	6	3
North Buffalo	Sagebrush Control Then Seed(1)	2,919	801	175,140	60	219	17	3
	Sagebrush Control Then Seed(2)	2,257	501	135,420	60	270	9	3
	SUBTOTAL	5,176	1,302	310,560				
Prince Royal	Sagebrush Control Then Seed	2,491	759	149,460	60	197	35	3
Rock Creek	Sagebrush Control Then Seed(1)	2,884	791	173,040	60	219	17	3
	Seed (2)	1,031	241	30,930	30	128	10	3
	SUBTOTAL	3,915	1,032	203,970				
Rodeo Creek	Sagebrush Control Then Seed(1)	1,012	313	60,720	60	194	42	3
	Sagebrush Control Then Seed(2)	1,207	363	72,420	60	200	31	3
	SUBTOTAL	2,219	676	133,140				
Rye Patch	Sagebrush Control Then Seed	6,072	1,748	364,320	60	208	22	3
Seven Troughs	Sagebrush Control Then Seed(1)	640	184	38,400	60	209	22	3
	Sagebrush Control Then Seed(2)	2,608	745	156,480	60	210	21	3
	SUBTOTAL	3,248	929	194,880				
Soldier Meadows	Sagebrush Control (1)	15,024	477	240,384	16	504	9	7
	Sagebrush Control (2)	6,266	268	100,256	16	374	10	7
	Sagebrush Control Then Seed(3)	6,150	1,537	369,000	60	240	12	3
	Sagebrush Control Then Seed(4)	3,853	899	231,180	60	257	10	3
	SUBTOTAL	31,293	3,181	940,820				
Sonoma	Sagebrush Control Then Seed	6,228	1,631	373,680	60	229	14	3
South Buffalo	Reseed (1)	1,790	398	53,700	30	135	9	3
	Sagebrush Control Then Seed(2)	5,254	1,459	315,240	60	216	18	3
	Sagebrush Control Then Seed(3)	1,479	415	88,740	60	214	19	3
	SUBTOTAL	8,523	2,272	457,680				
Star Peak	Sagebrush Control Then Seed(1)	856	244	51,360	60	210	21	3
	Sagebrush Control Then Seed(2)	740	220	44,400	60	202	27	3
	Sagebrush Control Then Seed(3)	5,137	1,514	308,220	60	204	26	3
	SUBTOTAL	6,733	1,978	403,980				
Thomas Creek	Sagebrush Control Then Seed	1,280	366	76,800	60	210	21	3
White Horse	Sagebrush Control Then Seed	1,207	345	72,420	60	210	21	3
Total		281,246	74,142	5,452,840				

Source: U.S. Department of the Interior, Bureau of Land Management, Winnemucca District, Sonoma-Gerlach Management Framework Plan 1980.

APPENDIX D
Section 3

MAXIMIZING LIVESTOCK USE LAND TREATMENTS
THAT ARE WITHIN WILDERNESS STUDY AREAS
SONOMA-GERLACH RESOURCE AREA

Allotment	Treatment Method (Ref. #)		Treatment Acres Within WSA	Projected AUM Increase Within WSA
Blue Wing	Sagebrush control then Seed	(2)	2,231	521
	Sagebrush control then Seed	(7)	2,833	877
Buffalo Hills	Seed	(3)	1,751	424
	Sagebrush control then Seed	(4)	10,859	2,632
	Sagebrush control then Seed	(8)	2,900	822
Leadville	Sagebrush control then Seed	(1)	2,040	578
	Sagebrush control then Seed	(2)	1,200	345
Rodeo Creek	Sagebrush control then Seed	(1)	122	38
Soldier Meadows	Sagebrush Control	(2)	3,559	153
	Sagebrush control then Seed	(3)	6,000	1,500
South Buffalo	Sagebrush control then Seed	(2)	1,180	328
TOTAL			34,675	8,218

Source: U.S. Department of the Interior, Bureau of Land Management, Winnemucca District, Sonoma-Gerlach EIS Team, 1980.

APPENDIX E

PROGRAMMATIC MEMORANDUM OF AGREEMENT

APPENDIX E

PROGRAMMATIC MEMORANDUM OF AGREEMENT BETWEEN THE DEPARTMENT OF THE INTERIOR, BUREAU OF LAND MANAGEMENT, THE ADVISORY COUNCIL ON HISTORIC PRESERVATION AND THE NATIONAL CONFERENCE OF STATE HISTORIC PRESERVATION OFFICERS REGARDING THE LIVESTOCK GRAZING AND RANGE IMPROVEMENT PROGRAM

WHEREAS, the Department of the Interior, Bureau of Land Management, administers public lands principally in the 11 Western States and Alaska, under concepts of multiple-use and sustained yield, and, among other responsibilities, the Bureau of Land Management is charged with management of rangeland and forage products under the Taylor Grazing Act of 1934 (43 U.S.C. 315) and the Federal Land Policy and Management Act of 1976 (43 U.S.C. 7101), which also charges the Bureau of Land Management with the management and protection of cultural resources; and

WHEREAS, Section 106 of the National Historic Preservation Act (16 U.S.C. 470f, as amended, 90 Stat. 1320) requires that the head of any Federal agency having direct or indirect jurisdiction over a proposed Federal, federally assisted, or federally licensed undertaking affecting properties in or eligible for the *National Register of Historic Places* shall afford the Advisory Council on Historic Preservation (hereafter Council) a reasonable opportunity for comment; and

WHEREAS, livestock grazing and range improvement activities undertaken by the Bureau of Land Mangement may have an effect upon properties in or eligible for the *National Register of Historic Places* and will require compliance with Section 106 of the National Historic Preservation Act, Section 2 of Executive Order 11593, May 13, 1971, "Protection and Enhancement of the Cultural Environment," and the Council's regulations, "Protection of Historic and Cultural Properties" (36 CFR Part 800); and

WHEREAS, the Bureau of Land Mangement is currently engaged in an ongoing program of rangeland management which involves the preparation, by 1988, of approximately 145 environmental statements on specific areas whre grazing is permitted on approximtely 174 million acres of public lands in the Western States and has requested Council review of the rangeland management program; and

WHEREAS, the Council and the Bureau of Land Management have met and reviewed the livestock grazing and range improvement program of the Bureau of Land Management and its relation to compliance with Section 106 of the National Historic Preservation Act of 1966 and Executive Order 11593, as implemented by the Council's regulations (36 CFR Part 800) and the responsibilities for historic and cultural resources under the National Environmental Policy Act of 1969 (42 U.S.C. 4321) as implemented by the Council on Environmental quality in the "National Environmental Policy Act Regulations" (40 CFR Parts 1500-1508).

NOW, THEREFORE, it is mutually agreed that the Bureau of Land Mangement will ensure, through the stipulations outlined in this Programmatic Memorandum of Agreement, that historic and cultural properties will be given adequate consideration in grazing management program decisions and implementation which includes, but is not limited to, the preparation of grazing environmental statements, thereby meeting its responsibilities under Section 106 of the National Historic Preservation Act.

STIPULATIONS

1. The Bureau of Land Mangement will conduct Class I (existing data inventory) and Class II (sampling field inventory) inventories of historic and cultural properties, as specified in BLM Manual Section 8111, to be completed at the appropriate planning state and prior to the preparation of the draft environmental statement. Inventory results will be evaluated, in consultation with the appropriate State Historic Preservation Officer, to identify properties including in or eligible for inclusion in the *National Register of Historic Places*.

a. The inventory requirement may be modified on a case by case basis for interim grazing environmental statements (i.e., those prepared during fiscal years 1979 through 1981) if an alternative is acceptable to the appropriate State Historic Preservation Officer.

b. If an acceptable alternative cannot be negotiated with the appropriate State Historic Preservation Officer, then the Bureau of Land Mangement will proceed with the preparation of the environmental statement and request the comments of the Council in accordance with 36 CFR 800. The Council's comments will be included in the final environmental statement.

2. This Programmatic Memorandum of Agreement and the inventory reports identifying historic and cultural properties will be referenced in each environmental statement.

3. Prior to commencement of any range improvement activities which involve land disturbance, the Bureau of Land Management will conduct a Class III inventory, as specified in the BLM Manual Section 8111.4, supplementing previous surveys to locate, identify, and evaluate properties in the impact area that may be eligible for inclusion in the *National Register of Historic Places*. Range improvement activities which involve land disturbance include, but are not limited to, such activities as construction of fencing and corrals, water development, chaining, and controlled burning. If properties that may be eligible for the National Register are found, the Bureau of Land Management will consult with the appropriate State Historic Preservation Officer and forward the documentation to the Keeper of the National Register to obtain a determination of eligibility in accordance with 36 CFR Part 63.

4. The Bureau of Land Management will provide the appropriate State Historic Preservation Officer with copies of the reports of the Class I, II, and III inventories in accordance with Sections 102(a)(2) and 202(c)(9) of the Federal Land Policy and Management Act of 1976 for inclusion as part of the State inventory conducted pursuant to 36 CFR Part 61.

5. The Bureau of Land Management will design the livestock grazing and range improvement program to avoid adverse effects on properties included in or eligible for inclusion in the *National Register of Historic Places*, unless this is not prudent or feasible.

6. Where it is not prudent or feasible to avoid adverse effects on properties included in or eligible for inclusion in the *National Register of Historic Places* as part of a livestock grazing and range improvement program authorization and the property is not a National Historic Landmark or National Historic Site, the Bureau of Land Management will consult with the appropriate State Historic Preservation Officer and will:

a. Develop mutually acceptable measures to mitigate the impact of the proposed action; and

b. Notify the Council in writing of agreements reached with the State Historic Preservation Officer under the provisions of 6(a) above. The Council need not be afforded further opportunity for review and comment.

7. The provisions of this Programmatic Memorandum of Agreement shall apply only to the States of Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington and Wyoming.

8. If it is determined that the affected property is a National Historic Landmark or National Historic Site, or agreement cannot be reached between the Bureau of Land Mangement and the appropriate State Historic Preservation Officer on satisfactory mitigation measures, the Bureau of Land Mangement will request the comments of the Council in accordance with 36 CFR Part 800.

9. At the request of the President or a Member of Congress, the Council may advise the Bureau of Land Mangement, that a particular action, authorized by a grazing permit or lease, will require individual review and comment pursuant to 36 CFR Part 800. In that event, the Bureau of Land Management will comply with the provisions of the Council's regulations.

10. The Council and the Bureau of Land Management will review the provisions of this Agreement on an annual basis to determine whether modification or termination is appropriate. Should the current livestock grazing program of the Bureau of Land Management be revised, the ratifying parties will mutually determine whether the provisions of the Agreement will continue to apply.

APPENDIX F

GUIDELINES FOR USE OF HERBICIDES ON PUBLIC LANDS

APPENDIX F

GUIDELINES FOR USE OF HERBICIDES ON PUBLIC LANDS

1) Environmental impacts will be identified through an environmental assessment and measures taken to mitigate potential adverse environmental impacts.

2) Programs will be reviewed with user groups, interested organizations, and the general public.

3) Only federally registered pesticides will be used on public lands except as authorized by Sec. 24c, Public Law 92-516, The Federal Environmental Pesticide Control Act of 1972. Section 24c provides for state registration of certain pesticides for local needs within the state. Any pesticide proposal planned under a state registration must include a copy of the state label.

4) Tank mixes of pesticides may be approved if: such mixture is provided for under a state registration or if the tank mix has been tested and has a written recommendation by an Agricultural Experiment Station or the State Department of Agriculture. The pesticide recommended in the misture must be applied at a dosage rate not to exceed the label instructions for use of any single product for the same target pest and must not be specifically prohibited from mixing on either label. Each tank mix proposal must be accompanied by appropriate labels and/or a written recommendation.

5) All proposed use of herbicides on public lands will be reviewed for approval in advance by the Bureau's Denver Service Center and/or Washington, D.C. office.

6) Federal and state agencies with resposibilities for the environment, public health, and fish and wildlife will be informed, when necessary, of programs and cooperative measures developed.

7) Only properly trained and/or licensed personnel will handle and use herbicides on public lands. This includes applications by permittees, grantees, or licensees. At least one member of the crew, preferably the on-the-ground supervisor, must be a qualified applicator.

8) All individuals associated with the handling of applications of herbicides on public lands will be familiar with emergency procedures to be used in case of a herbicide spill.

9) Water monitoring of important streams will be done when there is a possibility that contamination may result from a proposed herbicide use.

PROJECT DESIGN FEATURES

Specific measures are included in the design of each proposed herbicide project in order to minimize adverse impacts on the environment. They include the following:

1) Any specific BLM proposed herbicide project will be preceded by a preliminary archaeological survey. An evaluation of the findings will determine whether there are sites of value and whether they should be salvaged by removal, or left and circumvented by the project.

2) BLM projects possibly affecting areas of historical value will be preceded by a search through the cultural and historical sites listings currently on file with the State Historic Preservation Officer and the State Parks Department. The latest edition of the *National Register of Historic Places* and its monthly supplement will be consulted prior to undertaking and work on proposed treatment areas. In cases where there is an effect from proposed projects, the Bureau will comply with Section 106 of the National Historic Preservation Act through the Council's "Procedures for the Preservation of Historic and Cultural Properties."

3) The process of locating, identifying, and managing significant concentrations of rare and endangered plants is in a development stage. The *Federal Register* of July 1, 1975 (Vol. 40, No. 127) contains a comprehensive list of candidate endangered or threatened species. In addition, a tentative list of plants that are proposed for inclusion on the Federal list of threatened or endangered species is available upon request (32 pages). If these plants are kown or suspected to occur within the influence zone of the proposed action, an on-the-ground floristic inventory will be made. The proposed action will be modified to protect these plants if they are threatened by the proposed action.

4) On herbicide application projects conducted directly by Bureau personnel, a licensed employee will monitor and supervise the project. Work done by contractors will be monitored by a certified applicator.

5) Contracts for application will require that the intake operation of water for mixing shall be arranged so that an air gap or reservoir will be placed between the live water intake and the

mixing tank to prevent any backflow of chemical into the water source.

6) Contracts for application will require that contractors will not wash out any spray tanks in or near any stream or dispose of any chemical containers on the contract area.

7) During aerial spraying, spray will be turned off at the end of spray runs and during the time when a turn is being made to start another spray run. Initial spray swaths along buffer strips or areas to be protected will be made parallel to these areas and before spraying commences on the rest of the project area.

8) Mixing and loading operations will take place in an area where an accidental spill will not flow into a stream or body of water.

9) The following are minimum widths (measure horizontally) for protective buffer strips for all herbicides applied adjacent to waters which are valuable for domestic use, are important for angling or other recreation and/or used by significant numbers of fish for spawning, rearing or migration routes (Class I streams), bodies of water, or marshy areas.

a) Aerial Spraying Spraying Altitude (over ground) 30-40 feet--100 feet

b) Vehicle Spraying--25 feet

c) Hand application--10 feet

10) To minimize drift and volatilization, aerial application of all the herbicides proposed for use will be confined to periods when wind speed is less than six miles per hour, air temperature is under 70 degrees, relative humidity is over 50 percent, vegetation is free of snow or ice, precipitation is not occurrig or imminent, and air turbulence will not affect normal spray patterns. Label directions will be followed if they require additional restrictions. Low volatile ester formulation of 2,4-D will be used.

11) Daily measurements of weather conditions will be made by trained personnel at spray sites during application. Additional measurements will be made any time it appears that a weather change may be taking place that could jeopardize safe placement of spray on the target area.

12) Fixed wing or helicopters will normally be required to fly at an airspeed of 40 to 50 mph and 30 to 45 feet above the vegetation. Spray pressure in the boom will be 25 to 35 pounds per square inch. Maximum drift reduction with normal spray formulations and conventional application equipment will be obtained by using DB jet nozzles (1/8 inch diameter orifice) directed back along the airstream (Stewart 1976). All aerial nozzles will be equipped with automatic shutoff devices to prevent loss of herbicides along nonspray flight routes. Spray mixtures will contain drift reduction adjuvants where they will be effective.

13) During air operations a radio network will be maintained which links all parts of the project. Direct radio communications between spray aircraft and ground observers will be established. Prespray reconnaissance flights will be made to orient pilots when sensitive areas such as agricultural lands, important streams, residences, and fish hatcheries are near target areas.

MONITORING ENVIRONMENTAL IMPACTS

The overall responsibility for monitoring environmental impacts of chemical herbicides rests with the Environmental Protection Agency (P.L. 92-516, Sec. 20). No Dioxin (TCDD) containing compounds will be used. Precise identification of the minute quantities involved and the interpretation of the findings requires the highly sophisticated research techniques and methodologies of research organizations. The Bureau's research needs are met by published research results from research agencies and by contracting for research when existing or planned research is judged inadequate.

Research on environmental impacts of herbicides to animals, water, soil, and plants is conducted by chemical companies as a prerequisite to registration with the Environmental Protection Agency. Additional research is conducted by federal agencies and universities. The Bureau will keep abreast of these research findings and, where indicated by research results and EPA recommendations, adjust its proposed herbicide applications to minimize adverse environmental impacts.

A water monitoring program will be carried out by the Bureau as part of the proposed action. The purpose is to determine the effectiveness of buffer strips, and administrative controls in minimizing impacts on water quality and the aquatic environment. The guidelines for when to monitor water are listed below.

1) Water monitoring will be done when any herbicide application occurs in a municipal watershed.

2) Water monitoring will be done when any herbicide application is located in a fish hatchery supply watershed.

3) Water monitoring will be done when any herbicide application is in a watershed with a domestic water supply intake for drinking or irriga-

tion less than one mile downstream from the treatment area.

4) Water monitoring will be done where a herbicide application is adjacent to a major fish bearing stream.

SAFEGUARDS

The safe use of herbicides includes precautionary measures to prevent accidental spills. The following written precautions describe the measures that will be used to reduce the chance of such accidents, and the emergency action required if an accidental spill should occur.

The applicable federal regulations concerning the storage and disposal of herbicides and herbicide containers will be followed. These are described in the Environmental Protection Agency "Regulations for Acceptance and Procedures for Disposal and Storage," *Federal Register*, May 1, 1974, pp. 15236 through 15241.

TRANSPORTATION

1) It is essential to prevent damage to containers so that leaks do not develop; care will be exercised so that the containers are not punctured or ruptured, and so that the lids or caps are not loosened.

2) Precautions will be taken in the loading and stacking or herbicide containers on the transporting vehicle to assure that containers are tied down so that they will not fall as the vehicle moves.

3) Open containers will never be transported. Partly empty containers must be securely re-sealed before transport.

4) After transportation, all herbicide containers will be inspected for damage and leaks, and the vehicle should be carefully examined for contamination.

APPLICATION SAFETY

1) Arrange spraying schedules so that poor visibility before and shortly after sunrise and sunset will not seriously affect the safety of the pilot.

2) Do not permit uphill spraying when the climb required exceeds one-half the climbing ability of the helicopter.

3) Allow spraying from a higher altitude where steep canyonheads, snags, or standing timber in the spray area make it hazardous to spray at the specified contract heights.

4) Allow sufficient elevation to be gained by the pilot at the lower open end of drainages after a spraying run to eliminate the need to climb in returning for another spray run.

5) Allow the contractor's chief pilot to establish a pattern to avoid danger of collision when pilots spray adjoining blocks concurrently.

6) Instruct pilot to stop spraying when in his own judgement conditions are too hazardous.

7) Fly at a height above the ground that will produce effective treatment results. In no case should the minimum flight height be less than 30 feet.

8) Caution pilots about dangers such as lone snags or trees and location of downdrafts. Review project maps with each pilot, paying particular attention to heliports, areas being sprayed, and approaches to and from those areas.

9) Caution pilots as to the location of telephone and electric lines near any heliport which will be used. Mark telephone and electric lines with highly visible material if it can be done safely.

10) If an aircraft crashes check the pilot's clothing to see if he has been splashed with herbicide. If so, and if he is not seriously injured, help him wash several times with soap.

11) When an injured pilot is taken to a hospital or doctor, make certain they know the pilot has been exposed to a herbicide and provide any herbicide label information that is available.

TANK PREPARATION

1) All valves capable of emptying the tanker will be lockable.

2) An air gap or reservoir between the water source and the mixing tank is required. A separate portable pump may be used.

APPENDIX G

SOIL SURVEY DATA

APPENDIX G

SOIL SURVEY DATA
SONOMA-GERLACH RESOURCE AREA

Survey Name	Acres	Percent of Area
Buffalo-Pumpernickel Valley	330,071	6.0
Dixie Valley	359,040	6.5
Lovelock	75,384	1.4
North Cal-Neva	1,398,860	25.2
Sonoma	260,480	4.7
Surprise Valley-Home Camp	28,043	0.1 a/
Total	2,451,878	43.8 a/

a/ North Cal-Neva encompasses the Surprise Valley-Home Camp Survey, so 0.1 percent has been subtracted from total percent of area.

Source: U.S. Department of Agriculture, Soil Conservation Service, Reno, Nevada 1965-1979

APPENDIX H

SECTION 1
PSIAC Method for Estimating Sediment Yields

SECTION 2
Phase I Inventory of the Watershed Conservation and Development System

APPENDIX H

SECTION 1
PSIAC METHOD FOR ESTIMATING SEDIMENT YIELDS

Sediment yield estimates were derived using the method developed by the Pacific Southwest Interagency Committee (PSIAC), Water Management Subcommittee, Sedimentation Task Force in 1968 (see BLM Manual 7317).

Nine factors are considered in estimating sediment yield. These are geology, soils, climate, runoff, topography, ground cover, land use, upland erosion, channel erosion and sediment transport. The sediment yield characteristics of each factor are assigned a numerical value representing its relative significance in the yield rating. Phase I Inventory of the Watershed Conservation and Development System was employed as the basic data source. The numerical values were then summed and converted to tons per acre.

SECTION 2

PHASE I INVENTORY OF THE WATERSHED CONSERVATION AND DEVELOPMENT SYSTEM

The Watershed Conservation and Development System originated in 1970 as a six-phased system which included inventory, analysis, design, implementation, evaluation, and maintenance procedures necessary to identify and attain the watershed objectives on specific geographic areas. Phase I, conducted in the EIS Area in 1971-1974 was the reconnaissance level inventory and appraisal phase of the system. Specific methodology is outlined in BLM Manual 7322. According to manual procedure, areas were subdivided into homogeneous areas within a single vegetation community. Criteria used in delineation were differences in vegetation, composition, slope, aspect, or erosion condition. Each subtype was then field sampled to determine surface cover (vegetation, rock, bare ground, litter, effective rooting depth of plants, texture of the surface-and sub-soil, erosion condition [soil surface factor]). Specific sampling data as collected in the Phase I inventory are available at the Winnemucca District Office, BLM.

The soil surface factor (SSF) rating is a method of quantifying the erosion condition by assigning a value from 0 to 15 to each of seven surface erosion features which are: soil movement, surface litter, surface rock, pedestalling, rills, flow patterns and gullies. The total of these values is considered as the present soil surface factor for the area represented by that subtype. Based on the SSF, the subtype is categorized into one of five erosion classes as follows:

SSF	Erosion Condition Class
0- 20	Stable
21- 40	Slight
41- 60	Moderate
61- 80	Critical
81-100	Severe

APPENDIX I

SUITABILITY CLASSIFICATION

APPENDIX I

SUITABILITY CLASSIFICATION
SONOMA-GERLACH RESOURCE AREA

Allotment	Total Acres a/	Suitable		Potentially Suitable						Unsuitable	
				Water		Production		Water & Production			
		Acres	AUMs	Acres	AUMs	Acres	AUMs	Acres	AUMs	Acres	AUMs
Blue Wing	976,928	428,412	19,215	150,478	6,158	39,855	1,006	5,998	134	352,185	4,622
Buffalo Hills	394,516	282,085	22,141	0	0	30,777	816	0	0	81,654	2,005
Calico	36,490	22,392	1,706	0	0	0	0	0	0	14,098	361
Clear Creek	55,455	40,658	2,405	5,025	330	4,102	120	0	0	5,670	378
Coal Canyon-Poker	97,265	66,842	2,868	11,861	495	9,824	266	56	2	8,682	367
Cottonwood Canyon	12,470	4,572	155	1,818	34	12	0	0	0	6,068	20
Coyote	34,270	33,846	3,294	0	0	78	2	0	0	346	25
Desert Queen	123,161	9,447	730	10,562	883	20,458	500	10,058	251	72,636	770
Diamond S	18,393	12,257	674	0	0	3,920	0	0	0	2,216	130
Dolly Hayden	77,904	67,063	3,935	4,511	215	0	0	206	6	6,124	354
Goldbanks	37,460	27,542	1,512	4,873	241	0	0	0	0	5,045	216
Harmony	6,803	3,750	233	0	0	469	8	0	0	2,584	84
Humboldt House	23,837	8,635	433	0	0	6,547	183	0	0	8,655	164
Humboldt Sink	68,985	3,562	297	0	0	2,121	61	252	8	63,050	694
Jersey Valley	66,517	11,276	552	1,883	69	38,421	883	0	0	14,937	221
Klondike	50,321	31,276	1,456	469	18	2,048	56	2,743	66	13,785	421
Leadville	54,572	48,199	2,584	0	0	1,396	41	0	0	4,977	220
Licking	4,569	576	48	0	0	2,273	66	0	0	1,720	69
Majuba	100,581	77,812	3,312	9,650	379	2,299	67	2,585	73	8,235	165
Melody	3,762	3,762	616	0	0	0	0	0	0	0	0
North Buffalo	51,573	32,365	1,640	17,361	1,219	0	0	0	0	1,847	229
Pleasant Valley	174,543	144,557	8,586	4,096	224	4,542	122	327	8	21,021	1,446
Pole Canyon	13,877	4,193	200	4,847	196	0	0	0	0	4,837	186
Prince Royal	10,425	4,054	150	0	0	5,183	146	0	0	1,188	34
Pumpernickel	124,934	111,784	6,075	2,950	199	1,526	42	0	0	8,674	516
Ragged Top	86,314	9,947	416	5,888	269	21,902	620	14,414	410	34,163	486
Rawhide	122,631	63,213	2,451	13	0	1,260	34	0	0	58,145	696
Rochester	173,679	65,900	2,383	10,787	393	34,841	943	3,829	101	58,322	941
Rock Creek	23,365	20,290	1,744	0	0	0	0	0	0	3,075	236
Rodeo Creek	193,402	116,914	5,539	10,564	380	854	20	0	0	65,070	986
Rye Patch	40,123	34,527	1,415	0	0	0	0	0	0	5,596	312
Seven Troughs	302,371	94,854	3,895	13,475	521	146,127	3,998	25,011	692	22,904	649
Soldier Meadows	327,739	259,410	25,238	0	0	0	0	0	0	68,329	2,017
Sonoma	20,178	11,682	787	0	0	1,582	47	0	0	6,914	500
South Buffalo	234,335	163,255	7,484	4,539	185	13,730	377	0	0	52,811	1,620
Star Peak	84,091	55,333	2,624	0	0	583	14	616	18	27,559	1,188
Thomas Creek	11,264	7,631	401	0	0	0	0	0	0	3,633	229
White Horse	20,739	18,291	1,066	0	0	0	0	0	0	2,448	120
Total	4,259,842	2,402,164	140,260	275,650	12,408	396,730	10,438	66,095	1,769	1,119,203	23,677

a/ Includes fenced public land.

Source: U.S. Department of the Interior, Bureau of Land Management, Winnemucca District, Sonoma, Blue Wing, and Buffalo Hills Unit Resource Analyses, 1980.

APPENDIX J

ESTIMATED RANGE CONDITION AND TREND

SECTION 1
Estimated Ecological Range Condition

SECTION 2
Estimated Trend

APPENDIX J

ESTIMATED RANGE CONDITION AND TREND

The ecological range condition figures shown in Section 1 were taken from the Sonoma, Blue Wing and Buffalo Hills Unit Resource Analyses. As it stated in each of these documents, in the absence of inventory data professional judgement of the author was used to estimate condition.

The vegetation trend figures shown in Section 2 were also taken from the Sonoma, Blue Wing and Buffalo Hills Unit Resource Analyses. These figures are all estimates based upon the individual author's professional judgement.

APPENDIX J
SECTION 1

ESTIMATED ECOLOGICAL RANGE CONDITION

		Range Condition Class							
		Excellent		Good		Fair		Poor	
Allotment	Total Acres a/	Acres	%	Acres	%	Acres	%	Acres	%
Blue Wing	772,006	15,440	2	154,401	20	293,363	38	308,802	40
Lava Beds HMA	204,922	4,098	2	40,985	20	77,870	38	81,969	40
(Total)	976,928	19,538	2	195,386	20	371,233	38	390,771	40
Buffalo Hills	271,018	32,522	12	21,681	8	40,652	15	176,163	65
Buffalo Hills HMA	123,498	14,820	12	9,880	8	18,525	15	80,273	65
(Total)	394,516	47,342	12	31,561	8	59,177	15	256,436	65
Calico	36,490	4,014	11	6,203	17	14,961	41	11,312	31
Clear Creek	55,455	555	1	8,318	15	22,182	40	24,400	44
Coal Canyon-Poker	97,265	973	1	3,891	4	1,945	2	90,456	93
Cottonwood Canyon	12,470	0	0	0	0	3,492	28	8,978	72
Coyote	34,270	343	1	10,281	30	16,107	47	7,539	22
Desert Queen	123,161	12,316	10	18,474	15	43,106	35	49,265	40
Diamond S	18,393	368	2	1,839	10	7,357	40	8,829	48
Dolly Haden	77,904	1,558	2	23,372	30	26,487	34	26,487	34
Goldbanks	37,460	4,120	11	3,746	10	14,235	38	15,359	44
Harmony	6,803	340	5	3,402	50	748	11	2,313	34
Humboldt House	23,837	0	0	1,907	8	477	2	21,453	90
Humboldt Sink	68,985	6,898	10	10,348	15	37,942	55	13,797	10
Jersey Valley	66,517	1,996	3	4,656	7	665	1	59,200	89
Klondike	50,321	0	0	0	0	9,561	19	40,760	81
Leadville	54,572	0	0	21,829	40	22,920	42	9,823	18
Licking	4,569	183	4	457	10	2,741	60	1,188	26
Majuba	100,581	10,058	10	20,116	20	60,349	60	10,058	10
Melody	3,762 b/	-	-	-	-	-	-	-	-
North Buffalo	51,573	1,547	3	10,315	20	23,208	45	16,503	32
Pleasant Valley	174,543	10,473	6	52,363	30	78,544	45	33,163	19
Pole Canyon	13,877	139	1	139	1	1,943	14	11,656	84
Prince Royal	10,425	0	0	0	0	4,066	39	6,359	61
Pumpernickel	124,934	2,499	2	47,475	38	62,467	50	12,493	10
Ragged Top	86,314	21,578	25	25,894	30	34,526	40	4,316	5
Rawhide	122,631	245	0.2	19,621	16	3,679	3	99,086	81
Rochester	173,679	347	0.2	27,789	16	5,210	3	140,333	81
Rock Creek	23,365	2,337	10	12,617	54	7,009	30	1,402	6
Rodeo Creek	193,402	1,934	1	1,934	1	27,076	14	162,458	84
Rye Patch	40,123	0	0	13,641	34	13,241	33	13,241	33
Seven Troughs	275,549	13,777	5	41,333	15	96,442	35	123,997	45
Lava Beds HMA	26,822	1,341	5	4,023	15	9,388	35	12,070	45
(Total)	302,371	15,118	5	45,356	15	105,830	35	136,067	45
Soldier Meadows	327,739	49,161	15	98,321	30	131,096	40	49,161	15
Sonoma	20,178	1,009	5	1,009	5	11,098	55	7,062	35
South Buffalo	234,335	4,687	2	16,403	7	77,330	33	135,915	58
Star Peak	84,091	4,205	5	5,045	6	10,932	13	63,909	76
Thomas Creek	11,264	563	5	901	8	8,336	74	1,464	13
White Horse	20,739	0	0	1,452	7	2,489	12	16,798	81
Totals	4,259,842	226,444	5	746,061	18	1,323,765	31	1,959,810	46

a/ Includes fenced public lands.
b/ The Melody Allotment has been seeded to crested wheat grass and has no ecological condition class.

Source: U.S. Department of the Interior, Bureau of Land Management, Winnemucca District, Sonoma-Gerlach EIS Team, Sonoma, Blue Wing, and Buffalo Hills Unit Resource Analyses, 1980.

APPENDIX J
SECTION 2

ESTIMATED TREND

Allotment	Total Acres a/	Trend Direction: Upward Acres	%	Stable Acres	%	Downward Acres	%
Blue Wing	976,928	0	0	762,004	78	214,924	22
Buffalo Hills	394,516	0	0	47,342	12	347,174	88
Calico	36,490	0	0	0	0	36,490	100
Clear Creek	55,455	0	0	555	1	54,900	99
Coal Canyon-Poker	97,265	0	0	4,864	5	92,401	95
Cottonwood Canyon	12,470	0	0	0	0	12,470	100
Coyote	34,270	0	0	26,216	77	8,054	23
Desert Queen	123,161	0	0	61,581	50	61,580	50
Diamond S	18,393	0	0	368	2	18,025	98
Dolly Hayden	77,904	0	0	1,558	2	76,346	98
Goldbanks	37,460	0	0	7,866	21	29,594	79
Harmony	6,803	0	0	4,490	66	2,313	34
Humboldt House	23,837	0	0	0	0	23,837	100
Humboldt Sink	68,985	51,739	75	17,246	25	0	0
Jersey Valley	66,517	0	0	1,996	3	64,521	97
Klondike	50,321	0	0	0	0	50,321	100
Leadville	54,572	0	0	0	0	54,572	100
Licking	4,569	0	0	183	4	4,386	96
Majuba	100,581	90,523	90	10,058	10	0	0
Melody	3,762 b/	-	-	-	-	-	-
North Buffalo	51,573	0	0	1,547	3	50,026	97
Pleasant Valley	174,543	0	0	10,473	6	164,070	94
Pole Canyon	13,877	0	0	0	0	13,877	100
Prince Royal	10,425	0	0	0	0	10,425	100
Pumpernickel	124,934	0	0	2,499	2	122,435	98
Ragged Top	86,314	0	0	21,578	25	64,736	75
Rawhide	122,631	0	0	245	0.2	122,386	99.8
Rochester	173,679	0	0	347	0.2	173,332	99.8
Rock Creek	23,365	7,009	30	2,337	10	14,019	60
Rodeo Creek	193,402	0	0	0	0	193,402	100
Rye Patch	40,123	0	0	13,241	33	26,882	67
Seven Troughs	302,371	0	0	15,118	5	287,253	95
Soldier Meadows	327,739	147,482	45	0	0	180,257	55
Sonoma	20,178	0	0	9,080	45	11,098	55
South Buffalo	234,335	0	0	21,090	9	213,245	91
Star Peak	84,091	0	0	9,250	11	74,841	89
Thomas Creek	11,264	0	0	9,169	81	2,095	19
White Horse	20,739	0	0	0	0	20,739	100
Total	4,259,842	296,753	7	1,062,301	25	2,897,026	68

a/ Includes fenced public lands.

b/ The Melody Allotment has been seeded to crested wheatgrass and has no estimated trend.

Source: U. S. Department of the Interior, Bureau of Land Mangement, Winnemucca District, Sonoma, Blue Wing, and Buffalo Hills Unit Resource Analyses, 1980.

APPENDIX K

SECTION 1
Determination of Annual Increase in Wild Horses and Burros

SECTION 2
Determination of State and National Populations

SECTION 3
Vegetation Relationships Between Livestock and Wild Horses and Burros

APPENDIX K
SECTION 1

DETERMINATION OF ANNUAL INCREASE IN WILD HORSES AND BURROS

Data on annual increases of wild horses and burros are limited but studies indicate the increase falls between 4 and 13 percent (Wolfe 1980). In the Sonoma-Gerlach Resource Area an annual increase of 11 percent was used for analysis purposes for the following reasons:

> In an ongoing study in the Granite Range of the Winnemucca District, preliminary data from Dr. Joel Berger indicate an annual increase of wild horses of 27 percent. The Granite Range, however, has had very little livestock grazing since 1974 and the forage condition is good. Since these conditions do not exist together in the remainder of the resource area, 27 percent was considered high.
>
> In three aerial inventories conducted in 1974, 1977,and 1980 using experienced personnel and extensive use of helicopter, we estimated an annual rate of increase of 11 percent. This figure has been used through the URA-MFP process in the Sonoma-Gerlach Resource Area.
>
> The 11 percent figure is within the range given in the paper referenced above, and is our best available locally collected data.

SECTION 2

DETERMINATION OF STATE AND NATIONAL POPULATIONS

Data concerning wild horse and burro populations for the state and the nation were taken from the 1974 and 1978 issues of public land statistics. The 1971 through 1973 data were inconsistent or completely lacking. As a result, 1974 numbers were used in conjunction with between a 10 and 14 percent net annual increase to determine 1971 populations, and 1978 numbers were used in the same manner to estimate 1979 populations. The range from 10 percent to 14 percent was derived from the following Environmental Impact Statements: Caliente (10 percent), Tonopah (12.5 percent), Paradise-Denio (14 percent), and Sonoma-Gerlach (11 percent).

SECTION 3

VEGETATION RELATIONSHIPS BETWEEN LIVESTOCK AND WILD HORSES AND BURROS

There have been five fecal analysis studies of wild horses in recent years, all of which generally show grass species as the staple of the diet during spring, summer, and fall, and forbs and browse of secondary importance. In the winter, this pattern was reversed. In three studies of wild burros in California, forbs were the mainstay of the spring diet, while browse comprised a large percent of the fall diet. Forage preference between wild horses and cattle have been determined to be 45 to 77 percent identical in various studies in Nevada and the West while dietary overlap between wild horses, mule deer, and antelope was less than 3 percent (reference Sonoma, Blue Wing, and Buffalo Hills Unit Resource Analyses).

In the Sonoma-Gerlach Resource Area, while severe competition exists for the available vegetation, the dietary overlap was not considered during the allocation of forage to livestock, wild horses, burros, and big game. It was decided that one AUM of livestock forage would be considered equal to one AUM of forage for any big game species, wild horse or burro, because diet overlap was not considered in the 1947 and 1960s range surveys, the base data. Therefore, it is assumed that one AUM will support one cow, one horse, one burro, four deer, five bighorn sheep, five antelope, or five domestic sheep for one month.

APPENDIX L

SECTION 1
The Visual Resource Management System

SECTION 2
Average Impacts for Range Improvements

APPENDIX L
Section 1

THE VISUAL RESOURCE MANAGEMENT SYSTEM

The establishment of visual resource management classes is accomplished by a process of involving Visual Sensitivity, Visual Zones and Scenic Quality. The exact procedure is described in Bureau Manual 8411. The result of this procedure is to divide the resource area into the following classes:

Class I: This class provides for ecological changes. Any contrast created within the characteristic environment must not attract attention. It is applied to some natural areas, wilderness areas, wild portions of wild and scenic rivers and other similar situations where management activities are to be restricted.

Class II: Changes in any of the basic elements (form, line, color and texture) caused by a management activity should not be evident in the characteristic landscape. A contrast may be seen but should not attract attention.

Class III: Contrasts to the basic elements (form, line, color and texture) caused by a management activity may be evident and begin to attract attention in the characteristic landscape. However, the changes should remain subordinate to the landscape.

Class IV: Contrasts may attract attention and be a dominant feature of the landscape in terms of scale; however, the changes should repeat the basic elements (form, line, color and texture) inherent in the characteristic landscape.

Class V: Change is needed or change may add acceptable visual variety to an area.

To determine whether or not a proposed project will meet the limits of acceptable change listed above, a contrast rating system is used. This is described in detail in Bureau Manual 8431 and is accomplished with the use of form 8400-4 (Visual Contrast Rating Worksheet).

APPENDIX L
Section 2

AVERAGE IMPACTS FOR RANGE IMPROVEMENTS a/
(Long-Term)

Improvement	Maximum Element Contrast	Allowable Visual Resource Management Class b/
Well	Moderate	Class II
Water Pipeline	Moderate	Class II
Spring Developement	Moderate	Class III
Trough	Moderate	Class II
Fences c/	Weak	Class I
Cattleguards d/	Weak	Class I
Land Treatments:		
with seeding	Strong	Class IV
without seeding	Moderate	Class II

a/ These are the average visual impacts. The impacts for any particular project may vary thus requiring a Visual Contrast Rating analysis for each proposed project.

b/ For the contrasts listed, this is the most restrictive management class in which the project could be located without creating a significant impact.

c/ This rating is for fences where there is no blading of the fence line or access routes and approximately even grazing occurs on both sides of the fence.

d/ Cattleguards are visually insignificant compared to the associated road and fence.

APPENDIX M

SECTION 1
Methodology Utilized in Determining Archeologically Sensitive Areas

SECTION 2
Explanation of Potential Impacts to Cultural Resources

APPENDIX M

SECTION 1

METHODOLOGY UTILIZED IN DETERMINING ARCHEOLOGICALLY SENSITIVE AREAS

Archeologically sensitive areas have been identified for the Sonoma-Gerlach Resource Area. These areas are where high densities of prehistoric sites are likely to occur based on present data for the area. Criteria utilized in determining these sensitive areas are: (1) permanent water sources as listed on U.S. Geological Survey 7-1/2 and 15 degree topographic maps, (2) gently sloping land (no more than 10 to 20 percent slope) within 1/2 mile of permanent water sources. Several reservations concerning the information on these areas should be noted: (1) predictions are based on a very limited data base, consequently this evaluation of sensitivity is extremely tentative; (2) some permanent water sources are not recorded on topographic maps; (3) modern water sources do not necessarily reflect past conditions. Locations of springs and seeps can change as the result of geological and climatic processes. The locations of prehistoric and historic sites listed on the *National Register of Historic Places* are identified as well.

SECTION 2

EXPLANATION OF POTENTIAL IMPACTS TO CULTURAL RESOURCES

Cultural resources are finite, fragile, and non-renewable. Any structural change in the condition of cultural resource sites constitutes erosion of the total information base. Such changes are permanent and irreversible. Therefore, all changes are adverse impacts. The only beneficial impacts are those which reduce the intensity of factors promoting change. Following is a description of potentially significant impacts to cultural resources.

LIVESTOCK AND WILD HORSE GRAZING RELATED IMPACTS

Major impacts to cultural resource sites due to livestock and wild horse grazing involve trampling, rubbing and erosion.

Trampling

Lithic artifacts can be broken, chipped, buried and displaced by wildlife, livestock, wild horses and burros. Wear patterns on edges of lithic artifacts are critical in interpreting their function correctly, and fractures caused by trampling can alter or obliterate these wear patterns. Displacement of surface artifacts also constitutes an adverse impact since spatial distribution of artifacts on a surface can be important in reconstructing prehistoric activity patterns.

Some conception of the degree of artifact breakage and displacement caused by cattle trampling can be gleaned from an experiment conducted by Roney in the Winnemucca District in 1977. In an impact situation equivalent to 12 years of continuous grazing at a density of one cow per 20 acres, Roney found that 48 percent of a sample of premeasured artifacts suffered some degree of physical damage. In addition, 38 percent of the premapped specimens were displaced with an average displacement of between .75 and 1.6 meters. This amount of movement would be sufficient to obscure small-scale distribution patterns. Also, 95 percent of the specimens were buried beneath the surface. The result of this effect would be significant reduction of site visibility as well as mixing of cultural strata where subsurface components were involved.

This experiment was limited to a zone of very soft sandy loam. A harder, rockier surface would unquestionably result in a higher rate of artifact damage. Additionally, this experiment did not simulate the uneven distribution of cattle on the open range. Areas near water would receive heavier impacts while areas with poor feed would be less impacted.

Rubbing

Abrasion type wear can be sustained by historic structures as a result of livestock and wild horses rubbing against them.

Erosion

Livestock and wild horse grazing increases soil erosion which is detrimental to cultural resource sites. Consumption of vegetation results in increased soil erosion and consequently erosion of cultural resource sites. Also, cattle and wild horse trampling loosens surface soil, accelerating erosion. Alterations in the subsurface components of sites with vertical deposits would occur as a result of erosion. Vertical context is often an important key to the chronology of sites and mixing of distinct cultural layers results in the loss of this information as well as data concerning the spatial structuring of prehistoric activities.

IMPACTS FROM RANGE DEVELOPMENTS

Other impacts include disturbances to cultural resource sites by range developments. The individual impacts of these are outlined in the following section.

Fences

Cultural resource sites which are transected by fencelines would be directly impacted by fence construction activities. Use of heavy equipment in construction of fences would result in some probable disturbance to surface distributions and breakage of artifacts. Also, collection of artifacts might take place during fence construction. Principal impacts would be indirect, occurring after the completion of the fence. Vehicles and livestock tend to travel along fencelines, thus intensifying trampling damage and vehicle- caused breakage of artifacts and disturbance of surface distributions. Although instances are minor, these impacts are cumulative and continue throughout the life of the fence.

Cattleguards

Cattleguards are generally constructed along established roads where cultural resource sites on surface would have already suffered extreme disturbance. Thus the impact to the cultural resources would generally be insignificant unless subsurface cultural materials were present.

Spring Developments

Present inventory data indicates that aboriginal activity was concentrated around permanent and semi-permanent water sources such as springs. Consequently, spring developments could be highly detrimental to cultural resource sites. Open aboriginal sites could be seriously damaged by moving equipment across them and by excavation activities. In addition, springs are potential sources of pollen samples which could provide important paleo-climatic data as well as ethnobotanical information. Excavation in the vicinity of springs could cause mixing of pollen layers, thus rendering them useless for research purposes. Also, drying of pollen caused by spring development would adversely affect its information potential. Very little pollen data has been gathered thus far for this area. Climatic data has been largely based on geologic data to this point. Thus a potentially valuable source of information concerning the prehistory of the area could be lost.

Construction of a fence around a spring would result in a beneficial impact, if the fence encloses a site, because trampling of cultural materials would be prevented. Initially, however, adverse impacts would occur due to the heavy equipment utilized during fence construction. Adverse impacts also would be likely to occur if a gate is installed in the fence exclosure. Past experience suggest that ranchers may utilize the spring enclosure as a holding pen.

Pipelines

Excavation for laying of pipelines could transect cultural resource sites, destroying surface and subsurface cultural deposits of large sites and possibly obliterating small sites and isolated finds.

However, if cultural resource sites are avoided during installation, pipelines can be beneficial to cultural resources. Pipelines provide water over large areas, reducing the number of animals congregating in any one area and thus reducing the amount of trampling on some cultural resources sites.

Water Troughs

Water troughs established along fence lines would concentrate livestock in these areas. If troughs are located in cultural resource site areas, livestock-related impacts would be intensified in these areas.

Wells and Windmills

Cultural resources would be adversely impacted if these projects were executed within site boundaries. While the physical size of the area disturbed by each project would be small and only small sites would be obliterated, impacts could be severe, especially where deep, old, small, or unique sites were affected. Watering troughs at well sites would concentrate cattle, accelerating impacts from trampling.

Reservoirs

Movement of fill or excavation of a pit would mix deposits and destroy cultural contexts if they were to occur within a site's boundary. The intensity of such impacts would be a function of the size of the specific development and the size and nature of the cultural site affected; however, no reservoirs have been proposed.

Burning

Burning could destroy or damage historic structures and Basque Aspen Carvings as well as shattering stone and glass artifacts. Burning would also make archeological sites more visible and more susceptible to vandalism.

Sagebrush Control

The initial effect of spraying would be increased erosion of sites and increased susceptibility to vandalism since cultural resource sites would be made more visible. The long range effect would be decreased erosion of sites because of improved vegetative cover. Chaining and disking would result in severe damage to cultural resource sites. Serious displacement, and burial of artifacts would occur. Burning would result in the same impacts as are listed above.

Seeding

Plowing done prior to seeding could cause breakage of artifacts as well as result in serious disturbance to surface and subsurface deposits of cultural resource sites.

INDIRECT IMPACTS

Several indirect impacts can occur as the result of range improvements. When range development projects are located in isolated areas, construction and maintenance equipment may have to be brought cross-country. If cultural resource sites are crossed, displacement and breakage of cultural materials could occur, as well as possible shallow subsurface disturbance. Further disturbance could occur as a result of the tendency of temporary roads to become permanent. Occasionally, inaccessible range project sites may require the building of roads. Blading and other road building activities can obliterate isolated finds and small sites as well as portions of large sites. Even if a road does not transect cultural resource sites, they may provide better access to sites by vandals.

Reduced vegetation cover and increased erosion resulting from overgrazing causes increased numbers of artifacts to be exposed to vandalism and trampling.

One positive aspect of proposed range projects is that their implementation would require additional archeological surveys in order to mitigate adverse impacts to cultural resources. These surveys would contribute significantly to our understanding of the prehistory of this area.

APPENDIX N

SECTIONS 1 AND 2

Methodologies for Determining Change in Ecological Range Condition and Trend for the Proposed Action and Alternatives

SECTIONS 3 THROUGH 12

Estimated Future Ecological Range Condition and Trend Under the Alternatives

APPENDIX N
SECTION 1

METHODOLOGY FOR DETERMINING CHANGE IN ECOLOGICAL RANGE CONDITION FOR THE PROPOSED ACTION AND ALTERNATIVES

Changes in ecological range condition were determined in accordance with Appendix J using the criteria below.

Based on the cited references in the vegetation sections on ecological range condition and trend, knowledge of the resource area range site potentials and professional judgement of field personnel currently determining ecological range condition in the resource area. The following criteria was determined to project future changes in ecological range condition.

I. Projected changes for the Proposed Action and Maximizing Livestock Use alternative by management recommendations.

A. Allotments proposed for Allotment Management Plans and/or revision of existing Allotment Management Plans (Table 1-1 and 1-14).

1. Upward and/or Stable Estimated Trend.
Excellent condition areas would remain the same.

Three percent of good condition areas would improve one condition class to excellent condition.

Thirty percent of fair condition areas would improve one condition class to good condition.

Twenty percent of poor condition areas would improve one condition class to fair condition and ten percent of poor condition areas would improve two condition classes to good condition.

2. Downward Estimated Trend
Excellent condition areas would remain the same.

Two percent of good condition areas would improve one condition class to excellent condition.

Twenty-five percent of fair condition areas would improve one condition class to good condition.

Fifteen percent of poor condition areas would improve one condition class to fair condition and five percent of poor condition areas would improve two condition classes to good condition.

B. Allotments Proposed For No Allotment Management Plans (Table 1-1).

1. <u>Upward and/or Stable Estimated Trend</u>
Excellent condition areas would remain the same.

One percent of good condition areas would improve one condition class to excellent condition.

Twenty percent of fair condition areas would improve one condition class to good condition.

Ten percent of poor condition areas would improve one condition class to fair condition.

2. <u>Downward Estimated Trend</u>

Excellent condition areas would remain the same.

Good condition areas would remain the same.

Ten percent of fair condition areas would improve one condition class to good condition.

Five percent of poor condition areas would improve one condition class to fair condition.

C. Allotment and/or Areas Proposed For No Livestock Grazing (Herd Management Areas).

1. <u>Upward and/or Stable Estimated Trend</u>

Excellent condition areas would remain the same.

Good condition areas would remain the same.

Fair condition areas would remain the same.

Poor condition areas would remain the same.

2. <u>Downward Estimated Trend</u>.

One percent of excellent condition areas would decline one condition class to good condition.

Five percent of good condition areas would decline one condition class to fair condition.

Ten percent of fair condition areas would decline one condition class to poor condition.

Poor condition areas would remain the same.

II. No Action Alternative (Table 1-8).

A. Upward Estimated Trend

Excellent condition areas would remain the same.

Good condition areas would remain the same.

Fair condition areas would remain the same.

Poor condition areas would remain the same.

B. Stable and/or Downward Estimated Trend

Ten percent of excellent condition areas would decline one condition class to good condition.

Twenty-five percent of good condition areas would decline one condition class to fair condition.

Forty percent of fair condition areas would decline one condition class to poor condition.

Poor condition areas would remain the same.

III. No Livestock Grazing Alternative (Table 1-9).

A. Upward and/or Stable Estimated Trend

Excellent condition areas would remain the same.

Four percent of good condition areas would improve one condition class to excellent condition.

Thirty five percent of fair condition areas would improve one condition class to good condition.

Twenty percent of poor condition areas would improve one condition class to fair condition and 10 percent of poor condition areas would improve two condition classes to good condition.

B. Downward Estimated Trend

Excellent condition areas would remain the same.

Two percent of good areas would improve one condition class to excellent condition.

Twenty percent of fair condition areas would improve one condition class to fair condition.

Ten percent of poor condition areas would improve one condtion class to fair condition and three percent of poor condition areas would improve two condition classes to good condition.

IV. Maximizing Wild Horse and Burro Alternative (Table 1-18).

This criteria applies to allotments with wild horses and/or burro use only and the remaining allotments with no wild horses or burro use the proposed action criteria would be used.

A. Upward and/or Stable Estimated Trend.

Excellent condition areas would remain the same.

Two percent of good condition areas would improve one condition class to excellent condition.

Twenty five percent of fair condition areas would improve one condition class to good condition.

Twenty percent of poor condition areas would improve one condition class to fair condition.

Downward Estimated Trend.

Excellent condition areas would remain the same.

Good condition areas would remain the same.

Fair condition areas would remain the same.

Poor condition areas would remain the same.

APPENDIX N
SECTION 2

METHODOLOGY FOR DETERMINING CHANGE IN ECOLOGICAL RANGE TREND FOR THE PROPOSED ACTION AND ALTERNATIVES

Changes in ecological range trend were determined in combination with Appendix J using the criteria below.

Based on the cited references in the vegetation sections on ecological range condition and trend, knowledge of the resource areas range site potentials and professional judgement of field personnel currently determining ecological range condition in the resource area. The following criteria was determined to project future changes in ecological range trend.

I. Projected changes for the Proposed Action and Maximizing Livestock Use alternative by management recommendation.

A. Allotments proposed for Allotment Management Plans and/or revision of existing Allotment Management Plans (Table 1-1 and 1-14).

1. <u>Currently Upward and/or Stable Estimated Trend</u>

Excellent - 2 percent would continue upward
98 percent would stabilize

Good - 3 percent would continue upward
97 percent would stabilize

Fair - 30 percent would continue upward
70 percent would stabilize

Poor - 30 percent would continue upward
70 percent would stabilize

2. <u>Currently Downward Estimated Trend</u>

Excellent -100 percent would stablilize

Good - 2 percent would be upward
98 percent would stabilize

Fair - 25 percent would be upward
75 percent would stabilize

Poor - 20 percent would be upward
70 percent would stabilize
10 percent would continue downward

B. Allotments proposed for No Allotment Management Plans (Table 1-1).

1. <u>Current Upward and/or Stable Estimated Trend</u>

Excellent	-	100 percent would stabilize
Good	-	1 percent would continue upward 99 percent would stabilize
Fair	-	20 percent would continue upward 80 percent would stabilize
Poor	-	10 percent would continue upward 90 percent would stabilize

2. <u>Currently Downward Estimated Trend</u>

Excellent	-	100 percent would stabilize
Good	-	100 percent would stabilize
Fair	-	10 percent would be upward 80 percent would stabilize 10 percent would continue downward
Poor	-	5 percent would be upward 80 percent would stabilize 15 percent would continue downward

C. Allotment and/or areas proposed for No Livestock Grazing (Herd Management Areas).

1. <u>Currently Upward and/or Stable Estimated Trend</u>

Excellent	-	100 percent would stabilize
Good	-	100 percent would stabilize
Fair	-	100 percent would stabilize
Poor	-	100 percent would stabilize

2. <u>Currently Downward Estimated Trend</u>

Excellent	-	99 percent would stablilize 1 percent would continue downward
Good	-	95 percent would stabilize 5 percent would continue downward
Fair	-	90 percent would stabilize 10 percent would continue downward

Poor - 40 percent would stablilize
60 percent would continue downward

II. No Action Alternative (Table 1-8).

1. Currently Upward Estimated Trend

Excellent - 1 percent would continue upward
99 percent would stablilze

Good - 2 percent would continue upward
98 percent would stabilize

Fair - 99 percent would stabilize
1 percent would be downward

Poor - 98 percent would stabilize
2 percent would be downward

2. Currently Stable and/or Downward Estimated Trend

Excellent - 60 percent would stabilize
40 percent would continue downward

Good - 30 percent would stabilize
70 percent would continue downward

Fair - 20 percent would stabilize
80 percent would continue downward

Poor - 10 percent would stabilize
90 percent would continue downward

III. No Livestock Grazing Alternative (Table 1-9)

1. Currently Upward and/or Stable Estimated Trend

Excellent - 100 percent would continue upward

Good - 80 percent would continue upward
20 percent would stabilize

Fair - 70 percent would continue upward
30 percent would stabilize

Poor - 50 percent would continue upward
50 percent would stabilize

Currently Downward Estimated Trend

Excellent - 10 percent would be upward
90 percent would stablize

Good - 20 percent would be upward
80 percent would stablize

Fair - 70 percent would be upward
- 75 percent would stabilize
- 15 percent would continue downward

Poor - 5 percent would be upward
- 70 percent would stabilize
- 25 percent would continue downward

IV. Maximizing Wild Horse and Burro Alternative (Table 1-18).

This criteria applies to allotments with wild horses and/or burro use only and the remaining allotments with no wild horse or burro use, the proposed action criteria would be used.

1. Currently Upward and/or Stable Estimated Trend

Excellent - 100 percent would stabilize

Good - 2 percent would continue upward
98 percent would stabilize

Fair - 25 percent would continue upward
75 percent would stabilize

Poor - 20 percent would continue upward
80 percent would stabilize

2. Currently Downward Estimated Trend

Excellent - 99 percent would stabilize
1 percent would continue downward

Good - 95 percent would stabilize
5 percent would continue downward

Fair - 90 percent would stabilize
10 percent would continue downward

Poor - 60 percent would stabilize
40 percent would continue downward

APPENDIX N
SECTION 3

PROPOSED ACTION
ESTIMATED FUTURE RANGE TREND (2024)

Allotment	Total	Trend Direction					
		Upward	%	Stable	%	Down	%
Blue Wing	772,006	183,738	24	588,268	76	0	0
Lava Beds HMA	204,922	0	0	202,832	99	2,090	1
(Total)	976,928	183,738	19	791,100	81	2,090	<1
Buffalo Hills	271,018	46,480	17	206,922	76	17,616	7
Buffalo Hills HMA	123,498	0	0	72,988	59	50,510	41
(Total)	394,516	46,480	12	279,910	71	68,126	7
Calico	36,490	6,126	17	29,232	80	1,132	3
Clear Creek	55,455	10,603	19	42,412	76	2,440	5
Coal Canyon/Poker	97,265	18,713	19	69,506	71	9,046	10
Cottonwood Canyon	12,470	799	6	9,976	80	1,695	14
Coyote	34,270	12,283	36	21,987	64	0	0
Desert Queen	123,161	26,172	21	96,989	79	0	0
Diamond S	18,393	0	0	12,298	67	6,095	33
Dolly Hayden	77,904	12,417	16	62,838	81	2,649	3
Goldbanks	37,460	6,825	18	29,099	78	1,536	4
Harmony	6,803	796	12	5,776	85	231	3
Humboldt House	23,837	4,448	19	17,244	72	2,145	9
Humboldt Sink	68,985	15,970	23	53,015	77	0	0
Jersey Valley	66,517	6,100	9	60,417	91	0	0
Klondike	50,321	10,542	21	35,703	71	4,076	8
Leadville	54,572	8,132	15	45,458	83	982	2
Licking	4,569	936	20	3,515	77	118	3
Majuba	100,581	21,926	22	78,655	78	0	0
North Buffalo	51,573	9,340	18	40,583	79	1,650	3
Pleasant Valley	174,543	27,525	16	143,702	82	3,316	2
Pole Canyon	13,877	2,820	20	9,891	71	1,166	9
Prince Royal	10,425	2,289	22	7,500	72	636	6
Pumpernickle	124,934	19,116	15	104,569	84	1,249	1
Ragged Top	86,314	3,669	4	78,546	91	4,099	5
Rawhide	122,631	21,134	17	91,588	75	9,909	8
Rochester	173,679	29,933	17	129,713	75	14,033	8
Rock Creek	23,365	2,809	12	20,415	87	141	1
Rodeo Creek	193,402	39,300	20	137,856	71	16,246	9
Rye Patch	40,123	7,555	19	32,568	81	0	0
Seven Troughs	275,549	49,737	18	213,412	77	12,400	5
Lava Beds HMA	26,822	0	0	18,440	69	8,382	31
(Total)	302,371	49,737	16	231,852	77	20,782	7
Soldier Meadows	327,739	46,539	14	276,284	84	4,916	2
Sonoma	20,178	4,944	25	15,234	75	0	0
South Buffalo	234,335	47,102	20	173,642	74	13,591	6
Star Peak	84,091	15,750	19	61,950	74	6,391	7
Thomas Creek	11,264	2,826	25	8,292	74	146	1
White Horse	20,739	4,011	19	15049	73	1,679	8
TOTAL a/	4,256,080	729,405	17	3,324,364	78	202,311	5

a/ The Melody Allotment has been seeded to crested wheatgrass. This is a non-native (introduced) species and does not relate to the original climax plant community, thus ecological range trend cannot be determined.

Source: Extrapolated from Appendix J. See Appendix N, Section 2 for methodology.

APPENDIX N
SECTION 4

PROPOSED ACTION
ESTIMATED ECOLOGICAL RANGE CONDITION (2024)

Allotment	Condition Class (Acres)								
	Excellent	%	Good	%	Fair	%	Poor	%	Total
Blue Wing	18,528	2	264,026	34	267,114	35	222,338	29	772,006
Lava Beds HMA	3,688	2	39,325	19	79,940	39	81,969	40	204,922
(Total)	22,216	2	303,351	31	347,054	36	304,307	31	976,928
Buffalo Hills	32,956	12	38,897	14	56,913	21	142,252	53	271,018
Buffalo Hills HMA	14,820	12	9,386	8	17,117	14	82,175	66	123,498
(Total)	47,776	12	48,283	12	74,030	19	224,427	57	394,516
Calico	4,138	11	10,300	29	12,918	35	9,134	25	36,490
Clear Creek	721	1	14,735	27	20,296	37	19,703	35	55,455
Coal Canyon/Poker	1,090	1	8,104	8	15,027	15	73,044	76	97,265
Cottonwood Canyon	0	0	349	3	3,592	29	8,529	68	12,470
Coyote	651	2	15,006	44	13,185	38	5,428	16	34,270
Desert Queen	12,685	10	32,823	27	42,182	34	35,471	29	123,161
Diamond S	368	2	1,747	9	6,704	36	9,574	53	18,393
Dolly Hayden	2,025	3	30,653	39	23,838	31	21,388	27	77,904
Goldbanks	4,232	11	7,846	21	12,980	35	12,402	33	37,460
Harmony	442	6	3,622	53	871	13	1,868	28	6,803
Humboldt House	38	< 1	2,900	12	3,576	15	17,323	73	23,837
Humboldt Sink	7,208	10	22,525	33	29,318	42	9,934	15	68,985
Jersey Valley	2,043	3	4,742	7	6,452	10	53,280	80	66,517
Klondike	0	0	4,122	8	13,285	26	32,914	66	50,321
Leadville	437	1	27,540	50	18,663	34	7,932	15	54,572
Licking	192	4	1,184	26	2,234	49	959	21	4,569
Majuba	10,661	11	38,423	38	44,256	44	7,241	7	100,581
North Buffalo	1,753	3	16,612	32	19,881	39	13,327	26	51,573
Pleasant Valley	11,520	7	72,361	41	63,882	37	26,780	15	174,543
Pole Canyon	141	1	1,117	8	3,205	23	9,414	68	13,877
Prince Royal	0	0	1,287	12	4,003	38	5,135	50	10,425
Pumpernickle	3,449	3	62,673	50	48,724	39	10,088	8	124,934
Ragged Top	21,578	25	29,347	34	31,289	36	4,100	5	86,314
Rawhide	637	1	24,360	20	17,622	14	80,012	65	122,631
Rochester	903	1	34,500	20	24,957	14	113,319	65	173,679
Rock Creek	2,716	12	14,401	62	5,116	22	1,132	4	23,365
Rodeo Creek	1,973	1	15,568	8	4,676	23	131,185	66	193,402
Rye Patch	273	1	17,737	44	12,579	31	9,534	24	40,123
Seven Troughs	14,604	5	69,887	25	90,931	33	100,127	37	275,549
Lava Beds HMA	1,341	5	3,822	14	8,630	32	13,029	49	26,822
(Total)	15,945	5	73,709	24	99,561	33	113,156	38	302,371
Soldier Meadows	52,111	16	130,234	40	105,696	32	39,698	12	327,739
Sonoma	1,039	5	4,319	21	9,735	48	5,085	26	20,178
South Buffalo	5,179	2	41,020	18	78,384	33	109,752	47	234,335
Star Peak	4,356	5	10,343	12	17,785	21	51,607	62	84,091
Thomas Creek	584	5	3,443	31	6,055	54	1,182	10	11,264
White Horse	29	< 1	2,759	13	4,387	21	13,564	66	20,739
TOTAL a/	241,109	6	1,134,045	27	1,287,998	30	1,592,928	37	4,256,080

a/ The Melody Allotment has been seeded to crested wheatgrass. This is a non-native (introduced) species and does not relate to the original climax plant community, thus ecological range condition cannot be determined.

Source: Extrapolated from Appendix J. See Appendix N, Section 1 for methodology.

APPENDIX N
SECTION 5

NO LIVESTOCK GRAZING
ESTIMATED ECOLOGICAL RANGE CONDITION (2024)

Allotment	Excellent	%	Good	%	Fair	%	Poor	%	Total
	Condition Class (Acres)								
Blue Wing	23,446	2	360,486	37	319,540	28	273,540	28	976,928
Buffalo Hills	47,973	12	50,458	13	72,986	18	223,099	57	394,516
Calico	4,138	11	9,411	26	13,100	36	9,841	27	36,490
Clear Creek	721	1	13,320	24	20,186	37	21,228	38	55,455
Coal Canyon/Poker	1,129	1	6,838	7	10,601	11	78,697	81	97,265
Cottonwood Canyon	0	0	968	8	3,691	29	7,811	63	12,470
Coyote	754	2	15,054	44	13,185	39	5,277	15	34,270
Desert Queen	13,055	10	37,749	31	37,871	31	34,486	28	123,161
Diamond S	405	2	3,538	19	6,769	37	7,681	42	18,393
Dolly Hayden	2,025	3	28,997	37	23,838	31	23,044	29	77,904
Goldbanks	4,270	11	6,904	18	12,924	35	13,362	36	37,460
Harmony	476	7	3,597	53	718	10	2,012	30	6,803
Humboldt House	38	< 1	2,608	11	2,527	11	18,664	78	23,837
Humboldt Sink	7,312	10	24,593	36	27,422	40	9,658	14	68,985
Jersey Valley	2,089	3	6,472	10	6,452	10	51,504	77	66,517
Klondike	0	0	3,135	6	11,725	23	35,461	71	50,321
Leadville	473	1	26,271	48	19,318	35	8,546	16	54,572
Licking	192	4	1,032	22	2,312	51	1,033	23	4,569
Majuba	10,863	11	41,439	41	41,239	41	7,040	7	100,581
North Buffalo	1,753	3	15,245	30	20,217	39	14,358	28	51,573
Pleasant Valley	11,520	7	68,019	39	66,152	38	28,852	16	174,543
Pole Canyon	142	1	874	6	2,720	20	10,141	73	13,877
Prince Royal	0	0	1,004	10	3,889	37	5,532	53	10,425
Pumpernickle	3,448	3	59,394	47	51,223	41	10,869	9	124,934
Ragged Top	22,095	26	32,411	38	28,053	32	3,755	4	86,314
Rawhide	637	1	22,937	19	12,852	10	86,205	70	122,631
Rochester	903	1	32,485	19	18,201	10	122,090	70	173,679
Rock Creek	2,589	11	14,860	64	4,696	20	1,220	5	23,365
Rodeo Creek	1,973	1	12,184	6	37,907	20	141,338	73	193,402
Rye Patch	273	1	17,340	43	13,241	33	9,269	23	40,123
Seven Troughs	16,025	5	69,697	23	98,271	33	118,378	39	302,371
Soldier Meadows	53,094	16	122,082	37	109,793	34	42,770	13	327,739
Sonoma	1,049	5	3,895	19	10,291	51	4,943	25	20,178
South Buffalo	5,343	2	35,290	15	75,456	32	118,246	51	234,335
Star Peak	4,407	5	8,947	11	15,136	18	55,601	66	84,091
Thomas Creek	568	5	3,839	34	5,565	50	1,274	11	11,264
White Horse	29	< 1	2,425	12	3,671	18	14,614	70	20,739
TOTAL a/	245,189	6	1,165,798	27	1,223,654	38	1,621,439	38	4,256,080

a/ The Melody Allotment has been seeded to crested wheatgrass. This is a non-native (introduced) species and does not relate to the original climax plant community, thus ecological range condition cannot be determined.

Source: Extrapolated from Appendix J. See Appendix N, Section 1 for methodology.

APPENDIX N
SECTION 6

NO LIVESTOCK GRAZING
ESTIMATED FUTURE RANGE TREND (2024)

Allotment	Total	Trend Direction: Upward	%	Stable	%	Down	%
Blue Wing	976,928	496,280	51	480,648	49	0	0
Buffalo Hills	394,516	72,394	18	249,137	63	72,985	19
Calico	36,940	3,704	10	27,714	76	5,072	14
Clear Creek	55,455	5,657	10	40,371	73	9,427	17
Coal Canyon/Poker	97,265	8,803	9	65,556	67	22,906	24
Cottonwood Canyon	12,470	798	7	8,904	71	2,768	22
Coyote	34,270	18,780	55	14,282	42	1,208	3
Desert Queen	123,161	44,954	37	71,741	58	6,466	5
Diamond S	18,393	1,913	10	13,169	72	3,311	18
Dolly Hayden	77,904	10,205	13	57,104	73	10,595	14
Goldbanks	37,460	9,038	25	22,177	59	5,975	16
Harmony	6,803	3,701	54	2,524	37	578	9
Humboldt House	23,837	1,502	6	16,900	71	5,435	23
Humboldt Sink	68,985	48,634	71	20,351	29	0	0
Jersey Valley	66,517	5,954	9	45,663	69	14,900	22
Klondike	50,321	2,994	6	35,703	71	11,624	23
Leadville	54,572	7,149	13	41,529	76	5,894	11
Licking	4,569	608	13	3,253	71	708	16
Majuba	100,581	73,424	73	27,157	27	0	0
North Buffalo	51,573	6,756	13	37,210	72	7,607	15
Pleasant Valley	174,543	30,458	17	124,013	71	20,072	12
Pole Canyon	13,877	819	6	9,853	71	3,205	23
Prince Royal	10,425	724	7	7,501	72	2,200	21
Pumpernickle	124,934	18,865	15	93,575	75	12,494	10
Ragged Top	86,314	30,425	35	49,631	58	6,258	7
Rawhide	122,631	9,492	8	87,816	71	25,323	21
Rochester	173,679	13,442	8	124,372	71	35,865	21
Rock Creek	23,365	9,837	42	13,178	56	350	2
Rodeo Creek	193,402	11,411	6	137,315	71	44,676	23
Rye Patch	40,123	10,673	27	27,464	68	1,986	5
Seven Troughs	302,371	41,576	14	210,904	70	49,891	16
Soldier Meadows	327,739	143,385	44	152,399	46	31,955	10
Sonoma	20,178	6,457	32	12,056	60	1,665	8
South Buffalo	234,335	32,338	14	156,419	67	45,578	19
Star Peak	84,091	12,530	15	53,944	64	17,617	21
Thomas Creek	11,264	6,814	61	4,084	36	366	3
White Horse	20,739	1,379	7	14,787	71	4,573	22
TOTAL a/	4,256,080	1,204,143	6	2,560,404	60	491,533	12

a/ The Melody Allotment has been seeded to crested wheatgrass. This is a non-native (introduced) species and does not relate to the original climax plant community, thus ecological range trend cannot be determined.

Source: Extrapolated from Appendix J. See Appendix N, Section 2 for methodology.

APPENDIX N
SECTION 7

NO ACTION
ESTIMATED ECOLOGICAL RANGE CONDITION (2024)

Allotment	Excellent	%	Good	%	Fair	%	Poor	%	Total
	Condition Class (Acres)								
Blue Wing	17,584	2	148,005	15	252,341	26	558,998	57	976,928
Buffalo Hills	42,608	11	27,221	7	40,951	10	283,736	72	394,516
Calico	3,613	10	4,953	14	9,967	27	17,957	49	36,490
Clear Creek	499	1	6,280	11	14,566	26	34,110	62	55,455
Coal Canyon/Poker	876	1	2,991	3	1,765	2	91,633	94	97,265
Cottonwood Canyon	0	0	0	0	2,095	17	10,375	83	12,470
Coyote	309	1	7,736	23	11,212	33	15,013	43	34,270
Desert Queen	11,084	9	14,779	12	28,820	23	68,478	56	123,161
Diamond S	331	2	1,407	8	4,696	26	11,959	64	18,393
Dolly Hayden	1,402	2	17,646	23	19,421	25	39,435	50	77,904
Goldbanks	3,708	10	3,118	8	9,165	24	21,469	58	37,460
Harmony	306	5	2,577	38	964	14	2,956	43	6,803
Humboldt House	0	0	1,430	6	572	2	21,835	92	23,837
Humboldt Sink	6,208	9	8,278	12	40,702	59	13,797	20	68,985
Jersey Valley	1,796	3	4,856	7	665	1	59,200	89	66,517
Klondike	0	0	0	0	5,737	11	44,584	89	50,321
Leadville	0	0	16,372	30	17,026	31	21,174	39	54,572
Licking	165	4	356	8	1,716	38	2,332	50	4,569
Majuba	9,052	9	21,122	21	60,349	60	10,058	10	100,581
North Buffalo	1,392	3	7,852	15	15,496	30	26,833	52	51,573
Pleasant Valley	9,426	5	40,057	23	55,138	32	69,922	40	174,543
Pole Canyon	125	1	115	1	1,189	9	12,448	89	13,877
Prince Royal	0	0	0	0	2,440	23	7,985	77	10,425
Pumpernickle	2,249	2	35,794	29	44,639	36	42,252	33	124,934
Ragged Top	19,420	22	21,039	24	24,923	29	20,932	25	86,314
Rawhide	220	< 1	14,734	12	5,155	4	102,522	84	122,631
Rochester	312	< 1	20,868	12	7,300	4	145,199	84	173,679
Rock Creek	2,103	9	9,638	41	10,222	44	1,402	6	23,365
Rodeo Creek	1,741	1	1,595	1	16,565	9	173,501	89	193,402
Rye Patch	0	0	10,231	25	9,991	25	19,901	50	40,123
Seven Troughs	13,606	4	35,151	12	70,528	23	183,086	61	302,371
Soldier Meadows	49,161	15	98,321	30	78,658	24	101,599	31	327,739
Sonoma	908	4	832	4	6,826	34	11,612	58	20,178
South Buffalo	4,218	2	12,654	5	48,929	21	168,534	72	234,335
Star Peak	3,784	5	4,099	5	7,379	9	68,829	81	84,091
Thomas Creek	507	5	718	6	5,145	46	4,894	43	11,264
White Horse	0	0	1,089	5	1,711	8	17,939	87	20,739
TOTAL a/	208,713	5	603,914	14	934,964	22	2,508,489	59	4,256,080

a/ The Melody Allotment has been seeded to crested wheatgrass. This is a non-native (introduced) species and does not relate to the original climax plant community, thus ecological range condition cannot be determined.

Source: Extrapolated from Appendix J. See Appendix N, Section 1 for methodology.

APPENDIX N
SECTION 8

NO ACTION
ESTIMATED FUTURE RANGE TREND (2024)

Allotment	Total	Upward	%	Stable	%	Down	%
		Trend Direction					
Blue Wing	976,928	0	0	183,663	19	793,265	81
Buffalo Hills	394,516	0	0	75,352	19	319,164	81
Calico	36,490	0	0	8,392	23	28,098	77
Clear Creek	55,455	0	0	9,704	17	45,751	83
Coal Canyon/Poker	97,265	0	0	11,186	12	86,079	82
Cottonwood Canyon	12,470	0	0	1,596	13	10,874	87
Coyote	34,270	0	0	7,265	21	27,005	79
Desert Queen	123,161	0	0	26,480	22	96,681	78
Diamond S	18,393	0	0	3,127	17	15,266	83
Dolly Hayden	77,904	0	0	15,893	20	62,011	80
Goldbanks	37,460	0	0	7,979	21	29,481	79
Harmony	6,803	0	0	1,606	24	5,197	76
Humboldt House	23,837	0	0	2,812	12	21,025	88
Humboldt Sink	68,985	0	0	58,327	85	10,658	15
Jersey Valley	66,517	93	< 1	64,435	97	1,989	3
Klondike	50,321	0	0	5,988	12	44,333	88
Leadville	54,572	0	0	12,115	22	42,457	78
Licking	4,569	0	0	914	20	3,655	80
Majuba	100,581	402	< 1	95,052	95	5,127	5
North Buffalo	51,573	0	0	10,315	20	41,258	80
Pleasant Valley	174,543	0	0	41,018	24	133,525	76
Pole Canyon	13,877	0	0	1,680	12	12,197	88
Prince Royal	10,425	0	0	1,449	14	8,976	86
Pumpernickle	124,934	0	0	29,484	24	95,450	76
Ragged Top	86,314	0	0	28,052	32	58,262	68
Rawhide	122,631	0	0	6,769	6	115,862	94
Rochester	173,679	0	0	23,620	14	150,059	86
Rock Creek	23,365	0	0	12,266	52	11,099	48
Rodeo Creek	193,402	0	0	23,401	12	170,001	88
Rye Patch	40,123	0	0	8,064	20	32,059	80
Seven Troughs	302,371	0	0	43,844	15	258,527	85
Soldier Meadows	327,739	2,458	1	176,159	54	149,122	45
Sonoma	20,178	0	0	3,834	19	16,344	81
South Buffalo	234,335	0	0	36,790	16	197,545	84
Star Peak	84,091	0	0	12,614	15	71,477	85
Thomas Creek	11,264	0	0	2,421	21	8,843	79
White Horse	20,739	0	0	2,614	13	18,125	87
TOTAL a/	4,256,080	2,953	< 1	1,056,280	25	3,196,847	75

a/ The Melody Allotment has been seeded to crested wheatgrass. This is a non-native (introduced) species and does not relate to the original climax plant community, thus ecological range trend cannot be determined.

Source: Extrapolated from Appendix J. See Appendix N, Section 2 for methodology.

APPENDIX N
SECTION 9

MAXIMIZING LIVESTOCK USE
ESTIMATED ECOLOGICAL RANGE CONDITION (2024)

	Condition Class (Acres)								
Allotment	Excellent	%	Good	%	Fair	%	Poor	%	Total
Blue Wing	23,446	2	334,110	34	338,017	35	281,355	29	976,928
Buffalo Hills	47,973	12	56,623	14	82,848	21	207,072	53	394,516
Calico	4,138	11	10,300	29	12,918	35	9,134	25	36,490
Clear Creek	721	1	14,735	27	20,296	37	19,703	35	55,455
Coal Canyon/Poker	1,090	1	8,104	8	15,027	15	73,044	76	97,265
Cottonwood Canyon	0	0	1,255	10	3,960	32	7,249	58	12,470
Coyote	651	2	15,006	44	13,185	38	5,428	16	34,270
Desert Queen	12,685	10	32,823	27	42,182	34	35,471	29	123,161
Diamond S	405	2	4,016	21	6,842	37	7,130	41	18,393
Dolly Hayden	2,025	3	30,653	39	23,838	31	21,388	27	77,904
Goldbanks	4,232	11	7,846	21	12,980	35	12,402	33	37,460
Harmony	442	6	3,622	53	871	13	1,868	28	6,803
Humboldt House	38	< 1	2,900	12	3,576	15	17,323	73	23,837
Humboldt Sink	7,208	10	22,525	33	29,318	42	9,934	15	68,985
Jersey Valley	2,136	3	9,452	14	12,305	18	42,624	65	66,517
Klondike	0	0	4,122	8	13,285	26	32,914	66	50,321
Leadville	437	1	27,540	50	18,663	34	7,932	15	54,572
Licking	192	4	1,184	26	2,234	49	959	21	4,569
Majuba	10,661	11	38,423	38	44,256	44	7,241	7	100,581
North Buffalo	1,753	3	16,612	32	19,881	39	13,327	26	51,573
Pleasant Valley	11,520	7	72,361	41	63,882	37	26,780	15	174,543
Pole Canyon	141	1	1,117	8	3,205	23	9,414	68	13,877
Prince Royal	0	0	1,287	12	4,003	38	5,135	50	10,425
Pumpernickle	3,449	3	62,673	50	48,724	39	10,088	8	124,934
Ragged Top	22,096	26	34,191	40	26,541	31	3,486	3	86,314
Rawhide	637	1	24,360	20	17,622	14	80,012	65	122,631
Rochester	903	1	34,500	20	24,957	14	113,319	65	173,679
Rock Creek	2,716	12	14,401	62	5,116	22	1,132	4	23,365
Rodeo Creek	1,973	1	15,568	8	44,676	23	131,185	68	193,402
Rye Patch	273	1	17,737	44	12,579	31	9,534	24	40,123
Seven Troughs	16,025	5	76,690	25	99,782	33	109,874	37	302,371
Soldier Meadows	52,111	16	130,234	40	105,696	32	39,698	12	327,739
Sonoma	1,039	5	4,319	21	9,735	48	5,085	26	20,178
South Buffalo	5,179	2	41,020	18	78,384	33	109,752	47	234,335
Star Peak	4,356	5	10,343	12	17,785	21	51,607	62	84,091
Thomas Creek	584	5	3,443	31	6,055	54	1,182	10	11,264
White Horse	29	< 1	2,759	13	4,387	21	13,564	66	20,739
TOTAL a/	243,264	6	1,188,854	28	1,289,617	30	1,534,345	36	4,256,080

a/ The Melody Allotment has been seeded to crested wheatgrass. This is a non-native (introduced) species and does not relate to the original climax plant community, thus ecological range condition cannot be determined.

Source: Extrapolated from Appendix J. See Appendix N, Section 1 for methodology.

APPENDIX N
SECTION 10

MAXIMIZING LIVESTOCK USE
ESTIMATED FUTURE RANGE TREND (2024)

		Trend Direction					
Allotment	Total	Upward	%	Stable	%	Down	%
Blue Wing	976,928	232,509	24	744,419	76	0	0
Buffalo Hills	394,516	67,659	17	301,213	76	25,644	7
Calico	36,490	6,126	17	29,232	80	1,132	3
Clear Creek	55,455	10,603	19	42,412	76	2,440	5
Coal Canyon/Poker	97,265	18,713	19	69,506	71	9,046	10
Cottonwood Canyon	12,470	2,669	21	8,904	71	897	8
Coyote	34,270	12,283	36	21,987	64	0	0
Desert Queen	123,161	26,172	21	96,989	79	0	0
Diamond S	18,393	3,649	20	13,861	75	883	5
Dolly Hayden	77,904	12,417	16	62,838	81	2,649	3
Goldbanks	37,460	6,825	18	29,099	78	1,536	4
Harmony	6,803	796	12	5,776	85	231	3
Humboldt House	23,837	4,448	19	17,244	72	2,145	9
Humboldt Sink	68,985	15,970	23	53,015	77	0	0
Jersey Valley	66,517	18,140	27	48,377	73	0	0
Klondike	50,321	10,542	21	35,703	71	4,076	8
Leadville	54,572	8,132	15	45,458	83	982	2
Licking	4,569	936	20	3,515	77	118	3
Majuba	100,581	21,926	22	78,655	78	0	0
North Buffalo	51,573	9,340	18	40,583	79	1,650	3
Pleasant Valley	174,543	27,525	16	143,702	82	3,316	2
Pole Canyon	13,877	2,820	20	9,891	71	1,166	9
Prince Royal	10,425	2,289	22	7,500	72	636	6
Pumpernickle	124,934	19,116	15	104,569	84	1,249	1
Ragged Top	86,314	10,377	12	75,235	87	702	1
Rawhide	122,631	21,134	17	91,588	75	9,909	8
Rochester	173,679	29,933	17	129,713	75	14,033	8
Rock Creek	23,365	2,809	12	20,415	87	141	1
Rodeo Creek	193,402	39,300	20	137,856	71	16,246	9
Rye Patch	40,123	7,555	19	32,568	81	0	0
Seven Troughs	302,371	54,880	18	233,884	77	13,607	5
Soldier Meadows	327,739	46,539	14	276,284	84	4,916	2
Sonoma	20,178	4,944	25	15,234	75	0	0
South Buffalo	234,335	47,102	20	173,642	74	13,591	6
Star Peak	84,091	15,750	19	61,950	74	6,391	7
Thomas Creek	11,264	2,826	25	8,292	74	146	1
White Horse	20,739	4,011	19	15,049	73	1,679	8
TOTAL a/	4,256,080	828,765	19	3,286,158	77	141,157	4

a/ The Melody Allotment has been seeded to crested wheatgrass. This is a non-native (introduced) species and does not relate to the original climax plant community, thus ecological range trend cannot be determined.

Source: Extrapolated from Appendix J. See Appendix N, Section 2 for methodology.

APPENDIX N
SECTION 11

MAXIMIZING WILD HORSE AND BURRO ESTIMATED ECOLOGICAL RANGE CONDITION (2024)

Allotment	Condition Class (Acres) Excellent	%	Good	%	Fair	%	Poor	%	Total
Blue Wing	19,538	2	288,194	30	356,579	37	312,617	31	976,928
Buffalo Hills	47,342	12	31,561	8	59,177	15	256,436	65	394,516
Calico	4,014	11	6,203	17	14,961	41	11,312	31	36,490
Clear Creek	721	1	14,735	27	20,296	37	19,703	35	55,455
Coal Canyon/Poker	1,090	1	8,104	8	15,027	15	73,044	76	97,265
Cottonwood Canyon	0	0	0	0	3,492	28	8,978	72	12,470
Coyote	651	2	15,006	44	13,185	38	5,428	16	34,270
Desert Queen	12,685	10	32,823	27	42,182	34	35,471	29	123,161
Diamond S	368	2	1,839	10	7,357	40	8,829	48	18,393
Dolly Hayden	2,025	3	30,653	39	23,838	31	21,388	27	77,904
Goldbanks	4,195	11	3,671	10	14,235	38	15,359	41	37,460
Harmony	442	6	3,622	53	871	13	1,868	28	6,803
Humboldt House	38	< 1	2,900	12	3,576	15	17,323	73	23,837
Humboldt Sink	7,208	10	22,525	33	29,318	42	9,934	15	68,985
Jersey Valley	2,089	3	4,729	7	12,339	19	47,360	71	66,517
Klondike	0	0	0	0	9,561	19	40,760	81	50,321
Leadville	0	0	21,829	40	22,920	42	9,823	18	54,572
Licking	192	4	1,184	26	2,234	49	959	21	4,569
Majuba	10,661	11	38,423	38	44,256	44	7,241	7	100,581
North Buffalo	1,753	3	16,612	32	19,881	39	13,327	26	51,573
Pleasant Valley	10,473	6	52,363	30	78,544	45	33,163	19	174,543
Pole Canyon	139	1	139	1	1,943	14	11,656	84	13,877
Prince Royal	0	0	1,287	12	4,003	38	5,135	50	10,425
Pumpernickle	2,499	2	47,475	38	62,467	50	12,493	10	124,934
Ragged Top	21,578	25	29,347	34	31,289	36	4,100	5	86,314
Rawhide	637	1	24,360	20	17,622	14	80,012	65	122,631
Rochester	347	< 1	27,789	16	5,210	3	140,333	81	173,679
Rock Creek	2,716	12	14,401	62	5,116	22	1,132	4	23,365
Rodeo Creek	1,934	1	1,934	1	27,076	14	162,458	84	193,402
Rye Patch	273	1	17,737	44	12,579	31	9,534	24	40,123
Seven Troughs	15,118	5	45,356	15	105,830	35	136,067	45	302,371
Soldier Meadows	51,127	16	96,355	29	131,096	40	49,161	15	327,739
Sonoma	1,039	5	4,319	21	9,735	48	5,085	26	20,178
South Buffalo	5,015	2	16,075	7	77,330	33	135,915	58	234,335
Star Peak	4,356	5	10,343	12	17,785	21	51,607	62	84,091
Thomas Creek	584	5	3,443	31	6,055	54	1,182	10	11,264
White Horse	29	< 1	2,759	13	4,387	21	13,564	66	20,739
TOTAL a/	232,876	5	940,095	22	1,313,352	31	1,769,757	42	4,256,080

a/ The Melody Allotment has been seeded to crested wheatgrass. This is a non-native (introduced) species and does not relate to the original climax plant community, thus ecological range condition cannot be determined.

Source: Extrapolated from Appendix J. See Appendix N, Section 1 for methodology.

APPENDIX N
SECTION 12

MAXIMIZING WILD HORSE AND BURROS ESTIMATED FUTURE RANGE TREND (2024)

Allotment	Total	Trend Direction Upward	%	Stable	%	Down	%
Blue Wing	976,928	170,962	17	796,002	81	9,964	2
Buffalo Hills	394,516	0	0	284,716	72	109,800	28
Calico	36,490	0	0	30,119	83	6,371	17
Clear Creek	55,455	10,603	19	42,412	76	2,440	5
Coal Canyon/Poker	97,265	18,713	19	69,506	71	9,046	10
Cottonwood Canyon	12,470	0	0	8,530	68	3,940	32
Coyote	34,270	12,283	36	21,987	64	0	0
Desert Queen	123,161	26,172	21	96,989	79	0	0
Diamond S	18,393	0	0	14,033	76	4,360	24
Dolly Hayden	77,904	12,417	16	62,838	81	2,649	3
Goldbanks	37,460	75	< 1	29,818	80	7,567	20
Harmony	6,803	796	12	5,776	85	231	3
Humboldt House	23,837	4,448	19	17,244	72	2,145	9
Humboldt Sink	68,985	15,970	23	53,015	77	0	0
Jersey Valley	66,517	12,099	18	54,418	82	0	0
Klondike	50,321	0	0	33,061	66	17,260	34
Leadville	54,572	0	0	47,260	87	7,312	13
Licking	4,569	936	20	3,515	77	118	3
Majuba	100,581	21,926	22	78,655	78	0	0
North Buffalo	51,573	9,340	18	40,583	79	1,650	3
Pleasant Valley	174,543	0	0	150,806	86	23,737	24
Pole Canyon	13,877	0	0	9,013	65	4,864	35
Prince Royal	10,425	2,289	22	7,500	72	636	6
Pumpernickle	124,934	0	0	111,316	89	13,618	11
Ragged Top	86,314	3,669	4	78,546	91	4,099	5
Rawhide	122,631	21,134	17	91,588	75	9,909	8
Rochester	173,679	0	0	115,636	67	58,043	33
Rock Creek	23,365	2,809	12	20,415	87	141	1
Rodeo Creek	193,402	0	0	125,595	65	67,807	35
Rye Patch	40,123	7,555	19	32,568	81	0	0
Seven Troughs	302,371	0	0	234,093	78	67,278	22
Soldier Meadows	327,739	1,966	1	292,999	89	32,774	10
Sonoma	20,178	4,944	25	15,234	75	0	0
South Buffalo	234,335	328	< 1	171,908	73	62,099	27
Star Peak	84,091	15,750	19	61,950	74	6,391	7
Thomas Creek	11,264	2,826	25	8,292	74	146	1
White Horse	20,739	4,011	19	15,049	73	1,679	8
TOTAL a/	4,256,080	384,021	9	3,333,985	78	538,074	13

a/ The Melody Allotment has been seeded to crested wheatgrass. This is a non-native (introduced) species and does not relate to the original climax plant community, thus ecological range trend cannot be determined.

Source: Extrapolated from Appendix J. See Appendix N, Section 2 for methodology.

APPENDIX O

PROJECT DISTURBANCE TOTALS

APPENDIX O

PROJECT DISTURBANCE TOTALS a/
SONOMA-GERLACH RESOURCE AREA

Project Type	Proposed Action			Maximizing Livestock			Maximizing Wild Horses and Burros		
	Units	Short-Term Acre Disturbance	Long-Term Acre Disturbance	Units	Short-Term Acre Disturbance	Long-Term Acre Disturbance	Units	Short-Term Acre Disturbance	Long-Term Acre Disturbance
Sagebrush Control	-	-	-	21,290	21,290	0	-	-	-
Seeding/Reseeding	14,752	14,752	0	18,021	18,021	0	14,752	14,752	0
Sagebrush Control/Seeding	230,112	230,112	0	245,085	245,085	0	230,112	230,112	-
Spring Development	8 each	2.0	0	8 each	2.0	0	8 each	2	0
Wells	42 each	10.5	3.4	44 each	11.0	3.5	42 each	10.5	3.4
Pipelines	15.5 miles	19.4	0	15.5 miles	19.4	0	15.5 miles	19.4	0
Fences	399.0 miles	399.0	23.9	411.0 miles	411.0	24.7	692.0 miles	692.0	41.5
Troughs	102 each	25.5	25.5	106 each	26.5	26.5	102 each	25.5	25.5
Totals		245,320.4	52.8		284,865.9	54.7		245,613.4	70.4

a/ Acres of disturbance for range improvements were calculated using the following estimates:

	Short-Term	Long-Term
Spring Development	0.25 acres/each	0 acres/each
Wells	0.25 acres/each	0.08 acres/each
Pipelines	1.25 acres/mile	0 acres/mile
Fences	1.00 acres/mile	0.06 acres/mile
Troughs	0.25 acres/each	0.25 acres/each

Source: Robert Carroll, personal communication, 1980 and Sonoma-Gerlach Environmental Impact Statement Team.

APPENDIX P

SECTION 1

Proposed Action Anticipated Increase in Vegetation Production (AUMs) Through Management per Allotment

SECTION 2

Maximizing Livestock Use Alternative Anticipated Vegetation Production (AUMs) Through Management per Allotment

APPENDIX P
SECTION 1

PROPOSED ACTION
ANTICIPATED INCREASE IN VEGETATION PRODUCTION (AUMs) THROUGH MANAGEMENT PER ALLOTMENT a/
SONOMA-GERLACH RESOURCE AREA

Allotment	Reduction in Grazing Intensity (21%) c/	Implementation of Grazing Systems (AMPs) (5%) d/	Unsuitable with Potential to be Suitable b/			Increase	Suitable by Recompiled Survey	Combined Total
			Water	Production	Water & Production			
Blue Wing	4,035	961	6,158	1,006	134	12,294	19,215	31,509
Buffalo Hills	4,650	1,107	0	816	0	6,573	22,141	26,714
Calico	358	85	0	0	0	443	1,706	2,149
Clear Creek	505	120	330	120	0	1,075	2,405	3,480
Coal Canyon-Poker	602	0	495	266	2	1,365	2,868	4,233
Cottonwood Canyon	0	0	34	0	0	34	155	189
Coyote	692	0	0	2	0	694	3,294	3,988
Desert Queen	153	36	883	500	251	1,823	730	2,553
Diamond S	141	0	0	0	0	141	674	815
Dolly Hayden	0	196	215	0	6	417	3,935	4,352
Goldbanks	317	0	241	0	0	558	1,512	2,070
Harmony	48	11	0	8	0	67	233	300
Humboldt House	90	21	0	183	0	294	433	727
Humboldt Sink	62	14	0	61	8	145	297	442
Jersey Valley	115	0	69	883	0	1,067	552	1,619
Klondike	305	72	18	56	66	517	1,456	1,973
Leadville	543	0	0	41	0	584	2,584	3,168
Licking	10	2	0	66	0	78	48	126
Majuba	0	166	379	67	73	685	3,312	3,997
Melody	129	30	0	0	0	159	616	775
North Buffalo	344	82	1,219	0	0	1,645	1,640	3,285
Pleasant Valley	1,803	429	224	122	8	2,586	8,586	11,172
Pole Canyon	42	10	196	0	0	248	200	448
Prince Royal	31	7	0	146	0	184	150	334
Pumpernickel	1,256	299	199	42	0	1,796	6,075	7,871
Ragged Top	0	0	269	620	410	1,299	416	1,715
Rawhide	514	122	0	34	0	670	2,451	3,121
Rochester	500	119	393	943	101	2,056	2,383	4,439
Rock Creek	366	0	0	0	0	366	1,744	2,110
Rodeo creek	1,163	276	380	20	0	1,839	5,539	7,378
Rye Patch	297	0	0	0	0	297	1,415	1,712
Seven Troughs	817	194	521	3,998	692	6,222	3,895	10,117
Soldier Meadows	0	1,262	0	0	0	1,262	25,238	26,500
Sonoma	165	0	0	47	0	212	787	999
South Buffalo	1,572	0	185	377	0	2,134	7,484	9,618
Star Peak	551	131	0	14	18	714	2,624	3,338
Thomas Creek	84	20	0	0	0	104	401	505
White Horse	223	53	0	0	0	276	1,066	1,342
Total	22,483	5,825	12,408	10,438	1,769	52,923	140,260	193,183

a/ Use same table for Maximizing Wild Horse and Burro Alternative

b/ Areas that are currently unsuitable for grazing (application of suitability criteria) that would become suitable through management (grazing systems and reductions in grazing intensity) and development of water.

c/ Improvement through reduction in grazing intensity would result from reduction in livestock, wild horse and burro use to the estimated carrying capacity of the allotments.

d/ Improvement through grazing systems (AMPs) would be accomplished by implementation of intensive and/or non-intensive management.

APPENDIX P
SECTION 2

MAXIMIZING LIVESTOCK USE ALTERNATIVE
ANTICIPATED INCREASE IN VEGETATION PRODUCTION (AUMs) THROUGH MANAGEMENT PER ALLOTMENT

SONOMA-GERLACH RESOURCE AREA

Allotment	Reduction in Grazing Intensity (21%) b/	Implementation of Grazing Systems (5%) c/	Unsuitable with Potential to be Suitable a/			Increase	Suitable by Recompiled Survey	Combined Total
			Water	Production	Water & Production			
Blue Wing	4,035	961	6,158	1,006	134	12,294	19,215	31,509
Buffalo Hills	0	1,107	0	816	0	1,923	22,141	24,064
Calico	358	85	0	0	0	443	1,706	2,149
Clear Creek	505	120	330	120	0	1,075	2,405	3,480
Coal Canyon-Poker	602	0	495	266	2	1,365	2,868	4,233
Cottonwood Canyon	0	8	34	0	0	42	155	197
Coyote	0	0	0	2	0	2	3,294	3,296
Desert Queen	153	36	883	500	251	1,823	730	2,553
Diamond S	141	33	0	0	0	174	674	848
Dolly Hayden	0	196	215	0	6	417	3,935	4,352
Goldbanks	317	0	241	0	0	558	1,512	2,070
Harmony	48	11	0	8	0	67	233	300
Humboldt House	90	21	0	183	0	294	433	727
Humboldt Sink	62	14	0	61	8	145	297	442
Jersey Valley	115	28	69	883	0	1,095	552	1,647
Klondike	305	72	18	56	66	517	1,456	1,973
Leadville	0	0	0	41	0	41	2,584	2,625
Licking	10	2	0	66	0	78	48	126
Majuba	0	166	379	67	73	685	3,312	3,997
Melody	129	30	0	0	0	159	616	775
North Buffalo	344	82	1,219	0	0	1,645	1,640	3,285
Pleasant Valley	1,803	429	224	122	8	2,586	8,586	11,172
Pole Canyon	42	10	196	0	0	248	200	448
Prince Royal	31	7	0	146	0	184	150	334
Pumpernickel	1,256	299	199	42	0	1,796	6,075	7,871
Ragged Top	0	21	269	620	410	1,320	416	1,736
Rawhide	514	122	0	34	0	670	2,451	3,121
Rochester	500	119	393	943	101	2,056	2,383	4,439
Rock Creek	366	0	0	0	0	366	1,744	2,110
Rodeo Creek	1,163	276	380	20	0	1,839	5,539	7,378
Rye Patch	297	0	0	0	0	297	1,415	1,712
Seven Troughs	817	194	521	3,998	692	6,222	3,895	10,117
Soldier Meadows	0	1,262	0	0	0	1,262	25,238	26,500
Sonoma	165	0	0	47	0	212	787	999
South Buffalo	1,572	0	185	377	0	2,134	7,484	9,618
Star Peak	551	131	0	14	18	714	2,624	3,338
Thomas Creek	84	20	0	0	0	104	401	505
White Horse	223	53	0	0	0	276	1,066	1,342
Total	16,598	5,915	12,408	10,438	1,769	47,128	140,260	187,388

a/ Areas that are currently unsuitable for grazing (application of suitability criteria) that will become suitable through management (grazing systems and reductions in grazing intensity) and development of water.

b/ Improvement through reduction in grazing intensity will result from reduction in livestock, wild horse and burro use to the estimated carrying capacity of the allotments.

c/ Improvement through management systems would be accomplished by implementation of intensive and/or non-intensive management.

APPENDIX Q

Aquatic Habitat Protectability and Long Term Impacts to the Sonoma-Gerlach Resource Area Streams

APPENDIX Q

AQUATIC HABITAT - PROTECTABILITY AND LONG TERM IMPACTS TO THE SONOMA-GERLACH RESOURCE AREA STREAMS

									LONG TERM CHANGES		
Allotment	Streams	Stream Miles in Allotment	Percent of Total Stream in Allotment (Public and Private)	Percent of Public Streams Miles in Allotment	Current Condition a/ b/	Protectability c/	Proposed Action	No Action d/ e/	No Livestock Grazing	Maximizing Livestock	Maximizing Wild Horses & Burros
Buffalo Hills	Cottonwood Creek	9.0	100	33	Good	PW	Good	Good	Good	Good	Good
	Granite Creek	5.0	100	40	Poor f/	PW	Poor	Poor	Poor	Poor	Poor
	Negro Creek	14.0	100	14	-	NP	-	-	-	-	-
	Red Mountain Creek	16.0	100	56	Fair	P	Fair	Fair	Good to Excellent	Fair	Good to Excellent
	Rock Creek	6.0	100	50	Good	PW	Good	Good	Good	Good	Good
Calico	Donnelly	2.0	18	100	Fair f/	P	Fair	Fair	Good to Excellent	Fair	Fair
Clear Creek	Clear Creek	5.0	45	40	Fair f/	PW	Fair	Fair	Fair	Fair	Fair
Coal Canyon-Poker	Rocky Canyon Creek	5.0	100	80	Fair f/	P	Fair	Fair	Good to Excellent	Fair	Fair
Diamond S	Pole Creek	11	100	45	Good	PW	Good	Good	Good	Good	Good
Pleasant Valley	Golconda Canyon Creek	5	100	60	Poor	P	Poor	Poor	Good to Excellent	Poor	Poor
	Bushee Creek	7	100	86	Poor	P	Poor	Poor	Good to Excellent	Poor	Poor
Rock Creek	Rock Creek	12.0	86	17	-	NP	-	-	-	-	-
Soldier Meadows	Donnelly Creek	9.0	82	78	Fair f/	P	Fair	Fair	Good to Excellent	Fair	Fair
	Mahogany Creek	12.0	100	50	Excellent	P	Excellent	Excellent	Excellent	Excellent	Excellent
	Slum Gullion Creek	10.0	100	80	Poor	P	Poor	Poor	Good to Excellent	Poor	Poor
	Snow Creek	6.0	100	50	Fair f/	PW	Fair	Fair	Fair	Fair	Fair
	Soldiers Creek	10.0	100	80	Fair	PW	Fair	Fair	Fair	Fair	Fair
	Summer Camp Creek	4.0	100	50	Excellent g/	PW	Fair	Fair	Excellent	Fair	Fair
Sonoma	Sonoma Creek	6.0	100	100	Good	P	Good	Good	Good to Excellent	Good	Good
South Buffalo	Hoffman Canyon Creek	5.0	100	80	Fair	P	Fair	Fair	Good to Excellent	Fair	Fair
Star Peak	Buena Vista Creek	7.0	100	57	Fair	PW	Fair	Fair	Fair	Fair	Fair
	Cottonwood Creek	5.0	100	60	Good	PW	Good	Good	Good	Good	Good
	Coyote Creek	5.0	100	80	Poor f/	P	Poor	Poor	Good to Excellent	Poor	Poor
	Indian Creek	6.0	100	50	Good	PW	Good	Good	Good	Good	Good
	Star Creek	6.0	100	33	Poor f/	PW	Poor	Poor	Poor	Poor	Poor
Thomas Creek	Thomas Canyon Creek	8.0	100	38	Excellent	PW	Excellent	Excellent	Excellent	Excellent	Excellent
	Water Canyon Creek	7.0	100	29	Fair f/	PW	Fair	Fair	Fair	Fair	Fair

a/ The riparian-stream habitat condition is quantified using criteria outlined in the BLM stream survey manual #6671.
b/ Those streams which were not surveyed (Table 2-8, Chapter 2) are estimated by BLM to be in fair or poor condition.
c/ The determination of protectability is based on the percent of public stream miles, the location of public stream miles in relation to that part of the stream capable of supporting a sport fishery, and whether the public stream miles are blocked or scattered.
P = Protectable - those streams for which proper management by BLM would provide habitat for a sport fishery.
PW = Protectable with Agreements or Partially Protectable - streams on which the cooperation of private land owners is required to provide the necessary protection. The BLM cannot assume to control the use of livestock on private land and currently no agreements to provide this type of protection exist. Therefore a worst case analysis must be applied.
NP = Not Protectable - either this publicly-owned portion of the stream hasn't the potential to support a sport fishery or very little or none of the stream falls under the influence of BLM management.
d/ The impacts of the proposed action and alternatives to the resource area's aquatic habitat are analyzed in terms of expected changes in habitat condition. The level at which the change becomes significant is fixed by the BLM Manual for Wetland-Riparian Area Protection and Management #6740. This manual requires that public stream habitat condition be maintained at "Good or Excellent" rating.
e/ (1) maintaining the stream in good or excellent condition is considered "no impact".
(2) Maintaining the stream in fair or poor condition is considered a "significant and adverse impact". It is further considered avoidable if it is a protectable stream and unavoidable if it is not protectable or requires landowners cooperation for protection.
(3) Improvement of stream habitat condition from fair or poor to good or excellent is considered a "significant and beneficial impact".
f/ The streambank stability rating for these streams are high compared to the overall habitat condition ratings. The low habitat condition ratings are caused mainly by the lack of vegetative cover.

Source: U.S. Department of Interior, Bureau of Land Management, Winnemucca District, Sonoma-Gerlach Resource Area Unit Resource Analysis 1979.

APPENDIX R

SECTION 1
Impacts to Potential Wilderness Study Areas From Range Improvements

SECTION 2
Impacts of Alternative Range Projects on Wilderness Study Areas

APPENDIX R
SECTION 1

IMPACTS TO POTENTIAL WILDERNESS STUDY AREAS (WSAs) FROM RANGE IMPROVEMENTS SONOMA-GERLACH RESOURCE AREA

IMPROVEMENT	IMPAIRS WILDERNESS SUITABILITY	ALLOWABLE IN WSA
Well	No	Yes a/
Pipeline	No	Yes a/
Earthen Reservoir	No	Yes a/
Spring Development	No	Yes a/
Trough	No	Yes a/
Fences	No	Yes a/
Cattleguards	No	Yes a/
Land Treatments		
with seeding	Yes	No b/
without seeding	Yes	No b/
Road Construction	Yes	No b/

a/ These projects may be permitted in a WSA if a case-by-case analysis of each indicates the project would be nonimpairing to the area's suitability as wilderness. The analysis would include, but not be limited to, consideration of the project size, methods and material used in construction, rehabilitation activities, and maintenance requirements. In certain cases, such as when cumulative impacts would become substantially noticeable, or when the individual project is determined to be substantially noticeable because of topography and vegetation, the project would not be allowed.

b/ The Interim Management Policy and Procedure Guidelines give exceptions to these activities, permitting vegetative manipulations for control of small areas of poisonous plants or in emergencies for the control of insects and disease where there is no effective alternative. Prescribed burning may also be used where necessary to maintain fire-dependent natural ecosystems. Also, seeding to restore natural vegetation may be done by manual or aerial methods.

APPENDIX R
SECTION 2

IMPACTS OF ALTERNATIVE RANGE PROJECTS ON WILDERNESS STUDY AREAS SONOMA-GERLACH RESOURCE AREA a/

Improvements-Alternatives	East Fork High Rock Canyon Unit 006A #	Acres Affected	High Rock Lake Unit 007 #	Acres Affected	Little High Rock Canyon Unit 008 #	Acres Affected	Poodle Mountain Unit 012 #	Acres Affected	Fox Mountain Range Unit 014 #	Acres Affected	Calico Mountains Unit 019 #	Acres Affected	Selenite Mountains Unit 200 #	Acres Affected	Mt. Limbo Unit 201 #	Acres Affected	Mt. Tobin Unit 406 #	Acres Affected	North Black Rock Range Unit 622 #	Acres Affected	Pahute Peak Unit 621 #	Acres Affected
Proposed Action																						
Cattleguard		0		0		0		0		0		0		0		0		0		0		0
Windmill		0		0		0		0	1	.5		0		0		0		0		0		0
Fenceline		0	3	11 miles		0	1	1.5 miles	1	12 miles		0	2	3 miles	2	3.5 miles		0	2	8 miles	1	2.5 miles
Pipeline		0		0		0		0	1	1 mile		0		0		0		0		0		0
Trough		0		0		0		0	1	.1		0		0		0		0		0		0
Developed Spring		0		0		0		0	1	.1		0		0		0		0		0		0
No Action		0		0		0		0		0		0		0		0		0		0		0
No Livestock Grazing		0		0		0		0		0		0		0		0		0		0		0
Maximizing Livestock																						
Windmill		0		0		0		0	1	.5		0		0		0		0		0		0
Fenceline		0	3	11 miles		0	3	10 miles	1	12 miles		0	2	2 miles	2	3.5 miles		0	2	8 miles	1	2.5 miles
Pipeline		0		0		0		0	1	1 mile		0		0		0		0		0		0
Trough		0		0		0		0	1	.5		0		0		0		0		0		0
Developed Spring		0		0		0		0	1	.5		0		0		0		0		0		0
Maximizing Wild Horses and Burros																						
Windmill		0		0		0		0	1	.5		0		0		0		0		0		0
Fenceline		0	3	11 miles		0	1	1.5 miles	1	12 miles		0	2	3 miles	2	3.5 miles		0	2	8 miles	1	2.5 miles
Pipeline		0		0		0		0	1	1 mile		0		0		0		0		0		0
Trough		0		0		0		0	1	.5		0		0		0		0		0		0
Developed Spring		0		0		0		0	1	.5		0		0		0		0		0		0

a/ These projects may be permitted in a WSA if a case-by-case analysis of each indicates the project would be nonimpairing to the area's suitability as wilderness. The analysis would include, but not be limted to, consideration of the project size, methods and materials used in construction, rehabilitation activities, and maintenance requirements. In certain cases, such as when cumulative impacts would be substantially noticeable, or when the individual project is determined to be substantially noticeable because of topography and vegetation, the project would not be allowed.

Refer to EIS Wilderness Map and Land Treatment Maps for locations.

Source: U.S. Department of the Interior, Bureau of Land Management, Winnemucca District, Wilderness Files, 1980. Sonoma-Gerlach Management Framework Plan, 1979.

APPENDIX S

Economic Model Validation Reliability

APPENDIX S

ECONOMIC MODEL VALIDATION AND RELIABILITY

Information used to estimate economic impacts to the ranching sector was derived from examination of Sonoma-Gerlach Resource Area files, as well as formal and informal discussions with EIS Area ranchers. In order to facilitate analysis of impacts, area livestock operations were divided into categories based on size of operation, period of use of the public range, and type of livestock raised, as below:

1. Small Ranches (0-349 Head)
2. Medium Ranches (350-999 Head) - Spring and Summer Grazing
3. Medium Ranches (350-999 Head) - Winter Grazing
4. Large Ranches (> 1,000 Head) - Year Round Grazing
5. Sheep Ranches (All Sizes and Grazing Periods)

Worksheets describing a "typical" ranch in each category were developed by the Economics, Statistics, and Cooperatives Service (ESCS), based on meetings with area ranchers as well as budget data gathered by ESCS as part of a national cost of production study. These worksheets were used to generate complete ranch budgets for the typical ranch in each size category. These ranch budgets are shown in Appendix Tables S-1 through S-5. It should be emphasized that the five ranch models represent typical ranches only, and that in reality each ranch is unique, with resources and management practices that vary from those of the typical ranches represented in the models. The ranch models, however, were designed to reflect the ranch types which operate in the EIS area and should therefore roughly indicate the reactions of and impacts to the ranching sector.

A linear programming computer model was developed by the ESCS for each typical ranch based on these budgets. These models maximize return above variable cash cost, based on a series of production parameters and resource constraints. In order to determine economic impacts on the ranch sector, the period when livestock will be authorized to graze public land was altered to reflect the changes from existing conditions under the proposals in each of the alternatives, and the amount of vegetation supplied by BLM was increased, decreased, or eliminated in order to simulate conditions under the various alternatives. The resultant optimal solution reveals the adjustments in ranch conditions such as income and herd size which would likely occur in response to the proposals of each of the alternatives.

TABLE S-1
TYPICAL RANCH BUDGET

Nevada, Sonoma-Gerlach EIS Area - Cattle Enterprise 0-349 Cows

Item	Unit	Number	Average Weight	Price Cwt	Total Value
Sales:					
Steer calves	Head	29	420	69.15	8,422
Heifer calves	Head	20	385	56.25	4,331
Yearling steers	Head	30	650	64.63	12,603
Yearling heifers	Head	21	575	55.17	6,662
Cull cows	Head	12	1,000	28.84	3,461
Total					35,479
Total/cow					257.09

Cash costs:	Total Value	Value/ Cow
BLM grazing fee	1,631	11.82
Forest grazing fee	---	---
Private range lease/rent	---	---
State lease	---	---
Hay (produce)	3,800	27.54
Hay (purchase)	---	---
Protein supplement	629	4.56
Irrigated pasture	664	4.81
Salt and mineral	125	.91
Concentrate feeds	---	---
Veterinary and medicine	473	3.43
Hired trucking	123	.89
Marketing	144	1.04
Fuel and lubricants	1,412	10.23
Repairs (machine and equipment)	1,052	7.62
Land taxes	2,389	17.31
Other taxes	283	2.05
Insurance	701	5.08
Interest on operating capital	812	5.88
General farm overhead	1,230	8.91
Other cash costs	---	---
Hired labor	520	3.77
Total cash costs	15,988	115.86
Other costs:		
Family labor	4,689	33.98
Depreciation	4,223	30.60
Interest on investment other than land	11,858	85.93
Interest on land	21,980	159.28
Total other costs	42,750	309.78
Total all costs	58,738	425.64
Return above cash costs	19,491	141.24
Return above cash costs and family labor	14,802	107.26
Return to total investment	10,579	76.66
Return to land	-1,279	-9.27

Production assumptions - Herd size 138 head; 90 percent calf crop; 5 percent calf loss to weaning; 15-cows per bull; 13 percent replacement rate; 4 percent cow loss. BLM season of use April through September.

TABLE S-2
TYPICAL RANCH BUDGET

Nevada, Sonoma-Gerlach EIS Area - Cattle Enterprise — 350-999 Cows (Summer Use)

Item	Unit	Number	Average Weight	Price Cwt	Total Value
Sales:					
Steer calves	Head	150	430	69.15	44,602
Heifer calves	Head	77	400	56.25	17,325
Yearling steers	Head	36	650	64.63	15,123
Yearling heifers	Head	47	600	55.17	15,558
Cull cows	Head	44	900	28.84	11,421
Total					104,029
Total/cow					236.43

Cash costs:	Total Value	Value/ Cow
BLM grazing fee	5,311	12.07
Forest grazing fee	--	--
Private range lease/rent	5,330	12.11
State lease	--	--
Hay (produce)	11,366	25.83
Hay (purchase)	--	--
Protein supplement	2,006	4.56
Irrigated Pasture	1,157	2.63
Salt and mineral	594	1.35
Concentrate feeds	--	--
Veterinary and medicine	2,438	5.54
Hired trucking	1,012	2.30
Marketing	1,069	2.43
Fuel and lubricants	3,643	8.28
Repairs (machine and equipment)	2,429	5.52
Land taxes	3,366	7.65
Other taxes	634	1.44
Insurance	2,068	4.70
Interest on operating		
Capital	2,598	5.90
General farm overhead	3,590	8.16
Other cash costs	--	--
Hired labor	2,556	5.81
Total cash costs	51,167	116.29
Other Costs:		
Family labor	10,230	23.25
Depreciation	10,120	23.00
Interest on investment		
Other than land	35,416	80.49
Interest on land	43,175	98.13
Total other costs	98,941	224.87
Total all costs	150,108	341.15
Return above cash costs	52,862	120.14
Return above cash costs and family labor	42,632	96.89
Return to total investment	32,512	73.89
Return to land	-2,904	-6.60

Production Assumptions - Herd size 440 head; 90 percent Calf Crop; 6 percent calf loss to weaning; 20 cows per bull; 14 percent replacement rate; 4 percent cow loss. BLM season of use April through October.

TABLE S-3
TYPICAL RANCH BUDGET

Nevada, Sonoma-Gerlach EIS Area - Cattle Enterprise | 350-999 Cows (Winter Use)

Item	Unit	Number	Average Weight	Price Cwt	Total Value
Sales:					
Steer calves	Head	152	430	69.15	45,196
Heifer calves	Head	102	400	56.25	22,950
Yearling steers	Head	51	650	64.63	21,425
Yearling heifers	Head	34	600	55.17	11,255
Cull cows	Head	48	900	28.84	12,459
Total					113,285
Total/cow					236.01

Cash Costs:	Total Value	Value/ Cow
BLM grazing fee	5,426	11.30
Forest grazing fee	--	--
Private range lease/rent	8,310	17.31
State lease	--	--
Hay (produce)	4,809	10.02
Hay (purchase)	--	--
Protein supplement	2,189	4.56
Irrigated pasture	7,005	14.59
Salt and mineral	648	1.35
Concentrate feeds	--	--
Veterinary and medicine	2,659	5.54
Hired trucking	1,104	2.30
Marketing	1,166	2.43
Fuel and lubricants	3,974	8.28
Repairs (machine and equipment)	2,650	5.52
Land taxes	3,672	7.65
Other taxes	691	1.44
Insurance	2,256	4.70
Interest on operating		
Capital	2,850	5.94
General farm overhead	3,917	8.16
Other cash costs	--	--
Hired Labor	2,789	5.81
Total cash costs	56,115	116.91
Other Costs:		
Family labor	11,160	23.25
Depreciation	11,040	23.00
Interest on investment		
Other than land	38,609	80.44
Interest on land	50,713	105.65
Total other costs	111,522	232.34
Total all costs	167,637	349.24
Return above cash costs	57,170	119.10
Return above cash costs and family labor	46,010	95.85
Return to total investment	34,970	72.85
Return to land	-3,639	-7.58

Production Assumptions - Herd size 480 head; 90 percent calf crop; 6 percent calf loss to weaning; 20 cows per bull; 14 percent replacement rate; 4 percent cow loss. BLM season of use November through March.

TABLE S-4
TYPICAL RANCH BUDGET

Nevada, Sonoma-Gerlach EIS Area - Cattle Enterprise 1,000 & Over

Item	Unit	Number	Average Weight	Price Cwt	Total Value
Sales:					
Steer calves	Head	468	400	69.15	129,449
Heifer calves	Head	189	350	56.25	37,209
Yearling steers	Head	52	600	64.63	20,165
Yearling heifers	Head	189	550	55.17	57,349
Cull cows	Head	86	900	28.84	22,322
Total					266,494
Total/cow					186.36

Cash costs:	Total Value	Value/ Cow
BLM grazing fee	27,148	18.98
Forest grazing fee	--	--
Private range lease/rent	8,010	5.60
State lease	--	--
Hay (produce)	11,371	7.95
Hay (purchase)	9,606	6.72
Protein supplement	3,704	2.59
Irrigated pasture	4,312	3.02
Salt and mineral	2,317	1.62
Concentrate feeds	4,161	2.91
Veterinary and medicine	6,921	4.84
Hired trucking	1,258	.88
Marketing	1,344	.94
Fuel and lubricants	5,391	3.77
Repairs (machine and equipment)	4,519	3.16
Land taxes	8,809	6.16
Other taxes	1,502	1.05
Insurance	6,435	4.50
Interest on operating Capital	6,733	4.71
General farm overhead	9,281	6.49
Other cash costs	--	--
Hired labor	9,758	6.82
Total cash costs	132,580	92.71
Other Costs:		
Family labor	15,000	10.49
Depreciation	26,016	18.19
Interest on investment Other than land	112,362	78.57
Interest on land	102,653	71.79
Total other costs	256,031	179.04
Total all costs	388,611	271.76
Return above cash costs	133,914	93.65
Return above cash costs and family labor	118,914	83.16
Return to total investment	92,898	64.96
Return to land	-19,464	-13.61

Production Assujmptions - Herd size 1,430 head; 80 percent calf crop; 9 percent calf loss in weaning; 12 cows per bull; 10 percent replacement rate; 4 percent cow loss. BLM season of use is year-round.

TABLE S-5
TYPICAL RANCH BUDGET

Nevada, Sonoma-Gerlach EIS Area - Sheep Enterprise All sizes

	Unit	Quantity	Average Weight	Price	Total Value
Sales:					
Slaughter Lambs	Head	704	95	56.83	38,008
Feeder Lambs	Head	2,113	87	61.17	112,449
Ewes	Head	295	100	9.68	2,856
Wool	Lbs.	3,055	10	.78	23,829
Wool Incentive Payment	Dol.	23,829	--	.48	11,438
Unshorn Lamb Payment	Cwt.	2,507	--	1.43	3,585
Total					192,165
Total/Ewe					65.14

	Total Value	Value/ Head
Cash Costs:		
BLM Permit	3,640	1.23
Forest Permit	6,740	2.28
Irrigated Pasture	4,057	1.38
Sheep Pellets	1,741	.59
Hay (Purch.)	12,627	4.28
Hay (Prod.)	5,013	1.70
Grain (Purch.)	118	.04
Protein Supplement	236	.08
Other Feed	30	.01
Salt & Minerals	531	.18
Spray & Dipping	325	.11
Vet & Medicine	354	.12
Marketing	620	.21
Trucking	3,599	1.22
Shearing & Tagging	4,927	1.67
Utilities	620	.21
Lamb Promotion	708	.24
Organizations	118	.04
Legal & Acct.	1,151	.39
Wool Storage	148	.05
Predator Control	3,009	1.02
Ram Death Loss	571	.19
Machine Fuel & Lube	2,154	.73
Machine Repair	1,829	.62
Equipment Repair	1,918	.65
Labor	16,048	5.44
Land Tax	5,812	1.97
Other Tax	2,036	.69
Insurance	384	.13
General Farm Overhead	2,331	.79
Interest on Oper. Capital	4,462	1.51
Total	87,857	29.78
Other Costs;		
Family Labor	17,376	5.89
Depreciation	11,240	3.81
Interest on Investment other than Land	29,938	10.15
Interest on Land Investment	112,418	38.11
Total	170,972	57.96
Return Above Cash Costs:	104,308	35.36
Return Above Cash Costs & Family Labor	86,932	29.47
Return to Total Investment	75,692	25.66
Return to Land Investment	45,754	15.51

Production Assumptions - Herd size 2,950 ewes; 130 percent docking rate; 15 percent lamb loss docking to market; 15 percent replacement rate; 75 percent of lambs sold as feeders; 5 percent ewe loss; 10 lb. fleece weight; 28 ewes per ram. BLM season of use December through March.

The model provided ranchers with essentially two options for responding to the changes in vegetation and season of use proposed in the alternatives. The first option would be to purchase hay, and the second would be to reduce herd size. These particular options were incorporated into the model because they simulate the most feasibile reaction by ranchers to the alternatives that could be reliably analyzed in the linear programming (LP) models.

Other options available to EIS area ranchers but not considered in the model include leasing of additional private pasture, improving the yields of existing hayland through intensified cultivation, development of irrigated pasture on deeded land, and change in the type of ranch operation from the cow-calf ranch type typical of the EIS area to a yearling or stocker type operation. The lease of additional private pasture may not be a viable option for many of the permittees because 76 percent of the EIS area is in public ownership, and most of the remaining private land that could be available for lease as pasture would be more valuable for other purposes (i.e., crops) that could command a higher rent for use of the land. Development of irrigated pasture and increased hay yields may also be unrealistic for many EIS area permittees due to land, water, and financial constraints.

The type of computer model used in this analysis can present a fairly reliable indication of impacts over the short term (before ranchers can make major alterations in their operations), but is less reliable for predicting long-term impacts because it assumes existing production parameters, operating conditions, and factor costs will continue unchanged into the future. In the long term, ranch productivity will be determined by the resources of land and capital upon which a rancher is able to draw, and upon the individual rancher's managerial skill. These factors, and others, such as uncertainty of future prices of ranch inputs and outputs and of future technological conditions, are difficult to incorporate into the computer model. The only alterations allowed in the model for the long-term analysis other than those included in the short term discussion are the changes in calving and lambing percentages, and the increase in weaning weights predicted in the Livestock Srazing Sections (Chapter 3, Proposed Action).

Methodology for Determining Impacts to Ranch Income and Employment

Ranch income impacts were estimated by the use of the LP models discussed previously. The LP models maximize net revenue over variable cash costs. Net ranch income is computed by deducting fixed cash costs, a charge for family labor, and a charge for depreciation, from net of variable cash costs. The remaining revenue (net ranch income) is available to service long-term debts on land and capital and to provide a return to risk and management. Income impacts to the EIS economy as a whole are estimated by application of the value added multiplier (2.1021) for the meat animals and poultry sector of the Humboldt Regional Input Output Multiplier (Nevada State Engineers Office 1976) to net ranch income.

Employment impacts to the ranching sector are estimated by applying an adjusted Direct Employment Coefficient (23.436) from the Humboldt Regional Model to the change in gross ranch revenue resulting from each of the alternatives. The Direct Employment Coefficient indicates the change in sectoral employment for each million dollar change in gross revenue. Indirect employment impacts were estimated with the aid of the employment multiplier (1.8031) for the Meat Animals and Poultry sector of the Humboldt Regional Input Output Model.

Construction Impacts

The following assumptions and procedural steps were used to determine impacts on the construction sector as a result of the various alternatives.

Assumption 1: It was determined that approximately 15 percent of the total construction slated under each alternative would be awarded to firms based within the EIS area (personal communication with Bob Carroll, Chief of Operations for BLM, Winnemucca District Office, 1980).

Step 1: The resultant figure was multiplied by a consumer price index adjustment factor of .826 in order to express all impacts in terms of 1978 dollars (see Appendix Table S-6 for Consumer Price Index).

Step 2: After this adjustment for inflation, the total revenue accruing to local construction firms was divided by the seven year implementation period in order to determine the increase in annual direct revenue.

Step 3: Direct annual revenue was multiplied by the Direct Value added coefficient for the construction sector (.4072) in order to determine Direct Income.

Step 4: Direct income was expanded to Total Area Income via a sectoral multiplier of 1.2502.

Step 5: Direct employment was calculated by multiplying the change in construction revenues by an adjusted Direct Employment Coefficient (21.394) for the construction sector. This coefficient indicates the change in employment for a one million dollar change in revenue.

Step 6: Total employment was obtained by multiplying direct employment by 1.3855, the construction sector employment multiplier.

TABLE S-6

PRICE INDICES
SONOMA-GERLACH RESOURCE AREA

	Consumer Price Index All Items	Consumer Price Index Energy	Prices Received by Farmers Livestock and Products
1967	100.0	100.0	100.0
1968	104.2	101.5	104.0
1969	109.8	104.2	117.0
1970	116.3	107.0	118.0
1971	121.3	111.2	118.0
1972	125.3	114.3	136.0
1973	133.1	123.5	183.0
1974	147.7	159.7	165.0
1975	161.2	176.6	172.0
1976	170.5	189.3	177.0
1977	181.5	207.3	175.0
1978	195.4	220.4	217.0
1979	217.4	275.9	257.0

Source: Economic Report of the President, Together with the Annual Report of the Council of Economic Advisers, U.S. Government Printing Office.

Value added and employment coefficients and income and employment multipliers were obtained from the report Water for Nevada - Report 3: Nevada's Water Resources, State Water Engineer's Office, Carson City, Nevada see Table S-7. The following example illustrates the above outlined procedure for the proposed action.

Total cost of construction = $15,949,380

$15,949,380 x .15 = $2,392,407

Step 1: $2,392,407 x .826 = $1,976,128

Step 2: $\frac{\$1,976,128}{7}$ = $282,304

Step 3: $282,304 x .4072 = $114,954 = Direct Income

Step 4: $114,954 x 1.2502 = $143,715 = Total Area Income

Step 5: .282 x 21.394 = 7 additional employees in the sector

Step 6: 6 x 1.3855 = 8 total additional employees

Methodology - Impacts on Wildlife and Recreation

Projected tag allocations for each alternative for deer and antelope are presented in Table S-8. Hunter days per tag (3.7 for antelope; 3.95 for deer) were derived from Big Game Investigations, Nevada Department of Wildlife, 1979.

Table S-9 portrays the anticipated effect of each alternative on sage grouse numbers, and the consequent change in grouse hunting. A directly proportional relationship was assumed between sage grouse population on public land and number of hunters, based on the current ratio of hunter days to total population.

Expenditure information for hunter days was derived from Garrett (1970). The information in this report was adjusted for inflation by using a weighted average of the consumer price index and the energy price index to bring expenditure data up to the 1978 prices. While this report applies to big game only, the figures derived were also applied to sage grouse due to the negligible variations on expenditures indicated in two other independent reports (Hansen 1977, and Olivier 1977). An expenditure figure of $17 per day (1978 prices) was derived and used for the analysis of the alternatives. See Table S-10 for this derivation.

TABLE S-7

DIRECT VALUE ADDED, EMPLOYMENT, AND WATER COEFFICIENTS AND MULTIPLIERS FOR OUTPUT, VALUE ADDED, AND EMPLOYMENT - HUMBOLDT REGIONAL MODEL

	Sector	Output Multiplier	Value Added: Direct Coeff.	Value Added: Multiplier	Employment: Direct Coeff.	Employment: Multiplier
1	Dairy	1.3309004	.3200	1.5761	40.7070	1.3671
2	Meat Animals and Poultry	1.6926058	.2432	2.1021	30.9350	1.8031
3	Field Corps	1.2251859	.5142	1.2209	31.6210	1.2975
4	Vegetables and Misc. Crops	1.1808478	.5812	1.1602	69.7640	1.1268
5	Forestry and Fishing	1.0000000	.3000	1.0000	16.9500	1.0000
6	Ag. Forestry and Fish Svs.	1.2709112	.3000	1.5117	64.2200	1.1987
7	Metallic Minerals	1.2081339	.5076	1.2420	46.7398	1.1821
8	Nonmetallic Minerals	1.0661933	.2639	1.1463	4.9447	1.4741
9	Sand, Gravel, Clay and Stone	1.1176000	.5431	1.1256	33.2522	1.1301
10	New Construction	1.1589072	.4072	1.2502	28.2397	1.3885
11	Maint. and Repair Const.	1.1336180	.5909	1.1509	28.2397	1.4056
12	Food and Kindred Prod.	1.8223328	.2255	2.1926	20.7875	2.3354
13	Textiles, Textile Prod. and Apparel	1.0000000	.2902	1.0000	46.8750	1.0000
14	Lumber and Wood Prod.	1.0000000	.3447	1.0000	32.0218	1.0000
15	Fabricated Wood Prod.	1.0000000	.3565	1.0000	32.0218	1.0000
16	Household Furn. and Fixtures	1.0000000	.3875	1.0000	125.5858	1.0000
17	Publishing and Printing	1.1009666	.5054	1.1324	51.8106	1.0986
18	Industrial Chemicals, Fertilizers, Co	1.0000000	.3549	1.0000	12.9726	1.0000
19	Petrol. Ref. and Paving Mix	1.0000000	.2323	1.0000	7.0968	1.0000
20	Cement, Concrete, and Prods.	1.2165946	.4872	1.2630	8.2486	2.1288
21	Stone and Nonmetallic Min. Prod.	1.0000000	.2498	1.0000	223.5267	1.0000
22	Primary Metals and Fabricating	1.0000000	.1593	1.0000	19.3287	1.0000
23	Machine and Metal Prod.	1.0000000	.3843	1.0000	44.3403	1.0000
24	Other Mfg.	1.1800269	.4190	1.1767	56.3512	1.1200
25	Railroads, Air, and Pipeline Trans.	1.1891212	.6423	1.1828	22.0675	1.2990
26	Warehousing and Mtr. Freight	1.2376075	.6319	1.2428	68.9163	1.2173
27	Communications, Radio and TV	1.1898653	.7362	1.1660	44.1119	1.2837
28	Electric Utilities	1.2184850	.5943	1.2040	25.4574	1.2513
29	Gas Utilities	1.4162607	.3540	1.4626	25.4574	1.4541
30	Water Utilities	1.3835249	.2393	1.8820	25.4574	1.3815
31	Wholsl. Trade	1.1211555	.6759	1.1136	46.1169	1.1432
32	Retail Trade	1.0975189	.7719	1.0785	186.8299	1.0193
33	Finance and Ins.	1.1335066	.4703	1.1672	44.2026	1.1351
34	Real Estate	1.1781670	.7144	1.1441	9.5280	1.8252
35	Hotels and Lodging	1.1893202	.6320	1.1906	222.0197	1.0420
36	Personal and Repair Svs.	1.1222920	.6400	1.1241	48.1588	1.1375
37	Amusements and Recreation Svs.	1.1921252	.6394	1.1925	83.6762	1.1333
38	Medical Svs.	1.0591054	.7410	1.0611	80.7847	1.0436
39	Other Svs.	1.1627097	.6404	1.1626	253.2760	1.0249
40	Government Enterprises	1.3012666	.5175	1.3503	15.8647	1.7681

Source: Water for Nevada: Special Report - Input-Output Economic Models, Nevada State Engineers Office, 1974.

TABLE S-8

PROJECTED TAG ALLOCATIONS

	Short Term (1991)	Long Term (2024)
Proposed Action		
Deer	622	622
Antelope	173	179
No Action		
Deer	629	383
Antelope	98	75
No Grazing		
Deer	630	630
Antelope	182	188
Maximize Livestock		
Deer	608	608
Antelope	79	79
Maximize Wild Horses and Burros		
Deer	622	622
Antelope	173	173

Deviation Assumption: The ratio of tags allocated to total deer numbers would remain constant at the current level.
Existing estimated tag numbers are: Deer 629
Antelope 98

Source: E. A. Dahlem, Sonoma-Gerlach Resource Area, Wildlife Management Biologist.

TABLE S-9

TREND IN SAGE GROUSE POPULATION AND RELATED HUNTER DAYS BY ALTERNATIVE

Alternative	Response
Proposed Action	Grouse population rises 30 percent; Hunter days increase by 215 days annually.
No Action	Grouse population declines 50 percent; Hunter days reduced by 358 days annually.
No Grazing	Grouse population rises by 50 percent; Hunter days increase by 358 days annually.
Maximize Livestock	Grouse population rises by 20 percent; Hunter days increase by 143 days annually.
Maximize Wild Horses and Burros	Grouse population rises by 30 percent; Hunter days increase by 215 days annually.

Assumption: Grouse populations would respond to any alternative over the short term (by 1991), and would remain at these levels over the long term.

Source: E. A. Dahlem, Sonoma-Gerlach Resource Area Wildlife Management Biologist.

Income and employment effects of the expenditure data were calculated using multipliers from the Humboldt Regional input-output model (Nevada State Engineers Office 1974). An assumption of the analysis was that hunting expenditures would impact four sectors of the EIS area economy; Retail Trade, Hotels and Lodging, Personal and Repair Services, and Amusements and Recreation Services. The multipliers used in the analysis represent averages of these sectors, and are presented in Table S-11.

TABLE S-10
DERIVATION OF WILDLIFE EXPENDITURES

Resident expenditures (based on 1967 dollars from Garrett 1970)

$63.19 Gross expenditures per trip by resident hunters in Area 2 (Pershing and Humboldt Counties).

$32.50 Expenditures outside county of origin

$49.03 Expenditures within county of origin

3 days average length of trip

$81.33 Gross expenditures per trip by Nevada residents as a whole.

Average expenditures per day by other Nevada residents

$$\frac{32.50 \times 63.19}{81.33 \times 3} = \$8.42$$

Percent of total trip expenditures spent on gas and oil

Residents 25%

Adjustments for inflation

	CONSUMER PRICE INDEX	
	All Items	Energy
1967	100.0	100.0
1978	195.4	220.4

Adjustment for Nevada resident expenditures
(\$8.42 x 0.75 x 1.954) + (8.42 x 0.25 x 2.204) = \$16.98

TABLE S-11

MULTIPLIERS USED FOR CALCULATING WILDLIFE IMPACTS

	Output	Value Added		Employment	
	Multiplier	Direct Coeef.	Multiplier	Direct Coeef.	Multiplier
Retail Trade	1.0975	.7719	1.0785	141.537	1.0193
Hotels and Lodging	1.1893	.6320	1.1906	158.197	1.0420
Personal and Repair Svs.	1.1223	.6400	1.1241	46.48	1.1375
Amusements and Recreation Svs.	1.1921	.6394	1.1925	63.388	1.1333
AVERAGE	1.1503	.6708	1.1464	102.39	1.0830

Government Impacts

The increase in government sector income would derive from the increased demand for government services in the proposed action, maximizing wild horse and burro, and maximizing livestock alternatives. Additional Winnemucca District manpower requirements for these alternatives are presented in Table S-12.

The average income to the additional employees needed to implement the three alternatives is estimated at $105,318 per year, based on the wage grades reported by the Winnemucca District. Because this figure represents income to the individuals involved, the overall impact to the county would be calculated by applying the multiplier for the government enterprises section (1.3503) to the total income of the additional government employees.

TABLE S-12

BLM MANPOWER REQUIREMENTS

Position Required	Time Required	Grade
1 Civil Engineer	5 wm/yr	7/9/11
1 Engineering Technician	5 wm/yr	5/7
1 Range Conservationist	10 wm/yr	5/7/9
5 man Wild Horse Round-up Crew	50 wm/yr	WG 4/5

10 work months per year represents full-time employment

Methodology - Impacts on the County Economy

Total county income and employment data are from the Department of Commerce, Bureau of Economic Analysis, Regional Economic Information System. Income is based on a report entitled "Personal Income by Major Sources 1973-78", 1980, while employment was derived from "Employment by Type and Broad Industrial Sources 1973-78", and the 1979 Nevada Statistical Abstract. Total labor and proprietors income by place of work for the EIS area (Humboldt and Pershing counties) was $65,572,000 during 1978, with total employment amounting to 5,306 persons.

Overall impacts on the county economy were derived by applying output, employment, and value added (income) multipliers to the changes in revenue and employment generated in each of the sectors directly impacted by the alternatives. These multipliers, which were derived from the Water for Nevada report, are presented in Table S-7. Direct Employment Coefficients were adjusted for inflation by the Consumer Price Index to reflect 1978 conditions. The adjusted coefficents are presented in Table S-13.

Because these multipliers were derived for a region containing portions of Elko, Lander and Eureka counties as well as Humboldt and Pershing, some overestimation of impacts may result. Since the structure of these county economies is quite similar to that of the EIS area, however, this overestimation should be slight. Any overestimation would also be offset to some degree by the fact that the multipliers used are Type I multipliers which account for only direct and indirect effects. This limits the secondary effects to the interindustry flows and does not include the induced impacts associated with changes in the household sector.

Methodology - Impacts on Tax Revenues

The direct impact of each alternative on county tax revenue was broken down into two affected components. The first of these involves the grazing fee receipts collected by BLM. Existing regulations require that 12.5 percent of these receipts be expended in or returned to the county in which they were collected. This change was determined by multiplying the change in AUMs used under each alternative by the amount of fee receipts (12.5 percent of total fees collected) which would be returned to the county. BLM AUMs available in the LP models do not match the actual allocation under each of the alternatives. Consequently, the percentage change in BLM AUMs used under each of the alternatives derived from the LP models was applied to the actual allocation to estimate the actual number of BLM AUMs used. The change in AUMs used from 3-5 year average licensed use was then multiplied by $1.89 per AUM (the 1978 fee for BLM AUMs) and 12.5 percent to indicate the change in fees which would be returned to the county governments.

The second component of the county government revenue impacts revolves around the one-half (0.5) percent option tax which both Humboldt and Pershing counties collect on all taxable sales. Only the indirect portion of a change in sales was considered, since the fact that livestock sales (which are considered a foodstuff) are not taxed negates the direct change in ranch-related sales which would occur under the various alternatives. This indirect sales effect, which was determined by multiplying that fraction of the appropriate sectoral multiplier which is greater than one by the increase in total sales, was multiplied by .005 to determine the overall change in county revenue due to this sales tax effect. The grazing fee and sales tax effects were then summed to derive the overall impact of each alternative on county revenues.

TABLE S-13

ADJUSTED EMPLOYMENT COEFFICIENTS

Livestock	23.436
Construction	21.394
Government	11.996
Trade	141.537
Hotels and Lodging	168.197
Amusement and Recreation Svs.	63.388
Other Services	191.876

APPENDIX T

METHODOLOGY
FOR SOCIAL ASSESSEMENT

APPENDIX T

METHODOLOGY FOR SOCIAL ASSESSEMENT

In order to comprehensively study social impacts that might result from BLM's proposed action and alternatives, the affected social environment was broken into three study areas: the local ranching community, the regional area (which included residents and communities of the planning area) and state and national interests (which encompassed a variety of wild horse, wildlife, and conservation groups).

Altogether a BLM social scientist conducted 32 interviews in the fall of 1980 for the purpose of social impact assessment. Interviews were supplemented by information from the public participation record, letters from the public, newspaper articles, published literature, the Sonoma-Gerlach and Paradise-Denio Planning Area Analyses, and data gathered in the summer of 1980 for the Social Assessment section of the Paradise-Denio Preliminary Draft EIS (Majewski 1980).

Interviews with 17 Sonoma-Gerlach livestock operators (approximately 35 percent of area permittees) were conducted. A stratified random sampling procedure was not utilized in selecting ranchers. An attempt was made to include in the sample ranchers who were identified as informal spokesmen of the ranching community by Bureau staff. The remaining ranchers were selected randomly from the Sonoma-Gerlach range-users list. The sample was drawn to proportionately represent the five ranch classes utilized in the economic analysis (see Economic Section, Chapter 2, for definition of categories used). Although the original sample selected represented 50 percent of each ranch class, this percentage was not attained in all ranch classes due to appointments not being kept, inability to contact some operators, and timeframes which did not allow time to compensate for the first two factors. Interviews included 6 of the 19 small operators, 5 of the 9 medium summer operators, 2 of the 4 medium winter operators, 1 of the 8 large operators and 3 of the 8 sheep operators. No corporate owners were interviewed. However, due to their small dependencies on ranching, social impacts are not expected to be significantly adverse.

Since Winnemucca, the county seat of Humboldt County is the major trade center in the Sonoma-Gerlach planning area and contains a large portion of its population, information from interviews with 11 Humboldt County officials and community leaders conducted by a BLM social scientist in the summer of 1980 for the Paradise-Denio Preliminary Draft EIS was incorporated into this analysis. Nine additional residents of the planning area, identified as community leaders or people considered to be especially knowledgeable about the local area, were interviewed for the purpose of this analysis. One of the interviews was conducted on the telephone, while the remaining eight were conducted in person. The Sonoma-Gerlach and Paradise-Denio Planning Area Analyses, newspaper articles, and the public participation record also provided input for this section.

Interviews which provided information for the state and national social analysis were conducted with representatives of Wild Horse Organized Assistance (WHOA), the International Society for the Protection of Mustangs and Burros (ISPMP), Animal Protection Institute of America (API), the Wildlife Society, the Toiyabe Chapter of the Sierra Club, and the American Folklife Center of the Library of Congress. All but two of these interviews were conducted in person in Reno and Carson City, Nevada. This information was supplemented by data from interviews conducted for the Paradise-Denio Preliminary Draft EIS (Majewski 1980) with many of the same groups as well as with representatives of the Nevada Outdoor Recreation Association (NORA) and the American Horse Protection Association (AHPA).

The interviews outlined above are not assumed to be fully representative of the views of every member of the affected communities. Efforts were made to obtain comments from people who were in knowledgeable positions or who were expected to be significantly impacted by the proposed action and alternatives. Time and budget constraints prevented a more exhaustive research effort. The consistency of responses obtained, however, would seem to indicate that the sample was sufficiently representative.

Interviews conducted were informal and unstructured in nature. Consistency of data from one interview to the next was obtained by using a list of key topics which were covered in most interviews, at least within each group. Oftentimes topics covered with ranchers were not relevant to other groups interviewed. Because of Office of Management and Budget (OMB) constraints, no formal questionnaires were used. Field notes were taken at the time of the interviews and later analyzed and collated. Those topics which recurred most frequently during the interviews or which seemed most significant to informants were emphasized in subsequent writeups.

RANCHING COMMUNITY

As long-term users of the land, ranchers feel they are in the best position to judge the overall quality of the land. They believe that generally BLM employees have acquired their knowledge of range conditions from textbooks and lack the on the ground experience in livestock operations which they consider to be essential to making sound decisions. Because of the relatively rapid turnover rate, they feel that some employees are not in the area long enough to become familiar with the environment or to have a commitment to the area. They also express a belief that the general attitude of BLM employees toward them is negative and that many would prefer to see ranchers put out of business. Consequently, they feel that many of the decisions made which ultimately affect their fate are made by persons unsympathetic to them and inadequately prepared to make such decisions. They also would like to be consulted more when decisions are made and their input utilized. They consent that there are ample public meetings but they doubt that their comments are given any weight in the decision-making process.

While 59 percent (10) of the ranchers interviewed expressed criticisms of the BLM which are reflected above, 35 percent (6) commented that, thus far, their relationship with BLM has been fairly good. Two of the latter group of ranchers commended individual employees for their outstanding efforts. Also, one of those ranchers who expressed criticism, added that the BLM had seemed more responsive in recent times.

Ranchers react bitterly to stereotypes of themselves as being irresponsible users of the public lands. They maintain that to them conservation is a way of life which their survival in the ranching business actually demands. They say a rancher who abuses his land, be it public or private, only hurts himself in the long run. Some admit that they know of ranchers who have overgrazed, but say that these individuals put themselves out of business. They do not approve of operators who overgraze because they feel they are detrimental to the operations of ranchers who share their allotments and because they give all ranchers a bad reputation. Most feel that it is possible to preserve the ecological balance of the public lands without drastic reductions in AUMs or changes in periods-of-use. However, they believe the BLM has unrealistic expectations of the land's productivity.

Most area ranchers interviewed feel that environmentalists have disproportionate say in decisions made by the agency. Ranchers tend to feel that environmentalists have more time and money to spend on research and legal assistance than the ranchers do, and this has put the ranching community noticeably on the defensive where environmentalists are concerned.

The BLM is perceived as being caught in the middle as far as the wild horse issue is concerned. In areas where roundups have been undertaken, ranchers laud the efforts of the BLM wranglers. At the same time, they are pessimistic concerning the BLM's ability to control wild horse numbers because in their opinion the reproduction rate is too rapid to keep pace with.

From the ranchers' point of view the ideal way to control wild horse numbers would be to allow experienced ranchers and mustangers to resume harvesting and selling the horses as they did in the past. They believe this would improve the overall quality of the herds and save taxpayers the expense of rounding up and boarding horses for adopt-a-horse programs. (One exception to the generally negative point of view of ranchers, was a couple who have recently entered the business. They enjoy watching the horses on their allotment and actually would like to adopt them if this could be done without the horse having to go through any stress involved in capture and transportation to the distribution center.)

Most ranchers felt that the Coordinating Resource Management and Planning (CRMP) process was good at least in concept, though some expressed skeptism that it would work based on past relations with the BLM and the difficulty of reaching accordance within a group with such diversified interests. Most seemed willing to give this process a try, indicating that the only way to resolve the problems facing the resource area is for everyone to give a little.

NATIONAL ATTITUDES TOWARD RANCHING COMMUNITY

The American Folklife Center of the Library of Congress and the National Museum of History and Technology at the Smithsonian Institution collaborated from 1978 through 1980 on a study of community life and traditions in the ranching community of Paradise Valley. While the ranches studied are not within the Sonoma-Gerlach Planning Area, they are in close proximity to it and have very similar characteristics. One of the fruits of this study is an exhibit currently running at the Smithsonian Institute in Washington, D.C. which focuses on aspects of ranch life, particularly as associated with buckaroos (cowboys). According to team members, this exhibit has one of the best attendance records in the museum's history. This is indicative of a national interest in the lifestyle, tradition, and technology of these ranches. Reviews in Washington, D.C.'s two leading newspapers were enthusiastic, expressing delight that many of the elements of one of America's most colorful and romantisized eras are still to be found on many of the ranches of northwestern Nevada. The exhibit also provoked a request from Voice of America for an international broadcast of this information which was subsequently discussed in a broadcast. Many of these people who enjoy knowing that a part of American history which they consider to be rich and colorful is still ongoing in parts of America and could suffer perceptual adverse impacts from the demise of the small ranchers in this area.

Representatives of the study group portray ranchers as astute people whose ability and intelligence is demonstrated by the fact that they have survived in the ranching business in this harsh environment. While these are not the only small family run ranches in America, they represent a unique adaption to an arid environment.

Although tradition plays an important role in these peoples' lives and some of the techniques and technology they use have been passed down through the generations, study group members emphasize that local ranchers are not backward. They portray them as being well informed of the latest developments in livestock industry and their ranching methods as representing a combination of the new and old. They maintain that old ways and technology are retained where they work because ranchers see no reason to change them.

While the function of this group is to record lifestyle and culture, the major concern expressed by the group members was for individual ranchers and their right to retain their livelihood and lifestyle. Representatives object to the proposed action. They believe that it would divest individuals of a lifestyle and a source of livelihood for what they feel is basically a political decision and the result of environmental interest groups currently having the upper hand in decision making. They feel that the condition of the range has not really changed, just the rules for judging it. While their greatest concern is for the individuals involved, representatives suggest that if the proposed action is implemented, funds should be allocated to document ranching traditions and technology which would be lost since these represent unique adaptations to a rugged arid environment and are important elements of western history.

CONSERVATION AND WILDLIFE GROUP ATTITUDES AND VALUES

Regarding the CRMP process, group representatives expressed fears that the BLM would use this process to protect itself from adhering to its decisions. Also, they complain that the CRMPs process gives ranchers an unfair advantage because the meetings are held in local areas making it difficult for job holding urban dwellers with environmental concerns to attend. They believe the CRMP process may be effective if they are used to implement decisions or for areas where there are specific concerns. They suggest including as part of the proposed action or CRMP process a public education program in which ranchers, conservationists, and range specialists could participate.

Conservationalists and wildlife groups favor a Maximizing Wildlife alternative which would propose positive measures for improving wildlife habitat including riparian zones, non-game wildlife habitat, and water quality.

GLOSSARY

GLOSSARY

ABORIGINAL: Pertains to or describes the original inhabitants of an area.

ACRE FOOT: The amount of water or soil required to cover one acre to a depth of one foot (43,560 cubic feet or 325,851 gallons).

ACTIVE PREFERENCE: Portion of the grazing preference that is available for use. Active preference combined with suspended nonuse equals total preference.

ACTUAL USE: The use made of available vegetation on any area by livestock and/or game animals without reference to permitted or recommended use. It is usually expressed in terms of animal unit months (AUMs).

ADJUDICATION OF GRAZING PREFERENCES: The apportionment of grazing use on public lands among eligible applicants.

ALLOTMENT: An area designated for the use of a prescribed number and kind of livestock.

ALLOTMENT MANAGEMENT PLAN (AMP): A documented program which applies to livestock operations on the public lands, which is prepared in consultation with the permittee(s) or lessee(s) involved, and which: 1) prescribes the manner in and extent to which livestock operations will be conducted in order to meet the multiple-use, sustained-yield, economic, and other needs and objectives as determined for the public lands through land use planning; 2) describes the type, location, ownership, and general specifications for the range improvements to be installed and maintained on the public lands to meet the livestock grazing and other objectives of land management; and 3) contains such other provisions relating to livestock grazing and other objectives as may be prescribed by the authorized officer consistent with applicable law.

ANIMAL UNIT (AU): Considered to be one mature cow or its equivalent based upon average daily forage consumption of 25 pounds of dry matter per day.

ANIMAL UNIT MONTH (AUM): The amount of forage necessary for the sustenance of one mature cow or its equivalent (e.g., one cow and her calf, four deer, five antelope, five bighorn sheep, five domestic sheep or one mature horse or burro) for a period of one month.

ANNUAL PLANT: A plant that completes its life cycle and dies within one year or less.

APICAL DOMINANCE: Inhibition of the growth of lateral buds by the terminal bud of a shoot.

AQUIFER: A water-bearing stratum of permeable rock, sand or gravel capable of yielding water.

AREA OF CRITICAL ENVIRONMENTAL CONCERN (ACEC): An area where a special need or value has been identified which requires a specific management plan to protect the value. Management would be restrictive only in terms of uses that would impact the critical value identified for the ACEC.

ARCHEOLOGICAL RESOURCES: All prehistoric and historic physical evidence of past human activity, other than historical documents, which can be used to reconstruct lifeways and culture history of past peoples. These include sites, artifacts, environmental data, and all other relevant information and the contexts in which they occur.

ARTIFACT: Any object made, modified, or used by man, usually movable. Objects which are recorded as prehistoric or historic artifacts have socio-cultural or scientific values and meet the general criterion of being more than 50 years old.

ASPECT (VEGETATION): The visual first impression at the time of observation of the dominant or most common species of vegetation in a vegetation type, i.e., pinyon-juniper, big sagebrush.

AUTHORIZED USE: The total number of animal unit months of livestock authorized by permit or license to graze on public lands for each permittee.

AUXIN: An organic substance that is able to promote elongation of plant shoots and usually control other specific growth effects.

AVERAGE LICENSED USE: A mathematical average of the grazing use (stated in AUMs) in a specific physical area for a specified number of years.

BASE PROPERTY: Land that has the capability to produce crops or forage that can be used to support authorized livestock for a specified period of the year and has grazing preferences attached to it.

BROWSE: Leaves, twigs or shoots of shrubs, trees, or woody vines available as forage for domestic and wild browsing animals.

CALF CROP: The number of calves weaned per number of cows bred, usually expressed in percent.

CANOPY: A layer of vegetation.

CARBOHYDRATE RESERVES: Plant foods composed of sugars and starches which are stored in the roots, stems and seeds.

CARRYING CAPACITY: The maximum stocking rate possible without inducing damage to vegetation or related resources.

CHECKERBOARD LANDS: An area of land where alternate sections are privately and publicly owned.

CLASS I INVENTORY: An inventory of a defined area designed to provide a narrative overview derived from existing cultural resource data. Also provides a compilation of existing cultural resource site record data.

CLASS II INVENTORY: A sample-oriented field inventory of cultural resources.

CLASS III INVENTORY: An intensive inventory of cultural resources. See Intensive Cultural Resource Survey.

CLIMAX: The highest and most stable stage of ecological development of a biotic community capable of perpetuation under the prevailing climatic and soil conditions, when undisturbed by outside forces.

COLIFORM: A group of bacteria used as an indicator of sanitary quality of water.

COMPETITION: The general struggle for existence in which the living organisms compete for a limited supply of the necessities of life.

CONTRAST RATING: A method of determining the extent of visual impact for an existing or proposed activity that will modify any landscape feature (land and water form, vegetation, and structures).

COW-CALF OPERATION: An agricultural enterprise in which economic gains result from production and sale of calves.

CRITICAL GROWTH PERIOD: The period in a plant's growth cycle when food reserves are lowest and grazing is most harmful, i.e., in grass species this period begins with the boot stage and closes with complete maturation of the fruit.

CULTURAL RESOURCES: Those fragile and nonrenewable remains of human activity, occupation, or endeavor, reflected in districts, sites, structures, buildings, objects, artifacts, ruins, works of art, architecture, and natural features, that were of importance in human events. These resources consist of (1) physical remains, (2) areas where significant human events occurred--even though evidence of the event no longer remains, and (3) the environment immediately surrounding the resource.

CULTURAL RESOURCE INVENTORY: A descriptive listing and documentation, including photographs and maps, of cultural resources; included are the processes of locating, identifying, and recording sites, structures, buildings, objects, and districts through library and archival research, information from persons knowledgeable about cultural resources, and varying levels of intensity of on-the-ground field surveys. (See Class I, II, III inventory.)

CULTURAL RESOURCE SITE: A physical location of past human activities or events. Cultural resource sites are extremely variable in size and range from the location of a single cultural resource object to a cluster of cultural resource structures with associated objects and features. A site may consist of secondarily deposited cultural resource remains. Prehistoric and historic sites which are recorded as cultural resources have socio-cultural or scientific values and meet the general criterion of being more than 50 years old.

DECREASER: Plant species that will decrease in relative amount with continued overuse.

DEFERRED GRAZING/DEFERRED USE: Postponement of grazing for a stated period of time.

DETERIORATED RANGE: Range on which present vegetation and soil erosion conditions represent a significant departure from potential.

DISCLIMAX: A relatively stable ecological community that has displaced the climax community because of disturbance caused and/or maintained by man.

EAR TAG: A device inserted into the animal's ear for livestock ownership marking and easy field identification.

ECOLOGICAL RANGE CONDITION: The present state of vegetation of a range site in relation to the climax (natural potential) plant community for that site. It is an expression of the relative degree to which the kinds, proportions and amounts of plants in the present plant community resemble that of the climax plant community for the site. Range condition is basically an ecological rating of the plant community. Four range condition classes are used to express the degree to which the composition of the present plant community reflects that of the climax. The classes, with the percentage of present plant community that is climax for the range site are: Excellent (76-100), good (51-75), fair (26-50), poor (0-25).

ECOTONE: A transition area of vegetation between two communities having, characteristics of both, as well as characteristics of its own.

EDGE EFFECT: The influence which the juncture of plant communities has on the composition and density of animal populations.

ENDANGERED SPECIES: Any species in danger of extinction throughout all or a significant portion of its range.

EROSION: Detachment and movement of soil or rock fragments by water, wind, ice or gravity.

ESTIMATED CARRYING CAPACITY: An estimate of the maximum number of animals (expressed in AUMs) a given area can support each year without inducing damage to the vegetation or related resources.

ETHNOBOTANICAL: Pertaining to aboriginal uses of plants.

EXCAVATION: The controlled scientific removal of artifacts and the recordation of data from cultural resource deposits.

EXCLOSURE: An area fenced to exclude one or more species of animals.

EXTENSIVE CULTURAL RESOURCES SURVEY: A sample-oriented field inventory designed to locate and record all cultural resources sites within a portion of a defined area (Class II).

FECUNDITY: The number of young born per female.

FIXED COSTS: Those expenses, such as mortgage payments, that continue unchanged without regard to the level of production (e.g., number of cattle).

FORAGE: All browse and herbaceous foods that are available to grazing animals.

FORB: A non-grass seed-producing plant that does not develop persistent woody tissue.

FOREGONE INTEREST: This term applies to the ranch budgets developed by the ESCS and refers to the revenue that could be earned if the fuds invested in land and equipment were instead earning an average rate of return in the market place.

GERMINATION: The time plants begin to sprout or begin to grow from seed.

GRASS HAY AFTERMATH: The plant stubbles remaining after harvest.

GRASS TETANY: The disease occurs almost exclusively in cattle grazing lush green growth in the spring, and immediately before, during, or shortly after calving. An extreme irritability of the neuromuscular system which in severe cases results in convulsions and possible death.

GRAZING PREFERENCE: The total number of animal unit months (AUMS) of livestock apportioned and attached to base property owned or controlled by a permittee or lessee for grazing on public lands.

GRAZE TREATMENT: A prescription, under a grazing system, which grazes or rests a unit of land at particular times each year to attain specific vegetation goals.

GRAZING TRESPASS: The grazing of livestock on public land without proper authority.

GRAZING SYSTEM: A systematic sequence of grazing treatments applied to an allotment to reach identified multiple-use goals or objectives by improving the quality and quantity of the vegetation.

GROUND WATER: The water stored in permeable strata below the earth's surface.

GREEN UP: Beginning of new vegetative growth in the spring.

HABITAT AREA: The area which a wildlife species occupies for a certain time of year.

HEAD CUT: A natural process of active erosion in a water channel caused by an abnormal and abrupt change in channel gradient. This change causes a "waterfall" action as water tumbles from the upper level vertically to the lower. The turbulence erodes the channel by undercutting the substrate material. This causes the collapse of the upper level (or head). The "undercut-collapse" process advances up the channel whenever water is present or until bedrock is reached.

HEDGING: The persistent browsing of terminal buds or browse species causing excessive lateral branching and reduction in upward growth.

HERD MANAGEMENT AREA: A geographically defined area of yearlong wild horse use where wild horses will be managed intensively without livestock.

HERD USE AREA: A geographically defined area of yearlong wild horse use where wild horses and burros will be managed extensively in conjunction with livestock.

HISTORIC RESOURCES: All evidences of human activity that date from historic (i.e., recorded history) periods.

INCREASER SPECIES: A plant species that will increase in relative amount under continued overuse.

INDUSTRY INCOME MULTIPLIER: An indicator of how much income is stimulated in the economy of a region by an economic sector above and beyond the initial income produced by a sector.

INTENSIVE CULTURAL RESOURCE SURVEY: A field inventory designed to locate and record all cultural resources sites within a specified area (Class III).

INTENSIVE INVENTORY UNITS: Areas that may possess wilderness characteristics and which are studied to determine whether or not they meet the criteria for a wilderness study area.

INTENSIVE MANAGEMENT: Managing the vegetation resource through a grazing system to attain desired results.

INTERIM MANAGEMENT POLICY (IMP): Management of public lands during the wilderness review process.

INVADER: Plant species that were absent or present in very small amounts in undisturbed portions of the original vegetation of a specific range site and will invade following disturbance or continued overuse.

ISOLATED FIND: A single object without other associated historic or prehistoric artifacts.

KEY AREA: A portion of range, which, because of its location, grazing, or browsing value and/or use, serves as an indicative sample of range conditions, trend, or degree of use and guides the management of the entire area of which it is a part.

KEY MANAGEMENT SPECIES: Those species which must, because of their importance, be considered in the management program.

KIDDING GROUNDS/LAMBING GROUNDS: The area where young of a species are born.

KINDS OF LIVESTOCK: Species of domestic livestock, i.e. cattle, horses, sheep or goats, or a combination of these. May be broken down to greater detail such as cows with calves, yearlings, steers, ewes with lambs, etc.

LAMBING GROUNDS: See kidding grounds.

LAY-DOWN FENCES: A fence constructed in such a way that when not in use it may be laid on the ground.

LICENSED USE: Active use AUMs that a permittee has paid for during a given grazing period.

LITHIC: Pertaining to stone.

LITTER: A surface layer of loose organic debris consisting of freshly fallen or slightly decomposed organic material.

LIVESTOCK GRAZING PREFERENCE: See Grazing Preference.

LIVESTOCK VEGETATION CONDITION: An interpretation of the vegetation resource's ability to provide sustained livestock forage.

LIVESTOCK SUPPORT FACILITIES: A structure, action, or practice that facilitates management of the range or the livestock grazing on it.

LONG TERM: A point in time 35 years following the final implementation of land use decisions (year 2024).

MANAGEMENT FRAMEWORK PLAN (MFP): Land use plan for a specific planning area. It sets goals, objectives, and constraints to guide the development of detailed plans for the management of each resource.

MIDSTORY: A middle level of vegetation, occurring between understory (usually grasses) and overstory (usually trees).

MITIGATION: Measures taken to minimize or eliminate adverse impacts.

MIGRATION: The seasonal movement of a species from one habitat area to another.

MULTIPLE USE: The management of public lands and their various resource values so that they are utilized in a combination that will best meet the present and future needs of the public.

MULTIPLIER EFFECTS: The individual effects which spread throughout an economy as the result of a one unit change in an element of a sector directly impacted by an action, e.g., an income multiplier of 2.1021 for the meat animals and poultry sector means that for a $1 change in income within the sector the overall impact on the economy will be a change in income of $2.10. The indirect effect is the total impact ($2.10) minus the direct impact ($1.00) resulting in an indirect effect of ($1.10).

NATIONAL REGISTER OF HISTORIC PLACES: The official list, established by the Historic Preservation Act of 1966, of the Nation's Cultural Resources worthy of preservation.

NEOCLIMAX: Nonreverting vegetation types resulting from man's activities. That is, vegetation types that have been modified to the extent that they will not revert back to their original climax state.

NON-POINT POLLUTION: Pollution such as dust or automobile exhaust that does not arise from a specific, fixed point such as a factory.

NONUSE (REGULAR): An authorization to refrain, temporarily, from placing livestock on public ranges without loss of preference for future considerations.

NONUSE (SUSPENDED): Nonuse required by BLM when amount of available vegetation is not adequate to meet preference.

OBSERVED RANGE TREND: Professional judgement of apparent change in vegetation condition and soil erosion characteristics resulting directly from environmental factors, primarily climate and grazing, as observed at one point in time.

OPTIMUM NUMBERS: The number of animals, (in this usage, horses) that may survive in reasonably satisfactory condition in a specified area, based on the best available information.

PALATABILITY: The attractiveness of a plant to animals as forage.

PALEO-CLIMATIC: Pertaining to pre-historic climates.

PARALLEL BASE: Intermingled (with public lands), unfenced private lands that have livestock qualifications or preferences.

PASTURE: Grazing area of various sizes enclosed and separated from other areas by fence or natural barrier.

PEDESTALED: A condition where the soil has eroded from around individual plants or other objects such as small rock, leaving them on small pedestals of soil.

PERENNIAL PLANTS: A plant that has a life cycle of three or more years.

PERENNIAL WATERS: Waters which are available continuously during all seasons of the year.

PERIODS-OF-USE (DOMESTIC ANIMALS): The time of year when domestic animals would be allowed on a specific unit of range, as designated by a grazing authorization.

PERMITTEE: One who holds a permit to graze livestock on public lands.

PHENOLOGY: The study of periodic biological phenomena such as flowering, seed production, etc., as related to climate.

PLANT VIGOR: The state of health of a plant. The capacity of a plant to respond to growing conditions, to make and store food and to complete the reproductive stages.

PLAYA: The shallow central basin of a desert plain in which water gathers after a rain and is evaporated.

POISONOUS PLANT: A plant containing or producing substances that cause sickness, death, or a deviation from normal state of health of animals.

POTENTIALLY SUITABLE: Range which is presently unsuitable for livestock grazing, but which has the potential to become suitable through management and range improvements.

PROPER USE: The percentage of the current year's production during a specific period of the year that animals may graze a plant without harming the vegetation.

PROPER USE FACTOR: The percentage of use that can be made of a forage species under proper management. Used in the calculation of range inventories.

PROTECTABLE STREAMS (AQUATIC HABITAT): Those streams or portions of streams which do or could support a sport fishery and on which the aquatic habitat condition could be maintained by BLM management actions only.

PUBLIC LANDS: Lands administered by the Secretary of the Interior through the Bureau of Land Management.

RANCH BUDGET: An itemized summary of the expenditures and receipts of a ranch operation.

RANCH WEALTH-CAPITAL POSITION: The value of a ranch in a given market, at a given time.

RANDOM SAMPLING (OF CULTURAL RESOURCES): A sampling scheme designed to provide an unbiased selection of sample units or of the population being sampled.

RANGE IMPROVEMENT: A structure, development, or treatment used to rehabilitate, protect, or improve the public lands to advance range betterment.

RANGE READINESS: The defined stage of plant growth at which grazing may begin under a specific management plan without permanent damage to vegetation or soil.

RANGE SITE: A distinctive kind of rangeland that differs from other kinds in its ability to produce a characteristic natural plant community.

RANGE STUDIES: Appraisal of range land to determine range condition and trend.

RANGE SURVEY (VEGETATION INVENTORY): A method for the measuring of vegetation production to provide base data for establishing the grazing capacity used in making management decisions.

REASONABLE NUMBERS: Long-term average big game population cooperatively agreed upon by the BLM and the Nevada Department of Wildlife.

RECRUITMENT RATE: The net annual increase in a wild horse and burro population.

RIPARIAN: A biological zone influenced by the presence of water. Also used to refer to vegetation that grows along streams or around springs.

ROCK ART: Drawings made on or carved into rock.

ROCK SHELTER: A naturally occurring rock overhang that provided a protected location for human habitation.

SALVAGE: The recovery of material and data from an affected cultural resource, prior to its alteration or destruction, through recordation, documentation, partial or total excavation, and collection for analysis and interpretation.

SEED-RIPE: A phenological phase in the reproductive stage of a plant at which time seed is mature.

SEED TRAMPLING: Trampling of disseminated seed into the soil mantle by livestock, wild horses and burros and wildlife.

SENSITIVE PLANTS: - Species not yet officially listed but which are undergoing a status review or are proposed for listing according to *Federal Register* notices published by the Secretary of the Interior or the Secretary of Commerce, or according to comparable State documents published by State officials.

- Species whose populations are consistently small and widely dispersed, or whose ranges are restricted to a few localities, such that any appreciable reduction in numbers, habitat, availability, or habitat condition might lead toward extinction.
- Species whose numbers are declining so rapidly that official listing may become necessary as a conservation measure. Declines may be caused by one or more of several factors including: destruction, modification, or curtailment of the species or habitat; overuse for commercial, scientific, or educational purposes; disease; the inadequacy of existing regulatory mechanism; and/or other natural or manmade factors adversely affecting the species' continued existence.

SERAL: Pertaining to the successional stages of ecological communities.

SHORT TERM: A point in time nine years following the initial implementation of the grazing decision (year 1991).

SITE (CULTURAL): The physical location where human activities or events occurred.

SPRING DEVELOPMENT: A permanent structure on a naturally occurring surface water source providing potable water for livestock, wild horses and burros, and wildlife.

STAGGERED or PYRAMID LICENSE: A livestock grazing authorization that allows varying numbers of livestock at different time periods. This usually resembles a "pyramid" buildup and reduction of livestock numbers throughout the grazing season.

STOCKER OPERATION: A type of livestock operation where weaned calves or yearlings are bought in the spring or early summer, fattened on private or public range and sold in the fall. There is generally little or no year-round cow herd.

SUCKER: A shoot from the roots or lower part of the stem of a plant.

SUITABILITY: Physical and/or biological character of an area that makes grazing the area feasible.

SUITABILITY CRITERIA: Standards used to determine the suitability for grazing. These include steepness of slope, distance from water and vegetation production.

SUITABLE RANGE: Forage-producing land which can be grazed on a sustained yield basis under an attainable management system without damage to the basic vegetation and soil resource of the specific or adjacent areas.

THIRD ORDER SOIL SURVEY: A soil inventory which identifies phases of soil series or soil families on a map scale between 1:24,000 and 1:250,000.

THREATENED SPECIES: Any species likely to become endangered within the foreseeable future throughout all or a significant part of its range.

THRESHOLD: A threshold is a maximum or minimum number, or other parameter, established by somebody or something that will be affected by the impact. It may be an individual or interest group, or it may be a tolerance within the ecosystem itself. The threshold is set according to a particular point of view (value system).

THRESHOLD LEVELS: May be specific defined levels of resource use, production or development which are established as maximum or minimum constraints for determining significance. Threshold levels may be established to ensure that the analysis identifies an unacceptable level of cumulative impacts.

THRESHOLD ANALYSIS: This is the process of comparing possible threshold levels to anticipated cumulative impacts and establishing that point where an additional increment in the threshold will make a major change in impact (also reference the process for determining significance - Introduction to Chapter 3.)

TREND (RANGE): The direction of change in range condition over a period of time.

TREND PLOTS: A specific site, either 3 x 3 feet or 5 x 5 feet, in which quantitative vegetation changes that occur over a period of time are measured or estimated, and photographed.

TURBIDITY: A suspension of solid particles in water. Turbidity is determined by measuring the percentage of a beam of light which passes through a sample of water. The measurement is used as an indicator of erosion and sedimentation in streams.

UNDERSTORY: Plants growing beneath the canopy of other plants. Usually refers to grasses, forbs, and low shrubs under a tree or brush canopy.

UNIT RESOURCE ANALYSIS (URA): A comprehensive display of physical resource data and an analysis of the current use, production, condition and trend of the resource and the potentials and opportunities within a planning unit, including a profile of ecological values.

UTILIZATION: The portion of the current year's forage production that is consumed or destroyed by grazing animals. May refer either to a single species or to the vegetation as a whole.

UTILIZATION PLOT: A study plot used to determine proportion of the current year's forage production that is consumed or destroyed by grazing animals.

VARIABLE COSTS: Those expenses that fluctuate with the amount of production, e.g., feed for cattle.

VEGETATION: Plants in general, or the sum total of the plant life above and below ground in an area.

VEGETATION ALLOCATION: The apportionment of available vegetation to livestock, big game, wild horses, burros, and other resources.

VEGETATION COMMUNITY: A plant community with distinguishable characteristics.

VEGETATION COMPOSITION: Percentage of each plant species present within a vegetation type.

VEGETATION MANIPULATION: Alteration of vegetation by fire, mechanical, chemical, or biological means to meet management objectives.

VISUAL RESOURCE MANAGEMENT (VRM): The planning, design, and implementation of management objectives to provide acceptable levels of visual impacts for all BLM resource management activities.

VISUAL RESOURCE MANAGEMENT CLASS: The degree of visual change that is acceptable within the characteristic landscape. It is based upon the physical and sociological characteristics of any given homogeneous area and serves as a management objective.

VISUAL RESOURCES: Visible features of the landscape including land, water, vegetation and animals.

WATER INFILTRATION: Water penetration into the soil. Rate and amount of infiltration is limited by size and abundance of soil pores and water absorption capacity of the soil.

WATERSHED: A total area of land above a given point on a waterway, that contributes runoff water to the flow at that point.

WILDERNESS STUDY AREA: A roadless area or island that has been inventoried and found to have wilderness characteristics as described in Section 2(c) of the Wilderness Act of 1964 (78 Stat. 891).

YEARLING: An animal approximately one year of age. A short yearling is from 9 to 12 months of age and a long yearling is from 12 to 18 months.

ACRONYMS

ACEC - Area of Critical Environmental Concern
AMP - Allotment Management Plan
AUM - Animal Unit Month
BLM - Bureau of Land Management
EIS - Environmental Impact Statement
FLPMA - Federal Land Policy and Management Act
HMA - Horse Management Area
HUA - Horse Use Area
MFP - Management Framework Plan
NDOW - Nevada Department of Wildlife
SCS - Soil Conservation Service
UNR - University of Nevada, Reno
URA - Unit Resource Analysis

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