LIVESTOCK INTERACTIONS WITH UPLAND GAME, NONGAME, AND WATERFOWL IN THE GREAT BASIN

A WORKSHOP SYNOPSIS

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Abstract.

This report is a synopsis of the findings of a work group assembled to evaluate and define "Livestock Interactions with Upland Game, Nongame, and Waterfowl in the Great Basin." Interactions were assessed on the basis of broad wildlife habitat categories including mesic-riparian, sagebrush-grass, and wetlands. Basic principles of livestock-wildlife interactions on Great Basin rangelands are presented and primary areas of conflict are identified. Management options for improving wildlife habitat conditions are recommended and the ecosystem approach to rangeland management is stressed.

INTRODUCTION

On May 3-5, 1977, a workshop, sponsored by the California and Nevada Chapters (Sections) of the American Fisheries Society, The Wildlife Society, and The Society for Range Management, and entitled Livestock and Wildlife-Fisheries Relationships In The Great Basin was held in Sparks, Nevada. The basic objective of the workshop organizers was to assemble a varied array of inter-disciplinary resource scientists representing federal and state agencies, universities, public conservation organizations, and private industry, and to have this group collectively examine and evaluate livestock interactions with wildlife and fish in the Great Basin. The workshop was further designed to identify significant areas of conflict and develop management recommendations for problem solution.

The Great Basin as addressed here might best be defined synonymously with the Great Basin Floristic Division as described by Cronquist et al. (1972) to encompass a land area of 196,000 square miles which included almost all of Nevada, the eastern edge of California, southeastern Oregon, southern Idaho, and the western third of Utah. Although average annual precipitation varies from 4 to 14 inches over this massive land area, the overall average is between 6 and 8 inches. Because of its arid nature and short growing season, the production of livestock and livestock forage is the primary agricultural industry throughout most of the Great Basin. In Nevada, the heartland of the Basin, 82 percent of the agricultural income in 1970 was derived from livestock and livestock products, and nearly one million livestock grazed Nevada lands during that year (McNeely, 1974). Roughly three million AUM's of livestock grazing were provided in Nevada in 1970, and of this total only about 19 percent was provided by

private lands. The remaining 81 percent of the AUM's were accommodated on public lands administered primarily by the Bureau of Land Management and the U.S. Forest Service (McNeely, 1974).

From this information it is evident that substantial interactions occur between livestock and wildlife within the Great Basin Ecosystem. Because of the arid nature of the environment within this ecosystem, it is felt by many resource managers that livestock impacts are more acute here than on other western rangelands. Hence the need for a symposium to define the interactions and focus on significant problem areas.

The proceedings of this workshop are scheduled for publication by the Pacific Southwest Forest and Range Experiment Station in early 1978. As such, the intent of this presentation is to give an overview of the workshop and a synopsis of the findings of the work group which dealt with the topic: Livestock Interactions with Birds and Small Mammals. This work group was divided into the following subtopic groups: (1) Livestock interactions with Upland Game, (2) Livestock interactions with Nongame, (3) Livestock interactions with Waterfowl.

The entire work group met to develop some general guidelines for preparation of subtopic reports, and the subtopic groups then met separately to synthesize the available information concerning livestock interactions with the wildlife species in their respective areas of responsibility. On the third and final day of the workshop the three subtopic groups reconvened to discuss their findings and attempt to combine them into one work group paper.

Many people were instrumental in organizing and implementing the workshop, and many others contributed to its success. Much credit is due to workshop chairman John Menke of the University of California, Berkeley. John was the key man in organizing the workshop and in seeing it through to its successful conclusion. The findings presented in this paper are the results of the combined efforts of the subtopic group participants listed below. Without their diligent efforts, my presentation and participation in this panel discussion would not have been possible.

Subtopic:	Livestock and Upland Game
Leader:	Bob Autenrieth, Idaho Fish and Game Department, Jerome, Idaho
Participants:	Rick Brigham, B.L.M., Carson City, Nevada
	Paul Shields, U.S.F.S., INT, Ogden, Utah
	Jack Slossen, California Department of Fish and Game Sacramento, California
	Mike Wickersham, Nevada Department of Fish and Game, Ely, Nevada
Subtopic:	Livestock and Waterfowl
Leader:	Joe Mazzoni, Malheur NWR, Burns, Oregon
Participants:	Mark Barber, Stillwater NWR, Fallon, Nevada
	Wendell Miller, SCS, Davis, California
	George Studenski, U.S.F.S., Alturas, California
	Ron Critchlow, PG&E, San Francisco, California

Subtopic:	Livestock and Nongame
Leader:	Bob Oakleaf, Nevada Department of Fish and Game, Reno, Nevada
Participants:	Chris Maser, B.L.M., Vale, Oregon
	Tina Nappe, Sierra Club, Reno, Nevada

FINDINGS

The following statements and principles represent the concensus of opinion of the work group and serve as a basic background for analysis of livestock/wildlife relationships:

1. Livestock grazing is the dominant land use of Great Basin range ecosystems.
2. With the exception of Climate, livestock grazing is the primary force influencing wildlife and wildlife habitats in the Great Basin.
3. Livestock grazing and associated management practices have either short-term or long-term effects on wildlife and wildlife habitats.
4. Plant communities are constantly changing and these changes are reflected in wildlife species density and composition which are, to some degree, predictable.
5. In the natural scheme these changes progress from structurally simple habitats to structurally complex habitats with an attendant increase in wildlife species diversity.
6. Plant community alterations brought about by livestock grazing can either advance or retard succession; create new habitats while destroying established ones; and, in come cases, do irreparable damage to fragile habitats.

Due to the inherent characteristics of the various species involved in each subtopic group category, the individual groups used slightly different approaches for the task of defining livestock interactions and conflicts. The interactions and conflicts as presented here are a combination of the significant findings of all three groups and represent only the highlights of the total subtopic group findings.

Livestock interactions were segregated into two basic categories — Direct and indirect. Direct interactions were considered as those resulting directly from the impact of livestock grazing, while indirect interactions were defined as the impacts resulting from management practices related to livestock grazing.

Direct interactions were evaluated on the basis of broad vegetation or habitat types. Xeric classifications are characterized by dry conditions and represent the most extensive vegetative communities in the Great Basin. The habitat type of major concern here is the sagebrush (Artemisia tridentata), grass (Agropyron spicatum and Poa sandbergii) type. The other major habitat types are those in which the vegetative composition is determined by the presence of water and include mesic sites, riparian sites, and wetlands. There is little question that livestock grazing changes the characteristics of rangeland habitats. The degree to which habitats are changed is influenced by such factors as season of use, stocking rates, type of grazing system, and the sensitivity of the habitat.

Sagebrush-grass or sagebrush steppe communities were bunch grasses are dominant one existed in several areas of the Great Basin (Cronquist et al. 1972:125).

While a number of wildlife species use this type, the Columbian sharp-tailed grouse (Pedioecetes phasianellus columbianus) and the grasshopper sparrow (Ammodramus savannarum) are primarily restricted to this habitat type. Livestock grazing has nearly eliminated this vegetative community, and as a result, the Columbian sharp-tailed grouse has been virtually extirpated from the Great Basin, Although this change in vegetative composition eliminated the sharp-tail grouse, those life forms which require brush species to fulfill their life cycle were undoubtedly benefited.

In the strict sense, mesic and riparian sites are not necessarily synonymous, but for the purpose of this evaluation they are treated together and include meadows, seeps, springs, and streams. Mesic and riparian types represent a small fraction of the total rangeland area in the Great Basin, yet they encompass the most important wildlife habitats. Mesic and riparian sites provide critical brood use habitat for sage grouse (Centrocercus urophasianus), blue grouse (Dendragapus obscurus), and chukar partridge (Alectoris chukar), as well as year-round habitat for California quail (Lophortyx californicus), and cottontail rabbits (Sylvilagus nultallii). Many other species of wildlife are dependent upon these habitat types for all or part of their life cycle. Riparian is the most significant habitat type in the Great Basin as it supports the greatest number of wildlife species; and more species are dependent on this type to meet life cycle needs than on any other single habitat type. Unique characteristics of the riparian type which make it so valuable to wildlife include its structural diversity and provision of food, water, and cover in immediate proximity.

Mesic and riparian sites also provide highly desirable "habitat" for domestic livestock, especially in the arid Great Basin. Stoddart and Smith (1951:279,324) point out that areas around water sources are utilized first by cattle and that overutilization of mesic sites is often necessary to force cattle to use less accessible and rougher terrain. Because of this inherent characteristic of cattle grazing, mesic and riparian sites have, in many cases, become sacrifice areas. The Bureau of Land Management has documented this problem in its internal report "Effects of Livestock Grazing on Wildlife, Watershed, Recreation, and Other Resource Values in Nevada" (USDI, BLM, 1975) wherein they identify 883 miles of streambank riparian habitat as being adversely impacted by livestock grazing. The report further states that "The areas around most livestock waters and water courses visited in the three districts were denuded of vegetation and trampled by livestock." Such physical habitat change shifts the vegetative composition to a more simple structural stage with obvious debilitating impacts on many wildlife species.

Two areas of significant conflict which were identified in this work group are detailed below.

> Savage (1969) and Oakleaf (1971) in their studies of the relationship of sage grouse to upland meadows in Nevada showed that meadows are critical in providing succulent forbs as a food source for sage grouse chicks between one and eleven weeks of age. Oakleaf (1971) summed up the problem in the following statement:
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> > The upland meadow represents the primary summer habitat available to sage grouse throughout much of its range in Nevada. Past and present management of public lands in Nevada has regarded upland meadows as

sacrifice areas. A serious deterioration of this habitat has been the inevitable result and will continue unless meadows are specifically managed.

The influence of livestock grazing on plant succession is evidenced over much of the Great Basin by the failure of riparian aspen (Populus tremuloides) groves to regenerate. Oakleaf (1975) found that nesting goshawks are largely dependent upon a specific aspen situation which often occurs in swales or along streams with a low gradient and with the following characteristics:

1. Individual trees widely spaced but with complete canopy coverage of the site.
2. The stand composed of trees 18-24 meters high with the bottom of the canopy 9-15 meters above the ground.

Livestock also seem to prefer this type of aspen stand because of the level ground, shade, water, and freedom of movement through the trees. If the present trend of livestock use continues in these critical aspen sites, goshawk populations in Nevada will surely decline.

Wetlands support an abundance of water related wildlife species including waterfowl, shorebirds, and furbearing animals. Several major wetland areas which occur in the Great Basin are managed primarily for production of waterfowl. The livestock interaction of primary concern is the impact of grazing on waterfowl nesting cover. Waterfowl nest density and nesting success are both a function of the quantity and quality of nesting cover, and livestock grazing on Great Basin wetlands impacts the composition and density of native marsh vegetation. Hence waterfowl production values are severely reduced.

Indirect livestock management practices, where demonstrated conflicts exist with wildlife values, include vegetation manipulation, and water development. Vegetation manipulation, particularly spraying, chaining, and burning have received widespread application throughout the Great Basin region over the past 25 years. Almost without exception, sagebrush has been the major target species for these treatments. Sagebrush, long considered by land managers to be an undesirable shrub, has been reduced throughout its range in western North America. Conservative estimates are that at least ten percent of the sagebrush lands in the west have been altered through biological, chemical, or mechanical methods (Wilson Bulletin 1976). The eradication of large areas of sagebrush has generally been found to be detrimental to the sage grouse resource.

Wallestad (1975) reported that in Montana a 31% loss of habitat adjacent to a strutting ground coincided with 63% decline of strutting males. Peterson (1970), also in Montana, noted a strutting ground which had averaged 54 males (for 13 years) dropped to three within two years following spraying and since has been totally abandoned. Eradication of large areas of sagebrush in Wyoming resulted in a strutting ground decrease from an average of 50 birds per ground in 1961 to a complete absence of strutting males by 1965 (June & Higby 1965). Adjacent grounds in unsprayed areas had only minor fluctuations in bird numbers.

In some cases, however, vegetative manipulation in combination with intensive livestock grazing management has resulted in improved wildlife habitat conditions. In a study on the Curlew National Grassland in southeastern Idaho, McArdle (1976) found that sharp-tailed grouse preferred manipulated areas during the spring through fall period.

Although the development of artificial waters for livestock occasionally benefits wildlife, some problems are commonly attendant to such developments.

The "Nevada Report" (USDI, BLM, 1975) sums up water development conflicts in the following statements:

1. The reduction of water at its source through collector systems reduces succulent vegetation, often destroying entire meadows, and reduces the amount of free water available to wildlife.
2. Water is piped, usually without outlets for wildlife, to troughs without bird or small mammal ladders or floating devices.
3. Wells are operated only during the livestock use season leaving no water for wildlife at other times.

SUGGESTED MANAGEMENT CONSIDERATIONS

1. Management should consider the ecosystem as a whole irrespective of political boundaries. It must be recognized that to maintain both species diversity and ecosystem stability, management goals must not be single product oriented, but must be devoted to habitat management.

2. Rangeland habitats should be managed for species richness, but numbers of species should not outweigh professional judgement of species value.

3. Mesic and riparian areas constitute fundamental wildlife habitats, but have also been subjected to the greatest abuse by livestock grazing. These areas should receive special management consideration to preclude overutilization by domestic livestock; if they are to be maintained as a unique and highly productive segment of the Great Basin Ecosystem.

4. Livestock grazing is recognized as a legitimate use of the Great Basin rangeland resource, but public lands should be inventoried to determine areas where wildlife or other resource values are of such significance that these areas should be withdrawn totally from livestock use, or livestock used only as a tool for vegetation management.

5. Since soil and water comprise the basic elements of wildlife habitat, livestock grazing practices should be designed to maintain soil stability and water quality. Protection of the basic soil and water resources must be a paramount management consideration.

6. Range managers and scientists should develop methods to achieve multiple use requirements for vegetative conversion projects. Native, site adapted grasses, forbs, and browse should be used in seeding projects.

7. Extensive inventories should be completed of all public rangelands to determine the carrying capacity of these lands for all classes of animals both wildlife and domestic stock. Livestock and feral horse and burro numbers should be reduced to a level that will allow the perpetuation of a healthy vegetative resource that will accommodate the highest possible wildlife population levels.

DISCUSSION

The intent of this work group session was not to indict the western livestock industry, but to make an objective evaluation of the current situation regarding livestock/wildlife relationship on Great Basin rangelands. It is evident from the findings presented here that the current system of livestock-range management has failed to be responsive to the habitat needs of many wildlife species. A change in management emphasis for Great Basin rangelands is indicated. Single product oriented management must become multiple use management which is responsive to the greatest possible number of ecosystem components.

LITERATURE CITED

Cronquist, A., A.H. Halmgren, N.H. Holmgren, and James L. Reveal. 1972. Intermountain flora, vascular plants of the intermountain west. Volume one.

June, J.W. and L.W. Higby. 1965. Transactions of the western states sage grouse workshop. June 22-25, 1965. Walden, Colorado. 31 pp.

McArle, B.A. 1976. The effect of habitat manipulation practices on sharp-tailed grouse utilization in southeastern Idaho. Unpub. M.S. Thesis, Utah State University, Logan. 57 pp.

McNeeley, J.G. Jr. and C.E. Woerner. 1974. Water for Nevada, agriculture, State Engineer's Office, Nevada Division of Water Resources, Rept. No. 8. 216 pp.

Oakleaf, R.J. 1971. The relationship of sage grouse to upland meadows in Nevada. Nev. Dept. of Fish and Game Job Final Rept. Proj. W-48-2. 64 pp.

_____. 1975. Population surveys, species distribution and key habitats of selected nongame species. Nevada Dept. of Fish and Game Job Per. Rept. Proj. W-53-R. 42 pp.

Peterson, J. G. 1970. The food habits and summer distribution of juvenile sage grouse in central Montana. J. Wildl. Manage. 34(1):147-155.

Savage, D.E. 1969. The relationship of sage grouse to upland meadows in Nevada. Nev. Dept. Fish and Game Job Compl. Rept. W-39-R-9. 101 pp.

Stoddart, L.A. and A.D. Smith. 1951. Range management. McGraw-Hill Book Co. 2nd Ed. 433 pp.

U.S. Department of the Interior, Bureau of Land Management. 1975. Effects of Livestock Grazing on Wildlife, Watershed, Recreation and Other Resource Values in Nevada. 96 pp.

Wallestad, R. 1975. Male sage grouse responses to sagebrush treatment. J. Wildl. Manage. 39(3):482-484.

Wilson Ornithological Society Conservation Committee. 1976. Conservation Committee Report on effects of alteration of sagebrush communities on the associated avifauna. The Wilson Bull. 88(1):165-171.