

Value Shifts in Multiple Use Products from Rangelands

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The demands for natural resources and products are reflected in values. These demands are not constant and shifts in value occur requiring adjustments. Established markets could adjust to the shifts if all costs and benefits were included in prices. The markets are imperfect because not all costs and benefits are reflected in prices. Therefore, production adjustments and allocation changes must be made in the multiple use aspects of rangelands through non-market decision processes.

Values Defined

Peterson and Randall (1984) have defined four types of values that have importance in natural resource decision making. First, **use value**—the value associated with the use of materials and enjoyment of amenities. Market prices for goods and services are the most readily observable form of use value, but not all use values are market values. Second, **option value**—the value that accounts for risk in demand and supply. It represents the adjustment that must be made to present values to include risk discounts and premiums associated with future use. It is the value associated with insuring that certain uses and products will be available for decisions in the future. Third, **quasi-option value**—the value associated with delaying present use of resources based on the belief that knowledge concerning uses will increase in the future. Fourth, **existence value**—the value of knowing that something exists. If all else is equal, existence values will be greatest at the margin for those things which are rare, and will command immediate attention when those things are threatened with massive shock.

A given parcel of land may have values associated with all four of these types of values. The last remnant stand of a rare species does have value in its use for grazing, and a value associated with preserving options for future use of the species. Some individuals will also value knowing that the stand exists whether they ever see or experience it directly themselves. The future use of the area, or lack of use, depends on the relative importance associated with each type of value. High existence values may dictate that no grazing use be made in the area. All four sources of value are of importance in natural resource decision making.

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Historical View of Rangeland Values

I have chosen to separate the historical view of rangeland values into five periods during which the primary driving influence behind values was relatively constant. The first period is prior to 1900. The second began with the onset of the 20th century. The third major period began with the passage of the Multiple-Use Sustained-Yield Act in 1960. Another period began with passage of the land management planning acts in 1976 and continued through 1988. During this time land management plans were developed. The current period should see the attempt at implementing management plans.

Prior to 1900—Subdue and Conquer

Prior to 1900, regulations and laws were minimal concerning the provision of goods or resources for any purpose other than exploitation. Land was held for disposal with little regard for proper management or provision of amenity resources. Public pressure began to mount during the late 1800's calling for reform on timber and grazing land (Dana and Fairfax 1980). The greatest values associated with rangelands in the West were water and livestock numbers. Cattle were valued more for their hide than for their meat. The result was the abuse of vast acres of public and private land from overstocking. Floods and erosion were commonplace.

1900-1960—Regulatory Period

Laws were enacted to place land under management for the benefit of society rather than being held for disposal. It was during this period that the Forest Service and Bureau of Land Management were established. The Taylor Grazing Act was enacted, and grazing fees on public land were instigated. Wise use of the resources was the watch word of the time or "the greatest good, for the greatest number, for the long run." Industrial interest groups were successful in lobbying the land agencies for provision of the products they demanded. Values associated with rangelands emphasized red meat rather than mere numbers of animals. Wildlife, water, and recreation were gaining in recognition as important outputs, but were considered secondary for the vast acres of public forest and range lands. Use values were high with only limited areas reflecting high existence and option values.

1960-1976—Multiple Use and Conservation Period

Environmental awareness was the force that led to changes between 1960 and 1976. Public awareness was awakened of the environment and the use of resources flowing from public lands. On rangelands, grazing for red meat production remained a strong value but more

Table 1. Trend in value of major forest and rangeland uses through four time periods (before 1960, 1960-1976, 1976-1988, and 1988-2000).

Management category	n	Uses					Average Value
		Timber	Grazing	Recreation	Wildlife	Water	
Timber	19	-	-	+	+	+	6.34
Range	8	-	-	+	+	+	6.74
Water	13	+/-	-	+	+	+	6.34
Wildlife	22	-	-	+	+	+	6.19
Recreation	22	-	-	+	+	+	6.11
Resources	12	+/-	-	+	+	+	5.86
Planning	16	-	-	+	+	+	6.27
Engineering	12	+/-	-	+	+	+	5.75
Other	3	-	-	+	+	+	6.82
Total	127	-	-	+	+	+	6.20
Average Values		6.57	4.80	6.76	6.60	6.27	

Values are scaled from 1 through 10, with 1 being low and 10 being high.
 + = values increased through the 4 time periods.
 - = values decreased through the 4 time periods.
 +/- = values increased in the second time period and then decreased.
 n = number of respondents.

emphasis was placed on wildlife, recreation, water, oil, and minerals. Wildlife, water, and recreation were recognized as constraints on the production of red meat in setting stocking rates or allocating resources among uses. Use values remained high but option and existence values increased in general, and on some areas (for example, wilderness and roadless areas) these values were at the forefront of controversy.

1976-1988—Planning Period

As a response to public and environmental interest groups the public land agencies were given congressional mandates to modify their management techniques to include the public in the planning process. Agencies were directed to write 10-year management plans that had public input and represented multiple use objectives developed by interdisciplinary teams. Pressures on the planning process continued to mount from environmental interest groups that showed more interest in amenity resources than in traditional commodity resources. Values other than red meat production from rangelands became the common cry. Use values began to shift with more emphasis being placed on recreation and wildlife uses. Option and existence values continued to be brought into arguments for changes in existing or planned use patterns.

1988-2000—Implementation Period

The last 12 years of this century should see the implementation of forest plans and include the revision of plans periodically. Agencies are being pressed into providing more amenity resources than in past periods. Agencies will probably shift away from functional budgets toward a system designed to work with the forest plans, funding strategies in plans rather than functional work. High use values will be placed on water, recreation, and wildlife with lesser significance given to traditional timber and grazing values. Option and existence values will likely play a more important role in allocating resources on rangelands.

Management Mandates on Public and Private Rangelands

Society's mandates provide the foundation upon which values are built. Any proposed practice that opposes society's basic mandates meets with opposition from society, and the values associated with the opposing use decrease. As public environmental awareness increased, the values traditionally associated with rangeland use became increasingly pressured and managers are forced to modify management practices. When the public mandate was to subdue, values for red meat production and forage for livestock were high. When the public mandate shifted to conservation, the public values associated with non-consumptive uses became more apparent.

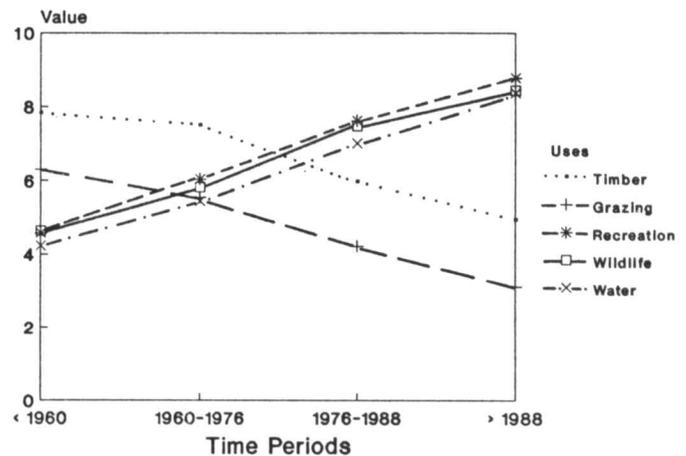


Fig. 1. Average values reported by all individuals for the five major uses and four time periods.

Recent laws and litigation clearly define the mandate given to managers of public and private rangelands. Current rangeland managers have been given direction to manage resources consistent with the maintenance of the basic resources and to preserve the productive potential of the land. The emphasis on public land is to accomplish these tasks while trying to provide desired outputs demanded by society. The emphasis on private land is to

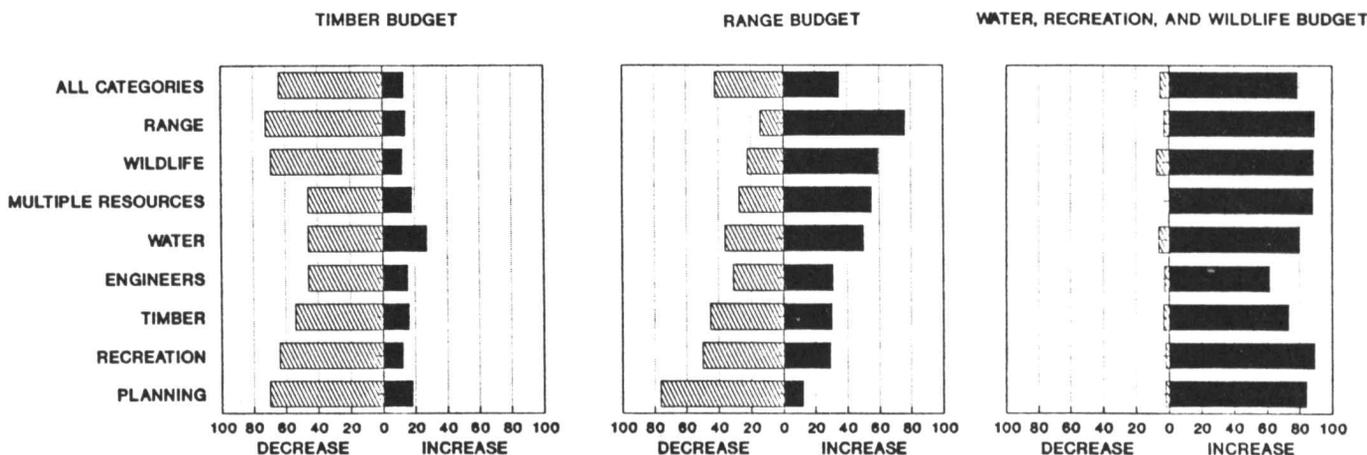


Fig. 2. Percent of respondents recommending budget increases or decreases for timber, range, and the average percentage for water, recreation, and wildlife shown by management category.

accomplish landowner objectives consistent with the provision of stewardship required by law. As society progresses from a philosophy of exploitation to conservation and environmental awareness, the emphasis placed on use of resources will continue to shift more toward non-consumptive attitudes and pressure will increase for resources used in leisure pursuits.

National Forests—Perception of Values for Use

Current management of resources reflects managers' perceptions of values associated with use. A survey questionnaire was used to determine how Forest Service personnel perceived society's values associated with the five traditional uses of the National Forests (timber, grazing, recreation, wildlife, and water) have shifted through time. The first portion of the questionnaire examined 4 time periods: before 1960 (prior to the Multiple-Use Sustained-Yield Act), 1960-1976 (from the Multiple-Use Sustained-Yield Act to the National Forest Management Act), 1976-1988 (from the National Management Act to the present), and 1988-2000 (the immediate future). For each time period the respondents were asked to record an integer value between 1 and 10 that corresponded to how they perceived society valued each use area. A 1 would indicate a very low value, while a 10 would indicate a very high value.

The questionnaire also asked for information concerning respondents' education and work assignment history, the management category that best described their qualifications, expertise, and loyalty, and the region of the country they thought their responses were aligned with. A question also asked how the National Forest System FY1988 budget should be reallocated.

A total of 175 questionnaires were mailed to Forest Service personnel serving in Forest, Regional Office, or Washington Office positions. Questionnaires were divided equally (25 each) among the following management areas: timber, range, wildlife, recreation, water, engineering, and land management planning. Several individuals could align themselves with no single management cate-

gory and so were classed as multiple resource managers. Response rate differed among management areas (Table 1). A total of 127 responses were returned and used in the analysis. An analysis of variance was used to determine statistical differences in values of uses among management categories.

Shifts in Forest and Rangeland Values Through Time

Significant differences ($p = .01$) were found among management groups in the average values reported from all uses and time periods. Range managers reported the highest average values indicating that they apparently perceive the total values associated with all uses as higher than other management groups. The lowest reported values were by engineers and multiple resource managers. Perceptions were not uniform within management groups; significant differences were observed in individuals within management groups. Differences were observed among uses for values averaged over all time periods. The lowest average values were for grazing (Managers responding to questions about range are likely to equate range with livestock use.) and highest for recreation. Timber and wildlife were nearly equal to recreation, while water was intermediate in value.

Overall averages show that grazing and timber use values dropped below recreation, wildlife, and water values between 1960 and 1988 (Fig. 1). Most managers believe that value shift has already occurred. Nearly all management category averages were consistent in valuing recreation the highest during the last time period; timber was the exception as that group valued water highest. All except engineers perceived the values of recreation, wildlife, and water in the 1976-1988 time period to have been higher than timber and grazing. Engineers ranked the value of uses for that period as recreation, timber, wildlife, water, and grazing.

The average value of timber and grazing uses decreased through time while recreation, wildlife, and water increased. Engineers, water resource specialists, and multiple re-

source managers perceived that timber was more highly valued in the 1960-1976 period than before 1960. All other management groups perceived timber values as consistently decreasing. Engineers perceived grazing values during the 1960-1976 period to be the same as values prior to 1960. All other management groups perceived grazing values as consistently decreasing.

Based on the assumption that the sum of all uses reported represents the total value, all individuals averaged together predict for the future an essentially equal share of value for recreation, wildlife, and water of 25% each. The remaining 25% is shared by timber (15%) and grazing (10%).

Reallocating the Forest Service Budget

All individuals were asked how they would reallocate the National Forest System FY1988 budget if they had the ability to do so. In considering all management categories the majority would allocate additional funds to water, wildlife, and recreation and would decrease timber (Fig. 2). Range allocations were nearly split with 42% favoring a decreased allocation and 35% favoring an increased allocation. No changes in these overall conclusions were observed when managers were separated by years of experience (those with less than 20 years and those with more than 20 years).

Not all management categories followed the overall pattern. Considering those with at least 5 years experience in a given management category, 76% of the range group, 59% of the wildlife group, 50% of the water group, and 55% of the multiple resource managers thought the range budget should increase. Engineers were distributed nearly equally among the three categories of change in the range budget with 38% favoring the status quo. Multiple resource managers, those who stated that their expertise and loyalty was not aligned with any one resource area and their responsibilities included multiple resource areas, were nearly equal in preferring the timber budget to decrease or stay the same. Engineers did not clearly favor decreasing the timber budget (46% to decrease and 38% to remain as is). Respondents were nearly unanimous in recommending an increased budget allocation to water, recreation, and wildlife. Dividing the respondents into education groups by those with at least a Master's degree showed little difference from the overall grouping.

It appears that the opportunity to substantially alter the Forest Service managers' opinions about budget reallocations for timber, water, wildlife, and recreation is small. The opportunity to effect change appears to be greatest in the range budget. This is probably related to the recent actions taken by the Forest Service in reviewing the range policy, initiatives to change the emphasis in range management to encompass more than livestock, and to the recognition among managers that reductions in budget will not correlate with improved management of rangeland resources. Wildlife, water, and multiple resource

managers appear to be strong allies in favoring increased range budgets. Managers who felt their perceptions represented those of the eastern U.S. and Forest Service planners were groups strongly opposed to increased range budgets.

Historical Trend of National Forest Budgets

Information provided from the Office of Management and Budget on expenditures of the Forest Service between 1963 and 1987 show trends that differ from the perception of public values. If the budget were to follow the perception of society's values, one would expect the National Forest System budget for recreation, wildlife, and water to increase relative to timber and range. Averaging the 1963 to 1976 period data together in constant 1987 dollars shows that timber received 20.7% of the National Forest System budget, recreation and construction of recreation facilities 10.2%, range including the range betterment fund 3.2%, fish and wildlife 1.5%, and soil and water 2.6% (Fig. 3). The relative ranking of budget shares shifted in

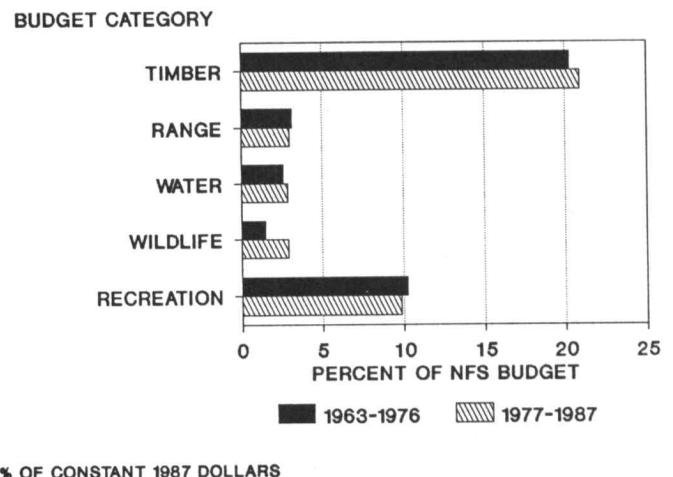


Fig. 3. Average Forest Service functional budgets shown as a percent of the National Forest System budget for 1963-1976 and 1977-1987 time periods.

the 1977 to 1987 decade. Timber was 20.9%, recreation 9.8%, and range, wildlife, and water each had nearly 3% (range 3%, wildlife 2.9%, and water 2.8%). The trend in budget share was up for wildlife, water and timber; down for range and recreation. Substantial percentage increases were seen in wildlife budgets with only minor increases in timber and water. These trends are contrary to the overall perceptions associated with the surveyed Forest Service personnel. Personnel in all management categories reported their perception of the public values as decreasing for timber between the 1960-1976 time period and the 1976-1988 time period. Personnel in all categories also perceived an increase in value associated with recreation during the time periods.

Values associated with uses of rangelands have shifted through time. Early ethics of land management revolved around subdue and conquer with the attendant motivat-

ing economic force being numbers of animals. Overuse and abuse were frequently the outcome. The environmental movement brought with it values expressed in legislation to provide multiple outputs and planned use with involvement from the public. Public input has been increasing to bring the values of the public to bear on uses. Traditional values appear to be receiving less emphasis now. Amenity values and emphasis on vegetation rather than forage are taking the forefront.

Legislative direction to alter management on public lands reflects the public's perception of values associated with public land resources. When land managers get out of sync with that legislators' perceptions of public values, legislative direction is given to shift management. Recent litigation relating to spotted owl and timber harvest, and congressional support for enhanced wildlife and fisheries budgets nationwide point to a shift in values.

Range is currently at a crossroads in history concerning values. No clear-cut proposals to increase or decrease the range budget allocations were made by Forest Ser-

vice personnel. The successful implementation of new policies concerning range direction, such as adopting new measures and emphasizing vegetation management, could have a decided effect on the outcome of Forest Service personnel's perception of budget need. It is likely that livestock will remain a viable product from public lands. An accelerated increase in values associated with resources that are perceived to compete with livestock is likely to continue. Movements away from single or dominant use concepts will be mandatory for future direction of public resource management. Recognizing joint production and the non-traditional values of rangeland will bring the rangeland manager of the future into sync with public values and more in harmony with legislative direction.

References Cited

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Call For Papers

The Second International Wildlife Ranching Symposium is planned for June 4-11, 1990 in Edmonton, Alberta, Canada. The theme for this meeting is '**Conservation and Sustainable Development**'. Session topics include conservation and sustainable development; wildlife production systems; capture and restraint; diseases and parasites; agricultural management (nutrition, reproduction, production, herd improvement and behavior, range and pasture management, grazing management); state-managed hunting; access fees and lease hunting; conservation, ecology, and management on farm and public land; guiding and hunt ranches; wildlife and indigenous people (ungulate management and economics); reindeer husbandary; exotic species; opportunities and risks; ethics and legislation; product development; culinary arts.

Persons are invited to present a paper or poster. Send an abstract and title to the Symposium Chairman by **January 1, 1990**. Papers and poster presentations will be published in proceedings titled '**Conservation and Sustainable Development**'. Guidelines and deadlines that generally follow the Journal of Wildlife Management style are provided in the pre-registration brochure which is available upon request. A first draft will be required by **March 1 1990**. Submit abstracts to: **Lyle A. Renecker, Symposium Chairman, SIWRS, 310 Ag/For Center, Dept. of Animal Science, University of Alberta, Edmonton, Alberta, Canada T6G 2P5 (403) 492-3232/492-2111; FAX: (403) 492-7219.**