

A remarkably high degree of agreement exists among public agency land managers and private landowners on the subjects of relative valuation of wildlands and relative priority of wildland fire protection, according to a recent survey. The non-market values of recreation, watershed, and hunting were clearly considered of importance on all classes of land. In many cases these non-market values were rated as more important than known or measurable values. Both timber and grazing interests agreed on the relative value of their activities on the different land classes. The survey revealed a full awareness of the complex structure of land value and its susceptibility to fire damage. This mutual understanding at the ground level should provide a firm basis for policy formulation affecting the wildlands of the central Sierra foothills.

KNOWLEDGE OF THE structure of wildland values and of potential damage is essential to economic planning for wildland fire protection. Because many land values such as those related to recreation or watershed use cannot yet be adequately appraised in dollars, the establishment of total land values and of priorities for fire protection becomes a complex task.

This opinion survey, designed to appraise land value structure, was made in

the foothill country of the central Sierra Nevada range in California. A questionnaire was sent to 182 persons of many different occupations—but all living and working in the foothill counties and with a vital interest in the wildland resource and possible fire damage. Approximately 70 per cent of the questionnaires were returned—many of them with letters and detailed comments attached. The respondents were carefully selected as a source of intelligent informed opinion and did not constitute a random sample.

Questions asked

Two kinds of questions were asked of the persons surveyed. First, what should be the ranking of the relative contributions of five types of wildland value (recreation, watershed, hunting, timber, and grazing) to the total value of each of six classes of land found in the central Sierra foothills (grass, woodland-grass, woodland, chaparral, ponderosa pine under 30 years old, and ponderosa pine over 30 years old)? Second, how should the six classes of land be ranked in terms of total land value per acre, degree of damage suffered from wildfire, and the order of priority for protection from wildfire?

Because the data consist of rankings or orderings of items, statistical analysis is limited to calculating the *coefficient of concordance*, 'W' (as discussed in *Rank Correlation Methods* by M. A. Kendall, 1955). This coefficient essentially measures the degree of agreement or disagree-

WILDLAND V

Shows Agreement on

L. S. DAVIS

ment found in the ranking of a particular set of items by a particular group. 'W' ranges in value from 0.0 to 1.0 with 0.0 meaning complete disagreement and 1.0 meaning perfect agreement of the rankers.

The rankings of wildland values by each occupational group of respondents are presented in Table 1. Seven occupational groups were used and the number of respondents in each category is given in parentheses. The rankings given in Table 1 for each land class and occupation group represent the average ranking of that land class by all members of the ranking group.

The agreement coefficient is listed for each of these average rankings and indicates how well the members of the rank-

GRASS



WOODLAND-GRASS



WOODLAND



LAND CLASSIFICATION FO

VALUE SURVEY

Fire Protection Priority

ANN DE BANO

ing group agree on the average ranking. For example, under "Grasslands" the ranchers have, as a group, given the rating "4 2 3 5 1 .83." This means that grazing is considered to contribute the most to total land value, watershed the next most, and so on down to timber which was considered to contribute the least to the total land value of grasslands. The agreement coefficient "W" for this ranking is .83, indicating a high degree of agreement among the ranchers as to the value structure of grasslands.

Rankings

Rankings for all respondents considered as a single group are given on the bottom row for each land class. Generally

the separate rankings of each land class by each occupation group agreed closely with the average ranking of all occupation groups combined. Also all occupation groups agreed with each other in most cases.

Some land classes appeared more difficult to rank than others. In the young ponderosa pine class, for example, all groups placed the values of timber first

and grazing last but there was little agreement as to the relative values of recreation, watershed and hunting. This disagreement is reflected by the lower values of 'W' for the rankings of this land class.

Similarly, there are differences in the extent of agreement within occupational groups. Ranchers generally show less agreement with each other than the other

TABLE 1—RELATIVE CONTRIBUTION OF WILDLAND VALUES TO THE TOTAL VALUE OF A LAND CLASS

LAND VALUE	GRASSLANDS					'W'	WOODLAND-GRASS					'W'	WOODLANDS					'W'	
	R	W	H	T	G		R	W	H	T	G		R	W	H	T	G		
OCCUPATION OF RESPONDENT	(#)																		
U. S. Forest Service....	(22)	4	2	3	5	1	.93	4	2	3	5	1	.71	4	1	2	5	3	.64
Calif. Div. of Forestry..	(19)	4	2	3	5	1	.88	4	3	2	5	1	.76	4	1	2	5	3	.56
Private Forestry	(15)	4	2	3	5	1	.93	4	3	2	5	1	.83	4	1	2	5	3	.80
County Officials	(15)	4	2	3	5	1	.87	4	3	2	5	1	.67	4	1	2	5	3	.60
Farm Advisors	(6)	4	2	3	5	1	.97	4	3	2	5	1	.87	4	3	2	5	1	.56
Ranchers	(37)	4	2	3	5	1	.83	4	2	3	5	1	.64	4	1	2	5	3	.38
Misc. Private	(7)	4	2	3	5	1	.91	4	3	2	5	1	.82	4	1	2	5	3	.69
All Respondents	(121)	4	2	3	5	1	.85	4	3	2	5	1	.67	4	1	2	5	3	.32
		CHAPARRAL						PONDEROSA PINE UNDER 30 YEARS OLD						PONDEROSA PINE OVER 30 YEARS OLD					
		R	W	H	T	G	'W'	R	W	H	T	G	'W'	R	W	H	T	G	'W'
U. S. Forest Service....	(22)	4	1	2	5	3	.86	3	2	4	1	5	.84	3	2	4	1	5	.78
Calif. Div. of Forestry..	(19)	4	1	2	5	3	.83	3	2	4	1	5	.55	2	3	4	1	5	.76
Private Forestry	(15)	4	1	2	5	3	.85	4	2	3	1	5	.77	4	2	3	1	5	.70
County Officials	(15)	4	1	2	5	3	.88	4	2	3	1	5	.37	3	2	4	1	5	.65
Farm Advisors	(6)	4	1	3	5	2	.68	3	2	4	1	5	.33	2	3	4	1	5	.66
Ranchers	(37)	4	2	1	5	3	.61	4	2	3	1	5	.45	2	3	4	1	5	.61
Misc. Private	(7)	4	1	2	5	3	.73	4	3	2	1	5	.33	2	3	4	1	5	.66
All Respondents	(121)	4	1	2	5	3	.70	4	2	3	1	5	.55	3	2	4	1	5	.63

KEY: LAND VALUES: R—Recreation T—Timber W—Watershed G—Grazing H—Hunting.
RANK VALUE: 1—Greatest Contribution to 5—Least contribution.

R THE SIERRA FOOTHILLS

CHAPARRAL



PONDEROSA PINE
(under 30 years old)



PONDEROSA PINE
(over 30 years old)



TABLE 2—RANKING OF TOTAL LAND VALUE, WILDFIRE DAMAGE, AND WILDFIRE PROTECTION ORDER FOR THE LAND CLASSES CONSIDERED

LAND CLASS	Total Land Value per Unit Area						Wildfire Damage per Unit Area						Priority Order for Wildfire Protection								
	W	G	PP	W-G	PP	C	W	G	PP	W-G	PP	C	W	G	PP	W-G	PP	C			
	< 30			> 30			< 30			> 30			< 30			> 30					
OCCUPATION OF RESPONDENT (#)																					
U. S. Forest Service (22)	4	5	2	3	1	6	.77	3	2	1	5	2	4	.70	4	6	1	3	2	5	.73
Calif. Div. of Forestry (19)	5	4	2	3	1	6	.78	4	5	1	3	2	6	.62	4	5	1	3	2	6	.70
Private Forestry (15)	5	3	2	4	1	6	.79	5	4	1	3	2	6	.70	5	4	1	3	2	6	.74
County Officials (15)	5	4	2	3	1	6	.74	5	4	2	3	1	6	.46	3	5	2	4	1	6	.70
Farm Advisors (6)	5	3	2	4	1	6	.89	5	3	2	4	1	6	.90	5	3	2	4	1	6	.91
Ranchers (37)	5	3	2	4	1	6	.78	5	3	2	4	1	6	.77	5	3	2	4	1	6	.77
Misc. Private (7)	5	3	2	4	1	6	.85	5	4	1	3	2	6	.87	5	4	2	3	1	6	.88
All Respondents (121)	5	3	2	4	1	6	.72	5	4	1	3	2	6	.61	5	4	2	3	1	6	.65

KEY: LAND CLASSES: W—Woodlands

G—Grasslands

PP < 30—Ponderosa Pine under 30 years old

W-G—Woodland-Grass

PP > 30—Ponderosa Pine over 30 years old

C—Chaparral

RANK VALUE: 1—Greatest, First

to

6—Least, Last

groups, while state foresters show less agreement than federal foresters.

Table 2 shows three separate orderings of the six land classes. In the first ordering, the respondents were asked to rank the six land classes in order of total value per unit area. In the second ranking, the relative amount of wildfire damage per unit area burned was considered. The

timberlands were generally considered to be the most susceptible to fire damage, and chaparral and woodlands the least. In the third ranking the respondents were asked to rank the six land classes in order of priority for wildfire protection. Again timberlands were judged to deserve protection first, followed by woodland-grass, grasslands, woodlands and chaparral.

Lawrence S. Davis and Ann DeBano are Assistant Specialists in Forestry, University of California, Berkeley.

This report is based on Project 1823 of the Agricultural Experiment Station, "Economics of Fire Protection on Wildlands of California," which receives financial support from the California Division of Forestry.

RESPONSE OF HARDINGGRASS TO GRAZING AND CUTTING

HARDINGGRASS IS WIDELY recommended in California for range and dryland pasture use, yet many of the factors that contribute to keeping this plant in a thrifty condition are not known. Some field observations have indicated that using hardinggrass during certain periods in the growth cycle decreases vigor and thrift, and on some occasions causes the plants to die.

Research

Research by the Agronomy Department is under way to determine the effects on grazing and cutting this grass at various stages of its growing cycle. The study area, located at the Hopland Field Station in Mendocino County, is planted to rows of harding and kept clean of weeds and other grasses. The harding is in its third growing season on a deep alluvial soil. At this location, new green growth often begins in late September or early October when average summer tempera-

tures start to drop. Leaf vegetation develops throughout the winter and early spring until May when the seedheads appear. During May and June, basal leaf development decreases, and the seedheads develop rapidly. By late June or early July the heads are mature, seeds are shattering, and most of the plant dries into a semidormant state until September or October.

Initial studies

In initial studies, plants are being grazed and cut at frequent intervals. A sheep is confined to a small plot area and held on this area until the grass is eaten as close to ground level as possible to simulate the cutting treatment. As the grass matures, it becomes more difficult to force the sheep to graze the coarse foliage and stems closely.

The first series of clipping and grazing tests was started in early spring and continued at regular intervals until seed-

head maturity. The plants' behavior will be related to the time of herbage removal, chemical composition, and environmental conditions.—Alfred H. Murphy, Specialist in the Experiment Station, Dept. of Agronomy, Davis, and Supt. of Hopland Field Station, University of California.

CALIFORNIA AGRICULTURE

Progress Reports of Agricultural Research, published monthly by the University of California Division of Agricultural Sciences.

William W. Paul *Manager*
Agricultural Publications

Jerry Lester *Editor*
California Agriculture

Articles published herein may be republished or reprinted provided no advertisement for a commercial product is implied or imprinted. Please credit: University of California Division of Agricultural Sciences.

California Agriculture will be sent free upon request addressed to: Editor, California Agriculture, 207 University Hall, 2200 University Avenue, Berkeley 4, California.

To simplify the information in California Agriculture it is sometimes necessary to use trade names of products or equipment. No endorsement of named products is intended nor is criticism implied of similar products which are not mentioned.

