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Managed and Natural Landscapes: What Do People Like?

Arthur W. Magill



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Visitors to wildland areas of the United States see an untold variety of natural and manmade features that comprise our national landscape. Efforts to assess public perceptions and concerns about the land and its management led to development of sensitivity levels that were presumed to be a measure of viewer concern for what they saw in the landscape. Sensitivity levels, however, measured frequency of visitor presence along travel routes, not visitor concern. A study was done to identify what people saw in slides of managed and unmanaged landscapes and to determine whether they liked what they saw. On a questionnaire most people reported natural landscape features such as trees, mountains, and open spaces and liked seeing them. Forest stands were the most frequently reported object and were liked. Roads were the most frequently reported management action and were disliked. Clearcuts were the management actions reported second most frequently, but were disliked more than 30 percent more often than were roads. Treatments to "green" various management disturbances should reduce their negative visual impact. Misinterpretation of what was seen in various landscapes by respondents suggests a need for more interpretive programs to improve public understanding of management. Respondents' strong disliking of clearcuts may be one more warning that timber harvesting practices should be changed to avoid continued public criticism.

Retrieval Terms: environmental perception, landscape management, public concern, resource management, verbal responses, visual sensitivity

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In Brief . . .

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Visitors to wildland areas of the United States see an untold variety of natural and manmade features that comprise our national landscape. Efforts to address public perceptions and concerns about the landscape and its management led to development of sensitivity levels in a Visual Management System. The levels were presumed to measure viewer concern for what may have been seen in the visual environment. However, the sensitivity levels actually measured frequency of visitor presence along travel routes, not visitor concern for landscapes.

Subsequently, research was undertaken to identify what people saw in slides of managed and unmanaged landscapes and to determine whether they liked what they saw. Verbal expressions of what people see in landscapes were expected to provide not only clues to the meanings people assign to landscapes, but

also to their concern for management and its influence on visual quality. In the study, color slides, depicting scenes of managed and unmanaged landscapes, were shown to several groups of people who specified on a questionnaire what they saw and whether they liked or disliked it.

Most people were attracted by natural landscape features, regardless of management or lack of it. Seventy-nine percent of the responses were related to various combinations of trees, mountains, hills, valleys, vegetation, and open spaces, and the respondents liked seeing them. Forest stands were reported nearly 40 percent more frequently than any other natural feature, and they were liked. Roads were the most frequently reported evidence of management and were disliked. As a consequence, care should be taken to minimize the visual impacts through sensitive location of new roads, realignment of existing roads, or vegetative screening of some road segments. Clearcuts were the second management action reported, but dislike of them was more than 30 percent greater than for roads. The negative reactions to clearcuts, or other objects perceived as clearcuts, appear in union with well known public disenchantment with clearcutting. The reactions may be a warning that a change is needed in the way our forests are managed.

Introduction

Visitors to wildland areas of the United States see an untold variety of natural and manmade features that comprise our national landscape. That people endow meaning to the landscapes they see has been suggested in the works of Lynch (1960) and Lee (1976). Eckbo (1969) said "the physical landscape is visual; the social landscape is verbal." Thus, it is through words that people express what landscapes mean to them and, possibly, their concern for what they see. Integration of the visual and verbal is possible though a verbal record of the thoughts, feelings, and memories visitors hold about landscapes they have seen (Schroeder 1988). Verbal expressions of what people see in landscapes provide not only clues to the meanings they assign to landscapes, but also their concern for management and its influence on visual quality. Thus, verbal expression may offer managers indicators—if not measures—of how the public reacts to natural resource management, and may suggest management alternatives sensitive to the desires of the public.

Efforts to assess public perceptions and concerns about the landscape and its management led to the development of sensitivity levels in the Visual Management System (VMS) used by the USDA Forest Service. Sensitivity levels were defined as, "a particular degree or measure of viewer interest in the scenic qualities of the landscape" (USDA, Forest Service 1974, p. 46). Similarly, the Bureau of Land Management defined sensitivity levels as, "an index of the relative importance or value of visual response to an area in relation to other areas in the planning unit" (USDI, Bureau of Land Management 1975, Glossary p. 3). While the Bureau's system does not specify that sensitivity levels are a "measure" of viewer interest, they are still called an "index" to visual response. Neither system identifies any verbal expressions of public interest or concern for what may have been seen in landscapes. Both systems use frequency of visitor presence along travel routes as a measure or index of interest or concern, which it is not. Even the professionals responsible for administering the systems doubt the validity of sensitivity levels for accurately assessing public concern for landscapes (Laughlin and Garcia 1986). Thus, the visual resource planning of both agencies does not account for public concern for landscapes or any management that the public may see.

Credit is due the Forest Service employees who drafted the VMS, because they clearly acknowledged the difficulty of quantifying visitor sensitivity to the visual environment and the need for "Additional research into the sociological aspects of man's perception of his environment" (USDA, Forest Service 1974, p. 18).

A study completed in 1989 was designed to provide some measure of public sensitivity or concern for landscapes and their management (Magill 1990). Its primary objective was to identify thresholds at which objects of a known size could be detected or identified. It also sought to determine if the objects were liked or disliked as an indicator of public concern for landscapes, or to suggest how such indicators might be devel-

oped. Additionally, the data provided an opportunity to analyze the two objects respondents reported seeing, regardless of detection or identification, and respondents' opinions of what they saw. Reporting the results of the analysis is the purpose of this paper.

Much of this paper represents another way of examining the data previously reported in my study of the detection and identification of visual thresholds (Magill 1990). The difference is, the previous work used landscape descriptors in a collapsed form (valleys included barren valleys, brown valleys, forested valleys, grassy valleys, and green valleys) to identify thresholds or distances at which people could detect (without identifying) or could identify certain types of management in simulated landscape views (slides). In this paper, nearly all terms were examined without being collapsed, to determine people's opinions about natural landscape features or resource management that they reported seeing in the various simulations.

Methods

Data for the 1989 study were obtained by collecting color slide sets of views composed of natural landscape features, manmade structures, and resource management seen throughout the western States. A slide set was composed of 1 to 6 slides obtained by photographing an object from a fixed position using different focal lengths to simulate the object's appearance at different distances. Slide sets were composed of unequal numbers of slides, because fewer slides were required to simulate distances to near objects than to distant objects. A total of 240 slides, representing a random selection of 73 slide sets, were randomly distributed into 8 slide shows of 30 slides each. With one or two exceptions, slides from a given set were shown only once during a show. Whenever it was necessary to show two slides from the same set in the same show, a wide angle view and a telephoto view were used and not shown one after the other. The objective was to prevent people from recognizing the scenes as being of the same object. The eight slide shows were shown to 41 audiences composed of specific interest groups, such as bicycle clubs, sportsmens clubs, conservation groups, and professional societies. Each group was shown only one show.

During the shows respondents completed a written questionnaire (Magill 1990) on which they briefly described the two objects in each slide that attracted their attention, in order of importance to them. They also indicated whether they liked, disliked, or were indifferent to the objects. All objects reported by respondents were natural objects (lakes, mountains, or meadows), development (roads, microwave stations, or buildings), or resource management (timber harvesting, mining, or revegetation on manipulated areas).

All data were coded to permit analysis of descriptive statistics using the SAS computer software system. In the following

discussion, responses were grouped according to types of management including timber harvesting, built structures (including farms and ranches), mining, skiing, range type conversions, areas cleared of brush, burned areas, and areas being regenerated to forests. The responses in these categories were also combined to provide an overall assessment of resource management, which could be contrasted with opinions reported for undeveloped or "natural" areas. Whenever applicable, opinions on specific impacts of management were supported by discussing the influence of societal and organizational memberships.

The purpose of the opinion analysis was to identify what people saw in the slides of landscape scenes, and to determine whether they liked, disliked, or were indifferent to what they saw. Thus, it was important to obtain opinions or characterizations of the attributes of objects such as bare, brown, green, forested, and unforested mountains, valleys, or hills.

The term *objects* has been used to indicate natural landscape features or attributes, development, or resource management reported by respondents. To clarify the definition, the term also has been used broadly to include verbal descriptions of less-obvious landscape attributes such as "bare areas," "openness," "erosion," "open spaces," "uncomprehended," "size of forest," "no trees," "form contrasts," "undefined development," or "new growth."

Most words and phrases that respondents used to describe what they saw were used verbatim. However, words that described similar objects that were infrequently reported or words that described the same object with unlikely differences of opinions were categorized. For example, "radio towers," "satellite dish," "microwave towers," and other infrequently reported electronic facilities were combined as *microwave towers*. And the terms, "brush," "chaparral," "brushfields," "shrubs," and "scrub" which described similar vegetative types without expressing differences about their size, color, density, or condition, were combined as *brush*. Despite efforts to make infrequent reports more useful, many objects such as "enclosed," "corridors," "marshes," "type conversions," "hydro plants," and "fog" were included, because they were unique.

Respondents used a rich collection of terms to describe what they saw in the simulations. Even though many of the terms clearly defined objects such as roads, clearcuts, forests, or mountains, the meaning of other terms may not have been so easily interpreted. Consequently, I interpreted what respondents meant by some responses on the basis of my training and experience. For example, terms such as "surrounded," "boxed-in," "closure," "closeness," and "lack of openness" were coded as *enclosed*, and "broad expanses," "panorama," "expansive," and "empty looking" were coded as *openness*.

The data set contained 47,280 possible responses (788 respondents $\times$ 30 slides per show $\times$ 2 possible reports per slide). A total of 33,751 responses were recorded for all management actions and 4,369 for all natural areas for a total of 38,120 responses. The remaining 9,160 possible responses were missing (people did not respond), but they were not coded as missing data. Missing data were coded for approximately 6 percent of all responses when respondents reported something but not whether they liked, disliked, or were indifferent to it.

Results and Discussion

Respondents

I had sent letters to groups such as bicycle clubs, service clubs, veteran organizations, and women's clubs as well as conservation oriented organizations, clubs, and societies, requesting that they invite me to present a slide show. While I thought the procedure would provide a representative cross-section of the public, many non-conservation groups failed to respond, especially service clubs. Organizations that might include minorities, those having less education and income, and blue collar workers were missed despite searching telephone directories for San Francisco, Oakland, and other Bay Area cities and Sacramento.

The composition of the respondents was surprising. Despite efforts to obtain a heterogeneous sample, 41 percent of the respondents were in professional occupations and another 29 percent were retirees or unemployed. Eighty percent had attended 1 or more years of college, 73 percent had family gross annual incomes of \$25,000 or more, and 29 percent had incomes of \$50,000 or more. Two-thirds of the respondents were male, and most recreated on wildland areas 3 to 10 times per year. The majority had lived currently as well as most of their lives as suburban residents of the Pacific coast states, primarily California.

Socioeconomic information was expected to be useful for explaining some of the perceptions held by the respondents. However, only responses related to organizational and societal membership proved useful for explaining the opinions some people held toward various types of resource management (*app. A*). The greatest number of responses (46 pct) were for members of conservation groups, and 21 percent of them were for members of the "Group of Ten" which includes "the largest and most influential conservation organizations in the country" (Wood 1989) (*app. A*). Sportsmens clubs accounted for 15 percent of the responses, and professional and scientific societies accounted for 10 percent, while industrial groups accounted for only 2 percent. Thirty-nine percent of the respondents were not affiliated with any organization. The inability of the majority of social characteristics such as age, sex, education, income, occupation, and residence location to explain a significant amount of the reaction to the simulated scenes was rather surprising considering others have used socioeconomic data to explain visitor reaction to the environment (Daniel and Boster 1976; Hampe 1988; Palmer 1988; Thayer and Freeman 1987).

What Respondents Saw in Landscapes

Respondents saw color slides that were simulations of real managed and natural landscapes. Slides were used, because of the logistic difficulty and expense of providing on site experi-

ences. Moreover, simulations are a practical, economic, and reliable surrogate for on site viewing (Zube and others 1987). Therefore, keep in mind that all results were obtained by having respondents look at slides of landscapes, and not by having them view actual landscapes on site.

Reports of what people saw in the slides were divided into several categories for analysis. The frequency of objects reported within managed and unmanaged or natural scenes are discussed in two ways: first, in terms of all scenes and then separately as managed areas and natural areas. Next, landscapes are discussed according to concerns about various types of management including timber harvesting, mining, development (such as roads, buildings, farms, powerlines), ski areas, and vegetative type conversions. Finally, concerns about natural landscape features are discussed in relation to managed and natural areas.

All Scenes

Respondents reported seeing 154 objects as being the two most important to them (*app. B*). Of these, 31 objects described development (such as "buildings," "dams," "roads"), and 20 described land management (such as "clearcuts," "mines," "plantations"). Seeing natural areas was indicated by responses of "undeveloped," "wilderness," or "natural areas." Also reported were 5 atmospheric situations, 48 land form descriptors (such as "valleys," "mountains," "rivers," "peaks"), 30 vegetative conditions (such as "brush," "forest stands," "woodlands"), and 17 landscape descriptors (such as "arid look," "desolate," "openness," "patterns"). Three categories were tallied in addition to

the 154 descriptive of landscape objects: not attracted, uncomprehensible, and miscellaneous. Some people said they were "not attracted" by anything. I assigned the term *uncomprehensible* to objects people said they saw that were not in the scene. I assigned the term *miscellaneous* to foreground objects (such as "cattle," "tables," "debris"), which were temporary intrusions on the landscape that distracted from the scene.

Natural landscape features and descriptors comprised 79 percent of the responses for all scenes (*app. C*). The diversity of responses was emphasized by the fact that forest stands, the most frequently reported object, accounted for 12.6 percent of the responses (*table 1*). In fact, only 23 of the 154 objects reported for all scenes accounted for 1 percent or more of the responses, and only 2 objects represented resource management—roads (5.2 pct) and clearcuts (2.2 pct). Roads ranked fourth, and clearcuts were tied with color contrasts for ninth place.

Managed Areas

The objects reported for all scenes show that people were attracted by a rich assortment of natural and made objects. Nevertheless, no management object, other than roads and clearcuts, was accounted for by 1 percent or more of the responses when managed areas only are considered (*app. D, table 1*). "Roads," the most frequently reported management object, were clearly disliked (43 pct) more often than liked (21 pct). "Clearcuts," the next most frequently reported object, were strongly disliked (76 pct). "Cuttings," regardless of type, were disliked (68 pct) although they were not as frequently reported. "Buildings" accounted for 0.9 percent of the responses, "farms"

Table 1—Objects most frequently reported by respondents for all scenes, managed scenes only, and natural scenes only (arranged from most to least frequently reported)

All scenes		Managed only		Natural only	
Objects	Totals	Objects	Totals	Objects	Totals
	Percent (number)		Percent (number)		Percent (number)
Forest stands	12.6 (4811)	Forest stands	12.8 (4311)	Forest stands	11.4 (500)
Mountain ranges	7.7 (2949)	Mountain ranges	7.6 (2554)	Mountain ranges	9.0 (395)
Dome peaks	6.5 (2483)	Dome peaks	6.7 (2272)	Rivers	7.2 (316)
Roads	5.2 (1989)	Roads	5.5 (1852)	Dome peaks	4.8 (211)
Hills	4.2 (1596)	Hills	4.2 (1428)	Brush	4.0 (175)
Bare areas	2.9 (1107)	Meadows	2.8 (955)	Hills	3.8 (168)
Brush	2.7 (1047)	Bare areas	2.8 (946)	Bare areas	3.7 (161)
Meadows	2.7 (1023)	Brush	2.6 (872)	Roads	3.1 (137)
Clearcuts	2.2 (851)	Clearcuts	2.5 (832)	Deserts	2.8 (120)
Color contrasts	2.2 (826)	Color contrasts	2.1 (708)	Color contrasts	2.7 (118)
Rocks	2.0 (753)	Rocks	1.9 (647)	Sand dunes	2.7 (117)
Valleys	1.8 (704)	Lakes	1.8 (614)	Snow	2.6 (115)
Vegetation	1.8 (675)	Valleys	1.8 (612)	Rocks	2.4 (106)
Snow	1.7 (638)	Snowcapped peaks	1.8 (599)	Valleys	2.1 (92)
Lakes	1.7 (635)	Vegetation	1.8 (594)	Landscapes	2.0 (88)
Rivers	1.8 (625)	Snow	1.5 (523)	Vegetation	1.8 (81)
Snowcapped peaks	1.6 (606)	Deserts	1.4 (467)	Openness	1.6 (72)
Deserts	1.5 (587)	Landscapes	1.3 (450)	Meadows	1.6 (68)
Landscapes	1.4 (538)	Snags/dead trees	1.2 (421)	Prairies	1.4 (61)
Openness	1.2 (458)	Openness	1.1 (386)	Erosion	1.4 (59)
Snags/dead trees	1.1 (427)	Prairies	1.0 (354)	Open spaces	1.4 (59)
Prairies	1.1 (415)	Erosion	1.0 (339)	Not attracted	1.4 (59)
Erosion	1.0 (398)				

for 0.8 percent, and "fences," "clearings," "powerlines," and "logging" for 0.7 percent each. Of these, "farms" or "ranches" were liked in 59 percent of the responses associated with managed landscapes. Possibly they were perceived as purposeful or having a pastoral image, either of which tend to be favorably received. The remaining 43 management objects were accounted for by 0.6 percent to a mere trace of the responses. Responses indicated a dislike for 47 percent of all management regardless of the type (*app. D*).

When managed landscapes were being viewed, 50 percent or more of the responses for "farms" or "ranches," "pastures," "trails," "grazing," "green pastures," "lookouts," and "campgrounds," showed that they were liked. Of these, green pastures were liked the most (88 pct). The most disliked object was "overgrazing" (90 pct) followed by "poorly managed" (86 pct), but few responses were recorded for either condition (*app. D*). On the other hand, 53 percent of the responses for "grazing" indicated it was liked and only 17 percent indicated dislike.

Natural Areas Only

People did "see" and report management in scenes of natural areas (Magill 1990). However, when the terms describing management were examined, only 7 percent of the responses were for management objects in natural areas. Foremost were roads (3 pct) (*table 1*), but most of the roads were reported from a scene of an undisturbed forest taken from a road that was visible in the foreground. When the scene was discounted, no management actions were among the first 22 objects reported for the natural areas.

Smog or smoke, seen in natural areas, was disliked according to 76 percent of the responses (*table 2*). In the same scenes,

undefined clearings were reported, but opinions on them were mixed. They were liked in 33 percent of the responses and disliked in 38 percent. Smog or smoke possibly was seen in scenes of natural areas, but clearings had to be natural openings that were mistakenly identified.

Clearcuts, selection cuts, and cuttings in general were seen in the slides of unmanaged areas but accounted for relatively few responses. Possibly, people reported the various cuttings and clearings because their attention was attracted to natural openings or sparse tree cover that led them to report what they expected to see rather than what they saw (Vernon 1968, p. 162). Of the 19 responses that identified clearcuts, 84 percent indicated dislike while the remainder indicated indifference (*table 2*). Of the 13 responses that specified cuttings, 38 percent indicated disliking, 38 percent indifference, and 15 percent liking. Only two responses were for selection cuts, and they expressed indifference. The remaining management actions reported for natural areas did not exist in the scenes or represented misinterpretations and involved very few responses.

Less than 1 percent of the responses indicated a "natural area" when one was the subject of a slide. Even fewer responses identified "wilderness" or "undeveloped." As previously reported (Magill 1990), a majority of the respondents thought the natural areas were managed, however that does not necessarily mean they saw or reported management actions. While less than 2 percent of the responses specifically accounted for naturalness (*app. C*), many responses specified natural landscape features or conditions such as "mountains," "lakes," "trees," "forests," "shrubs," "snow," "arid look," "openness," "tree growth," "rocks," and "open spaces" among the two choices. Thus, 89 percent of the responses (*app. C*), while not specifying unmanaged scenes as natural, indicated natural elements.

Table 2—Opinions of selected objects reported for natural scenes

Objects reported	Opinions of objects reported ²							
	Totals ¹		Liked		Disliked		Indifferent	
			Percent (number)					
Smog and smoke	0.9	(38)	5.3	(2)	76.3	(29)	5.3	(2)
Clearings	0.6	(24)	33.3	(8)	37.5	(9)	25.0	(6)
Clearcuts	0.4	(19)	0	0	84.2	(16)	15.8	(3)
Cuttings	0.3	(13)	15.4	(2)	38.5	(5)	38.5	(5)
Selection cuts	0.05	(2)	0	0	0	0	100.0	(2)
Average percent, total number	N A	(34)	5.9	(2)	61.8	(21)	29.4	(10)
Natural areas	0.8	(35)	77.1	(27)	2.9	(1)	8.6	(3)
Wilderness	0.4	(16)	87.5	(14)	0	0	6.3	(1)
Undeveloped	0.4	(16)	62.5	(10)	12.5	(2)	0	0
Average percent, total number	N A	(67)	76.1	(51)	4.5	(3)	6.0	(4)

¹Total number of all objects reported for natural areas equals 4,368.

²Nonresponse accounts for the sum of opinions not always equalling the totals.

Concerns About Land Management

Timber Harvesting

Despite the public debate about management versus environmental protection of public lands (Blondin 1989; Gup 1990), only two types of management were among the 22 most frequently reported objects from scenes of managed landscapes (*table 1*). On lands subject to timber harvesting, "forest stands," "mountain ranges," "dome peaks," "meadows," "hills," "bare areas" and "roads" were more frequently reported than "clearcuts" (*table 3*). Roads were ranked immediately above clearcuts. "Buildings," "cuttings," and "clearings" were the only other types of management mentioned in 1 percent or more of the responses for scenes depicting timber harvesting.

"Roads" made up 3.5 percent of the responses for scenes with timber harvesting, and "clearcuts" made up 3.4 percent (*table 3*). Sixty-seven percent of the responses indicated a dislike for clearcuts (*fig. 1*), while 15 percent actually indicated a liking for them. In addition, "cuttings" (unspecified as to type of cuttings) were disliked in 64 percent of the responses, and "clearings" (either tree cuttings or brush clearings) were disliked in 51 percent of the responses. In addition to "clearcuts," "cuttings," and "clearings," responses associated with selection cuts, partial cuts, regeneration cuts, and shelterwood cuts, and the combination of cutting types accounted for a total of 6 percent of all objects reported for areas managed for timber. The frequency of response was substantial, however, only for clearcuts, cuttings, and clearings.¹

Membership in different social groups, provided some insight into who liked or disliked clearcuts. The 15 percent liking of clearcuts was attributed predominantly to people belonging to professional societies, industrial associations, and to the unaffiliated (*table 4*). Of those belonging to industrial associations, 53 percent liked the scenes of clearcuts, while only 20 percent of those belonging to professional societies and 16 percent of the unaffiliated reported liking the clearcuts (*table 4*). The strongest dislike (82 pct) was expressed by members of the most influential conservation groups in the country (known as the Group of Ten), followed by members of other conservation groups (81 pct). Even though a few members of sportsmen's clubs indicated a liking for clearcuts, most (72 pct) were nearly as opposed to them as were the conservation groups. Just as for clearcuts, the strongest dislike for undefined cuttings was by members of the Group of Ten (83 pct) (*table 4*).

Mining

In scenes of mining operations, respondents most often saw either natural landscape features or management other than mining (*table 5*). Less than 2 percent of all the responses indicated "mines," and 49 percent of those indicated disliking them, 16 percent liking them, and 21 percent indifference. "Bare areas," "erosion," and "patches" also were reported. Each may have been mining that was not identified as such by the respondents. Regardless, 61 percent of the responses identifying bare areas indicated dislike, 56 percent identifying erosion indicated dislike, and 41 percent identifying patches indicated indifference.

Table 3—Opinions of objects reported for scenes of timber harvesting

Objects reported	Opinions of objects reported ²							
	Totals ¹		Liked		Disliked		Indifferent	
			Percent (number)					
Forest stands	14.5	(1,283)	78.2	(1,003)	4.1	(53)	11.5	(147)
Mountain ranges	8.0	(703)	80.9	(569)	2.3	(16)	11.2	(79)
Dome peaks	7.1	(630)	77.6	(489)	4.4	(28)	13.7	(86)
Meadows	5.3	(465)	77.0	(358)	3.7	(17)	14.6	(68)
Hills	4.4	(385)	63.9	(246)	7.0	(27)	24.9	(96)
Bare areas	4.0	(354)	12.4	(44)	58.5	(207)	24.3	(86)
Roads	3.5	(308)	16.2	(50)	45.8	(141)	33.4	(103)
Clearcuts	3.4	(302)	15.2	(46)	66.9	(202)	14.6	(44)
Lakes	3.3	(292)	88.4	(258)	2.4	(7)	3.4	(10)
Color contrasts	1.9	(172)	63.4	(109)	15.1	(26)	16.3	(28)
Valleys	1.8	(156)	71.8	(112)	6.4	(10)	18.6	(29)
Rocks	1.6	(144)	66.0	(95)	2.1	(3)	27.1	(39)
Buildings	1.5	(135)	36.3	(49)	16.3	(22)	40.0	(54)
Prairies	1.5	(134)	54.5	(73)	16.4	(22)	20.1	(27)
Openness	1.5	(131)	79.4	(104)	8.4	(11)	10.7	(14)
Open spaces	1.4	(121)	42.1	(51)	24.0	(29)	27.3	(33)
Cuttings	1.3	(116)	17.2	(20)	63.8	(74)	14.7	(17)
Snow	1.2	(105)	77.1	(81)	2.9	(3)	6.7	(7)
Clearings	1.2	(104)	15.4	(16)	51.0	(53)	27.9	(29)
Burns	1.2	(103)	3.9	(4)	63.1	(65)	23.3	(24)
Bare hills	1.1	(95)	13.7	(13)	48.4	(46)	31.6	(30)
Landscapes	1.0	(91)	67.0	(61)	12.1	(11)	16.5	(15)

¹Total number of all objects reported for timber harvest scenes equals 8,846.

²Nonresponse accounts for the sum of opinions not always equalling the totals.



Figure 1—Large regenerating clearcuts on Little Guard Peak, Coeur D'Alene National Forest, Idaho.

Table 4—Opinions of members of various social groups about clearcutting and cuttings in scenes of timber harvesting

Group type	Opinions ¹						Group	
	Liked		Disliked		Indifferent		totals	
	Percent (number)							
	Clearcutting							
Professional Societies	20	(16)	62	(48)	17	(13)	99	(78)
Group of Ten	4	(3)	82	(55)	9	(6)	95	(67)
Other Conservation	6	(2)	81	(29)	14	(5)	101	(36)
Sportsmens Clubs	14	(5)	72	(26)	11	(4)	97	(36)
Industrial Associations	53	(9)	12	(2)	29	(5)	94	(17)
Unaffiliated	16	(11)	62	(42)	16	(11)	94	(68)
	Cuttings							
Professional Societies	27	(4)	53	(8)	20	(3)	100	(15)
Group of Ten	8	(2)	83	(20)	8	(2)	99	(24)
Other Conservation	12	(2)	65	(11)	12	(2)	89	(17)
Sportsmens Clubs	12	(2)	69	(11)	19	(3)	100	(16)
Unaffiliated	15	(6)	60	(24)	18	(7)	93	(40)

¹Nonresponse on opinions or rounding accounts for the group totals not always equalling 100 percent.

Table 5—Opinions of objects reported for scenes of mining operations

Objects reported	Opinions of objects reported ²							
	Totals ¹		Liked		Disliked		Indifferent	
			Percent (number)					
Mountain ranges	11.6	(508)	79.9	(406)	2.6	(13)	12.0	(61)
Roads	9.9	(433)	31.2	(135)	27.9	(121)	33.0	(143)
Hills	7.5	(327)	68.8	(225)	6.1	(20)	17.4	(57)
Dome peaks	6.2	(273)	72.9	(199)	4.8	(13)	17.9	(49)
Forest stands	5.4	(237)	78.9	(187)	3.0	(7)	14.3	(34)
Deserts	4.0	(173)	64.2	(111)	11.0	(19)	18.5	(32)
Brush	3.6	(159)	52.2	(83)	13.8	(22)	28.3	(45)
Color contrasts	3.1	(136)	69.1	(94)	9.6	(13)	15.4	(21)
Bare areas	3.0	(132)	13.6	(18)	61.4	(81)	18.9	(25)
Farms/Ranches	2.7	(119)	63.9	(76)	3.4	(4)	26.1	(31)
Rocks	2.4	(106)	73.6	(78)	10.4	(11)	10.4	(11)
Erosion	2.0	(89)	28.1	(25)	56.2	(50)	11.2	(10)
Mines	1.9	(85)	16.5	(14)	49.4	(42)	21.2	(18)
Valleys	1.8	(81)	79.0	(64)	1.2	(1)	11.1	(9)
Bare hills	1.7	(75)	32.0	(24)	36.0	(27)	24.0	(18)
Prairies	1.7	(75)	52.0	(39)	16.0	(12)	21.3	(16)
Meadows	1.7	(75)	65.3	(49)	12.0	(9)	18.7	(14)
Landscapes	1.7	(74)	81.1	(60)	8.1	(6)	8.1	(6)
Arid look	1.5	(67)	13.4	(9)	49.3	(33)	23.9	(16)
Canyons	1.4	(61)	88.5	(54)	3.3	(2)	3.3	(2)
Vegetation	1.3	(56)	69.6	(39)	8.9	(5)	12.5	(7)
Openness	1.2	(51)	86.3	(44)	0	0	3.9	(2)
Not attracted	1.1	(50)	2.0	(1)	16.0	(8)	64.0	(32)
Patches	1.0	(44)	27.3	(12)	22.7	(10)	40.9	(18)

¹Total number of all objects reported for mining operations equals 4,373²Nonresponse accounts for the sum of opinions not always equalling the totals

ence. In general, the other objects people saw on areas subject to mining were liked. Even "roads," which are typically associated with mining, were neither strongly disliked nor liked.

Development

"Roads" were, predictably, the most frequently reported object in scenes of different development. "Roads," "powerlines," "microwave towers," and "buildings" were the most disliked of 25 objects that accounted for 1 percent or more of the responses (table 6). A few people liked these frequently reported developments, while responses indicated a 20 to 30 percent indifference towards them. Members of professional societies or the Group of Ten more often disliked roads, powerlines, and buildings (table 7). Of those who reported "trails," 52 percent liked them, and about equal percentage of the remainder either disliked them or were indifferent (table 6). In some scenes, it was nearly impossible to distinguish a road from a trail. Only one scene contained trails that were reported by 16 people, but 151 respondents saw trails where only roads existed. Since many of the trails that were liked were actually roads, people obviously find trails more acceptable than roads.

Other than trails, only "cemetery" and "lookouts" were liked in scenes containing development (table 6). Cemetery accounted for slightly less than 1 percent of the responses, and in 47 percent

of these the viewers liked it. Lookouts, which were liked in 64 percent of the responses, were reported where none existed, though a distant satellite dish could have been mistaken for one. Other reported objects, such as "airports," "campgrounds," "railroads," and "flumes," also were not in any of the scenes, either for managed or natural areas. These reports seem to support the findings of Lee (1978) in which some people saw young trees and stable soils while others saw erosion and logging debris in watercolor simulations where none of the images existed. The differences were attributed to "culturally determined values" of forest lands which respondents carried with them to the viewing—what they saw is what they expected to see.

Ski Areas

Since the three ski areas included in the study were surrounded by forests, "forest stands" were the most frequent object reported (14.7 pct), closely followed by "dome peaks" (14.2 pct), "snowcapped peaks" (11 pct), and "snow" (9 pct) (table 8). The fifth most frequently reported object was "ski areas," which accounted for nearly 8 percent of the responses. Whereas the natural landscape features were all liked, people disliked the ski areas as attested to by 47 percent of the responses. Since only Bald Mountain was strongly perceived as a ski area (172 reports

Table 6—Opinions of objects reported for scenes containing development

	Opinions of objects reported ²							
Objects reported	Totals ¹		Liked		Disliked		Indifferent	
	Percent (number)							
Natural features and developments								
Roads	10.7	(625)	14.7	(92)	51.7	(323)	29.6	(185)
Mountain ranges	9.5	(555)	69.2	(384)	4.5	(25)	21.3	(118)
Brush	5.8	(336)	45.2	(152)	19.3	(65)	29.8	(100)
Dome peaks	5.7	(330)	67.0	(221)	6.7	(22)	20.9	(69)
Forest stands	4.8	(281)	76.9	(216)	4.3	(12)	13.2	(37)
Rocks	4.0	(236)	61.4	(145)	8.9	(21)	25.8	(61)
Hills	4.0	(233)	58.4	(136)	13.7	(32)	21.5	(50)
Powerlines	3.3	(195)	4.1	(8)	71.3	(139)	20.5	(40)
Microwave	3.2	(188)	6.4	(12)	61.2	(115)	27.7	(52)
Bare areas	2.8	(164)	9.8	(16)	63.4	(104)	24.4	(40)
Valleys	2.2	(131)	75.6	(99)	2.3	(3)	16.8	(22)
Landscapes	2.2	(128)	64.8	(83)	11.7	(15)	21.1	(27)
Erosion	2.0	(117)	33.3	(39)	50.4	(59)	12.0	(14)
Vegetation	1.8	(108)	72.2	(78)	11.1	(12)	14.8	(16)
Color contrasts	1.8	(104)	54.8	(57)	21.2	(22)	17.3	(18)
Trails	1.6	(92)	52.2	(48)	22.8	(21)	21.7	(20)
Buildings	1.6	(91)	11.0	(10)	56.0	(51)	29.7	(27)
Canyons	1.5	(89)	69.7	(62)	9.0	(8)	20.2	(18)
Arid look	1.4	(79)	13.9	(11)	62.0	(49)	20.3	(16)
Steep slopes	1.3	(78)	57.7	(45)	12.8	(10)	24.4	(19)
Openness	1.2	(71)	80.3	(57)	5.6	(4)	14.1	(10)
Not attracted	1.1	(65)	0	0	20.0	(13)	64.6	(42)
Skylines	1.1	(64)	71.9	(46)	6.3	(4)	21.9	(14)
Texture	1.0	(59)	71.2	(42)	6.8	(4)	16.9	(10)
Bare hills	1.0	(59)	11.9	(7)	57.6	(34)	25.4	(15)
Additional developments only								
Cemetery	0.8	(45)	46.7	(21)	8.9	(4)	24.4	(11)
Farms and ranches	0.7	(40)	32.5	(13)	35.0	(14)	25.0	(10)
Mines	0.3	(18)	11.1	(2)	61.1	(11)	5.6	(1)
Lookouts	0.2	(14)	64.3	(9)	7.1	(1)	14.3	(2)
Fences	0.2	(12)	0	0	75.0	(9)	25.0	(3)
Observatories	0.2	(10)	10.0	(1)	30.0	(3)	40.0	(4)
Trailers	0.1	(7)	14.3	(1)	57.1	(4)	14.3	(1)
Subdivisions	0.1	(6)	0	0	66.7	(4)	33.3	(2)
Logging roads	0.1	(5)	20.0	(1)	40.0	(2)	20.0	(1)
Water towers	0.1	(4)	0	0	25.0	(1)	75.0	(3)
Excavations	0.1	(4)	0	0	75.0	(3)	25.0	(1)
Airports	0.0	(3)	33.3	(1)	33.3	(1)	33.3	(1)
Campgrounds	0.0	(3)	100.0	(3)	0	0	0	0
Dams	0.0	(3)	33.3	(1)	33.3	(1)	33.3	(1)
Railroads	0.0	(2)	0	0	50.0	(1)	50.0	(1)
Terraces	0.0	(1)	100.0	(1)	0	0	0	0
Flumes	0.0	(1)	100.0	(1)	0	0	0	0
Foot bridges	0.0	(1)	100.0	(1)	0	0	0	0
Parking areas	0.0	(1)	0	0	100.0	(1)	0	0

¹Total number of all objects reported for development equals 5,835.²Nonresponse accounts for the sum of opinions not always equalling the totals.

Table 7—Opinions of members of various social groups about roads, powerlines, and buildings in scenes of development

Group type	Opinions of objects ¹						Group totals	
	Liked		Disliked		Indifferent			
	Percent (number)							
	Roads							
Professional Societies	4	(4)	66	(61)	25	(23)	95	(92)
Group of Ten	4	(5)	71	(91)	24	(31)	98	(128)
Other Conservation	17	(13)	52	(39)	27	(20)	96	(75)
Sportsmens Clubs	38	(32)	30	(25)	31	(26)	99	(84)
Industrial Associations	33	(5)	7	(1)	60	(9)	100	(15)
Unaffiliated	14	(33)	45	(103)	34	(76)	93	(227)
	Powerlines							
Professional Societies	0	0	88	(14)	12	(2)	100	(16)
Group of Ten	0	0	94	(15)	6	(1)	100	(16)
Other Conservation	4	(2)	71	(35)	22	(11)	97	(49)
Sportsmens Clubs	3	(1)	70	(23)	24	(8)	97	(33)
Unaffiliated	7	(5)	65	(48)	24	(18)	96	(74)
	Buildings							
Professional Societies	18	(3)	71	(12)	12	(2)	101	(17)
Group of Ten	0	0	67	(8)	33	(4)	100	(12)
Other Conservation	6	(1)	44	(8)	44	(8)	94	(18)
Sportsmens Clubs	15	(2)	38	(5)	38	(5)	91	(13)
Unaffiliated	10	(3)	60	(18)	27	(8)	97	(30)

¹Nonresponse on opinions or rounding accounts for the group totals not always equalling 100 percent.

Table 8—Opinions of objects reported for scenes of ski areas

Objects reported	Opinions of objects reported ²							
	Totals ¹		Liked		Disliked		Indifferent	
	Percent (number)							
Forest stands	14.7	(350)	91.7	(321)	0.6	(2)	3.7	(13)
Dome peaks	14.2	(337)	87.5	(295)	2.1	(7)	7.4	(25)
Snowcapped peaks	11.0	(261)	98.1	(256)	0	0	0.4	(1)
Snow	9.1	(217)	89.4	(194)	3.2	(7)	1.4	(3)
Ski areas	7.8	(186)	23.1	(43)	46.8	(87)	28.5	(53)
Lakes	7.6	(180)	93.3	(168)	1.1	(2)	2.2	(4)
Mountain ranges	3.4	(82)	91.5	(75)	3.7	(3)	2.4	(2)
Roads	2.3	(54)	16.7	(9)	38.9	(21)	40.7	(22)
Snowcapped mountains	1.8	(44)	100.0	(44)	0	0	0	0
Hills	1.7	(41)	78.0	(32)	0	0	19.5	(8)
Meadows	1.7	(41)	85.4	(35)	2.4	(1)	9.8	(4)
Valleys	1.4	(32)	87.5	(28)	3.1	(1)	9.4	(3)
Color contrasts	1.4	(32)	87.5	(28)	3.1	(1)	6.3	(2)
Edges	1.3	(30)	86.7	(26)	0	0	10.0	(3)

¹Total number of all objects reported for ski areas equals 2,376.

²Nonresponse accounts for the sum of opinions not always equalling the totals.

vs. 7 each for the other two areas), it contributed most to the dislike of ski areas. The pictures of Bald Mountain were taken in summer when there was a strong contrast between the grass-covered ski runs and the adjacent forest (fig. 2), just as in winter when snow is on the ground. While the results cannot prove it, such stark contrasts may have contributed to the dislike of the ski area. People belonging to professional societies, the Group of

Ten, and other conservation groups disliked the ski areas in a range from 53 to 60 percent. However, 53 percent of those belonging to sportsmens clubs liked ski areas (table 9), as did 47 percent of those affiliated with activity-oriented conservation groups (table 9). This difference suggests that sportsmens and activity-oriented groups perceived a benefit to themselves; they might ski, so they liked seeing ski areas.



Figure 2—Contrast between forest and grass covered ski runs, Bald Mountain Ski Area, Sawtooth National Forest, Idaho.

Table 9—*Opinions of members of various social groups and organizations about ski areas*

Group type	Opinions of ski areas ¹						Group	
	Liked		Disliked		Indifferent		totals	
	<i>Percent (number)</i>							
Selected Social Groups								
Professional Societies	13	(5)	53	(20)	32	(12)	98	(38)
Group of Ten	14	(5)	60	(22)	27	(10)	101	(37)
Other Conservation	8	(2)	58	(14)	33	(8)	99	(24)
Sportsmens Clubs	53	(9)	29	(5)	18	(3)	100	(17)
Unaffiliated	28	(19)	39	(26)	30	(20)	97	(67)
Selected Groups Sampled								
Natural Resource Agency	16	(8)	54	(27)	30	(15)	100	(50)
Natural Resource								
Professional Society	7	(2)	55	(16)	34	(10)	96	(29)
Cause Oriented								
Conservation Groups	17	(5)	55	(16)	24	(7)	96	(29)
Activity Oriented								
Conservation Groups	47	(16)	29	(10)	24	(8)	100	(34)
General Public	38	(11)	24	(7)	34	(10)	96	(29)
Unaffiliated	10	(1)	80	(8)	10	(1)	100	(10)

¹Nonresponse on opinions or rounding accounts for the group totals not always equalling 100 percent.

Brush Clearings and Type Conversions

Two management actions, brush clearings and type conversions (*fig. 3*), represent changing from one type of vegetation to another but for different purposes. In the brush clearings, brush was removed before planting trees where they had previously grown. By contrast, in the type conversions brush or trees were removed to promote the growth of forage for wildlife or livestock. Respondents who saw simulations of brush clearings and type conversions, accounted for only three responses of “brush clearings” and one of “type conversions.” However, that did not mean the clearings or conversion were not seen. Respondents did mention “bare areas,” “clearcuts,” and “clearings” which most likely were brush clearings, because the scenes contained no other prominent bare areas, clearings, or clearcuts. Bare areas accounted for about 4 percent of the responses, clearings for 1 percent, and clearcuts for about 3 percent (*table 10*). Furthermore, 67 percent of the viewers disliked bare areas, 52 percent disliked clearings, and 76 percent disliked clearcuts.

All respondents, except those having industry affiliations, disliked clearcuts; the industrial group was indifferent. On the other hand, members of professional societies or the Group of Ten were more often opposed to clearcutting (*table 11*). Given the disapproval of clearcuts, one can expect a dislike for brush clearings or type conversions, if they are perceived as clearcuts.

Tree Regeneration

Tree regeneration following timber harvesting or large fires was the subject of several scenes. Respondents could not determine, from evidence in the slides, whether the regeneration was the consequence of fire or logging. Of the 20 objects accounted for by 1 percent or more of the responses, regeneration was last and was liked according to 68 percent of them (*table 12*). “Poor regeneration” was recorded only 4 times, and it was not liked. People also reported seeing “new growth,” “plantations,” “farms” or “ranches,” “growth,” “pastures,” “young trees,” “tree regeneration,” and “tree growth.” Any of these could describe regeneration, and all were liked.

“Forest stands” were the most frequently mentioned landscape feature for areas that supported tree regeneration. For such sites, forest stands likely were reported in lieu of regeneration—probably because the term, regeneration, was not meaningful to most respondents. Forest stands comprised 23 percent of the responses associated with viewing scenes of regeneration, and 82 percent of the responses indicated that viewers liked the stands.

Many respondents reported seeing “clearcuts,” “cuttings,” “bare areas,” and “logging” which were valid descriptions of the sites being viewed, even though they also supported fully stocked stands of tree regeneration. However, the respondents



Figure 3—Area chained to remove juniper in vegetation conversion to improve wildlife habitat, Church Hills, Fishlake National Forest and Public Domain Lands, near Holden, Utah.

Table 10—Opinions of objects reported for scenes of brush clearing

Objects reported	Opinions of objects reported ²							
	Totals ¹		Liked		Disliked		Indifferent	
			Percent (number)					
Forest stands	17.4	(580)	84.0	(487)	2.9	(17)	9.3	(54)
Dome peaks	8.9	(297)	86.5	(257)	3.4	(10)	6.1	(18)
Mountain ranges	8.3	(276)	81.5	(225)	1.1	(3)	13.0	(36)
Snowcapped peaks	4.5	(149)	96.6	(144)	0	0	1.3	(2)
Rocks	4.2	(138)	83.3	(115)	2.9	(4)	9.4	(13)
Bare areas	3.6	(121)	6.6	(8)	66.9	(81)	20.7	(25)
Clearcuts	3.3	(109)	8.3	(9)	76.1	(83)	13.8	(15)
Hills	3.0	(101)	68.3	(69)	6.9	(7)	19.8	(20)
Color contrasts	2.4	(81)	74.1	(60)	12.3	(10)	9.9	(8)
Vegetation	2.1	(69)	73.9	(51)	2.9	(2)	18.8	(13)
Brush	1.9	(62)	43.5	(27)	9.7	(6)	37.1	(23)
Meadows	1.9	(62)	71.0	(44)	9.7	(6)	17.7	(11)
Buildings	1.4	(47)	17.0	(8)	59.6	(28)	19.1	(9)
Clearings	1.3	(42)	11.9	(5)	52.4	(22)	31.0	(13)
Size of forests	1.2	(41)	65.9	(27)	12.2	(5)	14.6	(6)
Valleys	1.2	(39)	66.7	(26)	10.3	(4)	20.5	(8)
Landscapes	1.2	(39)	66.7	(26)	12.8	(5)	17.9	(7)
Regeneration	1.1	(36)	86.1	(31)	2.8	(1)	8.3	(3)
Shrub clearings	0.1	(3)	33.3	(1)	33.3	(1)	33.3	(1)

¹Total number of all objects reported for brush cleared areas equals 3,326.

²Nonresponse accounts for the sum of opinions not always equalling the totals.

Table 11—Opinions of members of various social groups about clearcutting in scenes of brush clearing

Group type	Opinions of Clearcutting ¹						Group totals	
	Liked		Disliked		Indifferent			
	<i>Percent (number)</i>							
Professional Societies	5	(1)	90	(17)	5	(1)	100	(19)
Group of Ten	3	(1)	94	(29)	0	(0)	97	(31)
Other Conservation	6	(1)	76	(13)	18	(3)	100	(17)
Sportsmens Clubs	15	(2)	62	(8)	23	(3)	100	(13)
Industrial Associations	17	(1)	17	(1)	67	(4)	101	(6)
Unaffiliated	13	(3)	65	(15)	17	(4)	95	(23)

¹Nonresponse on opinions or rounding accounts for the group totals not always equalling 100 percent.

were unable to distinguish the regeneration on such areas or simply failed to mention it. Regardless, when such scenes were perceived to involve timber harvesting, viewers disliked them according to 60 percent or more of the responses.

"Snags" and "dead trees" accounted for 5 percent of the responses for those who viewed scenes of regeneration, but opinions were equally divided between pro and con. Those who liked the snags and dead trees were among the members of

professional societies and various conservation organizations, but much less so for those belonging to the Group of Ten (table 13). Members of sportsmens clubs and industrial associations tended to dislike snags and dead trees. Possibly, these groups associated them with fire prevention messages that identify snags and dead trees as contributors to the spread of wildfires, whereas the other groups see them as beneficial to wildlife.

Table 12—Opinions of objects reported for scenes of tree regeneration

Objects reported	Opinions of objects reported ²							
	Totals ¹		Liked		Disliked		Indifferent	
			Percent (number)					
Most frequently reported								
Forest stands	22.6	(1,349)	81.6	(1,101)	3.3	(45)	9.0	(121)
Clearcuts	5.8	(348)	5.5	(19)	81.0	(282)	11.8	(41)
Roads	5.5	(326)	22.4	(73)	47.9	(156)	24.8	(81)
Snags/dead trees	5.3	(315)	35.9	(113)	34.9	(110)	23.2	(73)
Dome peaks	5.0	(301)	82.1	(247)	1.7	(5)	11.0	(33)
Vegetation	3.6	(212)	85.8	(182)	4.2	(9)	5.2	(11)
Rivers	3.4	(205)	89.8	(184)	2.0	(4)	5.4	(11)
Mountain ranges	3.2	(191)	77.0	(147)	3.1	(6)	13.6	(26)
Hills	2.2	(133)	66.2	(88)	7.5	(10)	19.5	(26)
Valleys	2.2	(130)	80.8	(105)	1.5	(2)	13.8	(18)
Lakes	1.9	(114)	85.1	(97)	0.9	(1)	8.8	(10)
Color contrasts	1.9	(111)	76.6	(85)	8.1	(9)	10.8	(12)
Meadows	1.8	(109)	66.1	(72)	11.9	(13)	15.6	(17)
Snowcapped peaks	1.8	(109)	94.5	(103)	0	0	2.8	(3)
Single trees	1.5	(92)	50.0	(46)	16.3	(15)	27.2	(25)
Cuttings	1.4	(86)	9.3	(8)	69.8	(60)	16.3	(14)
Size of forest	1.4	(86)	70.9	(61)	9.3	(8)	12.8	(11)
Bare areas	1.3	(78)	9.0	(7)	60.3	(47)	19.2	(15)
Logging	1.1	(67)	16.4	(11)	64.2	(43)	11.9	(8)
Regeneration	1.0	(63)	68.3	(43)	7.9	(5)	14.3	(9)
Objects related to regeneration								
New growth	0.8	(48)	83.3	(40)	14.6	(7)	2.1	(1)
Plantations	0.6	(37)	62.2	(23)	18.9	(7)	16.2	(6)
Farms/ranches	0.4	(23)	60.9	(14)	34.8	(8)	4.3	(1)
Growth	0.3	(18)	88.9	(16)	5.6	(1)	5.6	(1)
Pastures	0.3	(18)	50.0	(9)	27.8	(5)	22.2	(4)
Young trees	0.3	(16)	75.0	(12)	6.3	(1)	18.8	(3)
Tree regeneration	0.2	(14)	78.6	(11)	14.3	(2)	7.1	(1)
Tree growth	0.2	(13)	69.2	(9)	15.4	(2)	15.4	(2)
Poor regeneration	0.1	(4)	0	0	100.0	(4)	0	0

¹Total number of all objects reported for regenerating areas equals 5,974.²Nonresponse accounts for the sum of opinions not always equalling the totals.

Table 13—Opinions of members of various social groups about snags and dead trees in scenes of regenerating vegetation

Group type	Opinions of snags and dead trees ¹						Group	
	Liked		Disliked		Indifferent		totals	
	Percent (number)							
Professional Societies	50	(12)	25	(6)	25	(6)	100	(24)
Group of Ten	36	(21)	34	(20)	24	(14)	94	(58)
Other Conservation	47	(31)	29	(19)	23	(15)	99	(66)
Sportsmens Clubs	29	(8)	54	(15)	14	(4)	97	(28)
Industrial Associations	11	(1)	56	(5)	33	(3)	100	(9)
Unaffiliated	33	(40)	35	(43)	23	(28)	91	(122)

¹Nonresponse on opinions accounts for the group totals not always equalling 100 percent.

Concerns About Natural Features in Landscapes

Additional insight into respondents' concern for the environment may be gleaned from their descriptions of natural vegetation, natural landscape conditions, or other natural features they considered important, regardless of management or the lack of it. Also of interest were the modifiers respondents applied to variations in objects they saw, for example, "green valleys" versus "valleys" and "bare mountains" versus "mountains."

Forest Stands, Brush, and Other Vegetation

The object, "forest stands" (*fig. 4*), was reported most frequently and was liked 81 percent of the time (*app. E*, Vegetative Conditions). In fact, forest stands accounted for nearly 40 percent more responses than did "mountain ranges," which was second on the list. "Brush" was the only other vegetative condition that was reported among the 10 most frequently reported natural landscape elements. Of the responses associated with brush, 47 percent were attributed to liking, while 30 percent were indifferent to it.

Trees were variously described as *even-sized*, *old*, *sick*, *single*, or *young* (*app. E*). However, more respondents reported

"dead trees" or "snags," which were about equally liked (33 pct of responses) and disliked (38 pct). Similarly, vegetation was seen as *brown*, *green*, *riparian*, *sparse*, or *yellow*, but most of the responses (about 2 pct) simply indicated "vegetation" and 74 percent liked it.

Bare Areas and Bareness

Perceptions of specific landscape conditions (such as "bare areas," "erosion," "patterns") or of a sense of a landscape (such as "arid look," "desolate," "openness") did not describe typical landscape features (such as "hills," "valleys," "trees," "brush," "meadows") (*app. E*, Perceptions of Landscapes). "Bare areas" and "color contrasts" rated among the 10 most frequently reported natural landscape elements. Only bare areas were disliked in a majority of responses (61 pct) (*fig. 5*). As might be expected, "barren valleys," "bare hills," "bare mountains," and "bare peaks" were also disliked. Yet, if any of these landscape features were described as forested, grassy, or green, they were liked (*app. E*, Landscape Features).

Two vegetative conditions may be related to the perceptions of bareness: lack of vegetation and lack of trees. Landscapes that were reported as having either "no vegetation" or "no trees" were disliked even more than bare areas (*app. E*). Apparently the respondents preferred seeing landscapes that supported trees or



Figure 4—Natural forest stands, Reynolds Creek, Bitterroot National Forest, Montana.



Figure 5—Natural bare area on Snowstorm Peak seen from Lookout Pass, Coeur D'Alene National Forest, Idaho.

some other type of vegetation. Moreover, they preferred plant cover to be relatively continuous, of variable height, and green, because responses indicated they did not like “sparse forests” (42 pct), “sparse vegetation” (53 pct), or “even-sized trees” (72 pct). Respondents liked “green vegetation” (86 pct), “green valleys” (81 pct), “green hills” (80 pct), and “green mountains” (85 pct) (*app. E*).

“Openness” and “open spaces” (*fig. 6*) accounted for over 2 percent of the responses, and openness was liked in 83 percent of the responses. However, in only 44 percent of the responses were open spaces liked, while the remaining responses indicated a split between dislike and indifference. The difference cannot be explained, especially since one might interpret the two terms as describing the same environmental condition. A survey might prove helpful in determining how people interpret these ambiguous terms.

Mountains and Hills

The second, third, and fourth most frequently reported landscape features were “mountain ranges” (8 pct), “dome peaks” (6 pct), and “hills” (4 pct) (*app. E*). While 78 percent of the responses related to “mountain ranges” and “dome peaks” indicated that people liked them, even more liked scenes of “snowcapped peaks” (95 pct of responses) and “snowcapped

mountains” (94 pct) (*fig. 7*). Similarly, people liked “hills” according to 64 percent of the responses, while 80 percent indicated “green hills” were liked and 82 percent that “forested hills” were liked. Also included in the 10 most frequently reported objects were “meadows” which were liked according to 72 percent of the responses; “rocks” which were liked according to 68 percent; and “valleys” which were liked according to 76 percent.

Dry and Wet Landscapes

The driest and wettest landscape features were liked, but the frequency of liking varied. Fifty-seven percent of the responses concerning “deserts” indicated that viewers liked them, however the liking was even greater (75 pct) for “sand dunes,” which were a component of some desert scenes. “Lakes” and “rivers” were reported by some respondents, and they were liked as indicated by responses of 88 percent for “lakes” and 81 percent for “rivers.” Since most people tend to gather wherever water is found, the results could easily be expected.

Considerably fewer responses were concerned with objects associated with water. This may be surprising, because water usually is a focal point for recreational activities. Water was not emphasized, however, in most of the simulations. Nevertheless, more than 80 percent of the responses indicated that viewers



Figure 6—Openness and open spaces, Taylor and Cottonwood Creeks from Road Agent Rock near Bannack, Montana.

liked “lakes,” “rivers” (even “dry rivers”), and “waterfalls.” Scenes of shorelines were an exception. Liking responses for “shorelines” were only 47 percent and disliking were 36 percent. However, people disliking “shorelines” may have interpreted correctly that the shoreline was a large drawdown zone at a reservoir.

Line, Form, Color, and Texture

Line, form, color, and texture are regarded as “dominance elements” that exert differing degrees of visual influence (USDA, Forest Service 1973). Numerous responses referred to “lines,” “edges,” “patches,” “patterns,” and “texture,” all of which are difficult to interpret. Edges are basic to the “general outline or contour” of an object which provides its shape, makes it recognizable, and makes it stand out from its background—the basic “figure-ground” relationship (Vernon 1968). Some people mentioned “edges” as being important to them, possibly, because the edges they saw did not define an object identifiable to them, thus they could not name an object. Though probably closely related to edges, it is unclear what respondents meant by “line.”

Not surprisingly, some respondents mentioned “line,” and others mentioned “texture.” However, while 69 percent of the

responses indicated that viewers liked texture, only 37 percent indicated that lines were liked and 33 percent that they were disliked. A few respondents used the term “landscapes,” to describe what they saw, and they liked them according to 70 percent of the responses (*app. E*).

Color competes with form, line, and texture for dominance in any landscape, and it permits differentiation of objects that may be obscured by the other dominance elements (USDA, Forest Service 1973). Furthermore, objects that present no contrast are indistinguishable, so color contrast may be expected to enhance perceptions. In this study, “color contrast” was the 10th most frequently reported object, and was liked (response of 69 pct). Brown, green, and yellow were the only colors mentioned as modifying landscape objects. In three cases, brown was liked, but responses suggested an indifference towards “brown hills” and dislike for “brown valleys” (67 pct). “Yellow vegetation” was liked the most (91 pct of responses), but green landscapes were reported more frequently. Liking responses for all green landscapes exceeded 80 percent, and “green pastures” were liked the most (88 pct of responses). Clearly, the greening of mountains, hills, and valleys increased their appeal.



Figure 7—Snowcapped mountains, Mammoth Mountain and Sierra Nevada, Inyo National Forest, California.

Clearcuts, which contrast sharply with surrounding forests as a consequence of the sharp edge effect and contrasting brown soils against the green trees, will partially “green” in 4-5 years and completely “green” in 5-8 years (Bell 1983). Whether this greening effect will lessen the disliking of clearcuts is a remote possibility, at least for some observers.

The term “patches” may have been used by some respondents to describe timber cuts, brush clearings, or other openings which they could not identify, but which attracted their attention. Similarly, “patterns” may have referred to the mosaics of vegetation created by events such as fires, cuttings and clearings, windthrow, or landslides and avalanches. A person may have been attracted to such patterns with or without knowing what they were or how they were created.

The main emphasis of the foregoing discussion is that most respondents saw and liked natural landscape elements. In particular, they saw and liked forested landscapes. The predominant deviations from liking were specifically associated with perceptions of barrenness and related conditions such as “arid look,” “desolate,” and “erosion.” Also disliked were areas that did not support trees or other vegetation.

Management Implications

People tend to focus attention on things having greater interest or importance to them while things of lesser interest are seen peripherally (Vernon 1968). Previously, I concluded that respondents were more interested in and assigned more importance to natural landscape elements in contrast with various management actions (Magill 1990). In this paper, analysis of specific terms used by respondents to describe the two most important objects seen, fortified those previous conclusions. Most people were attracted by natural landscape objects, regardless of management, in simulated views. Thus, a vast majority (79 pct of responses) showed concern with various combinations of trees, hills, valleys, mountains, vegetation, and other less well-defined objects descriptive of natural landscape conditions. This concern also was expressed for scenes in which management was obvious.

Favorable Responses to Natural Scenes

Forest stands were reported more frequently than any other natural object, and they were well liked. Of course, natural landscape elements, such as mountain ranges, rivers, dome peaks, brush, and hills, contributed substantially to the liking of natural areas. However, the importance of forest stands was emphasized even more. When *forested* prefaced valleys, hills, mountains, or peaks, more people liked those locations than if the terms were used independently. Clearly, forests are important visual components of our landscapes, as indicated not only by this study but by the current public demand to preserve old-growth forests (Blondin 1989; Booth 1989; Gup 1990; Hunter 1989).

The positive influence of green tells managers that the sooner a landscape disturbance reverts to green the less likely it will be regarded with disfavor, at least from a color perspective. Anything that might accelerate the process, such as replanting immediately or fertilizing to accelerate growth, may shorten the duration of public criticism that can be expected after cutting. Similarly, treatments to "green" road cuts and fills, ski runs, mine tailings, and eroded areas should reduce their negative visual impact. Of course, distance will influence the effectiveness of such treatments. The nearer the disturbance, the less effective the mitigation.

Unfavorable Responses to Natural Scenes

The previous study (Magill 1990) found no evidence to explain why a few people liked or disliked some natural scenes. The analysis reported here did find some evidence. A few people erroneously perceived clearcuts in natural scenes where none existed, and most disliked them. Natural bare areas may have been seen and misinterpreted. Additionally, erosion, sparse vegetation, no vegetation, no trees, sick trees, bare areas, bare hills, or bare peaks are natural landscape objects that existed in scenes of natural areas. A few respondents reported such objects, and most disliked them. Some components, such as bare areas or eroded areas, tend to have well-defined or "hard" edges that have been reported as symbolic of "man-made" areas (Palmer 1989). The concept equating hard edges with human activity, however, is not accepted by some people.

Respondents did not like "bare areas" or places without trees or other vegetation, with some exceptions. "Sand" or "sand dunes," "rocks" or "rocky areas," "prairies," "open range," "open spaces," "openness," and even "deserts" were liked. Despite some people liking deserts, areas perceived by a few people as "desolate" or "arid" were not liked—a case of different people with different values. Managers ought to recognize the positive values inherent in desert lands and other wide open areas, and they ought not to confuse them with negative values associated with perceptions of barrenness where respondents may have expected to see trees and other vegetation. People expect to see certain things in specific situations (Vernon 1968).

Failing to satisfy expectations may lead to coping whereby people may perceive things more favorably to minimize disappointment (Rollins and Bradley 1986). If they are unable to cope, disappointment and possibly disliking may occur.

Acceptable Management

As previously reported, a majority of the managed areas were detected and were regarded as having been fairly to well managed (Magill 1990). The subsequent analysis of respondent opinions of management and various objects representative of management was also favorable, but it was unrelated to timber harvesting. People reported seeing and liking management (in general): "farms" and "ranches," "pastures," "green pastures," "trails," "plantations," "grazing," and even a "cemetery." Because most respondents were urbanites, their lives are immersed in some kind of management every day, and they may expect it wherever they go. Furthermore, farms, ranches, pastures, and plantations may evoke favorable images—those of pastoral scenes—often encountered at suburban fringes or portrayed in works of art. Thus, it might be expected that city folk would accept such management and perceive it favorably.

Unacceptable Management

People saw clearings, where unwanted brush was being replaced with trees, and reported them as "bare areas" or "clearcuts." In all likelihood, the activities were not identified as "brush" clearings, because respondents may have been unfamiliar with the nature of the management as well as the terminology used to describe it. Similar arguments could be applied to type conversions for livestock or wildlife habitat improvement and to tree regeneration following timber harvesting, brush clearing, or burns. These responses suggest a need for more interpretive programs to create better public understanding of natural resource management. Public programs, however, should include a "marketing" approach that explains current management practices while identifying different goals the public may have, that would favor alternative management practices. Accomplishing the job may not be easy, since resource managers have been reported to have difficulty with public interactions (Magill 1988) and to possess a "change them, not us" attitude (Dennis 1990).

People were not favorably disposed towards "overgrazing," "erosion," "sick trees," "dead trees," "sparse vegetation," "bare areas," or similar visual suggestions of mismanagement. In fact, a few respondents mentioned "poorly managed," and most of them disliked it. This disfavor implies that managers ought to be visionaries, that is, they should try to visualize the possible consequences of actions they are planning, and whether the action will be ecologically and visually sound, as well as economical. Management should not only protect resources and provide a sustained flow of goods and services, but should do so in a visually acceptable manner.

The most frequently reported development was "roads," and they were disliked except for three situations. They were seen on areas subject to mining and brush clearing, but opinions were not

discriminating. Roads also were seen on areas subjected to type conversions, and they were liked. Most type conversion scenes were photographed on open range where dirt or gravel roads faded into the horizon. Roads may have contributed to the aesthetic value of the scenes, but that cannot be proven by any respondent statements. Since the majority of opinions were to dislike roads, care should be taken to minimize visual impacts through sensitive location of new roads, realignment of existing roads, or judicious plantings to screen some road segments. Many of the problems are illustrated and solutions suggested in a landscape management training document on roads (USDA, Forest Service 1977).

Some managers may be amazed that "clearcuts" were the second most frequently mentioned type of landscape management rather than the first, especially considering the number of appeals and law suits concerned with timber harvesting. Equally astounding, clearcuts were not the kind of management that was most disliked, though they were more frequently mentioned than the other actions that were disliked more. Disliking responses for "overgrazing" and "poor management" were 10 percent greater than for clearcutting. Also, respondents reported seeing "cuttings," "logging," and "clearings" after viewing scenes containing clearcuts, but the frequency of responses and percent disliking was much less than when "clearcuts" were specified.

The intensity of disliking clearcuts was emphasized by respondents who reported seeing clearcuts in natural areas. The information collected does not permit determination of what was actually perceived as clearcuts, but logic suggests bare areas or openings or meadows may have been seen at sufficient distance to limit accurate discrimination. Regardless, reports of disliking clearcuts were 17 percent greater when people saw scenes of natural areas as contrasted with scenes of timber harvesting. And, even though roads were seen by the respondents more than twice as often as clearcuts, disliking was more than 30 percent greater for clearcuts than for roads.

The negative reactions to viewing clearcuts or objects perceived as clearcuts appear to be in union with the well known public disenchantment with clearcutting, as evidenced by numerous appeals of forest plans and injunctions against specific proposals to clearcut. One might contend the data reported here are too provincial to merit comparison with a nationwide public issue. The scenes viewed by respondents, however, are locations within timber producing areas and subjects of controversy. The disliking associated with clearcutting, in this study, came from persons who viewed 17 simulations of scenes of clearcuts or regeneration on obvious clearcuts from locations in California, Idaho, Montana, Oregon, and Washington. This result may be another warning that a change in forest management is needed; a change that may be coming as the "new forestry" (Franklin 1989) and "multiresource forest management" (Behan 1990).

Conclusions

This paper has offered a different approach to evaluating public perceptions and opinions of managed landscapes. It illustrates what a segment of the public saw in slides of managed and natural landscapes, and identified what they liked and disliked about the scenes. Thus, it supports opinions some managers may have about public reaction to the influence of various types of land management. Ideally, the approach described here will be refined and advanced by other scientists in a continuing effort to enhance understanding of public perceptions, opinions of landscapes, and how management influences concerns of the public. The goal is to provide managers with better understanding of public concerns for the visual impact of resource management practices on wildlands. This understanding will enable managers to be sensitive to desires of the public and responsive to their needs. The outcome would be resource management that minimizes visual effects that arouse public concern.

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Appendixes

A: Organizational Affiliation of Respondents

The numbers of *respondents* belonging to each organization and the percentage they represent of all respondents in the study are recorded after the name of each organization.

Each of the 788 respondents could specify membership in one to four organizations, therefore when the numbers for all organizations within a group are summed, they represent the total *responses* for the group.

Professional organizations:	Respondents	
	Percent	Number
American Association for the Advancement of Science	0.5	(4)
American Fisheries Society	2.5	(20)
American Forestry Association	0.6	(5)
American Museum of Natural History	0.1	(1)
American Society of Landscape Architects	1.4	(11)
American Sociology Association	0.1	(1)
Association of Interpretive Naturalists	0.3	(2)
Association of National Park Rangers	0.3	(2)
Canadian Entomological Society	0.4	(3)
Canadian Institute of Forestry	0.3	(2)
Ecological Society of America	0.5	(4)
Engineers, all	0.3	(2)
Entomological Society of America	0.5	(4)
International Society of Arboriculture	0.3	(2)
International Union of Forestry Research Organizations	0.1	(1)
Licensed resource professionals such as foresters	0.1	(1)
Miscellaneous professional societies	1.5	(12)
Park Ranger Association of California	0.1	(1)
Society of American Foresters	2.4	(19)
Society of Range Management	0.1	(1)
Soil Conservation Society of America	0.1	(1)
Surveying societies(national, state, local)	0.1	(1)
The Wildlife Society	1.3	(10)
Western Interpreters Association	0.3	(2)
Total responses for professional organizations		(112)
Percent of total responses (112/1,134)	9.9	

Group of Ten:	Percent	Number
Environmental Defense Fund	0.3	(2)
Environmental Policy Institute	0.0	(0)
Friends of the Earth	0.6	(5)
National Audubon Society	6.3	(50)
National Parks and Conservation Association	0.3	(2)
National Wildlife Federation	2.9	(23)
Natural Resources Defense Council	0.6	(5)
Sierra Club	15.6	(123)
Sierra Club Legal Defense Fund	0.0	(0)
The Wilderness Society	3.1	(24)
Total responses for the Group of Ten		(234)
Percent of total responses (234/1,134)	20.6	

Other conservation organizations:	Percent	Number
Earth First	0.3	(2)
Greenpeace	0.8	(6)
National Geographic Society	0.6	(5)
National Recreation and Park Association	0.4	(3)
Smithsonian Institution	0.1	(1)
The Cousteau Society	0.9	(7)
The Nature Conservancy	4.7	(37)
California Native Plant Society	0.6	(5)
California Park and Recreation Society	1.3	(10)
California Wildlife Federation	2.4	(19)
Environmentally oriented groups	12.6	(99)
Local conservation groups	9.6	(76)
Planning and Conservation League	0.1	(1)
Save-the-Redwoods League	0.1	(1)
California Conservation Corps	1.4	(11)
Total responses for other conservation organizations		(283)
Percent of total responses (283/1,134)	25.0	

Sportsmens organizations:	Percent	Number
California Striped Bass Association	0.1	(1)
California Trout	1.0	(8)
California Waterfowl Association	0.6	(5)
Ducks Unlimited	1.8	(14)
National Rifle Association	1.4	(11)
Off Road Vehicle Clubs	6.2	(49)
Sportsmens Clubs (e.g., hunting, fishing)	10.4	(82)
Trout Unlimited	0.3	(2)
Total responses for sportsmens organizations		(172)
Percent of total responses (172/1,134)	15.2	

Industrial organizations:	Percent	Number
Advertising Associations (e.g., signs, billboards)	0.1	(1)
Mining, in general	0.3	(2)
National Forest Products Association	0.1	(1)
Utilities (e.g., water, power)	0.1	(1)
Various logging associations	2.2	(17)
Western Timber Association	0.1	(1)
Total responses for industrial organizations		(23)
Percent of total responses (23/1,134)	2.0	

Miscellaneous organizations:	Percent	Number
Total responses for miscellaneous organizations		(2)
Percent of total responses (2/1,134)	0.2	

Responses and respondents:	Percent	Number
Total responses for the affiliated	72.8	(826)
Total responses for the unaffiliated	27.2	(308)
Total responses	100.0	(1,134)
Total affiliated respondents	60.9	(480)
Total unaffiliated respondents	39.1	(308)
Total respondents	100.0	(788)

B: Opinions of All Objects Seen by Respondents

Objects reported	Opinions of objects reported							
	Totals		Liked		Disliked		Indifferent	
			Percent (number)					
Atmosphere/weather								
Clean air	0.0	(10)	80.0	(8)	0	(0)	0	(0)
Fog	0.0	(5)	80.0	(4)	0	(0)	20.0	(1)
Smog or Smoke	0.5	(190)	12.6	(24)	69.5	(132)	8.4	(16)
Snow	1.7	(638)	86.1	(549)	2.4	(15)	3.4	(22)
Development								
Airports	0.0	(6)	16.7	(1)	50.0	(3)	33.3	(2)
Bridges, foot	0.0	(4)	100.0	(4)	0	(0)	0	(0)
Buildings	0.8	(294)	24.5	(72)	37.1	(109)	32.7	(96)
Campgrounds	0.0	(8)	75.0	(6)	12.5	(1)	12.5	(1)
Cemetery	0.1	(48)	47.9	(23)	8.3	(4)	22.9	(11)
Dams	0.0	(11)	27.3	(3)	36.4	(4)	36.4	(4)
Development, undefined	0.0	(1)	0	(0)	0	(0)	100.0	(1)
Excavations	0.0	(17)	0	(0)	70.6	(12)	23.5	(4)
Farms or Ranches	0.7	(277)	58.8	(163)	13.4	(37)	22.0	(61)
Fences	0.6	(247)	28.3	(70)	29.1	(72)	37.7	(93)
Flumes	0.0	(5)	40.0	(2)	40.0	(2)	20.0	(1)
Grazing	0.2	(84)	52.4	(44)	17.9	(15)	22.6	(19)
Hydro plants	0.0	(3)	0	(0)	100.0	(3)	0	(0)
Irrigated crops	0.1	(26)	34.6	(9)	3.8	(1)	50.0	(13)
Lookouts	0.0	(18)	61.1	(11)	5.6	(1)	22.2	(4)
Mines	0.3	(132)	14.4	(19)	53.0	(70)	18.2	(24)
Observatories	0.0	(12)	8.3	(1)	33.3	(4)	41.7	(5)
Parking areas	0.0	(2)	0	(0)	100.0	(2)	0	(0)
Pastures	0.5	(205)	59.0	(121)	12.7	(26)	22.4	(46)
Pastures, green	0.1	(33)	87.9	(29)	3.0	(1)	3.0	(1)
Pipelines	0.0	(2)	0	(0)	50.0	(1)	50.0	(1)
Powerlines	0.6	(242)	4.1	(10)	69.0	(167)	20.7	(50)
Railroads	0.0	(7)	14.3	(1)	42.9	(3)	14.3	(1)
Roads	5.2	(1,989)	22.4	(445)	41.1	(817)	31.3	(622)
Roads, logging	0.1	(20)	15.0	(3)	45.0	(9)	30.0	(6)
Ski areas	0.5	(201)	25.4	(51)	45.3	(91)	26.9	(54)
Subdivisions	0.0	(8)	0	(0)	75.0	(6)	25.0	(2)
Towers, microwave	0.5	(197)	7.1	(14)	59.4	(117)	28.4	(56)
Towers, water	0.0	(6)	33.3	(2)	16.7	(1)	50.0	(3)
Trails	0.5	(173)	56.1	(97)	22.5	(39)	17.9	(31)
Trailers	0.0	(19)	5.3	(1)	63.2	(12)	21.1	(4)
Land forms								
Alluvial fans	0.1	(20)	85.0	(17)	10.0	(2)	0	(0)
Canyons	0.6	(217)	75.6	(164)	6.0	(13)	15.2	(33)
Cliffs	0.3	(109)	75.2	(82)	9.2	(10)	10.1	(11)
Deserts	1.5	(587)	56.7	(333)	16.0	(94)	20.3	(119)
Glaciers	0.0	(11)	81.8	(9)	0	(0)	9.1	(1)
Hills	4.2	(1,596)	63.9	(1,020)	7.9	(126)	22.3	(356)
Hills, bare	0.9	(341)	17.3	(59)	51.3	(175)	24.6	(84)
Hills, brown	0.2	(61)	31.1	(19)	29.5	(18)	27.9	(17)
Hills, green	0.3	(116)	80.2	(93)	0.9	(1)	10.3	(12)
Hills, forested	0.4	(143)	82.5	(118)	3.5	(5)	10.5	(15)
Lakes	1.7	(635)	87.9	(558)	2.2	(14)	4.7	(30)
Marshes	0.0	(5)	80.0	(4)	0	(0)	0	(0)

continued

B: Opinions of All Objects Seen by Respondents, continued . . .

Objects reported	Opinions of objects reported							
	Totals		Liked		Disliked		Indifferent	
Percent (number)								
Land forms, cont.								
Meadows	2.7	(1,023)	72.1	(738)	6.5	(67)	16.3	(167)
Meadows, brown	0.2	(81)	49.4	(40)	25.9	(21)	22.2	(18)
Mountain ranges	7.7	(2,949)	78.3	(2,309)	2.8	(83)	13.6	(402)
Mountains, bare	0.3	(119)	26.1	(31)	42.9	(51)	21.8	(26)
Mountains, brown	0.1	(22)	45.5	(10)	27.3	(6)	22.7	(5)
Mountains, green	0.1	(39)	84.6	(33)	7.7	(3)	2.6	(1)
Mountains, forested	0.2	(83)	75.9	(63)	6.0	(5)	15.7	(13)
Mountains, snowcapped	0.3	(125)	93.6	(117)	0	(0)	2.4	(3)
Open range	0.2	(85)	62.4	(53)	5.9	(5)	23.5	(20)
Peaks, bare	0.4	(167)	26.3	(44)	43.7	(73)	24.0	(40)
Peaks, dome	6.5	(2,483)	78.2	(1,942)	3.9	(98)	13.4	(332)
Peaks, forested	0.1	(50)	78.0	(39)	4.0	(2)	16.0	(8)
Peaks, snowcapped	1.6	(606)	95.0	(576)	0	(0)	2.1	(13)
Peaks, volcanic	0.0	(18)	77.8	(14)	11.1	(2)	11.1	(2)
Prairies	1.1	(415)	48.0	(199)	17.3	(72)	27.5	(114)
Ridges, snowcapped	0.0	(1)	100.0	(1)	0	(0)	0	(0)
Rivers	1.6	(625)	80.8	(505)	2.7	(17)	8.8	(55)
Rivers, dry	0.2	(74)	48.6	(36)	18.9	(14)	28.4	(21)
Rocks	2.0	(753)	68.3	(514)	8.5	(64)	19.1	(144)
Saddles	0.0	(18)	61.1	(11)	16.7	(3)	22.2	(4)
Sand	0.1	(43)	48.8	(21)	23.3	(10)	23.3	(10)
Sand dunes	0.4	(150)	75.3	(113)	4.7	(7)	14.7	(22)
Shorelines	0.2	(93)	47.3	(44)	35.5	(33)	14.0	(13)
Skylines	0.7	(251)	58.2	(146)	4.8	(12)	35.1	(88)
Slopes, forested	0.1	(48)	75.0	(36)	2.1	(1)	20.8	(10)
Slopes, steep	0.5	(192)	58.3	(112)	12.0	(23)	21.9	(42)
Slopes, unforested	0.1	(48)	18.8	(9)	50.0	(24)	25.0	(12)
Valleys	1.8	(704)	76.0	(535)	3.8	(27)	15.6	(110)
Valleys, barren	0.0	(15)	26.7	(4)	46.7	(7)	13.3	(2)
Valleys, brown	0.0	(3)	33.3	(1)	66.7	(2)	0	(0)
Valleys, forested	0.1	(23)	82.6	(19)	0	(0)	13.0	(3)
Valleys, grassy	0.0	(11)	72.7	(8)	0	(0)	18.2	(2)
Valleys, green	0.1	(26)	80.8	(21)	3.8	(1)	11.5	(3)
Volcanos	0.2	(74)	73.0	(54)	5.4	(4)	20.3	(15)
Wastelands	0.0	(18)	11.1	(2)	44.4	(8)	38.9	(7)
Waterfalls	0.1	(34)	85.3	(29)	0	(0)	5.9	(2)
Landscape descriptors								
Areas, bare	2.9	(1,107)	11.5	(127)	60.8	(673)	22.0	(244)
Areas, flat	0.0	(1)	100.0	(1)	0	(0)	0	(0)
Arid look	0.7	(276)	13.0	(36)	53.6	(148)	24.3	(67)
Contrasts, color	2.2	(826)	69.2	(572)	12.0	(99)	13.9	(115)
Contrasts, form	0.1	(37)	81.1	(30)	2.7	(1)	16.2	(6)
Corridors	0.0	(1)	100.0	(1)	0	(0)	0	(0)
Desolate	0.2	(85)	32.9	(28)	43.5	(37)	8.2	(7)
Edges	0.8	(304)	67.1	(204)	11.8	(36)	17.8	(54)
Enclosed	0.0	(9)	55.6	(5)	22.2	(2)	22.2	(2)
Erosion	1.0	(398)	25.1	(100)	57.3	(228)	12.1	(48)
Landscapes	1.4	(538)	69.9	(376)	10.2	(55)	16.5	(89)
Lines	0.3	(119)	37.0	(44)	32.8	(39)	26.9	(32)
Open spaces	0.9	(348)	44.8	(156)	23.9	(83)	26.1	(91)

continued

B: Opinions of All Objects Seen by Respondents, continued . . .

Objects reported	Opinions of objects reported							
	Totals		Liked		Disliked		Indifferent	
	Percent (number)							
Landscape management								
Openness	1.2	(458)	83.0	(380)	5.7	(26)	7.0	(32)
Patches	0.6	(226)	23.9	(54)	38.5	(87)	29.2	(66)
Patterns	0.4	(144)	69.4	(100)	7.6	(11)	21.5	(31)
Texture	0.5	(174)	67.8	(118)	7.5	(13)	21.3	(37)
Clearcuts	2.2	(851)	9.0	(77)	75.9	(646)	12.8	(109)
Clearings	0.7	(266)	15.8	(42)	53.8	(143)	25.9	(69)
Clearings, shrub	0.0	(10)	20.0	(2)	50.0	(5)	30.0	(3)
Clearings, tree	0.1	(23)	30.4	(7)	39.1	(9)	30.4	(7)
Cuts, partial	0.0	(6)	33.3	(2)	66.7	(4)	0	(0)
Cuts, regeneration	0.1	(20)	45.0	(9)	15.0	(3)	30.0	(6)
Cuts, salvage	0.0	(1)	0	(0)	100.0	(1)	0	(0)
Cuts, selection	0.1	(22)	31.8	(7)	31.8	(7)	31.8	(7)
Cuts, shelterwood	0.0	(5)	0	(0)	40.0	(2)	60.0	(3)
Cuttings	0.8	(300)	11.7	(35)	67.0	(201)	17.0	(51)
Fuelbreaks	0.1	(29)	13.8	(4)	37.9	(11)	41.4	(12)
Logging	0.6	(234)	16.7	(39)	62.0	(145)	12.0	(28)
Managed, poorly	0.1	(49)	12.2	(6)	85.7	(42)	2.0	(1)
Management	0.3	(109)	49.5	(54)	31.2	(34)	8.3	(9)
Overgrazing	0.1	(54)	1.9	(1)	88.9	(48)	5.6	(3)
Plantations	0.3	(106)	48.1	(51)	26.4	(28)	21.7	(23)
Stumps and logs	0.3	(100)	32.0	(32)	41.0	(41)	14.0	(14)
Terraces	0.0	(16)	18.8	(3)	56.3	(9)	25.0	(4)
Thinnings	0.1	(26)	15.4	(4)	50.0	(13)	30.8	(8)
Type conversions	0.0	(1)	0	(0)	0	(0)	100.0	(1)
Vegetative conditions								
Brush	2.7	(1,047)	47.3	(495)	17.2	(80)	30.4	(318)
Burns	0.5	(201)	6.0	(12)	62.7	(126)	22.4	(45)
Forest groves	0.3	(112)	56.3	(63)	13.4	(15)	18.8	(21)
Forest, size of	0.6	(228)	68.9	(157)	10.5	(24)	13.2	(30)
Forest, sparse	0.6	(227)	23.3	(53)	41.9	(95)	27.3	(62)
Forest stands	12.6	(4,811)	81.1	(3,900)	3.1	(150)	10.3	(494)
Growth	0.2	(77)	75.3	(58)	9.1	(7)	10.4	(8)
Growth, new	0.3	(111)	73.0	(81)	9.9	(11)	8.1	(9)
Growth, shrub	0.0	(5)	20.0	(1)	20.0	(1)	20.0	(1)
Growth, tree	0.1	(29)	69.0	(20)	13.8	(4)	13.8	(4)
Regeneration	0.4	(161)	74.5	(120)	8.1	(13)	9.3	(15)
Regeneration, no	0.0	(12)	0	(0)	66.7	(8)	16.7	(2)
Regeneration, poor	0.1	(52)	0	(0)	90.4	(47)	5.8	(3)
Regeneration, tree	0.1	(37)	70.3	(26)	10.8	(4)	8.1	(3)
Timber, uncut	0.0	(13)	53.8	(7)	23.1	(3)	23.1	(3)
Trees, dead or snags	1.1	(427)	33.3	(142)	37.7	(161)	22.2	(95)
Trees, even-sized	0.1	(25)	0	(0)	72.0	(18)	28.0	(7)
Trees, no	0.5	(180)	6.7	(12)	78.9	(142)	10.0	(18)
Trees, old	0.1	(37)	78.4	(29)	13.5	(5)	2.7	(1)
Trees, sick	0.2	(84)	3.6	(3)	78.6	(66)	10.7	(9)
Trees, single	0.6	(225)	58.7	(132)	13.3	(30)	22.2	(50)
Trees, young	0.1	(44)	65.9	(29)	9.1	(4)	22.7	(10)
Vegetation	1.8	(675)	73.6	(497)	7.6	(51)	13.3	(90)

continued

B: Opinions of All Objects Seen by Respondents, continued . . .

Objects reported	Opinions of objects reported							
	Totals		Liked		Disliked		Indifferent	
Percent (number)								
Vegetative conditions, cont.								
Vegetation, brown	0.0	(5)	60.0	(3)	20.0	(1)	20.0	(1)
Vegetation, green	0.4	(160)	85.6	(137)	3.7	(6)	8.1	(13)
Vegetation, no	0.2	(85)	9.4	(8)	70.6	(60)	17.6	(15)
Vegetation, riparian	0.1	(32)	96.9	(31)	0	(0)	0	(0)
Vegetation, sparse	0.3	(131)	15.3	(20)	53.4	(70)	25.2	(33)
Vegetation, yellow	0.1	(33)	90.9	(30)	3.0	(1)	6.1	(2)
Woodlands	0.0	(4)	75.0	(3)	25.0	(1)	0	(0)
Naturalness								
Natural areas	0.5	(206)	82.5	(170)	3.4	(7)	7.3	(15)
Undeveloped	0.3	(96)	76.0	(73)	14.6	(14)	1.0	(1)
Wilderness	0.2	(70)	87.1	(61)	2.9	(2)	7.1	(5)
Undefined								
Miscellaneous	0.4	(135)	46.7	(63)	28.1	(38)	20.0	(27)
Not attracted	0.9	(354)	1.4	(5)	19.8	(70)	60.2	(213)
Uncomprehended	0.7	(259)	67.6	(175)	15.8	(41)	11.6	(30)
Totals	100.0	(38,119)	57.8	(22,015)	19.4	(7,386)	17.3	(6,594)

C: Totals of Responses and Percentage Determinations

Objects reported	All scenes	Managed scenes	Natural scenes
Totals of Responses			
Natural landscape objects	30,285	26,399	3,886
Natural areas, wilderness, undeveloped	372	305	67
Subtotal	30,657	26,704	3,953
Objects indicating management			
Smog/smoke	190	152	38
Development	4,297	4,194	103
Management	2,228	2,059	169
Subtotal	6,715	6,405	310
Miscellaneous, not attracted, or uncomprehended	748	642	106
Total	38,120	33,751	4,369
Percentage Determinations			
Natural landscape objects	79.4 (30,285/38,120)	78.2 (26,399/33,751)	88.9 (3,886/4,369)
Natural areas, wilderness, and undeveloped	1.0 (372/38,120)	0.9 (305/33,751)	1.5 (67/4,369)
Objects indicating management	17.6 (6,715/38,120)	19.0 (6,405/33,751)	7.1 (310/4,369)
Miscellaneous, not attracted, and uncomprehended	2.0 (748/38,120)	1.9 (642/33,751)	2.4 (106/4,369)

D: Opinions of Management Objects in Scenes of Managed Lands

Objects reported	Opinions of objects reported							
	Totals		Liked		Disliked		Indifferent	
			Percent (number)					
Roads	5.5	(1,852)	21.1	(391)	42.7	(791)	30.8	(570)
Clearcuts	2.5	(832)	9.3	(77)	75.7	(630)	12.7	(106)
Buildings	0.9	(292)	24.7	(72)	36.6	(107)	32.9	(96)
Cuttings	0.8	(287)	11.5	(33)	68.3	(196)	16.0	(46)
Farms or ranches	0.8	(274)	59.1	(162)	13.1	(36)	21.9	(60)
Fences	0.7	(247)	28.3	(70)	29.1	(72)	37.7	(93)
Clearings	0.7	(242)	14.0	(34)	55.4	(134)	26.0	(63)
Powerlines	0.7	(241)	4.1	(10)	68.9	(166)	20.7	(50)
Logging	0.7	(226)	16.8	(38)	61.9	(140)	11.9	(27)
Pastures	0.6	(202)	58.9	(119)	12.9	(26)	22.3	(45)
Ski areas	0.6	(200)	25.5	(51)	45.5	(91)	27.0	(54)
Microwave towers	0.6	(196)	7.1	(14)	59.7	(117)	28.6	(56)
Trails	0.5	(167)	56.9	(95)	21.6	(36)	18.0	(30)
Smoke or smog	0.4	(152)	14.5	(22)	67.8	(103)	9.2	(14)
Mines	0.4	(122)	14.8	(18)	51.6	(63)	18.0	(22)
Management	0.3	(101)	47.5	(48)	32.7	(33)	8.9	(9)
Plantations	0.3	(101)	47.5	(48)	26.7	(27)	22.8	(23)
Stumps and logs	0.3	(100)	32.0	(32)	41.0	(41)	14.0	(14)
Grazing	0.2	(78)	52.6	(41)	16.7	(13)	23.1	(18)
Overgrazing	0.2	(49)	2.0	(1)	89.9	(44)	4.1	(2)
Cemetery	0.1	(48)	47.9	(23)	8.3	(4)	22.9	(11)
Poorly managed	0.1	(44)	11.4	(5)	86.4	(38)	2.3	(1)
Green pastures	0.1	(33)	87.9	(29)	3.0	(1)	3.0	(1)
Fuelbreaks	0.1	(28)	14.3	(4)	35.7	(10)	42.9	(12)
Irrigated crops	0.1	(26)	34.6	(9)	3.8	(1)	50.0	(13)
Thinnings	0.1	(23)	17.4	(4)	56.5	(13)	26.1	(6)
Tree clearings	0.1	(23)	30.4	(7)	39.1	(9)	30.4	(7)
Logging roads	0.1	(20)	15.0	(3)	45.0	(9)	30.0	(6)
Selection cuts	0.1	(20)	35.0	(7)	35.0	(7)	25.0	(5)
Regeneration cuts	0.1	(20)	45.0	(9)	15.0	(3)	30.0	(6)
Trailers	0.1	(19)	5.3	(1)	63.2	(12)	21.1	(4)
Lookouts	0.0	(18)	61.1	(11)	5.6	(1)	22.2	(4)
Excavations	0.0	(16)	0	(0)	68.8	(11)	25.0	(4)
Terraces	0.0	(15)	13.3	(2)	60.0	(9)	26.7	(4)
Observatories	0.0	(11)	9.1	(1)	36.4	(4)	36.4	(4)
Dams	0.0	(11)	27.3	(3)	36.4	(4)	36.4	(4)
Shrub clearings	0.0	(8)	25.0	(2)	50.0	(4)	25.0	(2)
Subdivisions	0.0	(8)	0	(0)	75.0	(6)	25.0	(2)
Campgrounds	0.0	(7)	85.7	(6)	14.3	(1)	0	(0)
Railroads	0.0	(7)	14.3	(1)	42.9	(3)	14.3	(1)
Partial cuts	0.0	(6)	33.3	(2)	66.7	(4)	0	(0)
Airports	0.0	(5)	20.0	(1)	40.0	(2)	40.0	(2)
Flumes	0.0	(5)	40.0	(2)	40.0	(2)	20.0	(1)
Shelterwood cuts	0.0	(5)	0	(0)	40.0	(2)	60.0	(3)
Water towers	0.0	(5)	20.0	(1)	20.0	(1)	60.0	(3)
Foot bridges	0.0	(4)	100.0	(4)	0	(0)	0	(0)
Hydro plants	0.0	(3)	0	(0)	100.0	(3)	0	(0)
Parking areas	0.0	(2)	0	(0)	100.0	(2)	0	(0)
Pipelines	0.0	(2)	0	(0)	50.0	(1)	50.0	(1)
Salvage cuts	0.0	(1)	0	(0)	100.0	(1)	0	(0)
Type conversions	0.0	(1)	0	(0)	0	(0)	100.0	(1)
Undefined development	0.0	(1)	0	(0)	0	(0)	100.0	(1)
Totals	100.0	(6,406)	23.6	(1,513)	47.4	(3,034)	23.5	(1,507)

¹Total number of all objects reported for managed areas equals 33,751.

²Nonresponse accounts for the sum of opinions not always equalling the totals.

E: Opinions of Natural Features Reported in All Scenes

Objects reported	Opinions of objects reported							
	Totals		Liked		Disliked		Indifferent	
			Percent (number)					
Vegetative conditions								
Burns	0.5	(201)	6.0	(12)	62.7	(126)	22.4	(45)
Brush	2.7	(1,047)	47.3	(495)	17.2	(80)	30.4	(318)
Forest groves	0.3	(112)	56.3	(63)	13.4	(15)	18.8	(21)
Forest, size of	0.6	(228)	68.9	(157)	10.5	(24)	13.2	(30)
Forest, sparse	0.6	(227)	23.3	(53)	41.9	(95)	27.3	(62)
Forest stands	12.6	(4,811)	81.1	(3,900)	3.1	(150)	10.3	(494)
Growth	0.2	(77)	75.3	(58)	9.1	(7)	10.4	(8)
Growth, new	0.3	(111)	73.0	(81)	9.9	(11)	8.1	(9)
Growth, tree	0.1	(29)	69.0	(20)	13.8	(4)	13.8	(4)
Regeneration	0.4	(161)	74.5	(120)	8.1	(13)	9.3	(15)
Regeneration, tree	0.1	(37)	70.3	(26)	10.8	(4)	8.1	(3)
Regeneration, poor	0.1	(52)	0	(0)	90.4	(47)	5.8	(3)
Trees, no	0.5	(180)	6.7	(12)	78.9	(142)	10.0	(18)
Trees, dead or Snags	1.1	(427)	33.3	(142)	37.7	(161)	22.2	(95)
Trees, even-sized	0.1	(25)	0	(0)	72.0	(18)	28.0	(7)
Trees, old	0.1	(37)	78.4	(29)	13.5	(5)	2.7	(1)
Trees, sick	0.2	(84)	3.6	(3)	78.6	(66)	10.7	(9)
Trees, single	0.6	(225)	58.7	(132)	13.3	(30)	22.2	(50)
Trees, young	0.1	(44)	65.9	(29)	9.1	(4)	22.7	(10)
Vegetation, no	0.2	(85)	9.4	(8)	70.6	(60)	17.6	(15)
Vegetation	1.8	(675)	73.6	(497)	7.6	(51)	13.3	(90)
Vegetation, brown	0.0	(5)	60.0	(3)	20.0	(1)	20.0	(1)
Vegetation, green	0.4	(160)	85.6	(137)	3.7	(6)	8.1	(13)
Vegetation, riparian	0.1	(32)	96.9	(31)	0	(0)	0	(0)
Vegetation, sparse	0.3	(131)	15.3	(20)	53.4	(70)	25.2	(33)
Vegetation, yellow	0.1	(33)	90.9	(30)	3.0	(1)	6.1	(2)
Perceptions of landscapes								
Arid look	0.7	(276)	13.0	(36)	53.6	(148)	24.3	(67)
Areas, bare	2.9	(1,107)	11.5	(127)	60.8	(673)	22.0	(244)
Contrasts, color	2.2	(826)	69.2	(572)	12.0	(99)	13.9	(115)
Contrasts, form	0.1	(37)	81.1	(30)	2.7	(1)	16.2	(6)
Desolate	0.2	(85)	32.9	(28)	43.5	(37)	8.2	(7)
Edges	0.8	(304)	67.1	(204)	11.8	(36)	17.8	(54)
Erosion	1.0	(398)	25.1	(100)	57.3	(228)	12.1	(48)
Landscapes	1.4	(538)	69.9	(376)	10.2	(55)	16.5	(89)
Lines	0.3	(119)	37.0	(44)	32.8	(39)	26.9	(32)
Open spaces	0.9	(348)	44.8	(156)	23.9	(83)	26.1	(91)
Openness	1.2	(458)	83.0	(380)	5.7	(26)	7.0	(32)
Patches	0.6	(226)	23.9	(54)	38.5	(87)	29.2	(66)
Patterns	0.4	(144)	69.4	(100)	7.6	(11)	21.5	(31)
Texture	0.5	(174)	67.8	(118)	7.5	(13)	21.3	(37)
Landscape features								
Skylines	0.7	(251)	58.2	(146)	4.8	(12)	35.1	(88)
Canyons	0.6	(217)	75.6	(164)	6.0	(13)	15.2	(33)
Cliffs	0.3	(109)	75.2	(82)	9.2	(10)	10.1	(11)
Slopes, forested	0.1	(48)	75.0	(36)	2.1	(1)	20.8	(10)
Slopes, steep	0.5	(192)	58.3	(112)	12.0	(23)	21.9	(42)
Slopes, unforested	0.1	(48)	18.8	(9)	50.0	(24)	25.0	(12)

continued

E: Opinions of Natural Features Reported in All Scenes, continued . . .

Objects reported	Opinions of objects reported							
	Totals		Liked		Disliked		Indifferent	
Percent (number)								
Vegetative conditions, cont.								
Valleys	1.8	(704)	76.0	(535)	3.8	(27)	15.6	(110)
Valleys, barren	0.0	(15)	26.7	(4)	46.7	(7)	13.3	(2)
Valleys, brown	0.0	(3)	33.3	(1)	66.7	(2)	0	(0)
Valleys, forested	0.1	(23)	82.6	(19)	0	(0)	13.0	(3)
Valleys, grassy	0.0	(11)	72.7	(8)	0	(0)	18.2	(2)
Valleys, green	0.1	(26)	80.8	(21)	3.8	(1)	11.5	(3)
Hills	4.2	(1,596)	63.9	(1,020)	7.9	(126)	22.3	(356)
Hills, brown	0.2	(61)	31.1	(19)	29.5	(18)	27.9	(17)
Hills, bare	0.9	(341)	17.3	(59)	51.3	(175)	24.6	(84)
Hills, green	0.3	(116)	80.2	(93)	0.9	(1)	10.3	(12)
Hills, forested	0.4	(143)	82.5	(118)	3.5	(5)	10.5	(15)
Mountain ranges	7.7	(2,949)	78.3	(2,309)	2.8	(83)	13.6	(402)
Mountains, bare	0.3	(119)	26.1	(31)	42.9	(51)	21.8	(26)
Mountains, brown	0.1	(22)	45.5	(10)	27.3	(6)	22.7	(5)
Mountains, green	0.1	(39)	84.6	(33)	7.7	(3)	2.6	(1)
Mountains, forested	0.2	(83)	75.9	(63)	6.0	(5)	15.7	(13)
Mountains, snowcapped	0.3	(125)	93.6	(117)	0	(0)	2.4	(3)
Peaks, bare	0.4	(167)	26.3	(44)	43.7	(73)	24.0	(40)
Peaks, dome	6.5	(2,483)	78.2	(1,942)	3.9	(98)	13.4	(332)
Peaks, forested	0.1	(50)	78.0	(39)	4.0	(2)	16.0	(8)
Peaks, snowcapped	1.6	(606)	95.0	(576)	0	(0)	2.1	(13)
Peaks, volcanic	0.0	(18)	77.8	(14)	11.1	(2)	11.1	(2)
Volcanos	0.2	(74)	73.0	(54)	5.4	(4)	20.3	(15)
Meadows	2.7	(1,023)	72.1	(738)	6.5	(67)	16.3	(167)
Meadows, brown	0.2	(81)	49.4	(40)	25.9	(21)	22.2	(18)
Open range	0.2	(85)	62.4	(53)	5.9	(5)	23.5	(20)
Prairies	1.1	(415)	48.0	(199)	17.3	(72)	27.5	(114)
Rocks	2.0	(753)	68.3	(514)	8.5	(64)	19.1	(144)
Sand	0.1	(43)	48.8	(21)	23.3	(10)	23.3	(10)
Sand dunes	0.4	(150)	75.3	(113)	4.7	(7)	14.7	(22)
Deserts	1.5	(587)	56.7	(333)	16.0	(94)	20.3	(119)
Lakes	1.7	(635)	87.9	(558)	2.2	(14)	4.7	(30)
Rivers	1.6	(625)	80.8	(505)	2.7	(17)	8.8	(55)
Rivers, dry	0.2	(74)	48.6	(36)	18.9	(14)	28.4	(21)
Shorelines	0.2	(93)	47.3	(44)	35.5	(33)	14.0	(13)
Waterfalls	0.1	(34)	85.3	(29)	0	(0)	5.9	(2)



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- Protection and management of resources on 191 million acres of National Forest System lands
- Cooperation with State and local governments, forest industries, and private landowners to help protect and manage non-Federal forest and associated range and watershed lands
- Participation with other agencies in human resource and community assistance programs to improve living conditions in rural areas
- Research on all aspects of forestry, rangeland management, and forest resources utilization.

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- Represents the research branch of the Forest Service in California, Hawaii, American Samoa and the western Pacific.
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