Recreation, Resources, and Right Decisions

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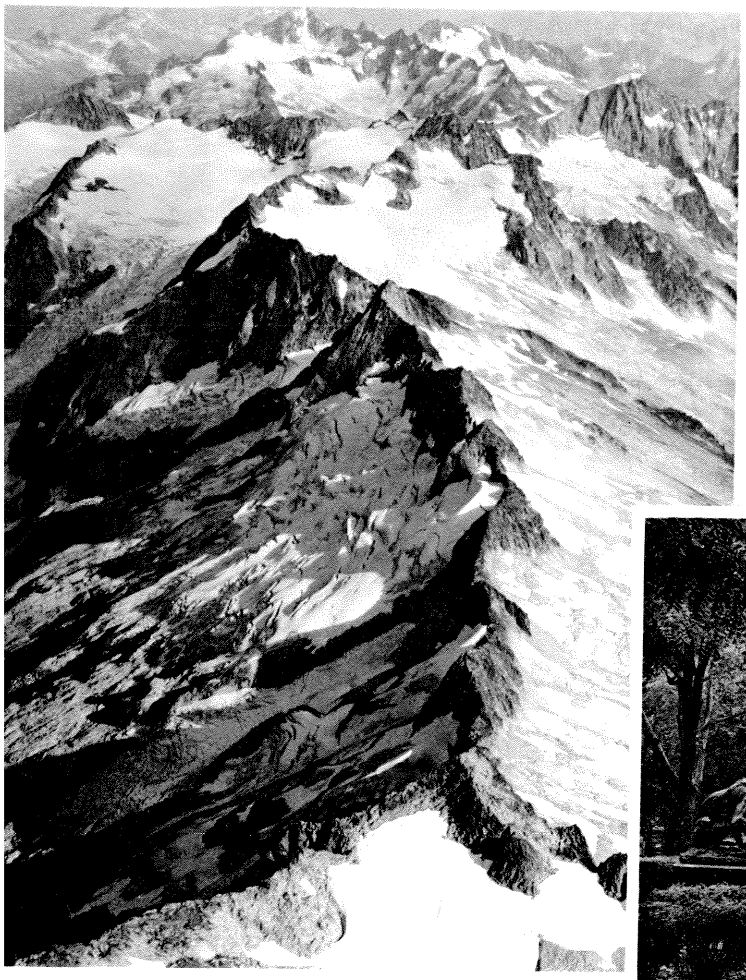

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ABSTRACT

In the midst of national concern for preserving ecosystems, stimulating the economy, and providing outdoor recreation opportunities for the American public, the modern recreation-resource decision-maker faces a monumental task. The authors present a series of relevance trees that pinpoint, in terms of interacting social and physical site variables, the important priorities in today's urban, rural, and wildland resource-management decisions. The results of this research provide a fairly simple structure for recreation managers to assess the effect of present and future social and political conditions on recreation planning and development decisions.

KEYWORDS: RECREATION, DECISIONS, URBAN, RURAL, WILDLANDS.

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IN THE MIDST of national concern for preserving ecosystems, stimulating the economy, and providing outdoor recreation opportunities for the American public, the modern recreation-resource decision-maker faces a monumental task. In this paper we present a series of *relevance trees* that pinpoint, in terms of interacting social and physical site variables, the important priorities in today's urban, rural, and wildland resource-management decisions.

Several years ago, a forecasting technique called PATTERN (Planning Assistance through Technical Evaluation of Relevance Numbers) was developed to help corporate decision-makers evaluate their decision-making (*Esch 1969*). Based on requirement- or need-oriented *relevance trees*, the methodology of PATTERN is flexible enough so that it can be applied to almost any situation where decisions must be made under conditions of uncertainty.

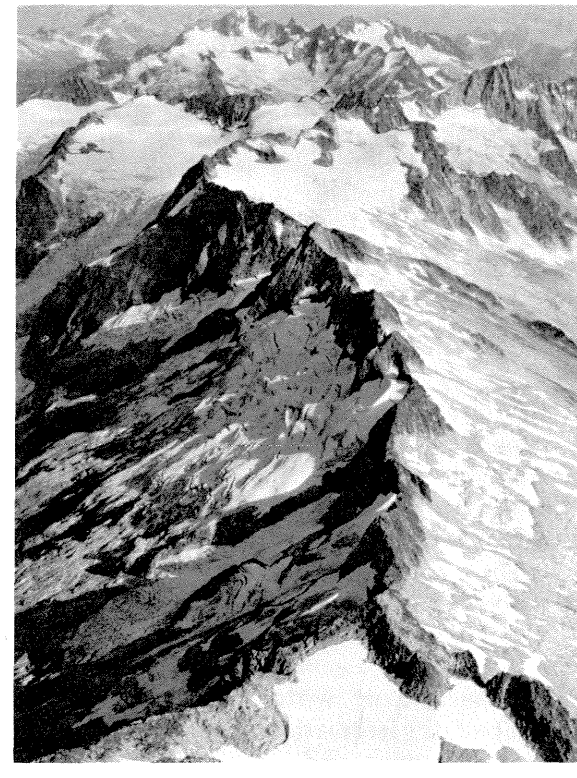
We have applied the PATTERN methodology to quantify some of the priorities that decision-makers assign to various social and physical factors in allocating and developing recreation resources for urban, rural, and wildland environments. Results of this research provide a fairly simple structure by use of which recreation managers can assess the effects of present and future social and political conditions on recreation planning and development decisions.

THE STUDY

We interviewed 47 decision-makers in four public agencies (table 1) about three decision situations:

1. Development of a typical 30-acre day-use recreation area in an urban environment.

2. Development of a typical 400-acre day-use recreation and overnight-use (camping) area in a rural forested enviroment.



3. Development of a 20,000-acre wildland recreation area with facilities such as hiking trails and canoe routes.

Table 1.—Agencies and number of top-level decision-makers interviewed about three recreation-management decisions

Agency	Number of people interviewed	Primary planning and development responsibility of agency
Bureau of Outdoor Recreation, Northeast Regional Office, Philadelphia, Pa.	18	Outdoor recreation in urban natural areas throughout the Northeastern States.
New York State Office of Planning Coordination, Albany, N. Y.	14	All types of planning and development activities throughout New York State, together with the relationships of state activities to federal and other governments.
Pennsylvania Bureau of State Parks, Harrisburg, Pa.	7	Recreation in natural areas throughout Pennsylvania.
United States Department of Agriculture, Forest Service, Washington, D. C.	8	Multiple-use forest management, including recreation throughout the Nation.
Total	47	

These decision-makers were on the staff of the chief executive of each agency. We asked them how they perceived certain priorities in urban-recreation development situations. We also asked urban-recreation decision-makers how they felt about selected items in forest-recreation development situations.

Social Factors Considered

For each of the three decision situations, the decision-makers were asked to assign priority values to 120 possible combinations of 12 social factors and 10 physical factors. These are the factors that most often influence one or more of the three decisions (tables 2 and 3). They were selected on the basis of preliminary discussions with decision-makers in the agencies studied.

Among the social factors that influence overall recreation demand and were used in this study were: *present recreation demand, expected similar future recreation demand, changing recreation demand patterns,* and *technological advances* related to demand.

The tangible and intangible social values considered were : *compatibility* of the recreation development with non-recreation uses, impact of the recreation development on *regional economies,* and impact of the development on *amenity values.*

Internal and external agency pressures that often influence recreation management decisions were considered in these factors: *money available, political influences, pressure groups,* and *interagency coordination* (table 2).

Physical Factors Considered

Physical factors associated with accessibility of a development were: *ease of access* and *distance from population* centers.

Factors of the physical resource were: *acreage* of the area to be developed, buildings and other *existing man-made structures, water-resource* development opportunities, *topography, natural vegetation, fish and wildlife* resources, and *uniqueness* of the area. This uniqueness factor is tied closely to the social factor called *amenity values* (table 3).

Interviews

The decision-makers were asked to quantitatively describe the relative importance of the social and physical factors in each of the three decision situations.

The interview form, the relevance-tree, was a two-dimensional matrix that contained the 10 physical factors and 12 social factors. Each of the 47 respondents completed a separate relevance tree for each of the three decisions. They were asked to assign a number between zero and 100 percent to show the importance that they attached to each of the social and physical factors in each decision.

Table 2.—Social factors considered by decision-makers in each of three decisions and examples of the kinds of activities, facilities, or environmental changes involved

Social factors	Definition	Examples		
		Decision 1: an urban recreation environment	Decision 2: a rural recreation environment	Decision 3: a wildland recreation environment
		OVERALL RECREATION DEMAND		
Present demand	The area's capability to meet present consumption for the type of recreation facilities being planned.	Leisurely strolls. Swimming pools. Playgrounds.	Lake swimming. Picnicking. Camping.	Canoe portages. Mountain-climbing. Backpacking in roadless areas.
Similar future demand	The area's capability to meet expected future consumption for the type of recreation facilities being planned.	Leisurely strolls. Swimming pools. Playgrounds.	Lake swimming. Picnicking. Camping.	Canoe portages. Mountain-climbing. Backpacking in trailess areas.
Changing demand patterns	The area's capability to meet possible shifts in future consumption caused by relatively new types of recreation activities and facilities.	Open park zoos. City rooftops with vegetation and shallow pools for birds and marine life. Terraced buildings with a series of setbacks for sunlight, and planted with lawns, flowers, shrubs, and small trees.	Snowmobiles. Motor bikes. Skin-diving.	Monorail observation trips through natural areas. Disneyland type developments. Introduction of new big-game species.
Recreation-related technological advances	Scientific breakthroughs in recreational equipment design and environmental control.	Elimination of car traffic in cities. Air- and water-pollution control. Enclosed parks that maintain summer environment throughout the year.	New types of underwater recreation equipment. Combination boat-trailer camping equipment. New strains of bacteria that completely eliminate human waste in outdoor toilets.	One-man jet backpacks. Noiseless motors for boats and trail bikes. Three-dimensional wall-sized home televisions for viewing trips through wildland areas.
		TANGIBLE AND INTANGIBLE SOCIAL VALUES		
Compatibility with non-recreation uses	Interaction of the recreation development with other land uses on or surrounding the recreation area.	Transportation systems. Commercial enterprises surrounding the area. Industrial development and expansion plans nearby.	Agricultural land use. Highway systems. Suburban expansion.	Timber and watershed management. Flooding land for power projects. Range management.

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Table 2.—Continued

Social factors	Definition	Examples		
		Decision 1: an urban recreation environment	Decision 2: a rural recreation environment	Decision 3: a wildland recreation environment
Regional economies	Impact of the recreation development on local and regional economies.	Present and potential opportunities for public and private capital investments in complementary recreation developments. Average annual income in the surrounding area. Influence on industry.		
Amenities	Effects of the recreation development on amenity values.	Landscaping. Distinguished buildings nearby. Art in the streets.	Climatologically pleasant surroundings. Unpolluted streams and lakes. Aesthetic, intangible values of the natural resource.	
		INTERNAL AND EXTERNAL AGENCY PRESSURES		
Money available	Budgetary constraints on recreation site planning and development goals.	Money allocated through public appropriations for development of recreation facilities.		
Political influences	Constraints emanating from executive, judicial, or legislative branches of government.	Social-welfare programs to provide better recreation facilities for the urban disadvantaged. Changes in administration.	Local government pressures to develop parks on the fringes of suburb. Political programs to stimulate the rural economy. Job opportunities for political appointees.	Legislative changes in resource-management practices. Laws governing allocation of forest-management areas to wilderness status. Articles written by legislators on wildland management.
Pressure groups	Influences resulting from organized recreation or resource-orientated pressure groups, other than state or federal.	Women's flower clubs. Men's civic groups. Institutional recreation groups.	Hunting and fishing clubs. Real estate companies. Public-utility development programs.	Wilderness organizations. Organizations representing surface and mineral interests. Groups and organizations concerned with air and water pollution and scenic beauty.
Interagency coordination	Public and private recreation administration agencies or organizations dealing with similar resources.	Agencies involved in the study defined the particular agencies they need to consider in each decision situation.		
		OTHER		
Other social factors	Decision-makers listed any other social factor that is important to consider in the particular decision.	Determined separately for each decision situation.		

Table 3.—Physical factors considered by decision-makers in each of three decisions and examples of the elements involved

Physical Factors	Definition	Examples		
		Decision 1: an urban recreation environment	Decision 2: a rural recreation environment	Decision 3: a wildland recreation environment
		RESOURCE ACCESSIBILITY		
Ease of access	The ease of access afforded by transportation systems to the area.	Subways. Bus lines. City streets.	Rural highways. Bus lines. Water routes.	Airlines. Interstate highways. Trails.
Distance from population centers	Physical distance from population centers.	Distance in miles.		
		RESOURCE CHARACTERISTICS		
Acreage	Size of area to be developed.	An average acreage was specified for each decision. Respondents were asked to restrict their evaluation of this factor to an "average" acreage figure because of the wide range of values that often exists around this average.		
Existing man-made structures	Buildings or facilities on the area to be developed.	Apartments. Commercial facilities. Cultural centers.	Old mills. Canal systems. Road networks.	Logging roads. Ghost towns. Forts.
Water resource	Existing and potential water-recreation resource opportunities	Ponds. Rivers. Water systems for fountains.	Existing dams. Water quality and underground water supply. Lake deep enough for water sports.	Waterfalls. Marshes. Secluded lakes.
Topography	Topography in and around the recreation area to be developed.	Level ground for playgrounds. Gentle slopes. Slow water currents.	Drainage for sewer systems. Adequate level areas for campsites. Sloping shoreline for beaches.	Number of mountain peaks. Variation in slopes. Landslide and avalanche potentials.

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Table 3.—Continued

Physical Factors	Definition	Examples		
		Decision 1: an urban recreation environment	Decision 2: a rural recreation environment	Decision 3: a wildland recreation environment
Natural vegetation	Diversity, amount, and distribution of natural vegetation in the area to be developed.	Pollution-resistant vegetation. Large trees that should be protected during development of the area. Vegetation needed to complement existing vegetation.	Wind-resistant trees in campgrounds and picnic areas. Vegetation to screen campgrounds. Fall coloration potential	Areas above timber line protected by ground cover to prevent erosion. Variability in timber size and distribution to provide maximum scenic quality. Enough ground vegetation to attract wildlife and also to afford adequate reproduction for future forests.
Fish and wildlife	Number and variety of fish and wildlife that are or could be introduced in the area to be developed.	Bird life. Stock water for fishing derbies. Den trees for squirrels.	Wildlife-viewing areas. Protecting people from bears. Fishing potential.	Hunting potential. Game preserves and flyway habitat. Fish stocking.
Uniqueness	Overall rarity value of the total resource before and after it is developed or preserved.	The *number* and *location* of similar areas already in existence or that could be developed in relation to the location of the present facility being planned.		
		OTHER		
Other physical factors	Decision-makers listed any other physical factors that are important in a particular decision.	Determined separately for each decision situation.		

Table 4.—An example of how relevance-tree data were recorded and adjusted

[In this example, only a few factors are included in a situation where the respondent chose to start with the social factors. Therefore, social factors are assigned first level scores and physical factors are assigned second level scores]

		Physical factors						
	Social Factors	Acreage		Water resources		Natural vegetation		Totals
0.70	Similar future demand	0.50	+	0.30	+	0.20	=	1.00
+								
.20	Money available	.30	+	.30	+	.40	=	1.00
+								
.10	Political influences	.70	+	.20	+	.10	=	1.00
1.00	Total							
	ADJUSTED DATA—FIRST X SECOND LEVEL SCORES							
	Similar future demand	0.35	+	0.21	+	0.14	=	0.70
	Money available	.06	+	.06	+	.08	=	.20
	Political influences	.07	+	.02	+	.01	=	.10
	Totals	0.48		0.29		0.23		1.00

The interviews were conducted in two stages. In stage one, a respondent was given a choice of which factor categories—social or physical—he wanted to consider *first*. Two relevance-tree forms were available. Form 1 listed the 12 social factors along the left-hand margin and the 10 physical factors across the top. Form 2 was arranged just the opposite. If a respondent wanted to consider social factors first, form 1 was used; if physical factors, form 2.

The factors in the left-hand margin of the form were designated as *first-level* relevance scores. The sum of the first-level scores that a respondent assigned was required to be 100 percent (table 4).

In stage two, each respondent was asked to consider the factors that were not chosen initially and to record the relative weights (second-level scores) that they felt each of the remaining factors should have *within the bounds or constraints of each of the first-level factors.* The sum of these second-level scores in any one row was required to be 100 percent (table 4).

The respondents were asked to complete the three relevance-tree forms at their convenience and to mail them back. However, as one top administrator pointed out, even this attempt to allow complete privacy when filling out the relevance trees may not alleviate the respondent's need to justify his reaction to each decision situation. To assure autonomous responses, the respondents were asked not to identify themselves on the survey forms.

Average Relevance Tree For Each Decision

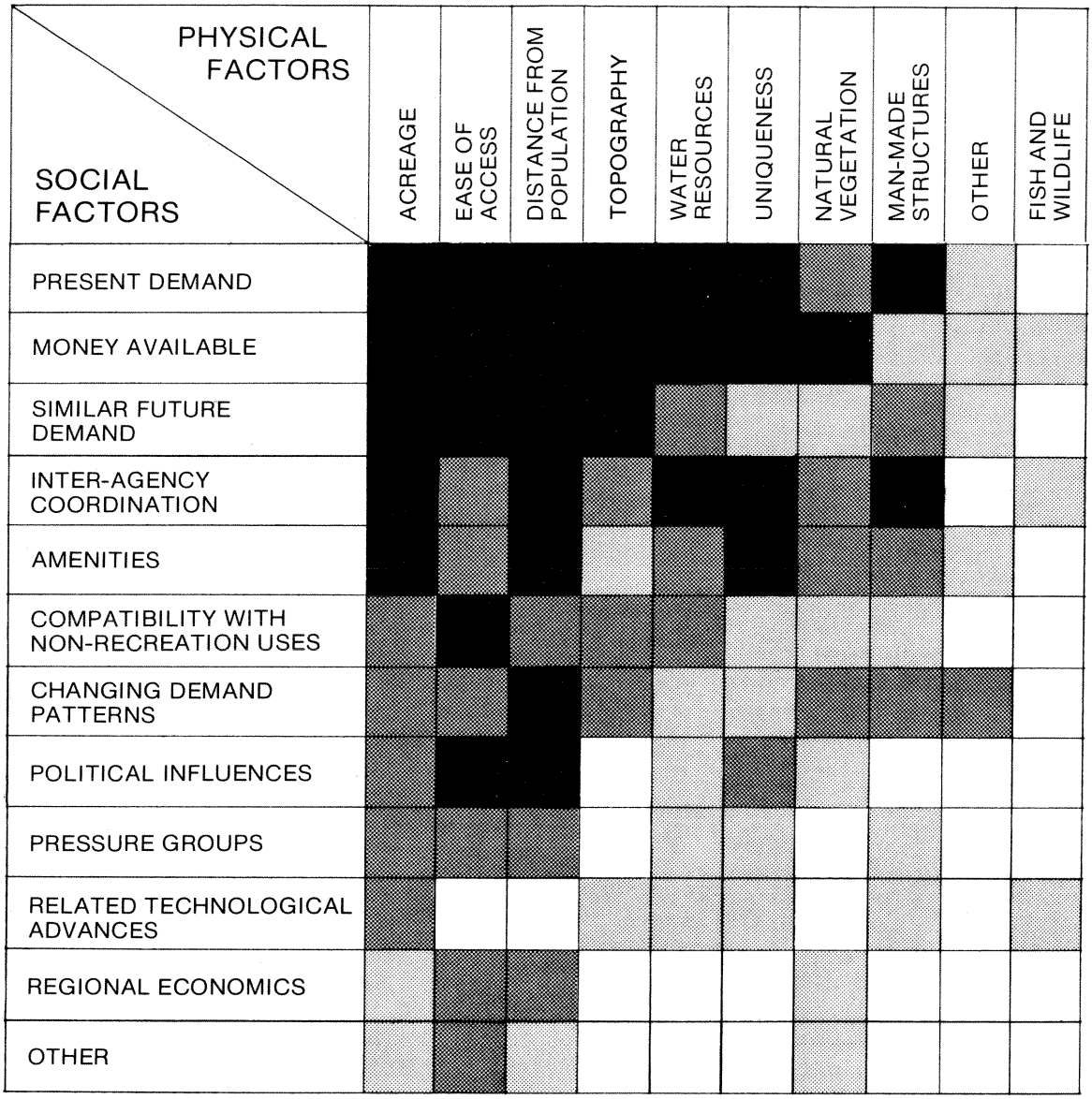
The relevance numbers entered by a respondent in the social and physical categories of a relevance tree were designated as *first-* or *second*-level scores according to their order of entry, as explained previously.

For each relevance tree, all second-level scores in the row adjacent to a given first-level category were multiplied by that first-level category score. This procedure *adjusted* all second-level scores throughout the relevance tree so the total of 120 cells equaled 100 percent (table 4).

The percentage values within any one adjusted relevance tree ranged from 0.000 to 0.045. Relevance-tree data were averaged for each of the three decisions within and across

Text continued on page 14.

Figure 1.—Decision one: average relative importance given 120 social-physical factors in decision-making by four agencies.



QUARTILE:	UPPER	UPPER MIDDLE	LOWER MIDDLE	LOWER
SUM OF THE 30 PERCENTAGES WITHIN EACH QUARTILE	54	27	14	5
RANGE OF PERCENTAGES WITHIN EACH QUARTILE	.04482 → .01182	.01166 → .0070	.0069 → .0029	.0028 → .0002

Figure 2.—Decision one: social and physical decision factors arranged by average order of priority for all four agencies combined. Percentage under each bar indicates the priority value or the relative importance of each factor in influencing the final decision. Average response for each agency is plotted around the overall average trend.

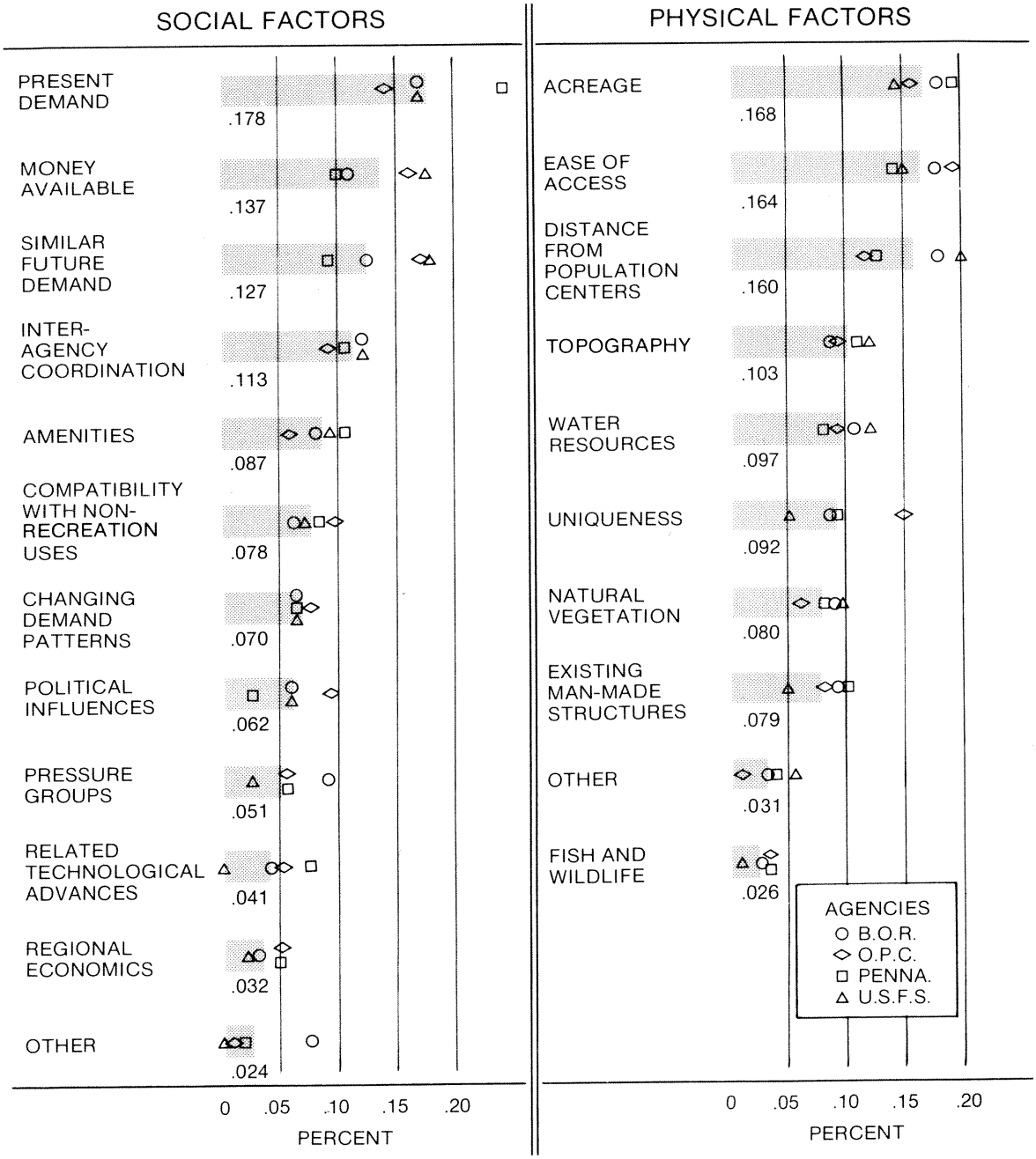
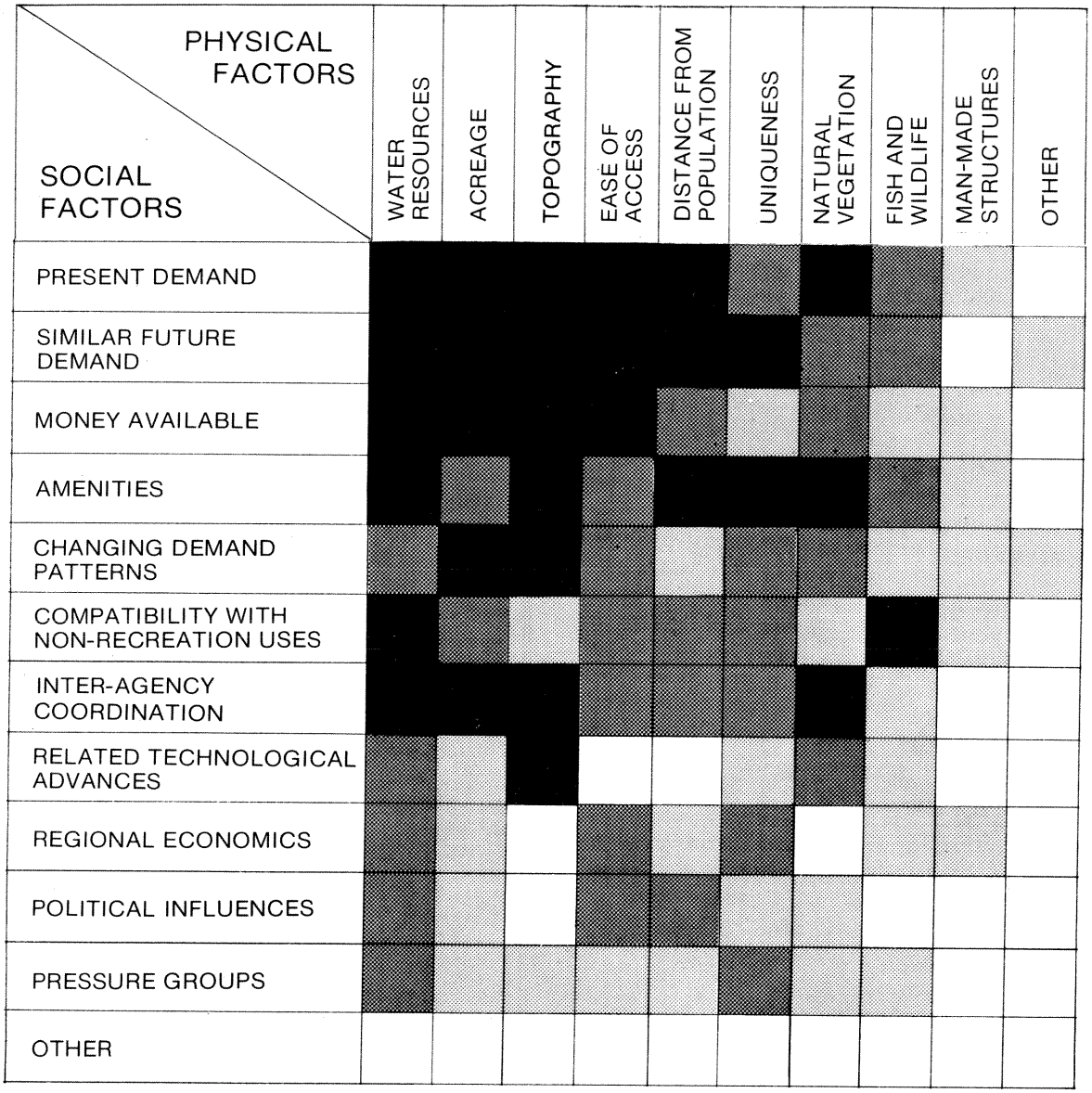


Figure 3.—Decision two: average relative importance given 120 social-physical factors in decision-making by four agencies.



QUARTILE:	UPPER	UPPER MIDDLE	LOWER MIDDLE	LOWER
SUM OF THE 30 PERCENTAGES WITHIN EACH QUARTILE	50	28	17	5
RANGE OF PERCENTAGES WITHIN EACH QUARTILE	.0272→.0116	.0113→.0080	.0076→.0038	.0037→.0000

Figure 4.—Decision two: social and physical decision factors arranged by average order of priority for all four agencies combined.

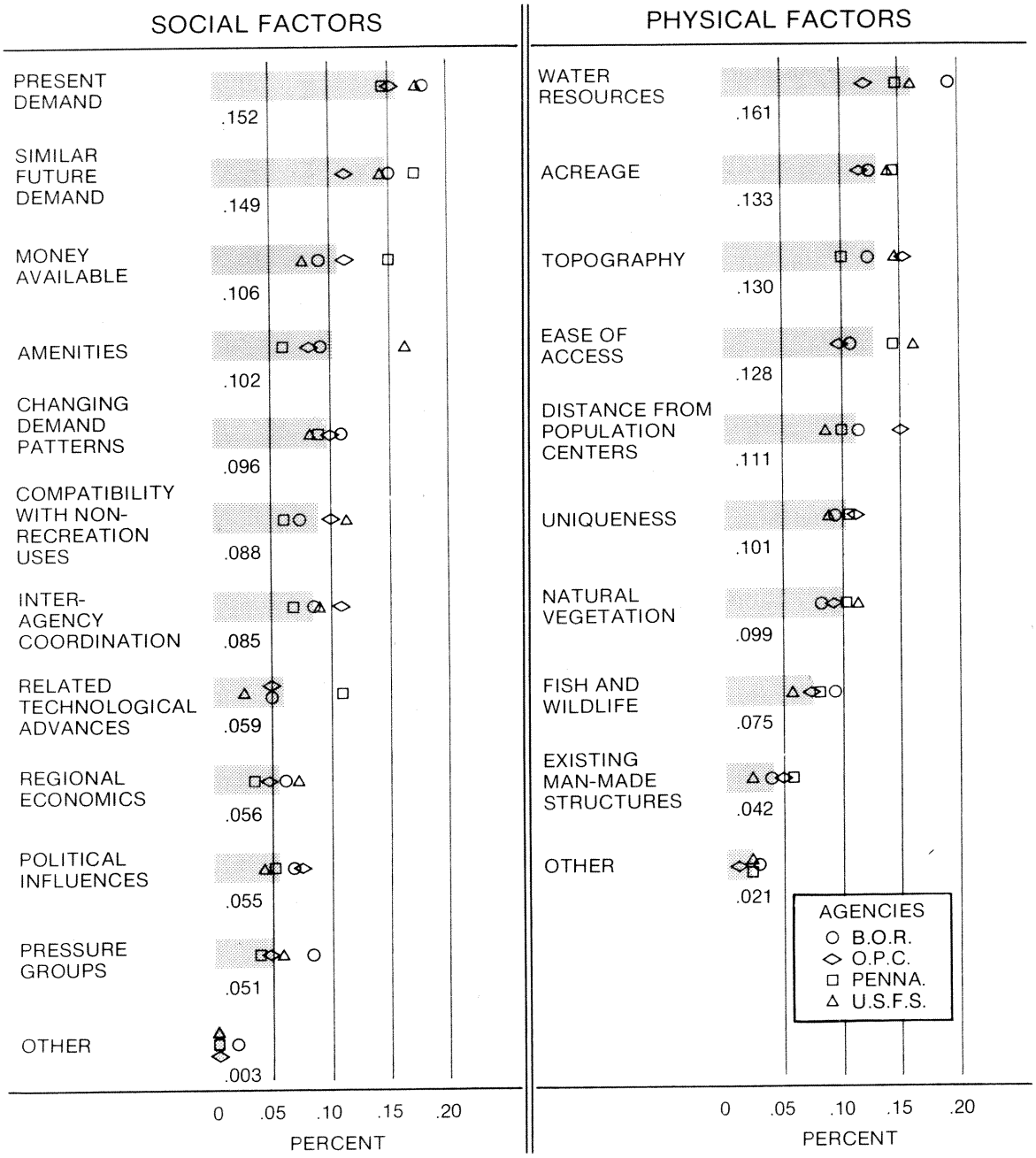
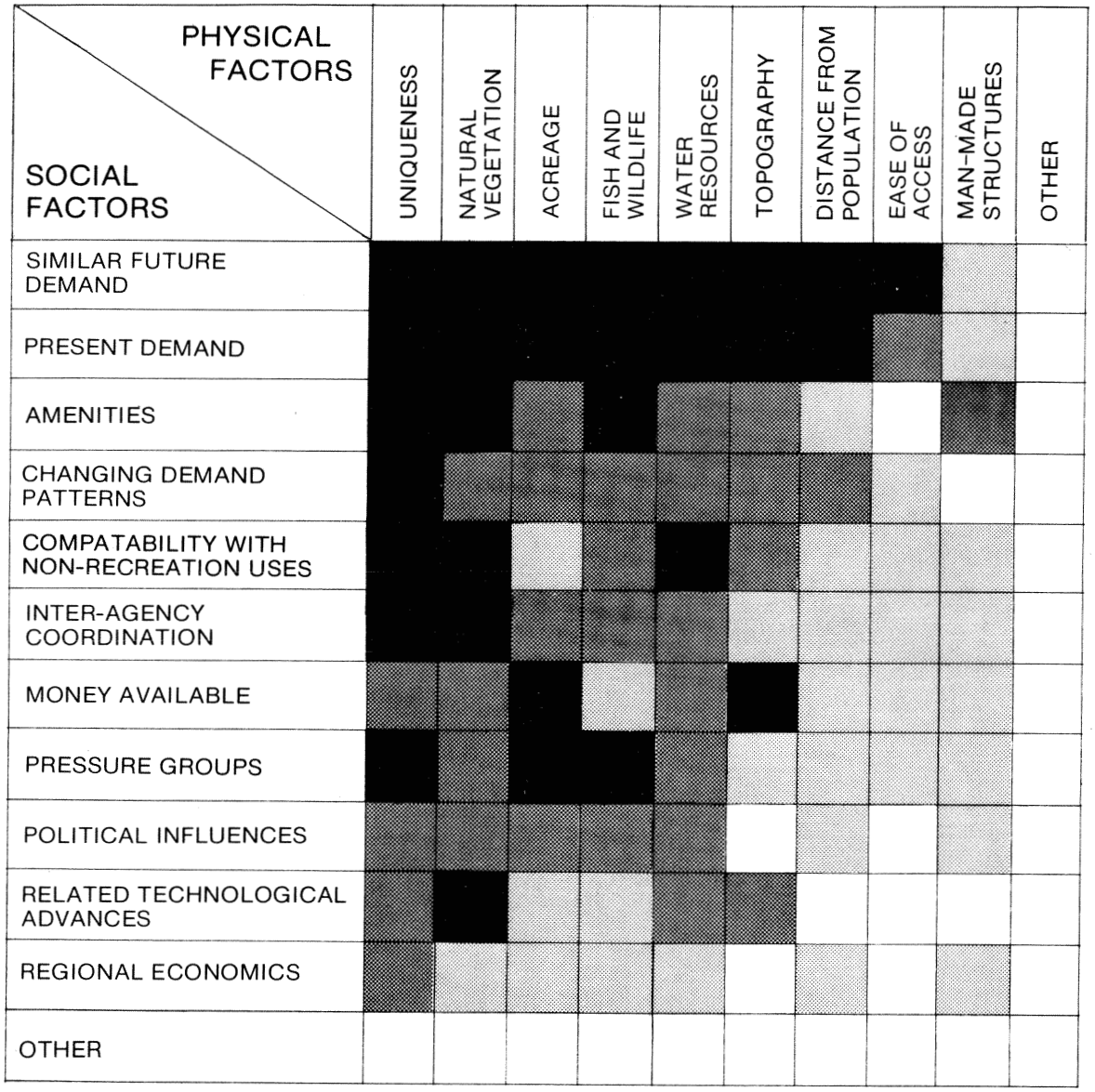
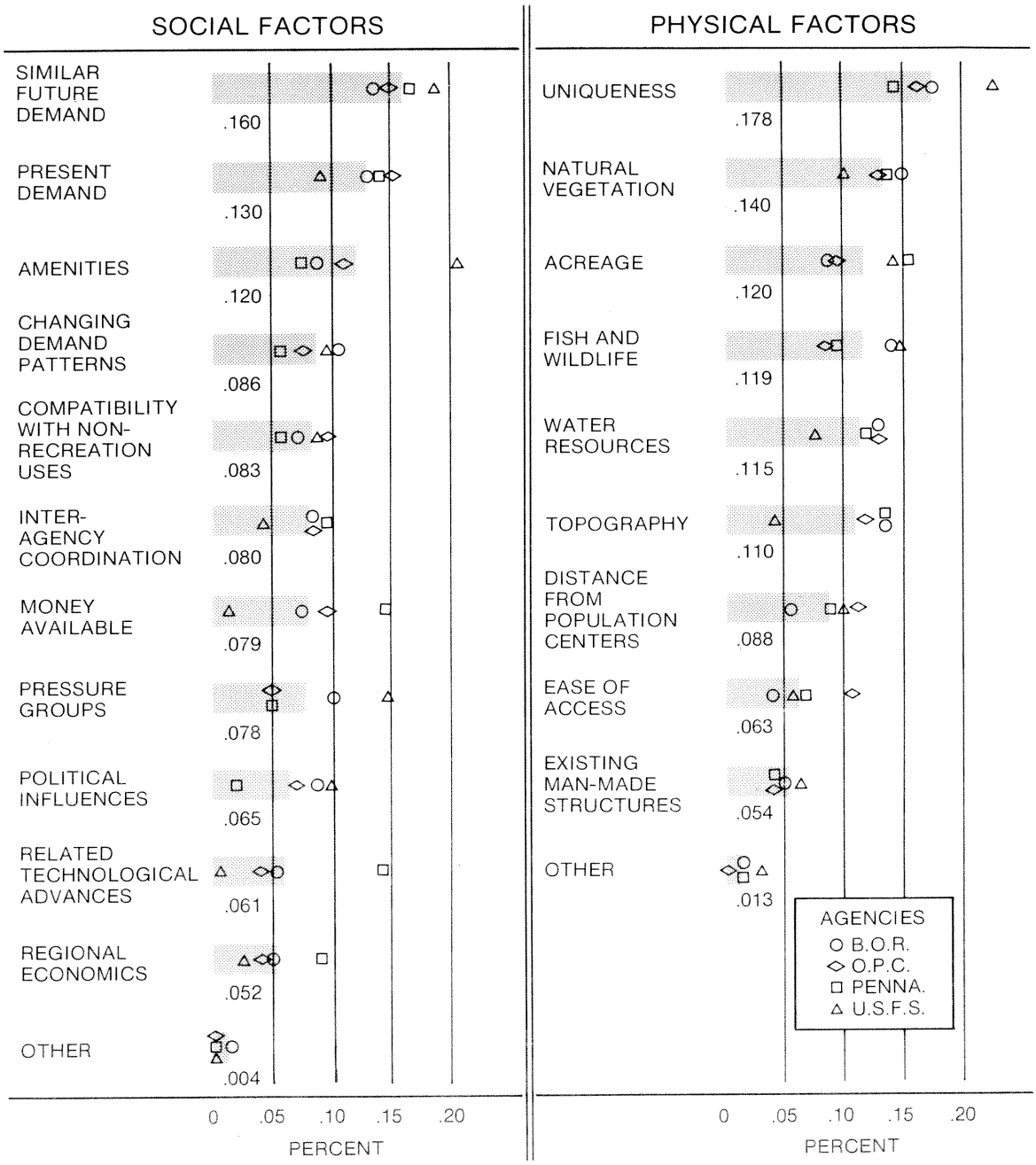


Figure 5.—Decision three: average relative importance given 120 social-physical factors in decision-making by four agencies.



QUARTILE:	UPPER	UPPER MIDDLE	LOWER MIDDLE	LOWER
SUM OF THE 30 PERCENTAGES WITHIN EACH QUARTILE	50	28	18	4
RANGE OF PERCENTAGES WITHIN EACH QUARTILE	.0309→.0112	.01116→.0077	.0074→.0042	.0040→.0001

Figure 6.—Decision three: social and physical decision factors arranged by average order of priority for all four agencies combined.



all agencies. This resulted in an average relevance tree for each of the three decisions.

To facilitate interpretation of the data, the percentage values in the average relevance trees were separated into upper, upper-middle, and lower quartile ranges. Each quartile range contained 30 social-physical factor combinations (fig. 1, 3, and 5).

In addition, the overall importance of any one factor in an average relevance tree was determined by adding percentage values across or down the rows or columns. Compiled this way, the sum of the percentages for either set of factors—social or physical—equaled 100 percent. This condition holds for any one interview (table 4, adjusted data) and also for the average relevance tree for any one decision.

The importance of individual social and physical factors varied considerably among the three decisions. However, percentage distributions showing the total influence of individual factors followed a similar pattern throughout all decisions (fig. 2, 4, and 6).

RESULTS

Decision-Maker Orientation

In decision one, 87 percent of the respondents chose to start with the social factors. In decision two, they were split about evenly. In decision three, 62 percent started with the physical factors.

From decision one through to three, there was a shift in orientation from social factors to physical-site characteristics. The effects of this shift were highlighted in the decision-maker's estimates of the social and physical factors that are important in influencing urban, rurals, and wildland recreation development decisions.

In the discussions that follow, if a social-physical factor combination value was in the upper quartile range of a relevance tree, we considered the combination as being very important or having high priority in the decision involved. If a social-physical combination value was in the upper-middle quartile range, we considered it as somewhat important; and if a combination was in the lower-middle or lower quartile range we felt it was not too important or of low priority in the decision involved (fig. 1, 3, and 5).

Of the 120 social-physical factor combinations considered in each decision, only about half had an important influence on any one of the three decisions. Regardless of the decision, the upper-quartile values always accounted for about half of the total influence in a decision; values in the upper-middle quartile always accounted for roughly another fourth of the influence.

Interagency Differences

For any one decision, priority values assigned to the various social and physical factors did not generally differ appreciably among agencies. Different public recreation-resource agencies assigned about the same values to most of the factors involved in the three decisions. This similarity among agencies implies that they may be expected to complement and coordinate their efforts and to understand the way each of them perceives the problems of recreation planning over a wide range of recreation resources and locations.

The only interagency differences discussed here involved factors that accounted for 10 percent or more of the total emphasis in a given decision.

In decision one, weights assigned by the individual agencies to *present demand*, *similar future demand*, and *uniqueness* of the area varied considerably from the average trend (fig. 2). These discrepancies among agencies may be caused by a certain degree of either major concern or unfamiliarity with the actual recreation development situation concerned.

In decision two, *amenities* were given a very high priority value only by the Forest Service (fig. 4). This agency is continually involved in decisions that weigh recreation uniqueness against productivity of an area for other forest products; and thus the constant need to consider amenity values may be reflected in this response.

In decision three, the Forest Service rated *amenities* and *uniqueness* factors somewhat higher than the average trend (fig. 6). These differences may be due partially to that agency's objective of providing wildland recreation

developments within the framework of the multiple-use doctrine.

Money available was rated both above and below average—depending on the agency involved. The variation may be due to existing budgetary constraints on a state agency as compared to federal agency.

The ratings assigned to social and physical factors for decisions two and three showed the least and greatest variability, respectively, between agencies (fig. 4 and 6). Overall, among the four agencies, social-factor ratings showed considerably more variation than physical factors.

Response patterns suggested that different recreation-resource agencies agree more often on the importance of physical factors, as compared to social factors, in management decisions. The importance of social factors is often influenced by the operating philosophies and goals of the agencies involved, while physical factors usually are fairly well defined in the minds of most decision-makers, regardless of their agency affiliation.

However, the few differences among agencies do not seem too serious most differences can logically be attributed to an agency's degree of involvement with a particular decision. At the same time, perhaps coordinated decision-making among various agencies to meet overall social goals may be hampered somewhat because of variation in priority values assigned to some social factors in the urban and wildland recreation decision situations (decisions one and three).

Recreation Demand

In the three decision situations, the respondents were concerned mostly with meeting present and similar future recreation demands for *today's* recreation activities. On the average, the social factors of *present demand* and *similar future demand*, in combination with most physical factors, always scored relatively high as important considerations—regardless of the decision.

On the average, for all agencies, *present demand* was slightly less important but still had top priority as respondents shifted from decision one to decision three. *Similar future demand* showed a slight upward trend from the urban to the wildland decision.

Changing recreation demand patterns were of secondary importance in all three decisions, and recreation-related *technological advances* had very low priority. Yet the interrelationship between technological advances and changing recreation demand patterns are only about one decade removed from most present demand situations (Esch, 1969). Nonetheless, decision-makers seem more interested in the problems of *current demand* than in potential *new demand* patterns that may emerge via new types of recreation equipment created by new advances in *technology*.

Some respondents said that they assumed that *future demand* was almost any type of recreation—including new types of activities not now in vogue. Thus there was a certain degree of overlap in respondent interpretation of the terms *changing demand patterns* and *similar future demand.* Therefore the decision-maker's concern about effects of technological advances may be more adequately expressed in his rating for *future demand patterns* than would seem to be the case in the graphed results (fig. 2, 4, and 6).

Present recreation-resource development decisions will likely perpetuate and increase demand for *today's* types of recreation activities—at least in urban and rural land environments. Decision-makers probably can make recreation demand whatever they want it to be, the major limiting factor being *money* for facility development—after consideration for the ecological integrity of an area.

If decision-makers continue to assign high priorities to *present* and *similar future demand*, one way to estimate future recreation demand 3 to 5 years from now would be to simply project demand on the basis of what recreationists do today or are likely to do in the very near future.

A useful way to estimate future recreation

demand might be to estimate how much money is available for recreation planning and development over the next 5 years and then convert this amount to expected demand based on today's recreation use/development cost ratios.

The drawback to such an approach for forecasting recreation demand 10 to 20 years from now is that priority values in future decisions may change. The present snowmobile boom is a classic example of this kind of phenomenon caused by new breakthroughs in technology and private advertising to promote the product.

Money

As might be expected, the amount of *money available* to achieve planning and development goals was a top-priority factor in decisions one and two, but was of secondary importance in decision three.

In decision one, the importance of money was associated with 8 of the 10 physical features of the resource (fig. 1).

In decision two, money was interrelated with six physical features as top-priority items (fig. 3); and in decision three, only five physical factors were assigned important monetary considerations (fig. 5). Regardless of the decision, *natural vegetation*, *acreage*, *water resources*, and *topography* were important physical-feature combinations always associated with *money* availability.

Amenities, Uniqueness, and Related Physical Factors

Recreation-resource executives do not overlook the importance of *amenity values* and the physical factors that contribute to those amenity values—such as *water resources*, *natural vegetation*, *fish and wildlife*, and *uniqueness* of the resource. Such factors are usually considered important in recreation-resource environments where they are already prominent, or where they will most likely occur. On the average, decision-priority ratings for recreation *amenity* and *uniqueness* factors increased steadily upward from decision one to decision three (fig. 1 to 6).

This upward shift becomes even more pronounced when one considers that the Forest Service (the agency concerned most with wildland recreation environments) assigned a very high priority rating to *amenity* and *uniqueness* factors in decision three.

A key element that affects the intrinsic or intangible values of any recreation environment is water. Existing or potential *water-resource* development opportunities were rated of medium importance in decision one, of maxium importance in decision two, and about as equally important as half of the other physical factors in decision three (fig. 2, 4, and 6).

The importance of *natural vegetation* and *fish and wildlife*, as they relate to *amenities* and *uniqueness* values, shifted noticeably from secondary importance in decisions one and two to top priority in decision three.

Overall, the respondents felt that *amenity* values and the physical factors that contribute to those values were two to three times more important in wildland recreation development than in urban recreation development.

Size of Area and Accessibility

Acreage of a potential recreation area has an important influence in the decision on how the area will be developed. The larger the area, the greater the opportunity for developing more kinds of recreation opportunities. The decision-maker's prime concern for the

size of a recreation area is related to his other major priority concerns—that is, trying to meet a variety of *present recreation demand* patterns and having enough space to provide a range of *amenity* values.

Ease of access and *distance from population centers* were major considerations in decision one (fig. 1 and 2). However, the importance of these two factors shifted steadily downward from decision one to decision three (fig. 5 and 6). This trend relates to present conditions: most wildland areas are farther from population centers and not as accessible as the recreation opportunities in decisions one and two.

Lower Priority Items

Throughout all three decisions, *interagency coordination* and *compatibility with non-recreation uses* were of intermediate importance.

The respondents placed *pressure groups* and *political influences* in low priority for all three decisions. They did not place much emphasis on the need for recreation developments to stimulate local or rural *economies.*

Any economic benefits generated by a recreation development may be somewhat automatic and thus may not be an important restrictive element in the recreation development decision process. *Existing man-made structures* in the area to be developed were also of low priority.

DISCUSSION

A decision cannot be fully and accurately evaluated by studying the quartile topography of a relevance tree. At best, the relevance trees used in this study are abstractions of some high and low points that affect three decisions.

Inferences are limited to what can be seen in two dimensions. Through a clearer understanding of priorities in these decisions, executives may systematically wish to change priorities of social and physical factors to increase the overall direction of a given decision. In a sense, the relevance trees are simulated chessboards, and we have tried to identify those squares where the powerful pieces are most likely to be.

The relevance trees used in this study also provide a reference point for measuring future changes in the perception of important factors in the decision-making process. A relevance-tree study in the future would point out—in comparison with results from the current study—where important changes in decision behavior patterns occurred. Such changes may be caused by future re-orientation of management procedures, changes in policy, or unexpected changes in recreation demand patterns.

The PATTERN methodology permits executives in one agency to better understand what their counterparts in other agencies feel are the important constraints in the decision-making process. Such information permits the various agencies to better coordinate their efforts to provide a wide range of recreation opportunities.

Furthermore, relevance-tree values developed in this study can help to delineate subject-matter areas and priorities for further research efforts. In-depth research that deals with factors at various high points (upper quartile) of relevance trees seems more justifiable than research studies in the lower-middle and lower quartiles. In this regard, any research aimed at forecasting demand or use of recreation facilities and research on management procedures for optimum allocation of operating budgets would be extremely helpful to recreation managers.

Priority values computed in this study can also be useful in developing resource-management decision games that can help decision-makers evaluate the consequences of various decision alternatives.

In general, the decision-makers who took part in our study assigned highest priorities to those factors that related to the immediate consequences of their decisions. *Present demand, money available, similar future demand*—in combination with most physical aspects of the resource—are the key considerations in decisions about outdoor recreation developments in urban, rural, and wildland areas.

REFERENCE

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