



STATE OF CALIFORNIA  
THE RESOURCES AGENCY

# RECREATION Planning Manual



## RELATIONSHIPS BETWEEN DEMAND AND BENEFITS

6400

Recreational demand has a definite relationship to benefits. Demand is translated into use by actual construction and operation of facilities. Use is translated into water project benefits by application of a "dollar value" to each visitor day of use. The recreation planner calculates the dollar value of a visitor day (recreation day) of use according to the Guidelines prepared by the Department of Water Resources and the procedures prepared by Parks and Recreation within those guidelines.

## MEASUREMENT OF BENEFITS

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The recreation planner measures benefits to recreation at a water development project in terms of visitor days of use and the dollar value of a visitor day of use. The dollar value of a visitor day of recreation use is based upon an evaluation of the recreation environment at a given reservoir to be used for public recreation. The Department of Water Resources has established guidelines for the calculation of the dollar value of a recreation day of use with the lower limit set at \$0.50 and the upper value set at \$2.50.

Following are detailed descriptions, with examples of Water Resources' Guidelines, Parks and Recreation's Supplemental Procedures for evaluating a recreation day of use at water projects and a brief description of the Trice-Wood Method of evaluation formerly used by the Department of Water Resources.

### Water Resources Guidelines for Evaluating Recreation Benefits

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#### General Recreation

6411.1

The objective of the Department of Water Resources in evaluating recreation benefits is to express the net benefit to the recreationist himself of participating in the recreation activity. Once derived, this individual value is multiplied by the total visitation to a project to derive the total benefit of the project.

Two factors obviously have an effect on the benefit to the recreationist: (1) the variety and quality of recreation, and (2) the esthetic qualities of the site. These guidelines consider only those two factors. Other factors such as proximity of the site to population centers and competition with other similar recreation areas are more related to total use than to the benefit accruing to individual recreationists, and thus, are not considered separately in these guidelines.

General Recreation (Cont'd.)

6411.1

Point scores of these factors are established as follows:

<u>Factor</u>	<u>Rating</u>	<u>Point Score</u>
Variety and Quality of Recreation	Poor	1
	Fair	3
	Good	5
Esthetic Qualities of the Site	Poor	1
	Fair	3
	Good	5

The point scores resulting from application of these factors would be added, and the unit value of a day's recreation would be derived from them, within the \$0.50 to \$2.50 range of values adopted by the Department for general recreation. These point scores cover the \$0.50 to \$2.50 range in 20 cent increments.

Variety and Quality of Recreation

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Factors to be considered in determining the variety and quality of recreation include analysis of the type of activity, quality of experience, and the quality of development, operation and maintenance of the facilities and area. Activities to be considered include bathing, picnicking, camping, boating, fishing, wildlife use, water skiing, hiking-riding-cycling, and scientific-historic appreciation.

Selection of ratings in this category is guided by the following:

Good Quality - Recreation activities give user varied experiences - National Park Service or Beaches and Parks standards of facility design and operation - Added support facilities to make experience more pleasing (concessions, boat docks, etc.) - Resource produces above normal returns to recreationist.

Fair Quality - Recreation activities supported by facilities necessary to protect health and safety - Below National Park Service or Beaches and Parks standards of facility design and operations. Delineated areas for activities. Resource produces reasonable returns to recreationist.

Poor Quality - Recreation activity not prohibited, but limited by lack of resources or facilities. - Uncontrolled environment.

Esthetic Qualities of the Site

6411.12

Factors to be considered in determining the esthetic qualities of the site include: (1) fluctuations in water surface elevation of reservoirs or other project operations and other aquatic factors, (2) geologic-topographic, (3) vegetative cover, (4) climate, and (5) other environmental influences.

Selection of ratings in this category is guided by the following:

Good Quality - A relatively small reduction in the ratio of average surface area to the average annual maximum surface area in the course of a recreation season - An unusually clear and interesting reservoir - Superior vegetative cover - good climate - absence of obnoxious noise, odor, unsightly works - opportunity for seclusion.

Fair Quality - A normal reduction in the ratio of average surface area to the average annual maximum surface area in the course of a recreation season - Geologic, climatic, and vegetative elements of a standard nature; i.e., useful and pleasant, but not outstandingly so - Little opportunity for seclusion - Possible presence of distractions from unrelated activity, e.g., noise, odor, unpleasant works visible, etc.

Poor Quality - A relatively large reduction in the ratio of average surface area to the average annual maximum surface area in the course of a recreation season - Vegetative cover deficient in shade or esthetic character - Geologic and climatic characteristics standard or deficient - little or no opportunity for seclusion or escape from evidence of distracting activity.

Application of Guidelines

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The factors used in these guidelines are environmental considerations which probably can be best evaluated by qualified recreation planners. In

applying these factors within Departmental programs it is intended that primary consideration will be given to the advice of contract recreation planning personnel of the Department of Parks and Recreation.

Further, it is intended that supplementary guidelines or procedures will be devised by recreation planning personnel of the Department of Parks and Recreation. Such supplementary or detailed procedures will be desirable to assure greater uniformity in rating procedures, and will allow numerical ratings intermediate between the rather wide point spreads of these general guidelines. These supplementary procedures follows.

Supplementary Procedures for Application  
of Department of Water Resources Guidelines  
for Evaluation of General Recreation

6411.14

The California Departments of Water Resources and Parks and Recreation have adopted a "Statement of Guidelines" for evaluating recreation activity and resources in connection with water resources development. This statement of guidelines provides for evaluating general recreation benefits in terms of two factors: (1) variety and quality of recreation and (2) esthetic qualities of the site. The statement specifies that these factors are to be given equal weight and that the sum of the factor ratings will be used in establishing the unit value within a \$0.50 to \$2.50 range.

The following detailed procedures are to be used in evaluating recreation visitor days within the adopted guidelines.

Variety and Quality of Recreation Offered by the Site (Weight 100 points)

It is believed that nine basic recreation activities cover sufficiently the major types of outdoor recreation which occur at water projects. These activities are: boating, bathing, camping, fishing, picnicking, enjoyment and/or harvesting of wildlife, water skiing, riding-hiking-cycling and scientific-historic appreciation. Each of these activities has been assigned a numerical value on the basis of the type of activity, the quality of experience, the quality of developed facilities and the quality of operation and maintenance of the recreation area.

Supplementary Procedures for Application  
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for Evaluation of General Recreation (Cont'd.)

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The relative value assigned to each activity is based upon an analysis of the relative numbers of persons engaging in the nine activities. A composite relationship based upon surveys of recreation use in California and nationwide was prepared from statistics presented in the Outdoor Recreation Resources Review Commission Report, California Public Outdoor Recreation Plan, and Part I of the California Recreation and Parks Study.

These relative values are presented in Table 1. In rating any of the nine recreation activities provided by a water project, a value between 0 and the rating for good, as listed in Table 1, is assigned based on comparison with the following definitions for Good, Fair and Poor. The determination as to ratings by activity and development criteria appears in Table 2.

Good Quality: Facility design equals or exceeds highest standards listed in Department of Parks and Recreation, Water Project Recreation Planning Manual. Added support facilities (concession services, boat docks, special equipment) generously provided to optimize the pleasure derived by the user. Resource produces very high material return to user. Operational staffing equals that outlined in the Department of Parks and Recreation staffing guide.

Fair Quality: Facility design equals the minimum standards listed in Department of Parks and Recreation, Water Project Recreation Planning Manual. Minimal support facilities. Resource produces average material return to user. Operational staffing below that suggested in Department of Parks and Recreation staffing guide.

Poor Quality: Recreation activity not prohibited but limited by lack of facilities or resource. Uncontrolled environment.

Supplementary Procedures for Application  
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Table 1  
Recreation Activity Values\*

<u>Activity</u>	<u>Good</u>	<u>Fair</u>	<u>Poor</u>
Bathing	22	15	7
Picnicking	17	12	6
Camping	13	8	5
Fishing	13	8	5
Boating	9	6	3
Enjoyment and/or Harvesting Wildlife	9	6	3
Hiking, Riding, Cycling	9	6	3
Water Skiing	4	3	1
Scientific-Historic Appreciation	<u>4</u>	<u>3</u>	<u>1</u>
Total	100	67	34

\*If an activity is not available,  
it is assigned a zero value.

Esthetic Qualities of the Site (Weight 100 points)

The relation of each person to his surroundings is peculiar to him. His entire background educates his perceptions, and conditions his intellectual and emotional responses. No specific kind of environment; no given combination of trees, rocks, and water; no certain selection of grassy hills and streams can promise the greatest reward to everyone. We like different things, arranged in different ways. Assignment of a level of esthetic quality must not depend upon any one person's delight in a certain kind of place or scene. Rather, the judge must broaden his judgment to allow all sorts of beauty equal validity, and give equal claim to every kind of scene.

Realizing the impossibility of describing real physical conditions that would afford esthetic satisfaction to everyone, or even to a significant grouping of minorities, it becomes necessary to describe generalized, subjective, or qualitative conditions which would be most likely to have universal appeal. These generalized conditions must be established and described in such a way as to be divisible into grades or levels of quality, each of which should give a similar grade or level of reward to everyone, or almost everyone.

For the purpose of this method, the full array of outdoor recreation quality is divided into a range of points. Precision, exclusiveness, and universality, while greatly desired, are unlikely of achievement. Therefore, the person using this method to assist in evaluating recreation must adopt a position of accommodation, molding his judgment to force the real situation into a single value.

In order to assign reservoir recreation areas a single value, it is necessary first to determine the major factors which contribute to the esthetic value of the areas. Those factors chosen as most representative of esthetic value are reservoir operations, geologic and topographic, aquatic, vegetative, climatic and other environmental influences. These six factors are described below. The sum of the points rated for these six factors express the measure of value to the recreationist with respect to the esthetic qualities of the site.



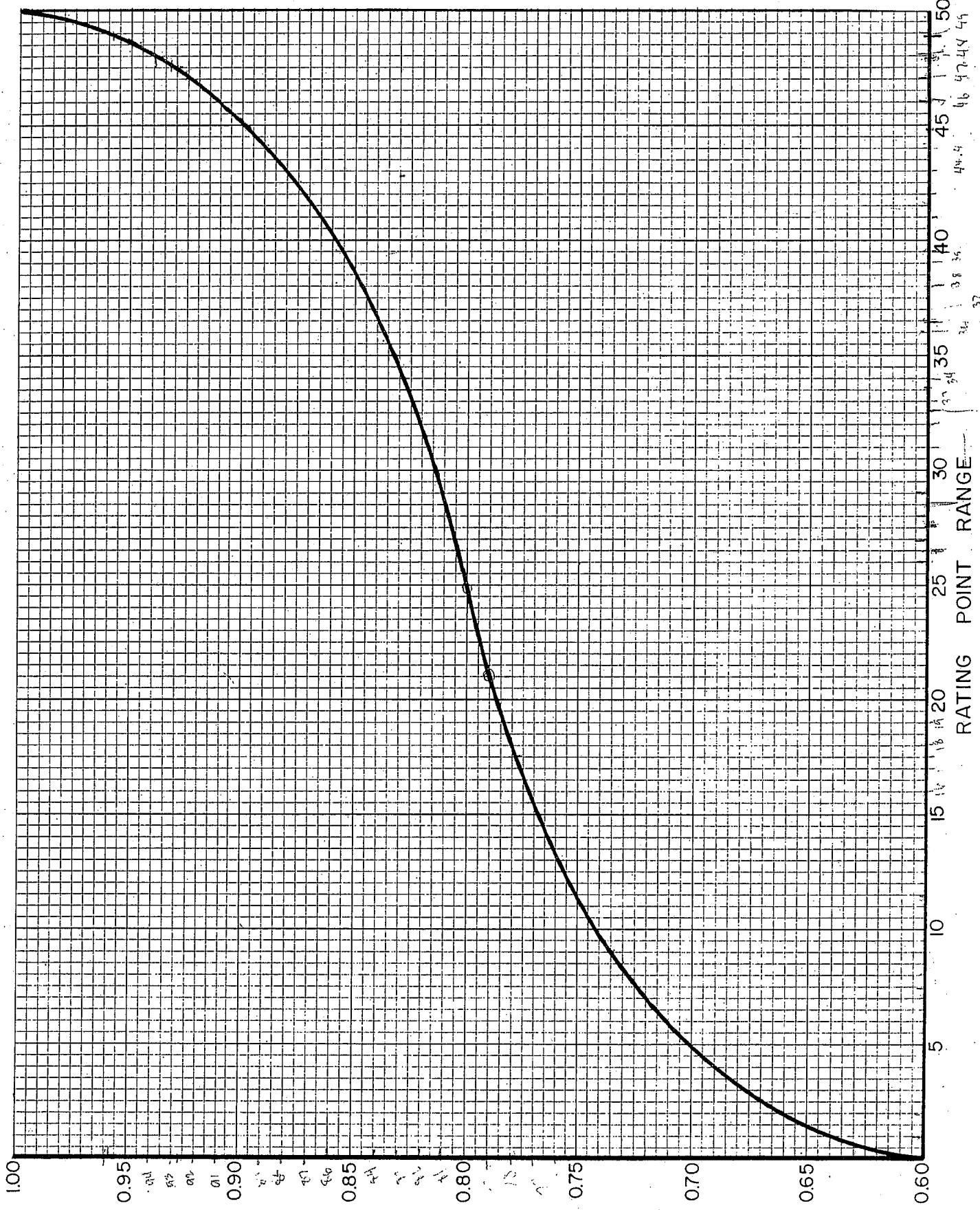
Reservoir Operations. The variations in quality resulting from reservoir operations are reflected in changes from the environment that would be found at a natural lake. A reservoir with an outflow timed to coincide with inflow (such as a diversion) represents a close replica of a natural lake. As the rate of outflow exceeds that of inflow, the resemblance to a natural lake decreases and the quality of recreation experience tends to decline. If one measurable variable can be selected to evaluate the change in recreation quality, and hence value to the recreation user, water surface area change should be chosen.

Change in water surface area affects the user in several ways:

- a. The water surface and shoreline may vary in both extent and location. A desirable use site later may be found to be either flooded or divorced from the water entirely.
- b. Change in water surface area also measures the variation in the extent to which the water area is bordered by exposed formerly flooded land. Such land area is usually devoid of vegetation and may include mud flats. It is always unattractive.
- c. Change in water surface area inhibits growth of vegetation along the shore even above maximum pool where natural lake shores may accommodate riparian habitat.
- d. Change in water surface area tends to reduce the fish production of the reservoir and the corresponding angling potential and satisfaction gained by the individual angler.

Reservoir storage information published in various sources, area capacity curves and information presented in Figure 1 can be used for calculating the point rating of existing reservoirs. At proposed reservoirs, operations studies, area capacity curves and information presented in Figure 1 (Figure 6411.14a) can be used. Situations which do not fit entirely the water surface fluctuation criterion are:

PROJECT OPERATIONS - RESERVOIR POINT RATING GRAPH



RATIO OF AVERAGE SURFACE AREA TO NORMAL POOL SURFACE AREA

RATING POINT RANGE

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- a. Reservoirs which fluctuate on a weekly or shorter cycle;
- b. Reservoirs which are emptied prior to the end of the recreation season;
- c. Reservoirs which are drawn down after the recreation season to such an extent that the fishery holdover is not assured; and
- d. Reservoirs which are operated to inundate the flood storage reservation so infrequently, or for periods of such short duration, that recreation development is or may be planned for these lands.

For reservoirs in the above categories the point ratings may be calculated on an individual basis, subject to normal procedures for review and approval. The simplest and most representative method of measuring the effect of reservoir operations on the visitor day value is the ratio of the average surface area during the recreation use season\* throughout the project period of analysis to the surface area at normal pool.

Average surface area during the recreation season is computed by determining the arithmetic mean of surface areas on the last day of each month during the period when heavy recreation use can be expected (recreation season) for the period of historical record or based upon the predicted reservoir operations throughout the repayment period of the project. The surface area at normal pool elevation is measured at the spillway lip for a dam with an ungated spillway. It is measured at the top of the spillway gates for a dam so equipped. Annual surcharge acreage should be added to the above surface areas wherever surcharge delimits the zone of recreation development. In the case of infrequent surcharge for periods

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\*The recreation use season includes those months within the calendar year when the visitation meets or exceeds the monthly average for the year.

ie. 8.3%

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of short duration where development is feasible in the flood zone, the water surface area at the elevation marking the break between landscaped or developed shoreline and non-landscaped reservoir storage area should be used instead of the water surface area at normal pool plus surcharge.

The ratio of recreation season surface area to normal pool (plus any surcharge) surface area is converted to a point rating by use of Figure 1. (Section 6411.14a.)

Geologic-Topographic. The characteristics which seem most important in judging the effect of geology and topography on esthetics are: unique, colorful, large, significant, precious, varied, conveniently oriented, durable, and useable. A compatible combination of five or more of these characteristics would give this factor a value of 10 points. Combinations of fewer characteristics would scale the points proportionately from 10 down to 0.

Aquatic. Aquatic characteristics which bear upon esthetic value are: large or extensive, clean and pure, attractive, and safe. Points range from 10 to 0 on the basis of number of characteristics which occur.

*Missouri  
lack of gold  
blooms  
turkey*

Vegetative Cover. Characteristics of vegetative cover which bear upon esthetic value are: unique, beautiful, perennial, well located, durable, withstand public use, shade producing, safe for human use, large or extensive. Points range from 10 to 0 on the basis of a combination of <sup>5</sup> compatible characteristics.

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Climate. Characteristics which bear upon esthetic value are: temperature range within reasonable extremes, absence of violent or prolonged storms during visitor season, predictable weather, long recreation season. Points range from 10 to 0 on the basis of number of favorable climatic conditions.

Other Environmental Influences. Other elements conducive to esthetic enjoyment are: absence of structures incompatible with the environment, absence of disturbing noise, absence of unsightly major transportation facilities, absence of obnoxious pests, absence of obnoxious odors, a low density of use, and the opportunity for seclusion. Points range from 10 to 0 on the basis of the number of these characteristics or the seriousness of the lack of one or more of them.

Conversion of Evaluations to Dollar Value

The adopted guidelines currently provide for a range of recreation benefit values from \$0.50 to \$2.50 with equal weight given to the two factors: (1) variety and quality of recreation and (2) esthetic qualities of the site. These rating procedures provide up to 100 points for each factor or a maximum of 200 points. Therefore, the points are directly convertible to cents and the dollar value of a recreation visitor day is obtained by adding the rated value for the two factors to the \$0.50 minimum. These guidelines can be used for other dollar ranges through use of the appropriate minimum value and a point conversion factor.

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Examples:

	<u>Folsom Reservoir</u>	<u>Box Canyon Reservoir</u>
<u>Factor</u>	<u>Rating Points</u>	<u>Rating Points</u>
Variety & Quality		
Bathing	22	22
Picnicking	17	17
Camping	8	13
Boating	9	8
Fishing	8	13
Wildlife	3	9
Water Skiing	4	3
Trails (R, H & B)	6	9
Scientific-Historic	3	3
	<u>80</u>	<u>97</u>
Esthetic		
Fluctuation	32.5	50
Geologic	5	10
Aquatic	7.5	10
Vegetative	5	10
Climate	7.5	10
Other	7.5	10
	<u>65</u>	<u>100</u>
	Total	Total
	80	97
	<u>65</u>	<u>100</u>
	145 points	197 points
	<u>50</u> base value	<u>50</u> base value
	\$1.95 total value	\$2.47 total value

Specialized Recreation

6411.2

The Department will use the definition of activities contained in Senate Document 97 for specialized recreation. Further, the Department will use the range of values -- \$2.00 to \$6.00 -- established in that document.