

The Future Supply and Demand of Outdoor Recreation in America

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The Renewable Resources Planning Act (RPA) requires that the U.S. Forest Service produce a comprehensive assessment of the demand and supply situations regarding forest and range resources. This assessment occurs every 10 years, with the next reporting due in 1989. As a required part of RPA, projections of future outdoor recreation demand and supply have been developed for a number of activities. These projections are summarized in this article using numbers of recreational trips and the costs of those trips to the recreation traveler. Reported projections represent the most current effort to estimate future changes in recreational trips taken by the American public and associated trip costs. These two pieces of information are useful planning and policy tools.

Outdoor Recreation Demand and Supply: The Basis of the Approach

Demand

Recreation *demand* refers to the total number of recreational trips people are willing and able to take at various direct trip costs to themselves. Trip costs refer to total travel costs which are a function of the *distance, time* and *fees* incurred while traveling to and entering a site. As total travel costs increase, people living in a community may take (demand) fewer trips. Conversely, if total travel costs decrease, a community can be expected to take (demand) more trips (Clawson and

Knetsch, 1980; Dwyer, Kelley and Bowes, 1977; Ward and Loomis, 1986).

Supply

Outdoor recreational trips cannot be purchased, per se, but must be "produced" by recreators themselves. That is, recreators combine travel, time, knowledge, equipment, supplies and recreational sites and settings to produce a recreational trip. The price or cost of producing a trip is total travel costs which are determined by the monetary travel, time and fee costs of the trip (Bockstael and McConnell, 1981; Cicchetti, 1973).

The *supply* of outdoor recreational trips, therefore, refers to the total number of recreational trips people in a community are able to produce at various costs. The farther people in a community travel, the more trips they produce (supply) because increased recreation sites and opportunities are opened up to them. These increased opportunities, however, come at a higher cost per trip. Conversely, as the distance people travel and therefore trip costs decrease, a community is able to produce (supply) fewer recreational trips since more distant recreation sites and opportunities become unavailable.

The exact number of trips a community can produce at various trip costs is mostly dependent on the number and distribution of recreational facilities available to them. If the availability of recreational facilities

or opportunities within a given area is increased, a community will be able to produce more trips without increasing trip costs.

Demand and Supply Trends and Implications

Trips Taken by the American Public

The demand for recreational trips is determined by trip costs, characteristics of people such as income and age, and the availability of substitute recreational opportunities. Of course, population increases also tend to increase demand. The supply of recreational trips is determined by trip costs and the availability of recreational opportunities. The combined effect of demand (the number of trips a community desires to take at various costs) and supply (the number of trips a community is able to produce at various costs) determines the number of recreational trips people in a community will take or consume.

Demand and supply factors were used to project recreational trips taken by the American population. Data were from the Public Area Recreation Visitors Study and the National Outdoor Recreation Supply Information System (Cordell, Hartmann, Watson, Fritschen, Propst and Siverts, 1987). These data are housed by Forest Service Research in Athens, Georgia.

Future participation in recreation is uncertain and depends on

Table 1. Percentage Changes in Future Outdoor Recreational Trips Taken by American Public

Activity	Percentage Change in Trips by 2000 Under Alternative Public Recreational Opportunity Growth Scenarios			
	Decreased Growth	Zero Growth	Medium Growth	High Growth
Land				
Developed Camping	16	17	20	23
Picnicking	5	7	10	13
Sightseeing	15	16	17	18
Family Gathering	12	16	20	25
Pleasure Driving	12	13	15	17
Visiting Historic Sites	18	18	19	21
Attending Events	11	12	15	17
Visiting Museums	15	16	18	19
Off-road Driving	4	5	5	6
Biking	21	22	24	25
Running/Jogging	26	27	31	34
Walking	13	14	16	18
Cutting Firewood	10	11	12	14
Collecting Berries	10	12	14	16
Visiting Prehistoric Sites	28	29	31	32
Photography	18	20	25	29
Day Hiking	25	27	30	33
Horseback Riding	16	19	22	26
Small Game Hunting	-10	-8	-5	-2
Big Game Hunting	-7	-4	0	4
Nature Study	2	4	9	14
Backpacking	28	31	36	41
Primitive Camping	10	12	15	18
Wildlife Observation	11	14	20	26
Water				
Pool Swimming	30	31	33	35
Motorized Boating	3	5	7	10
Water Skiing	9	10	11	13
Rafting/Tubing	-2	8	34	67
Canoeing/Kayaking	7	10	16	22
Other Boating/Rowing	10	11	12	13
Stream/Lake Swimming	2	4	7	9
Saltwater Fishing	3	4	8	12
Warm Water Fishing	-10	-9	-8	-7
Cold Water Fishing	11	11	12	14
Snow/Ice				
Downhill Skiing	41	46	51	57
Cross-Country Skiing	32	37	47	57

changes in such factors as population size and characteristics, as well as government actions. Trends in recreational trips were, therefore, projected under four scenarios or possible futures. Changes in demand factors such as income, population and age were assumed to increase into the future at a moderate and widely accepted rate. The four scenarios reflected different assumed growth rates of recreational opportunities. The decreased growth scenario depicted public recreational opportunities as decreasing over time, perhaps by attrition of old sites. The zero growth scenario depicted growth of public recreational opportunities as unchanging over time. The moderate growth scenario assumed public recreational opportunities would increase at a moderate growth rate over time (about one-half of one percent per year). In the high growth scenario, recreational opportunities were assumed to increase at a high rate over time (equal to about one percent per year, or equal to expected population growth).

The four scenarios enabled measurement of the sensitivity of future recreational trip consumption to alternative growth rates of public recreational opportunities. All are viewed as feasible and possible. The scenarios are of potential interest to state and federal governments which must make decisions about national forests, state parks and other public lands in the future.

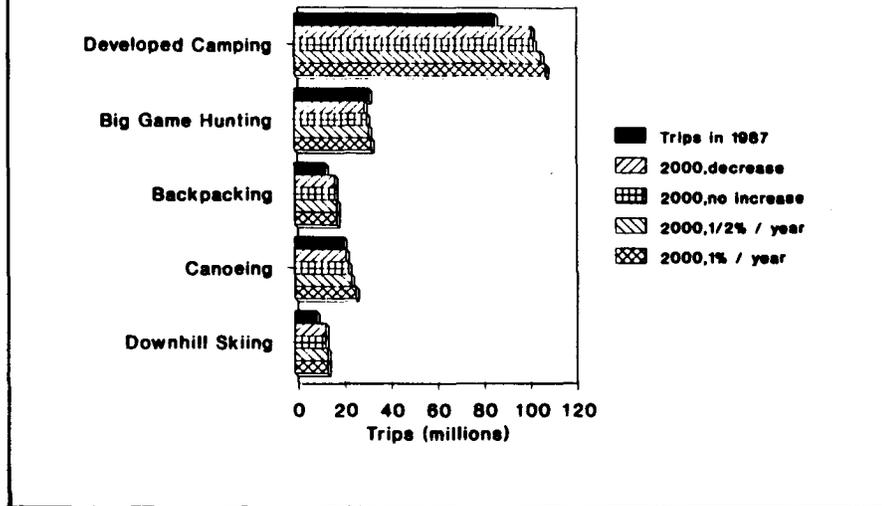
Percentage changes in recrea-

tional trips taken by the American public by the year 2000 under the four recreational opportunity growth scenarios are shown in Table 1. Percentage changes from Table 1 are shown graphically in Figure 1 for selected activities. Across the four alternative recreational opportunity growth scenarios, annual trips for most recreational activities are projected to increase by the year 2000. Notable exceptions are consumptive uses including big and small game hunting and warm water fishing. Under the assumption of either a decrease or zero growth of public recreational opportunities, hunting and fishing

trips are projected to decrease slightly by 2000. Small game hunting and warm water fishing also are projected to decrease by 2000 under the assumption of either medium or high growth of public recreational opportunities, indicating that these activities are decreasing in popularity.

Big game hunting is projected to increase under the assumptions of either medium or high growth of public recreational opportunities. All other activities besides big and small game hunting and warm water fishing show varying degrees of consumption increases by 2000. The magnitude

Figure 1 - Projected Change of Outdoor Recreational Trips 1987 - 2000 with Different Rates of Increasing Supply



of consumption increases is dependent on the particular activity in question and whether public recreational opportunities are assumed to decrease, or grow at zero, medium or high rates.

The Cost of Participating in Outdoor Recreation

The interaction between recreation demand and supply is summarized by the percentage change of future total trip costs (travel expenditures, time costs and fees). A zero percentage change suggests that recreation demand and supply are increasing at about the same rate. A negative percentage change means that trip costs are decreasing over time. The implication is that the recreation supply is growing faster than recreation demand. A positive percentage change means that trip costs are increasing, and that recreation demand is growing faster than recreation supply. Percentage changes in trip costs by the year 2000 under the four recreational opportunity growth scenarios are shown in Table 2.

The cost or price percentage changes in Table 2 provide a means for evaluating options the

public sector may take in providing increased recreational facilities or opportunities. For example, with either decreasing or zero growth of public recreational opportunities, trip costs are likely to increase over time for most activities. The implication of increasing trip costs is that finding recreational opportunities is becoming more and more difficult. People may have to travel greater distances and/or spend more time searching for uncrowded recreational facilities.

Under the assumption of medium growth of public recreational opportunities, trip costs remain constant over time for many activities. The implication is that the availability of recreational opportunities is remaining stable. Moderate facility growth is defined as about seven percent from base year 1987 to the year 2000. This represents an average of about one-half of one percent per year, and is about one-half of the expected growth percentage of persons 12 years and older.

Under the assumption of high growth of public recreational opportunities, trip costs decrease over time for many activities. The implication of decreasing trip

costs is that availability of recreational opportunities is increasing over time relative to demand growth. For example, people may not have to travel as far or spend as much time searching for recreational facilities. Thus, gains in the overall availability of opportunities will require a relatively high growth rate of public recreational facilities over time (a growth of about one percent per year). This increase may include the addition of new sites, improvement of access or better information about opportunities.

Some recreational activities appear to be more sensitive to public recreational opportunity growth than others. This sensitivity is indicated by the relative magnitude of trip cost changes across alternative public recreational opportunity growth rates. Activities that are highly dependent upon public recreational opportunities show a relatively large decrease in trip costs as public facilities are increased.

For example, under zero public recreational opportunity growth, trip costs for rafting are projected to *increase* seven percent by the year 2000. Under the assumption of high public recreational opportunity growth, however, rafting trip costs are projected to *decrease* by 20 percent by the year 2000. The relatively large decrease in trip costs caused by increasing public recreational opportunity growth from a zero rate to a high rate indicates that participation in rafting is highly sensitive to changes in rafting opportunities.

Conclusions

Although subject to error caused by an uncertain future, projections reported in this article are well grounded and are the standard tools of the business world. An example is grain futures reflecting grain dealers' speculations about future grain demand and supply. Recreation demand and supply needs to be taken out of the realm of the mysterious and unmeasurable. Recreation demand and supply are heavily influenced by market behavior and forces. Recreation customers are the same ones who buy bread at the grocery store, and they decide to recreate or not in a manner very similar to how they choose which brand and what amount of bread to purchase.

The estimates in Tables 1 and 2 are the best available current estimates of outdoor recreation demand and supply futures. They offer an opportunity to be responsive, rather than reactive to the future. The estimates provide unique and useful planning and decision-making tools.

It is not suggested, however, that they are the only relevant informational input. These research results are offered as advancement of the understanding of recreation demand and supply. The results should be interpreted and applied using professional judgment, and with due consideration of social, political and other qualitative factors which impact outdoor recreation demand and supply.

Table 2. Percentage Changes in Future Costs of Participating in Outdoor Recreation

Activity	Market-Clearing Cost Per Day in 1987	Percentage Change in Costs by 2000 Under Alternative Public Recreational Opportunity Growth Scenarios			
		Decreased Growth	Zero Growth	Medium Growth	High Growth
Land					
Developed Camping	\$21	2	1	0	-2
Picnicking	40	1	1	-1	-2
Sightseeing	66	1	1	1	0
Family Gathering	67	3	1	-1	-2
Pleasure Driving	40	1	1	0	-1
Visiting Historic Sites	60	2	1	1	0
Attending Events	54	2	1	0	-2
Visiting Museums	57	2	1	0	0
Off-road Driving	34	1	0	0	0
Biking	41	2	2	1	0
Running/jogging	12	3	2	1	-1
Walking	45	2	1	0	-1
Cutting Firewood	26	2	1	0	-2
Collecting Berries	30	3	1	-1	-3
Visiting Prehistoric Sites	14	3	3	2	0
Photography	31	3	2	-1	-4
Day Hiking	32	3	2	1	-1
Horseback Riding	33	3	2	0	-1
Small Game Hunting	33	2	1	-1	-2
Big Game Hunting	48	2	0	-1	-3
Nature Study	35	2	0	-2	-5
Backpacking	29	5	3	-2	-6
Primitive Camping	24	2	1	0	-1
Wildlife Observation	41	3	1	-2	-5
Water					
Pool Swimming	46	3	2	1	1
Motorized Boating	40	1	0	-1	-2
Water Skiing	41	1	1	0	-1
Rafting/Tubing	47	7	2	-9	-20
Canoeing/Kayaking	39	2	1	-1	-3
Other Boating/Rowing	40	1	1	0	-1
Stream/Lake Swimming	57	1	0	-1	-2
Saltwater Fishing	88	1	0	-1	-3
Warm Water Fishing	41	1	1	0	0
Cold Water Fishing	41	1	1	0	0
Snow/Ice					
Downhill Skiing	43	6	4	2	0
Cross-Country Skiing	28	7	4	0	-5

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