

A PREDICTIVE MODEL OF RECREATIONAL BEACH USE IN SOUTHERN CALIFORNIA

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Abstract: California's beach areas are a vital recreation resource for millions of Americans. A recent study by the National Oceanic and Atmospheric Administration (Leeworthy & Wiley, 2002) estimates that 12.5 million people visit these areas every year, accounting for over 151 million visitor days in the process. Only the State of Florida has a higher rate of visitation. Despite the popularity of California's beaches, very little information exists regarding the nature of beach use within the state. The purpose of this study was to develop profiles of beach users and non-beach users within southern California, and to develop a predictive model that demonstrates how demographics and activity preferences affect participation and non-participation at southern California beaches. Data were gathered in the spring of 2000 through a random telephone survey of 1,846 residents of Orange, Los Angeles, Riverside, and San Bernardino counties. The findings show that 1) there are significant differences in user status based upon age, ethnicity, level of education, county of residence, and presence of a disability; 2) that participants are most likely to be young coastal residents, and that a lack of education, increasing age, minority status, and presence of a disability are all likely to lead to non-participation. Activity preferences were not significant. The results of this study provide valuable baseline data for the managers of southern California's beaches, as well as researchers who are interested in modeling participation patterns.

Introduction

The California coast stretches 1,100 miles from the Oregon border to Mexico. Each year an estimated 566 million people visit this region, contributing over 27 billion dollars to the California economy in the process. This spending accounted for nearly

three percent of state's economy in 1995 and created over 500,000 jobs (King & Potepan, 1997). A recent National Oceanic and Atmospheric Administration Study (Leeworthy & Wiley, 2002) found California to be the second most popular destination for marine recreation in the United States. With an estimated annual participation rate of 17.7 million participants per year, California recorded nearly three times as many participants as did South Carolina, the third ranked state. Only Florida had a higher level of participation.

Beach use is an important component of marine recreation. Leeworthy and Wiley (2002) estimated that 61.9 million people visited a beach area in 1999. Due to the fact that some individuals participated on multiple occasions, the estimated number of visitor days was 853 million. California ranked second in terms of beach users per year (12.6 million) and the number of visitor days per year (151.4 million). Current trends indicate that these numbers will increase. By the year 2050, seventy-five percent of Americans will visit a beach or freshwater recreation area in a given year. The greatest increase in visitor days is projected along the Pacific Coast (Bowker and others, 1999). In California, much of the increase will be likely to occur at saltwater beaches due to the fact that a majority of the state's residents indicate a preference for saltwater beach use over other forms of water-based recreation (King & Potepan, 1997).

These figures indicate that California's coastal areas are a vital recreation resource, yet very little information exists regarding the nature of beach recreation. Though numerous studies have investigated marine recreation, a review of the literature revealed only one study that dealt specifically with beach use in California (King & Potepan, 1997). This is a significant finding given the demographic changes that are projected as California's population continues to grow. According to Murdock (1991, p.238), "Changes in rates of population growth, as well as in the characteristics of the population, were major determinants of the rapid growth in outdoor recreational activity in the past several decades and have been recognized as important determinants of both past and present levels of participation in recreational and leisure activities." As a result, the agencies that over-see California's beaches will be unable to promote effective, efficient, and equitable

management plans until further information is gathered.

The purpose of this study was 1) to develop profiles of beach users and non-beach users within southern California, and 2) to develop a predictive model that demonstrates how demographics and activity preferences affect participation and non-participation at southern California beaches. The results of this study were used to determine whether certain groups are more likely to be precluded from participation than others. According to McGuire and others (1990), participation models are useful because they expand the concept of non-participation from an activity-specific or constraint-specific level to a broader conceptual framework. In other words, participation models allow for the analysis of the many factors that contribute to non-participation and show how such factors inter-relate.

The results of this study are particularly relevant to the agencies that are responsible for managing beaches within southern California, and they provide a framework for other organizations that are interested in assessing visitation and non-use. An understanding of the factors that influence participation trends will become increasingly important as demographic trends begin to shift. Despite an increasing population, growth rates for most recreation activities are projected to slow as the population becomes older and more ethnically diverse (Murdock, 1991). Although over all participation rates are likely to increase, slower growth rates and differences in the ways that beach areas are being utilized will necessitate a shift in management priorities. While past efforts have focused on meeting recreation demand, future efforts will need to account for changing consumer preferences (Murdock, 1991).

Rationale & Significance

There are currently more than 34 million people living within the State of California and nearly 80 percent reside within one hour of the coast. Projections by the State Department of Finance indicate that California's population will reach 60 million by the year 2040. Hispanics will account for over 50 percent of the population and other ethnic groups will also increase in numbers (Locklin, 1999). These trends will have important ramifications for the management of California's beaches.

It is well documented that differences in race and ethnicity affect recreation participation. Hutchinson (1988) noted that whites and blacks tend to recreate in small groups whereas Hispanics prefer an extended family atmosphere. Johnson and Bowker's (1999) research indicates that blacks prefer developed recreation facilities while whites have a preference for natural areas. Shinew and others (1995) found that activity preferences differ among whites and non-whites based on social class. Other demographic variables such as age, county of residence, gender, household income, level of education, and physical disability have also been shown to influence the use of leisure time (Leeworthy & Wiley, 2002).

As a result of these differences, researchers have attempted to identify the users of recreation services and the ways that resources are being utilized. Hecock (1970) found that use patterns at public beaches along the Atlantic Coast differed according to the demographic characteristics of the visitors. Hecock explained that use patterns are related to the perceptions of site characteristics among different demographic groups. Fensenmaier (1988) studied visitation patterns and activity preferences at Oklahoma State Parks and found similar results.

While certain groups may be attracted to particular activities/sites, it is also possible that under-represented groups are being discouraged or prevented from visiting the beach. Previous research has demonstrated that certain groups are more likely to be precluded from participation in an activity because the presence of constraints limits the formation of activity preferences. Shinew and others (1995, p.87) state,

A leisure preference implies having a choice among a set of viable alternative activities. However, choices are rarely free of limitations imposed by social roles, socio-economic resources, and familiarity with or awareness of available options. Understanding what might limit or constrain preference formation as well as actions based on preferences would suggest ways for disadvantaged individuals and groups to negotiate barriers to engagement in fulfilling, enjoyable, and meaningful activity.

Searle and Jackson (1985a) have identified four

areas that can be assessed from a constraints perspective: leisure philosophy, policy analysis, programming, and marketing. Given that public service agencies are responsible for providing opportunities for all classes of citizens, research that identifies who is being served and who is not will allow for the development of philosophically sound management strategies. Identifying those who are unable to participate, and why, will allow managing agencies to determine whether or not such factors are within their control. Efforts can then be taken to reduce constraints and policies can be developed to make opportunities more available to under-represented sectors of the population.

Research is also needed to identify current and potential target markets. This will allow for the development of strategies that will increase accessibility and drive demand towards suitable facilities. In some cases, managing agencies may find it necessary to construct new facilities to accommodate changing visitation patterns. Research findings can then be used to justify budget proposals. This is an important consideration given that funding is often associated with visitation rates. Should visitation decline, marketing efforts can be undertaken to promote use by groups that have not traditionally utilized beach areas, a necessary strategy if current funding levels are to be maintained.

Theoretical Background

The hierarchical model of constraints, proposed by Crawford and Godbey (1987) and extended by Crawford and others (1991), was used as a basis for the investigation. This model categorizes constraints as intrapersonal, interpersonal, or structural and groups them in a relational manner. Intrapersonal constraints are internal factors that influence people on an individual basis. Examples include personality traits, cultural values, and psychological states. Interpersonal constraints, the result of interaction between individuals or groups of individuals, include lack of partners, crowding, and incompatible uses. Structural constraints are specific to the activity such as lack of time, expense, and limited access.

Fundamental to constraint theory is the idea that limiting factors can be negotiated. Crawford and Godbey (1987) proposed that participation was dependent upon the successful negotiation of

constraints. Those who were unsuccessful either chose not to participate or were prevented from doing so. Crawford and others (1991) expanded upon the model by hypothesizing that intrapersonal constraints affect the formation of activity preferences. Before a preference can be formed these constraints must be overcome. Once a preference has been established the individual encounters interpersonal constraints that must be successfully negotiated. Success leads to interpersonal compatibility and coordination. However, there are also structural constraints that must be overcome. Participation results only after all three categories of constraints have been negotiated. In this instance, the strength of the preference has outweighed the strength of the constraints.

Constraints have been shown to affect different groups of people in different ways. Searle and Jackson (1985a, 1985b) studied the constraining effects of seven socio-economic variables upon recreation participation in Alberta, Canada. They found that income and age were the most significant variables in the reporting of constraints. The manner in which constraints affected participation also varied accordingly. Lack of time, lack of someone to participate with, lack of opportunities near home, and crowding were the most significant factors in relation to non-participation. Income was the most significant socio-economic variable, affecting both the frequency of constraints, and the type of constraints that were encountered. This finding supported the work of Howard and Crompton (1984) who reported a significant relationship between low income and nonparticipation.

Gender has also been shown to affect recreation participation (Bialeschki & Henderson, 1988; Henderson et al., 1988; Henderson, 1991; Henderson, 1994; Shaw, 1994). Shaw's study found that lack of time, lack of money, and lack of transportation were more prevalent among women than men. Although both sexes experience these constraints, they occur more frequently among women due to differences in social status and gender roles.

County of residence is another important factor that should be included in participation studies. Leeworthy and Wiley (2002) found that those who

live in coastal counties are more likely to participate in beach recreation than those who live in non-coastal counties. It is likely that this trend is associated with constraints such as lack of time and lack of money. However, it is also possible that those who live in non-coastal counties choose to spend their time elsewhere because they have developed a preference for non-beach related activities. The usefulness of a model that predicts those values that are most likely to influence use and non-use is particularly evident in this instance.

Of particular relevance to constraint studies is the influence of race and ethnicity. According to Phillip (1995, p.113), "race has functioned as the single most important constraint to education, housing, and employment in the United States and should also be an important constraint to leisure." The under-representation of minorities in outdoor recreation activities has been well documented (Carr and Williams, 1993; Floyd et al., 1994; Phillip, 1995; Shiner et al., 1995; Johnson and Bowker, 1999).

The previously listed demographic characteristics are important factors that need to be assessed in regard to beach use and nonuse in southern California. Leeworthy and Wiley (2002) have shown that nationally, a distinct difference exists between beach users and nonusers. In general, they found that beach users are likely to be younger, white males with high levels of education and income who reside in coastal counties. The following hypotheses were developed based upon the results of previous research:

H1: Older respondents are less likely to be beach users than non-users.

H2: Non-whites are less likely to be beach users than non-users.

H3: Those with lower levels of education are less likely to be beach users than non-users.

H4: Females are less likely to be beach users than non-users.

H5: Those who favor non-beach related activities are less likely to be beach users than non-users.

H6: Those who live in non-coastal counties are less likely to be beach users than non-users.

H7: Those with a physical disability are less likely to be beach users than non-users.

H8: Those with lower household incomes are less likely to be beach users than non-users.

H9: Those with full-time jobs are less likely to be beach users than non-users.

Methods

This study is part of a larger project that was conducted by the Survey Research Center at California State University, Chico. Data were gathered in the spring of 2000 through a random telephone survey of 1,846 southern California residents in Orange, Los Angeles, Riverside, and San Bernardino counties. Respondents were asked a series of initial questions to classify their user status. Separate scripts were then used to interview residents about the nature of beach use and nonuse in Orange, Los Angeles, Ventura, San Diego, and Santa Barbara Counties. The responses to selected questions have been utilized to produce a predictive model of beach use in southern California.

There were 1,846 completed interviews. A total of 965 potential respondents refused to participate in the survey and an additional four respondents completed only part of an interview. This yielded a cooperation rate of 66%. A total of 1,570 cases remained unresolved at the completion of the survey. An additional 793 cases were never answered or had a perpetual busy signal, 308 were answering machines, and 468 resulted in scheduled callbacks that were never successfully completed. Of the 1846 completed interviews, a total of 35 were unusable due to data entry errors. Therefore, the actual response rate is equal to 1811 (64%).

Once the data was collected descriptive statistics were compiled to create profiles of users and nonusers. A logistic regression model was then constructed to identify those variables most important in determining beach use and nonuse. Knoke and Bohrnstedt (1994) note that logistic regression is an appropriate method when analyzing a dichotomous dependent variable (one that one that contains two choices or outcomes) with continuous independent variables. Logistic regression is similar to a cross-tab, only more powerful because it adjusts for the influence of the other independent variables. This method is useful because it illustrates how the degree of change within an independent variable influences the outcome of the dependent variable while holding all other factors constant. In other words, logistic regression will explain how changes in a person's age (or other demographic characteristic) will

predict participation and non-participation while controlling for the influence of other variables.

Findings

A majority (55%) of those sampled had visited a southern California beach within the previous year. Those between the ages of 18-29, 30-39, and 40-49 were more likely to be beach users (67%, 61%, & 66% respectively) than non-beach users. Those over 49, on the other hand, were less likely to be beach users. Among this group, 55% of those between the ages of 50-64 had not been to the beach within the previous year. The rate of non-participation was higher for those 65 and over (68%).

Whites tended to be beach users (61%) as opposed to non-beach users (39%). Approximately half of non-whites (51%) had visited a southern California beach within the last year. Gender exhibited similar results. Males were more likely to be beach users (60%) than non-beach users. Females, on the other hand, were about equally likely to be beach users (52%) or non-beach users (48%). Presence of a disability seemed to have a stronger effect. Those with a disability were more likely to be non-participants (66%) than participants. Those without a disability, on the other hand, were more likely to visit the beach (58%) than to refrain from doing so.

Level of education exhibited a clear trend in which higher rates of participation were related to corresponding increases in schooling. Those without a high school degree were less likely to be beach users (35%), than were high school graduates (47%), those with some college education (62%), and college graduates (66%). Household income exhibited a similar trend. Those with lower levels of income were less likely to be beach users than non-users. Those from households who earned less than 50 thousand per year were about equally likely to use the beach (54%) as opposed to going elsewhere. An income of 50-99,999 thousand per year resulted in a participation rate of 66%. The highest rate of beach use (77%), however, was among those from a household that earned over 100,000 per year.

Those who live in coastal counties were more likely to be beach users (59%) than non-beach users (41%). Non-coastal residents were less likely to be

beach users (44%) than non-beach users (56%). Of the four counties included in the study, participation rates were highest among Orange County residents (70%), followed by Los Angeles County (55%). The two inland counties, Riverside and San Bernardino, had participation rates of 46% and 42% respectively.

Employment status exhibited an interesting trend. The highest rate of participation was among those with part-time jobs (69%). Those employed full-time were slightly less likely to use the beach (62%). A significant decrease in participation occurred among the retired (32%) and the unemployed (48%). Another interesting trend was exhibited by activity preferences. Those who preferred beach-related activities were only slightly more likely to visit the beach (68%) than those who preferred non-beach related activities (65%).

The output from the logistic regression model indicates that a typical southern California beach user is a white coastal county resident, between the ages of 18-29, who has graduated from high school and who does not have a disability. Therefore, hypotheses 1,2,3,6, &7 were accepted. The remaining hypotheses, however, were rejected. Table 1 provides the relevant output of the logistic regression model. The degree of influence is measured by the odds ratio - the greater the variation from zero, the greater the influence of the independent variable. It is important to note that one group has been left out of each categorical independent variable so that it can serve as the baseline comparison against which all other groups are measured. For example, the age group 40-49 is the base line that is used to determine the degree of influence that the other four age categories have upon the dependent variable. A measure of less than one indicates that those in a selected age group are less likely to be beach users than are 40-49 year olds. A measure of greater than one indicates that those in a selected age group are more likely to be beach users than are 40-49 year olds. A measure of zero indicates that those in a selected age group are equally as likely to be beach users as are 40-49 year olds. It is the strength of the odds ratio that ultimately reveals the most information about the predictive value of the independent variable. Therefore, the results of these measures are interpreted along with the measures of statistical significance.

There are 1811 observations accounted for in the logit model. However, some of the respondents refused to answer specific demographic questions. As a result, the number of cases for some of the variables does not equal 1811. In the case of activity preferences, the missing information can be explained by noting that not all of the respondents stated that they have a favorite activity. As a result, these individuals were not asked the question that pertained to activity preferences. In order to account for all of the cases, the missing responses have been recoded into separate independent variable categories. For example, 93 respondents refused to give their age. These cases, which appeared in the data set as refusals, were recoded into the Age Missing category. This was also the case for activity preference, disability, employment status, ethnicity, and household income. All cases were accounted for under county of residence, gender, and level of education. Therefore, it was unnecessary to create recodes for these variables.

County of residence, age, disability, ethnicity, and level of education had a significant influence on beach use and non-beach use. The most important predictors of use were coastal county residence and age (18-29). Coastal residents residing in Los Angeles and Orange counties were 2.01 times more likely to visit the beach than are non-coastal residents residing in Riverside and San Bernardino counties. Those between the ages of 18-29 were also positively associated with beach visitation. This group was 1.45 times more likely to visit the beach than are 40-49 year olds.

The most salient predictors of non-use were minority status (.65), lack of a high school degree (.62) and presence of a disability (.60). Age, however, is also significant. Those 50 and older were less likely to use that beach than are 40-49 year olds. The odds ratio for those between the ages of 50-64 was .43, while the ratio for those over 65 was .40. Interestingly, gender, employment status, household income, and a preference for beach-related activities were not significant predictors of beach use and nonuse.

Conclusions & Recommendations

The results of this research are similar to those from the national study by Leeworthy and Wiley (2002). It was determined that beach users tend to be young white coastal residents with higher levels

of education and no disabilities. However, this study did not find significant differences based on gender and household income. This suggests that constraints to beach visitation are likely to be related to other characteristics. County of residence was the strongest predictor of beach visitation. While a variety of factors are likely to contribute to this finding, transportation-related constraints are a possible explanation. Many of the beaches within southern California are within a two-hour drive of Riverside and San Bernardino counties. However, traffic congestion and parking problems are likely to increase perceptions of constraints among potential users. These areas, along with Los Angeles County, also have a higher percentage of minority residents - a factor that decreased the likelihood of beach visitation. Another factor that has been associated with this demographic is a lower level of education. Together, these characteristics may lead to greater perceptions of constraints among non-coastal residents.

The results of this study also indicate that beach use declines as age increases. Previous research has demonstrated that older individuals face a wider range of constraints than younger people. Therefore, it is logical to assume that constraints are precluding the elderly from visiting southern California's beaches. While this trend may be related to health constraints that develop as one ages, it is also possible that older people are less inclined to visit the beach due to interpersonal constraints/conflicts with a predominately younger class of users. Given the demographic changes that are projected within the state, it is recommended that managers identify the factors that are leading to higher rates of non-participation among the elderly, minorities, non-coastal county residents, and those with disabilities. While managers are likely to have little control over many of the constraints faced by these groups, it will be necessary to account for the possibility that interpersonal and structural constraints are precluding members of these groups from visiting southern California's beaches.

Managers should also consider the possibility that demographic changes will lead to new participation patterns. Although the results of this study indicate that older individuals and minorities are less likely to visit the beach, the rapid growth of these populations will result in a corresponding increase

in beach use. Therefore, managers will be forced to account for changes in the ways that these areas are being utilized. In order to do so, it will be necessary to determine the type of opportunities that are desired, along with existing and potential constraints. This will allow for a more realistic determination of the impact that shifting demographic patterns will have upon the management of southern California's beaches. Questions for future research include: What are the preferred activities/settings among existing and potential beach users within southern California. How are participation trends changing over time? Will changing use patterns lead to conflicts between user groups? How can managers best accommodate the needs of an increasingly diverse public? Answering these questions will allow managers to focus their efforts on the identification of desirable resource, social, and managerial conditions. This will allow for the development of a coastal recreation opportunity spectrum that will assist managers in matching desirable conditions with existing resources. In formulating such a plan, it will be important to identify existing constraints so that managers can account for the needs and desires of those groups that would otherwise remain unnoticed. This research takes an important step in that direction by outlining potential areas of concern, and by establishing a baseline for monitoring participation trends over time.

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