ABSTRACT. The varying parameter multiple site travel cost model is used to determine the economic valuation of fishing success for a sample of Long Island sports fishermen. The marginal value of angler success (measured as the number of fish caught) and per trip consumer surplus are computed and distinguished by the motivations for fishing trips and by controls for the availability of alternative sites. The valuation of success and consumer surplus are found to be substantially higher when controlling for substitution effects.

Keywords - recreational fishing / economic valuation / travel cost method / demand substitution / multiple-site model.

1. INTRODUCTION

Like other natural resources fishery resources are limited or scarce. The optimum utilization of fishery resources in terms of net social benefits generated is a major concern for public decision makers. This in turn requires an efficient allocation of fish stocks between commercial and recreational fishing. However, it is not an easy task to compare the benefits from recreational fishing, usually a nonmarket activity, with those from commercial fishing. In the absence of market prices the task for economists is to devise proper nonmarket valuation techniques to simulate market demands in order to estimate the social benefits of recreational fishing.

The purpose of this study is to use the travel cost method to determine the economic valuation of fishing success for individual sports fishermen and to investigate the sensitivity of these estimates to the availability of substitutes. We use the varying parameter travel cost model to estimate the value of angler success (measured as the number of fish caught) within a multi-site framework. The marginal values of angler success and per trip consumer surplus are derived and are distinguished by the motivations for fishing trips and by controls for the effects of alternative sites.

Since the travel cost method (TCM) was first suggested by

Hotelling [16], it has been applied extensively in valuing recreational benefits. The basic hypothesis is derived from the fact that it is difficult to estimate a demand function for publicly-owned recreation sites since typically entry to these sites is provided free or at a nominal-fee. However, it may be possible to infer how people would respond to changes in the entry price by examining data on how individuals respond to differences in travel costs. Recreationists pay an implicit "price" for a site's services when they visit it. This implicit price includes vehicle-related and time costs of the trip. The diversity in visitor's origins provides the information to estimate a demand function for a site services.

The essential feature of the simple TCM is that the quantity of visits, or visits per capita in the case of the zonal TCM, is related to the cost of reaching the site. Cost is usually defined as some linear function of distance. The basic TCM has the following form:

\[ Q = f(P, X) \]  

where:

- \( Q \) = visits per capita to a given site;
- \( P \) = travel cost and entrance fees; and
- \( X \) = a vector of demand shifters such as income, age, education, etc.

Simple models like Equation (1) have been used in a variety of studies. Clawson and Knetsch [10] used such a model to estimate the demand for national parks. Other studies include: reservoirs ([19], [14]), goose hunting [2], river running [5], and urban recreation [11].

The basic TCM has been generalized in recent years to include a multi-site, multi-attributes framework to where demand functions or a system of demand functions for several sites are estimated. Since a site's characteristics influence the productivity of its services, it is reasonable to relate demand functions to the site's characteristics or qualities. While it is difficult to measure incremental changes in the quality services for a single site, it is possible to observe quality effects by using data for several sites. Examples of the empirical estimation of multi-site models are Burt and Brewer [6]; Cesario and Knetsch [8]; Vaughan and Russell [29]; Samples and Bishop [25], and Rosenthal [24]. Empirical applications of travel cost models in estimating recreational demand have achieved somewhat satisfactory results in recent years. Yet many problems encountered by researchers still remain.

2. CURRENT ISSUES IN TRAVEL COST METHODOLOGY

Time costs are one of the important considerations in the TCM. The basic TCM fails to consider that the cost of time plays an important role in determining the demand for outdoor recreation. Time, like money, is part of the total costs of recreational activities.