

## Measuring Values in Recreation: Six Different Approaches

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### INTRODUCTION

The increase in demand for outdoor recreational resources is increasing the pressures on the landbase which is already under heavy demand from agriculture, urban development, industry, transport and even forestry. In Ireland, recreation has the greatest impact on the urban fringe where the conflicting demands are also greatest. Recreation must be able to compete with other uses if it is to be regarded as a legitimate land use. It is also important in an era of financial constraint that investment should not continue on the vague notion that it is "a good thing" especially where no demand exists. It is, however, essential that recreation should not suffer because of financial constraint when the demand is very likely to increase in the future due to changing patterns in society.

The recreation land manager and those responsible for resource allocation, both financial and natural, must be able to examine proposed recreation projects using cost benefit approaches. There are two separate aspects to benefit calculation. Recreation managers must be able to estimate the level of demand or consumption, which should be measured in visitor days as opposed to visits, and the willingness of users to pay for the service. This paper deals with the techniques which are available to measure user's willingness to pay for recreation services.

Many people question the feasibility of placing a value on an experience as personal as an afternoon spent in the forest or a day spent hiking in the hills. However, Knetsch and Davis (1967) stated that "outdoor recreation facilities differ only in kind, but not in principle, from other goods and services".

As with other goods and services, Clawson and Knetsch (1966) suggested that recreation values "are reflected . . . by what people are willing to give up to obtain them". Therefore, by measuring what people are willing to give up in order to enjoy recreation, whether it be travel costs or payments or any other measure, the value of the activity itself can be measured.

### BENEFIT MEASUREMENT TECHNIQUES

Six methods were field tested during this study. Some of the methods, for example the travel cost methods, have a common basis, but all interpret the data in a different way. The six methods studies are outlined below.

#### *Method I—The Cost Approach*

One of the earliest methods for measuring recreation benefits was that of the U.S. National Park Service which proposed that benefits would equal twice the costs. This method proposed that primary benefits, i.e. benefits to the users, equal costs, while secondary benefits, i.e. benefits to the local community, equalled primary benefits (Trice and Wood 1958). However, in the present study secondary benefits were not included since there was no benefit accruing to the local community.

#### *Methods II and III*

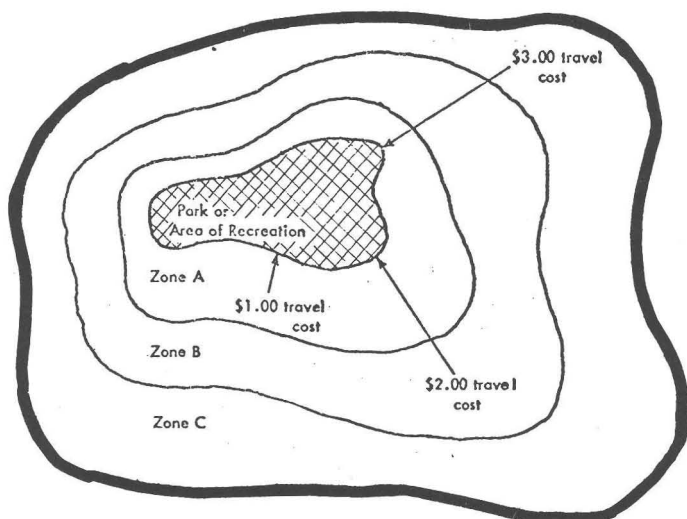
Travel costs, i.e. the cost of travel to the recreation area, are important and are widely used in methods of visitor benefit calculation. Travel costs were first proposed by Prof. Harold Hotelling in a submission to the National Park Service in 1947 (Prewitt 1949). Hotelling's approach proposed that those travelling the greatest distance to a recreation area set the price for that area. Therefore, those travelling from a nearer zone made a saving (the consumer surplus) which was a measure of the benefit accruing to them. Those travelling from Zone C (Fig 1) pay \$3.00 while those travelling from Zone A only pay \$1.00 and therefore make a saving of \$2.00 per trip. However, from Hotelling's basic model two different interpretations have resulted, the first proposed by Trice and Wood (1958) and the second proposed by Clawson (1959).

#### *Method II—The Trice and Wood Method*

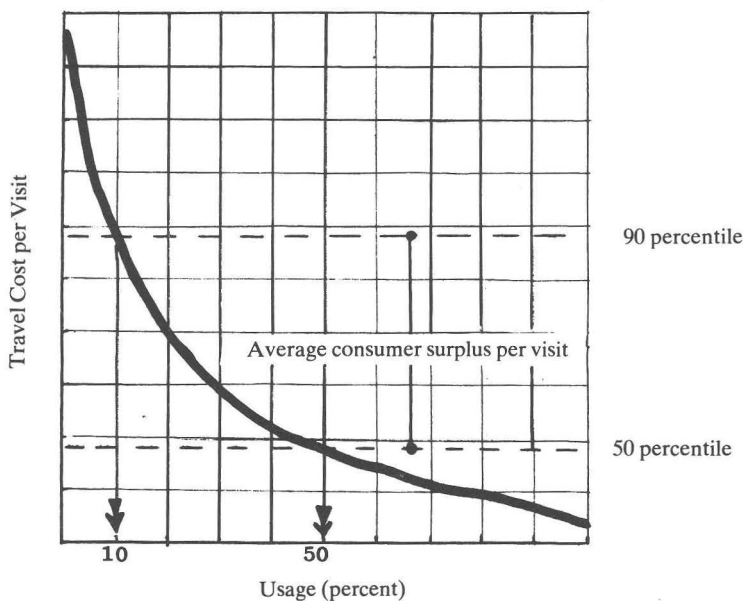
These latter workers followed closely Hotelling's approach. However, they used the average consumer surplus per visit which they calculated by subtracting the average cost per visit from the cost at the 90 per cent level of attendance. This eliminated those who travelled from extremely long distances. For example in Fig 2 the average cost would be 1.8 units while the cost at the 90 per cent level is 5.8 units. This gives an average consumer surplus of four units.

#### *Method III—Clawson's Approach*

Clawson (1959) developed the consumer surplus to its present and most widely used form. The method developed by this worker

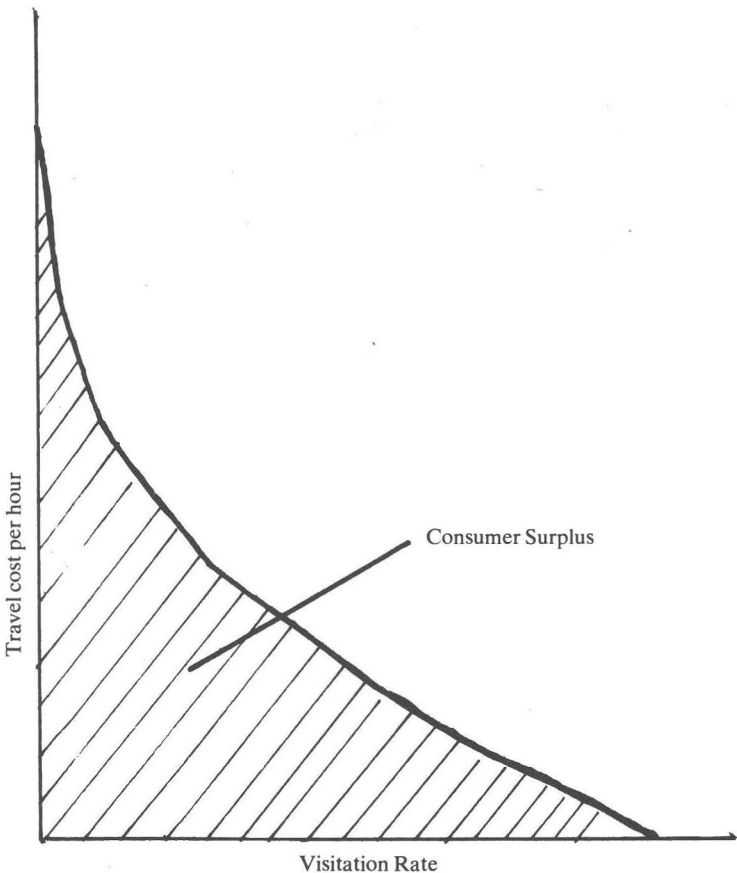


**Fig 1** A representation of Prof. Harold Hotelling's Concentric Travel Cost Zones around a hypothetical recreation area. (After Trice and Wood 1958).



**Fig 2** Calculating the consumer surplus using the model proposed by Hotelling and adapted by Trice and Wood (1958).

involved the construction of a demand curve for the recreational experience. Clawson defined distance zones and collected data on the number of visitors from each zone. He then simulated a demand curve for the recreational facility. The actual responses to travel costs, (in visits per head of population), were used to simulate hypothetical increases in entrance fees. Clawson proposed that the area under this derived demand curve (Fig 3) was therefore a measure of the total consumer surplus for the area.



**Fig 3** Hypothetical demand curve using Clawson's method of consumer surplus simulation. (After Clawson 1959).

### *Methods IV, V and VI*

The second group of methods involved direct questioning of the visitors to infer willingness to pay.

#### *Method IV — Cost-Less Choice Method*

Romm (1969) suggested the use of the cost-less choice method. Respondents were asked to choose between the service under investigation and products and services of a known value. The known products were arranged in order of decreasing value (Table 1). If the respondents chose the alternative 'A', (for example Clean Air), in all cases, as in Col. 3 then the value of one year's clean air would be \$1,900. If the response was similar to Col. 4 then clean air has no value. Inconsistent responses, such as those in Col. 5 cannot be interpreted however.

Table 1 Possible responses using cost-less choice method.

(1)	(2)	(3)	(4)	(5)
Alternatives	Cost	Possible Responses		
New Family Car	1900	< A	> A	> A
New Swimming Pool	1600	< A	> A	> A
Family Holiday	1000	< A	> A	< A
New Furniture	850	< A	> A	> A
New Television	650	< A	> A	> A

#### *Method V — Willingness to Pay*

This method made use of Bohm's suggestion (1971, 1972) to overcome bias. Two questions were used. One elicited the upper limit of payment, while the second elicited the lower limit of payment. The true value was said to lie mid way between the responses.

#### *Method VI — Willingness to Travel*

The willingness to pay method might fail because of the free nature of recreation in Ireland. Murphy and Gardiner (1983) found that some respondents were unwilling to indicate willingness to pay when questioned. Therefore a willingness to travel question elicited information on the respondents' willingness to travel which was used as a surrogate price or payment. The time allowed for extra travel was also requested and this was used to check responses by simple correlation of indicated travel time and travel distance. It was felt that respondents were unlikely to cheat on both.

### FIELD TESTS

Shankill Wood, a small, frequently used recreation area, seven miles south west of Dun Laoghaire, was chosen as the location to field test the various methods. The area is surrounded by private land which is not suitable for recreation and which made it ideal for this study since there were no competing attractions adjacent to the area. Therefore, values could be attributed to the area solely.

A questionnaire was used to collect data (Appendix A) on randomly selected days from July 4th to September 11th, 1983. A personal interview method was used as this method maximised response (Shafer and Hamilton 1967).

Data from the questionnaires provided the basic information for all the methods with the exception of the cost approach. In the case of the cost approach costs were obtained from the Forest and Wildlife Service. These included annual site management and maintenance, lost timber production and site construction calculated as an annual payment. These costs were transformed to give a value for the period July to September. The number of visitor hours 'consumed' during the period was also estimated using the model proposed by Schreuder *et al* (1981). The total cost for the period divided by the total number of recreation hours 'consumed' gave the value per recreation hour.

All the evaluation methods employed in this study attempted to measure the same value, that of one hour of forest recreation. In order to examine the various methods' ability to give accurate and consistent estimates of this value, the approach adopted by Beardsley (1970) was used. Beardsley suggested that where clustering of values occurred, it gave increased confidence in the ability of the methods to give accurate estimates. Therefore, where two or more values were similar, they were assumed to be the most accurate.

### RESULTS

The value of a recreation hour at Shankill Wood determined by the six methods are listed in Table 2 for comparison. The values range from £0.061 to £0.93 per hour. Two sets of values cluster around the same point. Clawson's method and the cost method, with values of £0.075 and £0.061 respectively, and the Projected Travel Cost and Willingness to Pay methods, with values of £0.179 and £0.149 clustered around two points. This would indicate that the time value of the recreation hour lies in the lower values as opposed to the values indicated by the two remaining methods.

Table 2 The value of a recreation hour determined at Shankill Wood.

Method	Value (IR£)
Cost Method	0.061
Clawson's Method	0.075
Trice and Wood's Method	0.330
Projected Travel Cost Method	0.179
Willingness to Pay Method	0.149
Cost-Less Choice Method	0.930

## DISCUSSION

A number of methods have been developed for the evaluation of recreation values. Six of these were field tested in this project. It was found that a number of them suffer from defects which render them of limited value. The costless choice method, for example, failed in field use for two reasons. Firstly, the users were probably biased towards forest recreation when answering the questions because they were acutally involved in recreation at that time. In addition, the list of alternatives may not have been activities which all respondents would have undertaken. Similarly the recreational value obtained by the cost method is highly suspect since total revenue remains the same irrespective of the number of users. This is at variance with normal economic theory. Clawson's method also seems to have underestimated the true value of a recreation hour at Shankill Wood. This has been found to happen in other field tests where the recreation area is not the only attraction in the area (Grayson et al, 1972).

The method of Trice and Wood has also been found in previous studies to overestimate recreational values, since the value is set by the visitors who travel the greatest distance. These visitors probably set a higher subjective valuation on the recreational facility. In this study the methods which infer willingness to pay through questioning appeared to be most correct. The fact that these values are close supports this reasoning. The correlation between indicated travel time and travel distance (+0.723) increases the confidence in the results.

Thus it appears that these latter methods of recreational evaluation can be modified to give valid results under Irish conditions. Ideally, both methods should be used in any one situation so that they can validate one another. In view of the

emphasis placed upon cost-benefit evaluation of recreational investment by the National Planning Board (Anon, 1984) it appears reasonable that these methods should now be tested on a wider scale in the country.

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#### APPENDIX A QUESTIONNAIRE

Date: ..... Time: ..... Weather: .....

Interviewee Details: .....

Length of Stay: ..... Occupation: .....

1. Origin of Visitor: ..... Miles
2. Is this site your only destination on this visit? Yes ..... No .....
3. Mode of transport: Car ..... Bus ..... Bike ..... Foot ..... Motor Bike .....
4. No. in Groups: Adults ..... Children .....
5. Is Killiney Hill or any other forest nearer to you? Yes ..... No .....
6. How long did the journey from your home to here take? ..... Hours
7. If this area was further away would you still travel to it? Yes ..... No .....
8. If yes to 7, how much further would you travel?  
.....5 .....10 .....15 .....20 .....25 .....30 .....35 .....40 miles
9. What is the maximum time you would spend in travel to an amenity like this?  
.....¼ hr. ....½ hr. ....1 hr. ....1½ hrs. ....2 hrs.
10. In relation to each of the following which would you prefer to do? (Assume both cost the same).  
Visit Shankill Wood ..... or visit Zoo .....
- Visit Shankill Wood ..... or visit Museum/other forest .....
- Visit Shankill Wood ..... or visit Cinema .....
- Visit Shankill Wood ..... or attend Football or Sports Match .....
- Visit Shankill Wood ..... or visit Seaside .....
- Visit Shankill Wood ..... or visit Powerscourt Waterfall .....
11. If a charge was introduced to cover some of the cost of upkeep would you still visit?  
Yes ..... No .....
12. If yes to 11, what is the maximum charge per person you would be willing to pay?  
.....10 .....20 .....30 .....40 .....50 .....75 .....£1
13. If an honesty box was in use how much would you feel obliged to pay per person?  
.....0 .....10 .....20 .....30 .....40 .....50 .....£1



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