Monitoring and Management of Visitor Flows in Recreational and Protected Areas
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Observation as a Technique for Establishing the Use made of the Wider Countryside: a Welsh Case Study

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Abstract: Surveying the use made of the wider countryside for recreation is problematic due to the scale of the area to be covered. In particular the distribution, numbers and activities of countryside visitors are difficult to ascertain using conventional methodologies such as questionnaires and counters. This paper describes an observational methodology that has been used investigate recreational activity in a 466 square kilometre area of Mid Wales. The results illustrate the countryside resources that are being utilised, the activities undertaken and the number of people involved. It is concluded that observation is a valuable tool in understanding the nature of recreation in the wider countryside.

INTRODUCTION

The strategic planning of recreation in the countryside is becoming increasingly important as a means of ensuring that the demands of visitors to the countryside are met whilst controlling any adverse effects that recreation may have on the environment. Strategic planning normally involves considering large areas of countryside such as the area contained within a national park or within an administrative boundary. Research has shown that such strategic planning is often based upon inadequate levels of information regarding countryside usage and is often based on nothing more than presumption (Curry and Pack, 1993).

To plan countryside recreation strategically a wide variety of information is required about the countryside and the visitor. Information requirements include:

- The countryside resources that are available for countryside recreation
- The constraining factors that may limit the use of areas for recreation
- The profiles of visitors
- The number of visitors
- The distribution of visitors
- The activities carried out by visitors
- The attitudes of visitors

Trends in visitor usage of the countryside

There are a variety of established methodologies for providing answers to many of these questions (such as questionnaires, focus groups and facilities audits). Many of these methodologies work at a localised site level but are not so effective when it comes to larger countryside areas. In particular, present methodologies find it difficult to establish visitor numbers, visitor distribution and the activities carried out by visitors in open countryside where visitor density may be low. This paper presents an observational methodology that can establish use, distribution and activities over areas of open countryside.

OBSERVATIONAL STUDIES

Observational studies, often labelled as 'naturalistic' and sometimes referred to as behavioural mapping, are characterised by the systematic and unobtrusive observation and recording of behaviour (Ely, 1981; Campbell, 1970; Glancy, 1986; Beer, 1987). When studying large or highly mobile mammals to establish distribution, resource usage and behaviour, researchers are forced into an observational approach (mammals are not known for their ability to fill in questionnaires or sit on focus groups!). Can we adapt the methods used to survey mammals to study *Homo sapiens?* An example of an observational approach is the national badger survey carried out in the United Kingdom by Professor Stephen Harris of the University of Bristol (N.C.C., 1990, Wilson, Harris and McLaren, 1997). This survey was carried out between 1985 and 1988 and repeated between 1994 and 1997. This survey sought to find answers to key questions concerning badgers such as how many badgers there were in the countryside, their distribution (both at a national and habitat scale) and whether the population was changing (both in numbers and distribution)? The methodology used for the national badger survey was based upon systematic observation for signs of badgers within randomly selected one-kilometre squares, selected in proportion to land area as classified by a land classification scheme, (Bunce, Barr, Clarke, Howard and Lane, 1996). Similar surveys have also been carried out on bats (Walsh and Harris, 1996a and b; Walsh, Harris and Hutson, 1995).

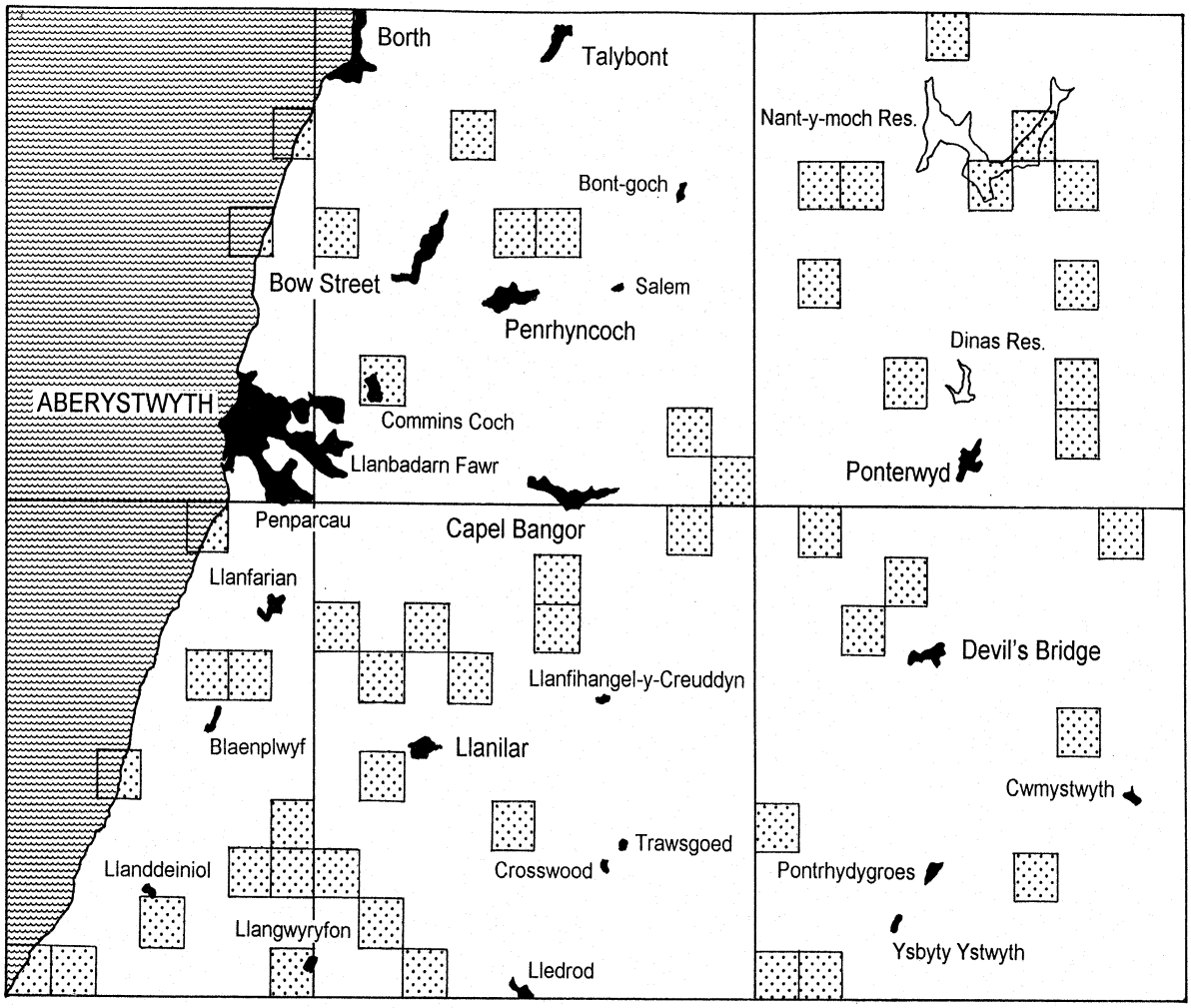

Figure 1. Map of the Aberystwyth area, showing the randomly chosen 52 Ordnance Survey one by one kilometre grid squares that were surveyed for the study

There are therefore tried and tested methodological approaches for systematic research through the use of observation, of mammal distribution, numbers and behaviour.

It can be noted that the issues the national badger survey tried to answer are very similar to the issues identified for countryside recreation, that of numbers using the countryside and distribution.

OBSERVATIONAL STUDY OF NORTH CEREDIGION

This paper describes a methodology, adapted from observational studies of mammals, that has been used to investigate recreational activity in a 466 square kilometre area of Mid Wales during the summer of 1996. This survey in particular sought to find out:

1. the activities people undertake as countryside recreation
2. the exact types of access people use when visiting the countryside
3. the types of countryside people visit
4. an estimate of the number of people using the wider countryside

This study was carried out in North Ceredigion in Mid Wales. An area described by six adjacent Ordnance Survey ten by ten kilometre squares, in a three by two rectangle, (grid reference of the South

West corner being SN5/7) was selected, giving 466 Ordnance Survey one-kilometre grid squares containing land above the high water mark. From within this 52 one-kilometre squares (11.2% of the study area) were chosen using random numbers (Figure 1). The survey was conducted between the 4th and the 26th of August 1996. During this period each square was surveyed three times, once on a weekday, once on a weekend day and once over the three days of the August Bank Holiday weekend. Surveys were carried out between 11.00 a.m. and 6.00 p.m. with each surveyor covering no more than three squares in any one day.

INFORMATION GATHERING

Within each square all access routes considered to be open to the public were walked to assess the most appropriate positions from which to observe recreationalists and to collect information regarding the nature of the countryside within the square.

All legal access routes displayed on the Ordnance Survey map and observed on the ground within the square, were mapped onto an enlarged (1:10,000 scale) photocopy taken from a 1:25,000 Pathfinder Ordnance Survey (O.S.) map. Each discrete length of path was assigned a unique link number to which additional information was referenced. The length of each link was measured from the O.S. map using a digital opisometer, it is thus a plan measure and takes no account of the rise and fall of the terrain. The legal status of each link, as identified by the O.S. map, was recorded.

OBSERVATION OF DISCRETE AREAS

Each square was observed to record recreational activity. Pilot testing on the ground established that in most cases it is impossible to observe a whole kilometre square from one observation point. This problem was addressed by observing discrete areas within each square for a standard amount of time. A discrete area was defined as an area that could be viewed from one location or whilst walking slowly along a linear access route so that all recreational activity could be observed. In some cases this was just one field or length of footpath, whereas in others a whole square could be observed at one time (for example an open hillside). By careful observation of a series of separate discrete areas it was possible to survey the whole square such that each area within the square is observed for an equal amount of time. For this study each discrete area was observed for a period of five minutes.

The data from all the discrete areas within one square was combined to estimate the recreational use of the square. As an example, if a one kilometre grid square can be observed as four discrete areas recording will take twenty minutes plus the time taken to move between observation points. The net effect of this is that the whole square will have had the equivalent of a standard five minutes of observation.

For each person or group of people observed during the survey a location, description and activity were recorded with each person being allocated to a single activity code. Most categories of data were pre-coded, but each surveyor was also asked to give a written description (to validate the pre-coding). Where an individual was not observed on a linear access route another coding system was used to record the category of landscape they were in. During the observation of any one square each person was only recorded once. This meant that if an individual was recorded within one discrete area at the start of a square's observation that person would not be subsequently recorded for that square if rediscovered in another discrete area.

All recreational activity was recorded including the use of off road vehicles away from metalled roads. No attempt was made to record people within the curtilage of their houses or travelling through the countryside on metalled roads in motor vehicles. The nature of the study area and the random sample meant that no extensive urban areas were included and therefore the surveyors needed no urban definition or exclusion instructions. Data were entered onto a relational database (Microsoft Access) for analysis.

NATURE OF THE STUDY AREA

The results must be viewed in relation to the rural nature of the study area, which contains no intensively visited and managed sites such as theme or countryside parks. There are also no extensive urban areas with only one town of significant size (Aberystwyth: population size approximately 12,000). The landscape of the study area is a mixture of upland and lowland grassland with extensive areas of conifer plantations and to a lesser extent broad-leaved woodland.

RESULTS

Numbers and type of people observed within the study area

A total of 540 people were observed, of which 448 were classified as being involved in a countryside recreational activity. Of the 98 people not classed in this way 57 were working out of doors (agricultural workers) and 35 were classed as non-recreational utilitarian walkers (people shopping or walking from home to their car for example). The results given in Table 1 are calculated excluding these 98 people. It can therefore be said that in this survey 82.9% of people observed were undertaking some form of recreational activity.

Group size	Number of groups observed	Number of people observed	Percentage of people observed
1	57	57	12.7
2	57	114	25.4
3	22	66	14.7
4	20	80	17.9
5	5	25	5.6
6	5	30	6.7
8	3	24	5.4
10	1	10	2.2
17	1	17	3.8
25	1	25	5.6
Totals	172	448	100

Table 1. Group sizes of observed recreationalists.

The activities people undertake as countryside recreation

It can be seen from Table 2 that walking was clearly the most common activity with 48.7% of all observations being coded as this. A miscellaneous coding of "other static activities" comprised the

second largest recreational category with 11.2% of people being observed sunbathing, talking or admiring the view. Cycling accounted for nearly 6.9% of the observations, with road bicycles out-numbering mountain bicycles. However, all cyclists seen were using metalled roads. A range of 14 other activities were observed. This illustrates the variety of countryside recreational activities undertaken within the study area.

Activity	Percentage of observations (n=448)
Walking	48.7
Other static activity	11.2
Sitting in a car	5.6
Picnicking	5.4
Cycling	6.9
Off road motor vehicle	3.6
Boating (sea)	3.6
Children playing	2.7
Horse riding	2.5
Fishing	2.2
Model plane flying	2.2
Camping	2.2
Swimming/paddling	1.3
Horse and cart driving	0.4
Collecting	0.4
Shooting	0.4
Kite flying	0.4
Reading information board	0.2
Total	100

Table 2. The activities ordered by percentage participation, that countryside recreationalists were undertaking when first observed.

Locations of recreationalists within the study area

The locations of observed recreationalists can be put into three categories with 148 people using public rights of way, 106 people on roads (excluding 12 people observed on unclassified tracks) and 182 people observed away from linear access routes. Of these 182, 40.6% were found near their cars in car parks, on the side of roads or in caravan and camping grounds (which occurred in 7 of the 52 sampled squares). The remainder was recorded in 6 categories with 37.9% being found on or near water bodies.

The linear access routes that people were observed using within the study area

To enable a comparison of the relative amount of use of different categories of linear access route, using analysis of variance, the data were transformed using the formula *log (x+1)* to create an approximately normal distribution with a variance almost equal to the mean. The analysis showed that there was no significant (at 95%) difference between the density of people (numbers per unit length) observed on public roads, public footpaths and the amalgamated category of bridleways, roads used as public paths (RUPPs) and byways open to all traffic (BOATs). These results show that the use made by recreationalists of roads, footpaths and other public rights of ways are in proportion to their length and no significant preference could be found (see Figure 1).

An estimate of the number of people using the wider countryside

For the observed squares an estimate of the average density of countryside recreationalists in any one five minute period of the study time frame was calculated at 2.87 people per km^2. From this it may be further estimated that 1,337 countryside recreationalists were at large in the wider countryside of the 466 square kilometres of the study area in any one five minute period between 11.00am and 6.00pm during the August survey period. However, this does not take account of known managed sites within the survey area that were not sampled or people touring in cars, but does reflect the use made of the wider countryside.

Number of recreationalists	Expected percentage of one km squares
0	21.3
1	12.3
2	9.1
3	7.3
4	6.1
5	5.1
6	4.4
7	3.8
8	3.3
9	2.9
10	2.6
15	1.4
20	0.8

Table 3. The probability (expressed as a percentage) of finding between 0 and 20 recreationalists within one by one kilometre squares within the study area of north Ceredigion.

From observations of the number of people found in each surveyed square a negative binomial distribution was found. From this data the *expected* negative binomial distribution of people for all 466 squares in the study was calculated (Fowler and Cohen, 1998) from the observed (52 surveyed squares) sample. The results from this calculation can be seen in Table 3. This calculated data predicts for example, that 21.3% of the surveyed one-kilometre squares contain no recreationalists at all and that 43.9% contains five or more.

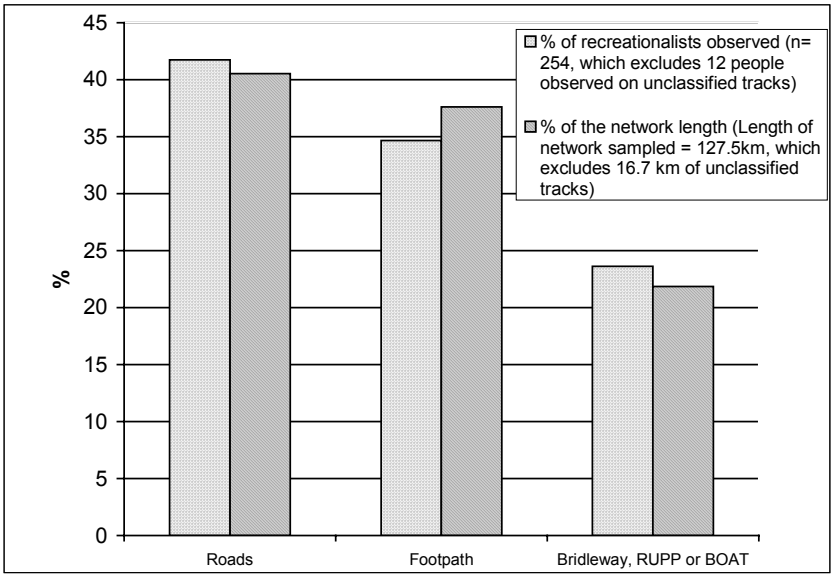

Figure 1. A comparison of the percentage of observed countryside recreationalists found on each category of linear access route and the percentage that each access route comprises of the whole rights of way network within the observed squares.

DISCUSSION OF RESULTS

The results must be viewed in relation to the rural nature of the study area which contains no intensively used and managed sites such as theme or countryside parks. There are also no extensive urban areas with only one town of significant size (Aberystwyth: population size approximately 12,000). It is also important to view each observation as one moment in time, as peoples' activities were coded using the activity in which they were first observed, which is often only a small element of their countryside trip. The results are records of observations of real behaviour and introduce a spatial element and level of detail not normally available to the countryside planner.

CRITIQUE OF METHODOLOGY

This study was undertaken to evaluate the potential of observation as a method of collecting data about countryside usage. While useful data were collected, several refinements to the methodology may be identified. Difficulties were experienced in establishing the legal status of access to certain areas. In particular, on O.S. maps access routes such as white roads do not have their status shown and public rights of way may be recorded inaccurately. The development of survey maps based upon the definitive map and the highways register held by the local authority would improve the accuracy, by confirming the current legal status and location of public rights of way. The status of unclassified tracks or white roads is likely to be an area of uncertainty until procedural or legal changes are made. In this survey no urban areas were encountered, but future application of this methodology is likely to include such areas. The adoption of a definition of 'countryside' may be required in these cases. A reliable definition is not easily constructed although it is suggested that, for convenience, areas of dense urban housing or industrial areas, often with dedicated pedestrian walkways or pavements are excluded. A clear and robust definition would be needed if future observational surveys were to be comparable.

The survey squares observed in this study were selected in a purely random manner and did not deliberately cover know busy recreational sites (in fact the study area contains no known sites which have a large visitor pressure such as country or theme parks or attractive villages). In future surveys it may be useful to ensure a large enough proportion of squares are sampled to ensure that the studies obtain a representative sample of heavily used managed sites as well as the wider countryside. Another issue not encountered within this study is how to record large numbers of people that may be observed at busy sites. It is suggested that one approach to this may be to subdivide the area into smaller areas that will allow for accurate recording.

CONCLUSION

It can be concluded that the use of observation of discrete areas of the countryside as outlined in this paper is a viable and practical method for analysing recreational behaviour of the wider countryside. It provides a truly systematic method of recording real behaviour and distribution. In comparison to other methods this type of survey allows for the collection of information about countryside usage which is beyond that collected by traditional methods. As such it provides a valuable and additional tool to aid the understanding and planning of countryside recreation. It is important in any study of countryside usage to ensure that data collected is comparable over time and space. For future studies using this technique it is therefore important to standardise the method and sampling frame used. Future studies using such a

standardised approach could then provide the first regional or national picture of the abundance, distribution and behaviour of countryside recreationalists. Such data could provide a baseline upon which trends in recreational behaviour can be analysed. The method is considered to be very adaptable and could be used to gather important information on many facets of the behaviour and use made of the countryside that have not been covered in this study.

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