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Observing visitors behaviour as a methodical alternative to questionnaires – a proposal

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Abstract: Basing on case studies in South-West- and North-East-Germany techniques of hidden observation such as observing visitors behaviour with binoculars from far distance are discussed. Their origin in ethological field studies is reflected, ethical aspects are mentioned and the conditions to produce valid data are qualified. Especially in case of analysing non-legal behaviours direct questionnaires are often not be able to clear whether serious damages in the protection areas are resulting or not. Also the intentions of "breaking the rules" cannot be reflected totally by socio-empiric methods. On the other hand behaviour observations require a lot of time and energy and should be limited on serious indications because of ethical aspects. So it is necessary to describe conditions and cases, where observing techniques can be implemented successfully.

INTRODUCTION

The discussion about visitors influences on protection areas is dealing with two not solved questions:

1) How can be "measured" a direct relation between visitors will, visitors activity, and biotope damages or disturbances ?
2) Do we have valid definitions on what we call "biotope damaging or disturbance by visitors" ?

The following contribution deals mainly with the first question. Its intention is to describe practical methods of getting data on visitors behaviour and activity. But nevertheless it is necessary to solve the second question too, because the ideas of what should be evaluated as damage or negative influence are changing. In one of our test areas for example the light erosion processes initiated by visitors foot steps can be declared as constructive elements in revitalizing traditional biotopes. Furthermore new results in disturbance ecology should be mentioned in this case (ANL 2001). Generally the evaluation of several disturbance sources is changing a lot.

To mention these problems without page-consuming explications, the neutral term "influence" is used instead of "damage" or "disturbance".

The main idea of the proposed methods is that there might be no fundamental difference between observing behaviour and activity of animals or man. A lot of observing methods are common in animal ecology. Habitat suitability and usage of almost any bird or mammal species are investigated with a bright acceptance – so why not to use these techniques with man as objects ?

Of course some ethical aspects should be mentioned in this context: Are any legal or ethical rules be endangered by observing techniques ?

BASING STUDIES AND STUDY AREAS

Between 1993 and 2000 we proved the proposed methodical equipment in four studies:

1) A study on negative influences of very intensive visitors appearance in large grassland areas (Kaiserstuhl, SW-Germany, Coch & Hirnschal 1998)
2) A diploma work on visitors behaviour in a coastal forest (Rügen, NE-Germany, Thomas 1995)
3) A diploma work on visitors behaviour in an alluvial forest (Taubergiessen, SW-Germany, Schenck 1996)
4) A study on nature reception in an extended beach forest area near Zurich, Switzerland (Coch et al., in prep.)

The complete set (see table 1) has not been proved in one area since yet, so we call it a proposal and are very hopefully looking forward to initiate further discussions.

CONVENIENT SAMPLING METHODS

Coch & Hirnschal (1998) are giving an overview to convenient sampling methods in case of observing visitors behaviour and activity.

To describe the intensity of visitation normally a "census" is used: From hidden or open counting points the number of visitors is sampled. Often technical solutions decrease the personal stuff, e.g. by using infra-red photoelectric barriers and counting machines. As result the total number of visitors and the daily or seasonal frequency of visitation can be used as indicators.

By counting the visitors it is not possible to get data about the intentions of the visit. From several studies (compare e.g. Ammer & Pröbstl 1991) it is well-known that different intentions are creating different behaviour patterns. In the Kaiserstuhl area for instance the special intention of finding rare plant species creates a certain movement in the area (Institut für Landespflege 1993). Other foot paths are used, the speed of moving is very slow. In the case of developing behaviour rules for the visit of protected areas the importance to have data about the visitors intentions should be underlined. Convenient data sources are questionnaires. This can be done directly by asking the visitors or indirectly by distribution of form-sheets, which can be filled in and sent back by the visitor (e.g. Ott 1994). Practical problems with questionnaires can be summarized as following:

- The possibilities to get representative data are limited. In typical cases only five percent or less of the visitors are asked.
- The returning rate of form sheets is low (between 20 and 40 %) without any gratifications. It can be increased with several facilities (Ott 1994)
- The possibilities to get a differentiated impression about the specific influences are limited, because "hidden" or "illegal" activities are concealed.

Nevertheless in most cases questionnaires are used to work out guidance models of visitors flow in protected areas.

THE VIEW BEYOND THE END OF ONE´S OWN NOSE: COMPATIBLE ETHOLOGIGAL METHODS

In ecological sciences a impressive variety of sampling methods can be found (bride overview in Eibl-Eibesfeldt 1999). Because of the comprehensible relations between visitors behaviour and effects on the biotopes and their plants or animals. Especially the sampling methods using fixed sampling rates or defined sampling techniques to assess habitat use and quality (such as Hildén 1965 describes) might be interesting to discuss in context of developing methods to produce data for a qualified visitors flow management.

Collecting valid data on mans or animals behaviour causes the following conditions (following Lorenz 1957):

- The observer does not influence the behaviour of the observed objects. This can be guaranteed in three different ways: There is a fitting fractal distance between observer and object (common especially in studies about bird behaviour, e.g. Jenni 1983). Instead of the fractal distance a "mental nearness" can take place (e.g. the well-known chimpanzee-studies by Jane Goodall (1986) or Konrad Lorenz itself with his geese. The third approach bases on disguising or hiding the observing intentions and can be compared with the strategy of hunters.
- The way of observation must be methodically fixed. This is an indispensable condition for an objective evaluation of the results. In practise this requirement is very hard to solve, because the variety of visitors behaviour is high. Examples of stratifying visitors behaviour or action are given in table 1.

Behaviour/action	**Observed as:**
Lying in the grass and smoking a cigarette	Comfort behaviour, position is to be assessed (e.g. with GPS-coordinates)
Jogging on a foot-path	Moving behaviour, direction is to be assessed
Digging out a rare orchid	Special activity (taken from an extended list), position is to be assessed (e.g. with GPS-coordinates)

Table 1: Examples of stratifying visitors behaviour in an observation campaign .

- The conditions of variables, which seem to influence the result of observation, should be assessed. In case of observing visitors this can be realized with assessing e.g. the actual weather, the weather forecast of the evening before, the actual TV-programme, the blooming flower species…
- Certain hypotheses should be elaborated to give the directives in analysing and evaluating the collected data. In case of working out rules for the visitors flow these hypotheses should refer on the main objectives of critical relations between visitors behaviour and possible damages or disturbances (negative influences), e.g.: Hypothesis a: "Open grassland invites to walk outside of the foot-paths" against Hypothesis b: "The frequency of walking outside the foot-paths does not correlate with the vegetation structure".

In the next chapter several techniques in collecting data to evaluate visitors behaviour are discussed basing on the field experience of case studies mentioned above.

OBSERVATION STRATEGIES TO COLLECT DATA ON VISITORS BEHAVIOUR

In our case studies we proofed three different strategies dealing with two different conditions of protection areas: size and vegetation structure. In large areas it is not possible to have a permanent overview on moving visitors from one observation point. Areas covered with mixed vegetation types (grassland, forest) do not allow observation from outside viewing points. Table 2 offers the three solutions we found.

area	Proposed observing strategy
Open land, <100 ha	"One point outside" - strategy: behaviour observation with binoculars from one viewing point in near distance (< 1000m)
Open land, 100-500 ha	"Several points outside" – strategy: behaviour observation from middle-far distances with highly magnifying lenses (> 20times) and several observation localities
Mixed land, without size limitation	"Several points inside" – strategy: behaviour observation within the area, from hidden viewing points or disguised as visitor

Table 2: Overview: Proposed methods to observe visitors behaviour and activity.

"One point outside" - Strategy

The observer takes position on a viewing point outside the observed area, on which it is possible to overview more than 75 % of the object. It can be advantageous to hide the viewing point, especially, when the observation should last some time. Before starting a time system should have been worked out with fixed observation times and days spread in a representative way over the observing period. Useful background information can be the estimated frequency of visitors flow. It is necessary to observe on days with minimum frequency too, because there might be a relation between typical behaviour patterns and frequency (e.g. "digging out orchids" does not take place on periods with high frequency). Convenient working tools are binoculars (ten to twelve times magnifying) and writing utensils. Alternatively a Dictaphone can be used. Best working position is in about 500m distance from the observed area, but using binoculars with high magnification it is possible even to work up to 1200m distance. Depending to the magnification the viewing field should not exceed 150 meters. Behaviour patterns or activities should be mentioned in a stratified way as the examples given in table 1.

"Several points outside" – Strategy

In case of large protection areas to be observed it is not useful to work only with one viewing point. By using several viewing points the planning of the monitoring campaign should mention a representative spreading of viewing times over all viewing points. It is very helpful to work with as many observers as viewing points are, so that observing can be planned in an simultaneous way. Possible distances may rise to 3000 meters by using monocular glasses with high magnification (30 to 60 times). The working procedure is not differing from the "one point outside" – strategy.

"Several points inside" - Strategy

The evidence of visitors flow management is usually increasing with the size of the protected area. Especially in the National Parks flow management is well implemented, but there might be cases to proof the success. Using ethological methods this task can be solved with the "Several points inside – Strategy". Instead of fixed viewing points outside the area the observers are using hidden or disguised positions inside. The observing technique must be adapted to the way of hiding or disguising: Using raised hides the procedure can be same as in "Point outside – Strategies". Being disguised as "innocent visitor" the observing method can lean on transect or line sampling with planned sampling routes. In this case the usage of a Dictaphone with an extern microphone is recommended. The conditions depending on a representative way of spreading the observing periods should be mentioned.

ATTIBUTES TO ASSESS WITH ETHOLOGICAL METHODS

Comparing questionnaires with ethological field methods significant differences in the assessed attributes can be identified:

- The personal background of a visitor can be assessed very precisely with direct or indirect questions. "The art of questioning" produces qualified information even to aspects visitors think better to hide. With observation strategies only physiological attributes (sex, age) are assessable.
- The real activity is not assessable with questionnaire. Even in combination with some assessed behaviour aspects (e.g. the main activity just before beginning the questionnaire) the special situation of questioning and answering, which can be identified by the visitors rather early, will modify the behaviour patterns. Naturally the emphasize of ethological assessment is set on a precise reporting of behaviour patterns.
- Questionnaires often are interested in future actions. The interviewer tries to find out, what visitors will do depending to different conditions (e.g. "Will you visit this nice forest when you have to pay one Euro next time ?"). Observing can not produce data with relation to future.

Table 3 shows possible attributes to be assessed with ethological field methods in case of deriving a visitors flow management. The "ideas of interpretation" should be understood only as proposal.

Attribute	idea of interpretation
Actual activity, stratified assessed	Variety of activities on different locations, preference on special activities depending to location, weather, physical conditions, potential negative influences
Speed and direction of moving	Preferences on main routes, indicator of possible disturbance (real frequency in parts of the area)
Continuity of moving	Special interests or needs, potential negative influences
With-carried tools	Special interests, potential negative influences
Social behaviour	Social needs of the visit, relations between activities and social aspects
Sex and classified age	Age or sex-depending needs or preferences

Table 3: Some proposed attributes of an ethological field assessment and ideas of interpretation in case of deriving a visitors flow management.

ETHICAL ASPECTS

Ethological field data to elaborate a visitors flow management are affecting personal rights of the visitors. Especially hidden observation can not be tolerated without the following rules on data security and bewaring of personal rights:

- All data is assessed without personal interest on the identity of the visitors.
- All data is handled anonymously.
- All data is stored without any possibility to identify the observed persons later on. This means that – in opposite to the practice in ethological sciences – no photographic techniques or movies should be allowed.
- Situations which require observing strategies are given. There is no "lack of methodology" in cases requiring only data on the quantity of visitors flow (e.g. in case of constructing adapted parking or resting places in an protection area).

CONCLUSIONS AND NOTES OF THANK

In several cases the elaboration of visitors flow management plans requires data to visitors real intentions, activities and behaviour. The methodical input of ethological field studies allows to collect those data objectively. First experience is made in different areas. It would be very exciting to proof this methods in very large areas (National Parks) in future. Of course traditional questionnaires should not be substituted but supplemented with ethological methods.

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