



Project no. GOCE-CT-2003-505298  
ALTER-Net

# A Long-Term Biodiversity, Ecosystem and Awareness Research Network

**Deliberative events: approaches to assess public attitudes to  
biodiversity and biodiversity management**

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**WPR5 2005 D1**



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Instrument: Network of Excellence  
Thematic Priority: Global Change and Ecosystems (Sub-priority 1.1.6.3, Topic 6.3.III.1.1)  
Due date of deliverable: 31<sup>st</sup> December 2005  
Submission date: 13<sup>th</sup> February 2006  
Start date of project: 1<sup>st</sup> April 2004  
Duration: 5 years  
Deliverable lead contractor: Macaulay Land Use Research Institute & Umweltforschungszentrum  
Halle/Leipzig (UFZ)  
Revision: 1.0

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**DELIBERATIVE EVENTS:  
APPROACHES TO ASSESS PUBLIC ATTITUDES TO BIODIVERSITY AND  
BIODIVERSITY MANAGEMENT**

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## **Short summary**

The biodiversity concept is undoubtedly important for ecologists and policy-makers concerned with nature conservation. But what does the general public think about biodiversity, its changes and its management?

We conducted public discussions and interviews – so-called deliberative events – in six European countries, and collected information on the general public’s perceptions and attitudes: What do people understand by the term “biodiversity”? What do they perceive as important issues with regard to biodiversity management? What do they value about biodiversity, and what are their attitudes towards biodiversity changes?

The report presents findings from case studies conducted in the Netherlands, Scotland, Romania, Hungary, Germany and Slovakia. It also offers an assessment of the methods that we used, namely focus-group discussions, (semi-)structured interviews and value clarification sessions. We compare the strengths and weaknesses of these techniques as a research tool and as a means to involve the public into a discussion of biodiversity issues.

This report is of relevance for anyone interested in engaging people in debates on nature-related topics. In addition, it provides insights into the perception of biodiversity issues by members of the general public, which might be particularly interesting for ecologists and policy-makers.

# 1 Introduction

Since the beginning of its active promotion in the late 1980s, the concept of biodiversity has gained tremendous influence on scientific research programmes and policy-making at local, national and international levels. Ecologists, economists and social scientists address biodiversity-related topics from a wide variety of perspectives, and an increasing number of international conventions and regulations as well as national legislations are directly concerned with biodiversity conservation and management. But what does this concept mean to the general public? How does the general public – apart from the scientists and policy-makers who are directly involved in biodiversity-related issues – perceive biological diversity, its changes and its management?

This is the core concern of Research Activity (RA) 5 of the ALTER-Net Network of Excellence. As one of the main activities in RA5 during the first 18 months of ALTER-Net, seven partners from six European countries applied deliberative techniques to approach the questions mentioned above. Objectives of the so-called deliberative events were twofold. They set out

- (i) to gain an initial overview of public perceptions and attitudes towards biodiversity, biodiversity change and management<sup>2</sup>
- (ii) to test methods to engage members of the general public in a debate on biodiversity-related topics which are suitable for scientific research.

The events were designed to meet these requirements and to provide a basis for future research on public attitudes to biodiversity-related issues. They can be considered an exploratory stage of both (i) more detailed studies that investigate particular aspects in greater depth and (ii) larger-scale quantitative studies that might provide representative data on attitudes and attitude changes on a European level. In spite of the still exploratory character of the events, research on public attitudes to biodiversity is not new – the RA5 literature review gives insights into the abundance of research on these and related issues that has been conducted to date.<sup>3</sup> However, previous studies into the public understanding of biodiversity and related attitudes often focus on rather narrow issues, or are designed to fulfil specific purposes, for example as preliminary stages of economic valuation exercises. The deliberative events, in contrast, aim to provide an overview of people's views on biodiversity issues by drawing on case studies from six European countries with different social, cultural, economic, institutional and ecological contexts.

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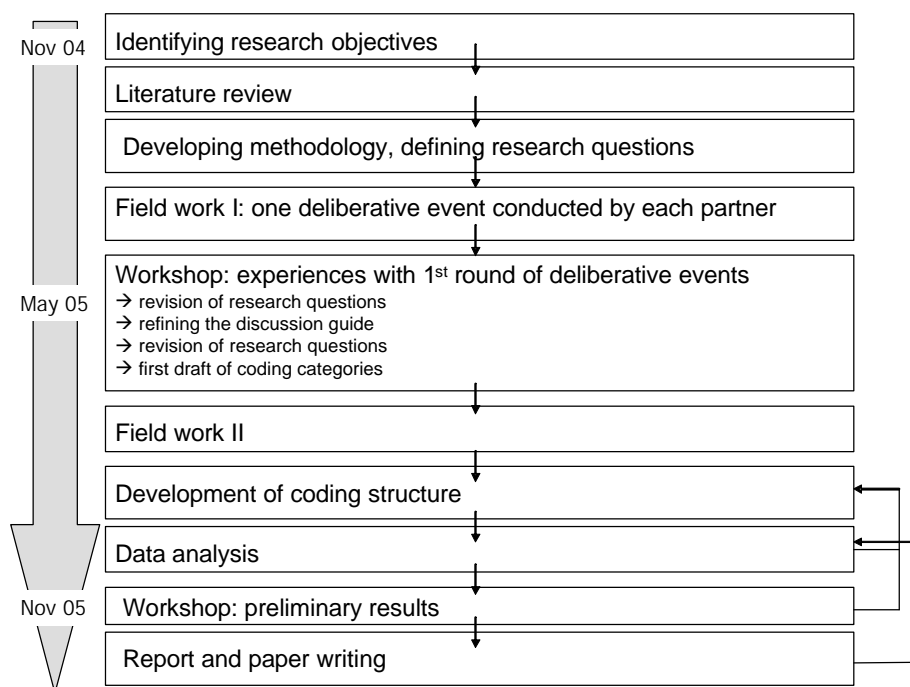
<sup>2</sup> for the social scientific background and definitions of these terms see <http://www.alternet-lynx.ceh.ac.uk/Documents/R5/RA5%20Literature%20report.doc>

<sup>3</sup> <http://www.alternet-lynx.ceh.ac.uk/Documents/R5/RA5%20Literature%20report.doc>

To ensure the qualitative comparability of the results, a common methodology had to be developed. One of the main aims, however, was to test different methods for their suitability as a research tool that engages the public into a deliberative process. Different methods were thus applied, namely focus group discussions, face-to-face interviews and value clarification sessions. To achieve comparability of the approaches a number of factors had to be similar amongst all groups. These included

- (i) a set of research questions underlying the deliberative events (see Annex 7.2)
- (ii) a focus on certain target groups within the general public
- (iii) the reference of the deliberative events to protected areas in the vicinity of the event
- (iv) the use of a common discussion guide (see Annex 7.3)
- (v) the analysis of the data through a common coding procedure (see Annex 7.4).

Figure 1 shows the iterative research process that was necessary to agree on the common features of the different case studies.

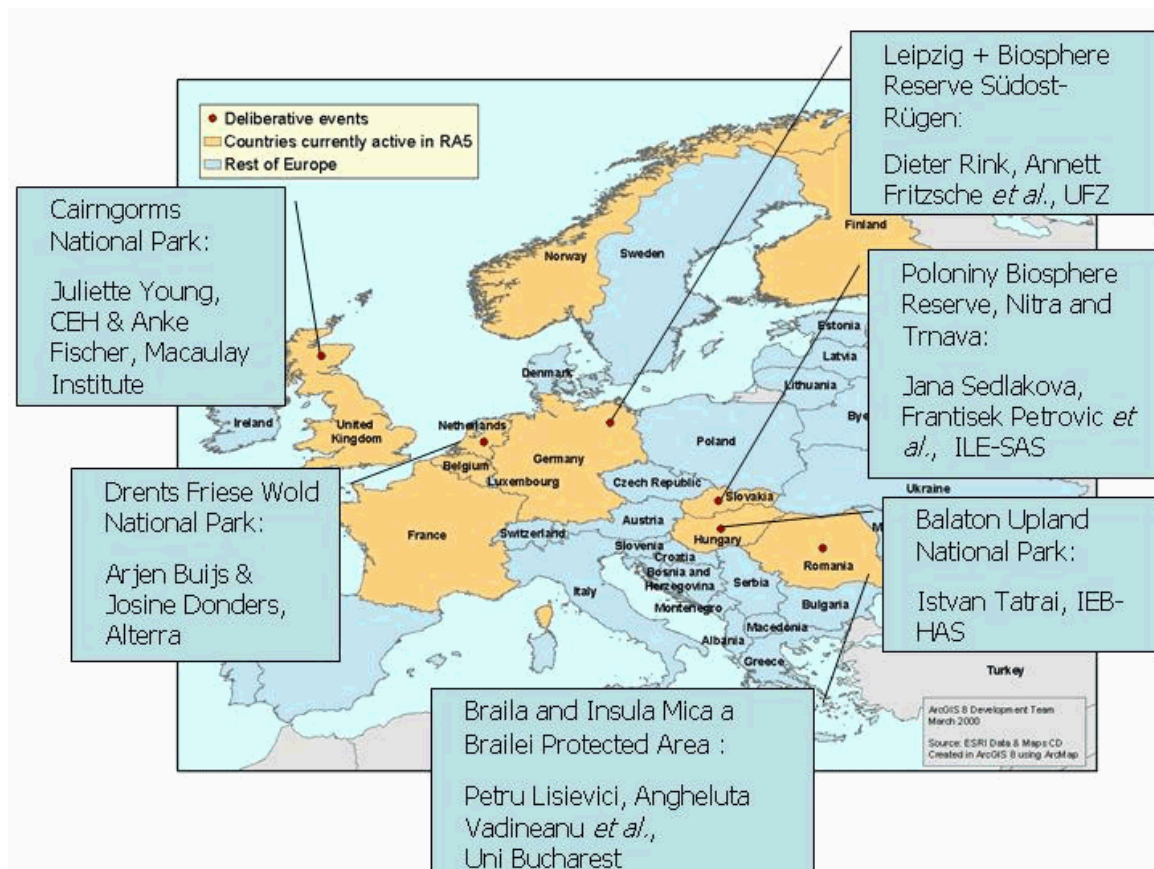


**Fig. 1: Research and development process November 2004 – December 2005**

Figure 2 illustrates the geographical distributions of the case studies. Whereas the deliberative events in Slovakia, Germany, Scotland, Romania and the Netherlands were part of the ALTER-Net activities in a strict sense, the events in Hungary were funded from a different source, and thus differed in their structure and contents. In some of the countries

such as Scotland and Romania the research took place in sites that are part of the currently evolving “long-term socio-ecological research” (LTSER) network.

The remainder of this report is structured as follows: Section 2 presents the methods applied and discusses their advantages and disadvantages. Section 3 highlights results across case studies with regard to (i) the understanding of the biodiversity concept by members of the public and (ii) public attitudes to biodiversity management. In Section 4, results of each of the cases are briefly summarised in case study reports to provide a better understanding of the different cases’ specific features. The last section offers some conclusions and open questions that might be addressed in future work of the work package.



**Fig. 2: Participating partners and locations**

## 2 Methods used and evaluation of the methods

One of the two main objectives of the project was to test methods to engage the public in debates about biodiversity-related topics and to assess their attitudes. The methods tested had to meet the following criteria:

- (a) they should stimulate participants to engage in a discussion, preferably with each other and not only with the facilitator, allowing for a dynamic debate and, if possible, learning processes
- (b) they should be suitable as a scientific research tool, providing information on people's perceptions and attitudes that can be used for qualitative analysis
- (c) they should be applicable to biodiversity-related topics, making these topics accessible to different groups of the wider public which might have differing sets of prior knowledge
- (d) they should allow every participant to express their views
- (e) they should be relatively easy to organise with a low budget.

We chose to make use of three techniques from different scientific traditions which were considered to fulfil these criteria to varying degrees:

- (i) focus group discussions in the Netherlands, Scotland, Hungary and Germany
- (ii) face-to-face (semi) structured interviews in Slovakia and the Netherlands
- (iii) value clarification techniques in Romania.

The label “deliberative events” that we gave our activities suggests group processes characterised by discussion and careful consideration. However, for several reasons we also decided to include personal interviews into the methods to be trialled. We are thus able to compare the merits of group-based approaches to those that target individuals. The three approaches, their advantages and disadvantages are described in the following section.

### **Focus group discussions**

Focus group discussions are a form of qualitative research used in marketing and the social sciences, in which data are obtained from a relatively small group of respondents. These data are not analysed with statistical techniques, but with methods of qualitative analysis. This differentiates this technique from quantitative research in which a large group of respondents provides data that is statistically analysed. “Focus groups” are small groups selected from a broader population and interviewed through facilitator-led discussions for opinions and emotional responses about a particular subject. A group of people are asked about their attitude towards a product, concept, advertisement, idea, or packaging. Questions are asked in an interactive group setting where participants are free to talk with other group members.

Focus groups are thus characterised by the explicit use of group interaction to generate data. Instead of asking questions to each person in turn as in other form of group interviews, focus group research encourages participants to talk to each other.

The focus group method was developed by Robert K. Merton in the 1950s and has been used especially in market and medical research. The technique is not meant to produce generic results; but rather to help identify issues that are perceived as relevant by the participants, and to generate questions and hypotheses, in this case for example about public attitudes and notions of biodiversity. The method allows participants to pursue their own priorities on their own terms and in their own words. Focus groups can easily be combined with other qualitative and quantitative research methods such as personal interviews. They are often used as an introduction to more quantitative research.<sup>4</sup>

Since the 1980s the use of focus group methods has increased considerably. This increase can be directly linked to the theoretical developments in social sciences. Since the 1980s the social sciences have placed much more emphasis on the discursive processes in which meaning is being produced by able actors. The social construction of meanings (such as biodiversity) became a particularly important issue in research. Also the use of language in building a discourse and the struggle for dominance in politics, media or scientific discourses became much more acknowledged. It was felt by many researchers that these concepts should be researched in real life debates, for example in groups of stakeholders discussing the relevant topics.<sup>5</sup>

For our purposes, we developed a discussion guide (see Annex 7.3) to gather respondents' attitudes and experiences of biodiversity in an informal and interactive, yet comparable manner.

### **Value clarification methods**

For the purposes of this RA5 study, the University of Bucharest working group decided to adapt the Values Grid and Values Ranking methods to the above-mentioned objectives and conducted eight deliberative events using these two methods.

Value clarification methods were initially developed in the domain of moral education in order to strengthen the abilities of young people to make their own choices, independent from peer pressures, power propaganda or submission to authority.

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<sup>4</sup> Barbour, R .S. & Kitzinger, J. (1999): *Developing focus group research. Politics, theory and practice*. London: Sage.

<sup>5</sup> Howarth, D. (2000): *Discourse*. Buckingham: Open University Press.

Burgess, J., Clark, J. & Harrison, C. M. (1998): Discounted knowledges: Farmers' and residents' understandings of nature conservation goals and policies. *Ecological Economics* 35 (1), 119-132.



Since the publication of *Values and Teaching* by Raths, Harmin and Simon<sup>6</sup> in 1966, a growing number of methods have been developed, tested, and made available to the scientific community. Value clarification methods have a number of features that distinguish them from focus group methods and personal interview techniques:

- some methods can provide quantitative data (participants rank values, attitudes or behaviour alternatives)
- due to the higher degree of external structure of the sessions, the resulting data might be more reliable than data collected in focus group situations
- most of the methods are instrumental in attitude modification – however, this is explicitly not an objective of the deliberative events carried out by the other RA5 partners through focus group discussions and personal interviews
- most of the methods are effective with groups of up to 30 or more people.

A deliberative event may make use of one or more of the approximately 60 different values clarification techniques that have been developed to date. Two of these techniques are described in the following paragraphs.

### ***Values Grid sessions***

In a Values Grid session, written instructions including an overview on biodiversity and the ongoing session are handed out to participants, together with a Values Grid form and a personal factual data form. The moderator provides a brief overview of the event structure and on filling in the forms, and encourages the participants to interact and agree on three to six biodiversity-relevant issues in their community. The issues that participants agree upon are then written on the flipchart and, subsequently, on each participant's Values Grid form. Each participant privately writes a few key words to summarize their own position on each issue, and then answers seven questions about their positions with regard to each of these issues (e. g., “Are you proud of your position?” “Have you publicly affirmed your position?” see also Section 4.4). Each participant also fills in the “personal factual data form”.

After they have completed marking their grids, participants are encouraged to cluster in discussion groups of three to six individuals. Each group selects one of the issues that have already been brought forward. Group members discuss their positions on the issue and how definite these individual positions are. At the end of the session the moderator collects the documents from the participants and encourages them to interact informally.

### ***Values Ranking sessions***

Written instructions including an overview on biodiversity and the ongoing session are made available to participants, along with a list of six questions. Each question elicits the participants' responses to certain situations (e. g., “If you had the financial resources, where

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<sup>6</sup> Raths, L., Harmin, M. & Simon, S. (1966): *Values and Teaching*. Columbus, Ohio: Charles E. Merrill.

would you buy a house?"). Three alternative answers are provided for each question, the first one consistent with biodiversity conservation, the second one inconsistent with biodiversity conservation, and the third one neutral.

The moderator provides information on the procedure. Each participant then privately ranks answers and fills in a personal factual data form. After the participants have finished ranking alternative answers, the moderator copies each of the questions on the flipchart and encourages groups of six to eight participants to present their rankings. For some or all the questions, the moderator can contribute his/her own ranking. In small discussion groups of three to six individuals, each participant then explains their choices in ranking the alternative answers for each question which subsequently are discussed by the group. At the end of the session the moderator collects the documents from the participants and encourages them to interact informally.

Both the values grids and the values ranking methods contain a "triggering stage", during which participants identify issues of relevance for biodiversity, clarify their positions on those issues, or respectively, make choices consistent with own perceptions and attitudes. During this stage, participants fill in forms that are collected and used for content analysis at the end of the meeting. Each of the two methods also includes a "debate stage", during which participants interact in small groups.

### **Face-to-face interviews**

Interviews are commonly used to find out about people's attitudes, beliefs, feelings and actions. In empirical research contexts, the main activities of an interviewer include listening to the interviewee, asking questions and gathering answers. An extreme form of interview is the free interview that has no fixed structure and usually takes the form of free narration.

Advantages of the interview method are:

- the possibility to find out if the respondent understands the questions
- the opportunity for respondents to express their views and opinions
- respondents can independently offer their thoughts, mental associations and perceived links between issues
- the possibility to address the actual conditions of the individual respondent's situation.

Qualitative interviewing methods include open structured interviews, interviews with instructions, informal interviews, phenomenological interviews, narrative interviews, episodic interviews, and group discussions. Depending on the context it is also possible to use techniques such as think aloud, associative interviews, brainstorming, and others. These methods differ with regard to (i) the extent of prior determination and standardisation of

questions and their sequence, (ii) the number of respondents that can take part at the same time, (iii) the kind of information that is gained by the interview, and (iv) appropriate locations of the interview. Each of the methods mentioned above has its strengths and weaknesses, requiring different levels of preparation and leading to different kinds of outcomes.<sup>7</sup>

When preparing for a structured interview, it is necessary to clarify the content of the questions, their form, sequence and the duration of the interview. At the beginning of an interview it is necessary to overcome possible mental and inter-personal barriers and get the individual's approval to record the interview. Even at the end of interview or when saying goodbye it is still possible to gain important information.

Generally, it seems easier to answer questions dealing with the present than with the past, therefore it is better to start with questions from the present and then use the answers as a lead for questions about the past.

The way in which questions are asked will have a strong influence on how the respondents will answer. Interview questions should be open, neutral, sensitive and clear. Probing is used to gain deeper understanding of the respondent's answers. Interviews should be conducted in normal conversational language. An interview has been well prepared when both the respondent and the interviewer feel that the communication is mutual and equal.

### **Strengths and weaknesses of the methods tested**

The strengths and weaknesses of the three methods described above, the opportunities and potential pitfalls of their use are summarised in Table 1. The assessment of the methods is based on the criteria listed above. Each technique proved to have advantages and disadvantages in relation to these criteria. Their relative suitability depends on their purpose, for example their role in the research cycle, but also on the cultural context of the research. While in some social contexts group discussions might be a familiar and accepted form of interaction, in others interviews might be a less contentious and demanding way to express personal views. Focus groups are clearly an instrument suitable for early stages in the research cycle, as they allow an exploratory approach to new and complex subjects. Value clarification sessions, especially value rankings, are instruments to be used later in the research process, as they require a good overview of the relevant issues as a basis for the design of the questions.

Both value clarification sessions and personal interviews have the potential to produce both quantitative and qualitative data, whereas focus group discussions result in qualitative

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<sup>7</sup> Jan Hendl (2005): Kvalitativní výzkum: základní metody a aplikace. Portál: Praha.

findings. However, sampling is an issue for those techniques which are meant to provide quantitative results, as issues of representativeness have to be considered, depending on the objectives of the study.

There was a debate whether the fact that group discussions take place in a social setting stimulates discursive expressions rather than attitude statements. Group discussions might hence be more suitable to help reveal discourses rather than attitudes and it might be difficult to separate between these constructs when analysing the results. However, this might be equally valid for the value clarification sessions and personal interviews. These thoughts highlight the need for a critical review of research on attitudes as opposed to discourses in general.

**Table 1: SWOT analysis**

	<b>Focus group discussions</b>	<b>Value clarification methods</b>	<b>Face-to-face interviews</b>
<b><i>Strengths</i></b>	<ul style="list-style-type: none"> <li>• allows interaction between participants: clarification of own positions and learning</li> <li>• participants can determine pace, language, issues, emphasis on certain issues</li> <li>• efficient way to reach many respondents</li> <li>• relatively close to “naturally occurring talk”</li> </ul>	<ul style="list-style-type: none"> <li>• allow interaction between participants: clarification of own positions and learning</li> <li>• through questionnaire-based phase, each participant gets chance to express individual views</li> <li>• big sample sizes at relatively low cost</li> <li>• strict structure</li> </ul>	<ul style="list-style-type: none"> <li>• each participant has equal chance to express their view</li> <li>• interviewer can steer the course of interview</li> <li>• create a more personal relation with respondent</li> <li>• more targeted probing possible</li> <li>• respondent has chance to ask when (s)he doesn’t understand question</li> <li>• set sequence of questions → replication possible</li> <li>• standardisation easier to apply (no interaction between respondents)</li> </ul>
<b><i>Weaknesses</i></b>	<ul style="list-style-type: none"> <li>• dynamics difficult to control by facilitator: individuals might dominate group and steer discussions away from the topic</li> <li>• views of more timid participants might be suppressed</li> </ul>	<ul style="list-style-type: none"> <li>• values ranking restricts participants to selected aspects – other relevant aspects might be ignored</li> </ul>	<ul style="list-style-type: none"> <li>• no interaction between respondents</li> <li>• usually relatively artificial conditions, not naturally occurring talk</li> </ul>

<b><i>Oppor- tunities</i></b>	<ul style="list-style-type: none"> <li>• analysis can reveal importance of issues across different groups</li> <li>• can provide basis for more in-depth research</li> </ul>	<ul style="list-style-type: none"> <li>• strict structure: results comparable across groups</li> <li>• may be used to investigate attitude changes</li> <li>• additional qualitative information can be collected from transcripts of debates in groups</li> </ul>	<ul style="list-style-type: none"> <li>• respondents have chance to express their opinions – feeling that they are listened to</li> </ul>
<b><i>Threats</i></b>	<ul style="list-style-type: none"> <li>• different groups focus on different aspects: results difficult to compare</li> <li>• strategic behaviour in group context might make interpretation of results difficult</li> </ul>	<ul style="list-style-type: none"> <li>• values ranking requires careful selection and pre-testing of contents</li> </ul>	<ul style="list-style-type: none"> <li>• presence of researcher could lead to interviewer bias and socially desired responses</li> </ul>

### 3 Results

Overall, 359 individuals took part in the deliberative events. Sample sizes of the case studies ranged from n=31 in the Hungarian case to n=90 in the Romanian case. Table 7.1 (see Annex) shows the distribution of the events, sample sizes and the methods applied in each case.

The deliberative events covered a large number of issues, ranging from people's views and associations with a particular protected area or landscape, their concept of biodiversity, the issues that they considered relevant in biodiversity management, to the values and attitudes related to these issues. To make these results accessible and useable – be it for scientific or policy-making purposes – the abundance of information had to be analysed according to a common, consistent procedure. Recordings of the focus group discussions and interviews were transcribed and coded according to a jointly agreed coding system (see Annex Section 7.4). This coding system was based on the research questions that had been formulated in the first phase of the project (see Fig. 1 and Annex Section 7.2). Summaries, so-called dossiers, of the main results were produced and illustrated with key quotes translated into English. The dossiers were used as a scaffold to analyse, compare and interpret the results in more detail.

In the following section, we present results with regard to two of the main topics: (i) the understanding of biodiversity and related concepts and (ii) knowledge and attitudes with regard to biodiversity management.<sup>8</sup>

#### 3.1 *Understanding of biodiversity*

The way in which the general public understands the biodiversity term and concept is an essential question for both science communication and policy making: How people view biodiversity-related issues is based on the concepts they have developed in interaction with their social and natural environment. For us, the constructed nature of mental concepts such as biodiversity is an important feature, although our research was not designed to reveal the construction process itself. Previous work (see RA5 literature review) has shown that many people understand the concept of diversity in nature though they are not familiar with the technical terms. It is thus useful to distinguish between (i) the mental concept that individual members of the public have when they hear the term “biodiversity” from (ii) people's mental concepts of biological diversity that might not be related to the word “biodiversity”. To gain deeper insights into the understanding of biodiversity – both as a term and as a concept – of different groups within the general public is hence of highest relevance to actors involved in

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<sup>8</sup> Further analyses are going to be published as journal papers.

political decision making, environmental education, biodiversity conservation and science communication.

In particular, the deliberative events activity set out to provide information with regard to the following questions (see also Annex 7.2):

- What do individuals in different groups of the general public understand by “biodiversity”?
- Do people know the term “biodiversity”?
- How much do ecological concepts shape the perception of biodiversity?
- On which spatial/temporal scale do the respondents relate to biodiversity?
- How do the respondents see the functions of biodiversity?
- What levels of biodiversity are mentioned?

The following paragraphs highlight results with regard to the understanding of biodiversity from the different case studies. For more information please see the case study reports (Section 4).

### ***The Drents Friese Wold case***

In the Netherlands it is clear from any discussion with lay people that the concept of biodiversity is very hard for lay people to grasp. Most people have heard of it, but many have difficulty defining it. Most people almost immediately turn towards the more general concept of nature.

Three different definitions of biodiversity (BD) are often used in the discussions:

- A. BD as an ecological concept: The variety of species, with special attention to the endangered ones.

*I support the goal for a higher biodiversity of the park. To get back other types of birds (...), that other types of plants have a change of returning to the area.*

- B. BD as a biological concept, i.e., the existence (visibility!) of different general species
- When I was young, I saw meadows, full of flowers. Quite some different types of flowers, for example cornflowers. Some time ago it was all gone, but now it is returning.*

- C. BD as a perceptual concept, i.e., the variety and diversity in landscapes, including different agrarian crops.

[When talking about BD]: D2: *If they cut parts of the forest, I find that beautiful. You get more variety between old and small trees.*

Moderator: You call that variety also BD?

D5: *yes, yes*

D2: *yes diversity, not in species but in landscapes*

The biological and perceptual concepts can both be defined as aesthetical concepts.

Although lay people made no explicit references to ecosystems, professionals claimed the concept of biodiversity was directly linked to specific ecosystems.

The concept of biodiversity is very much debated, and is closely related to the concept of nature. What is nature and what is the relationship between nature conservation and the promotion of biodiversity? For some lay people biodiversity is a much contested concept. It contradicts their own concepts of nature (see Section 3.2). Although the concept is also hard to grasp for other lay people, they do not express distrust in the use and definition of the concept. Surprisingly, some professionals not directly involved in the area claim biodiversity is mainly a device to communicate with people, while in our discussions with lay people, they either define biodiversity as a political term (from conservationists to promote their conception of nature) or as a term difficult to grasp.

### ***The Cairngorms case***

In the Scottish case, three main groups with regard to the understanding of biodiversity could be identified. However, we chose a classification different from the one found by the Dutch team:

A number of respondents, mainly people who had a non- or semi-professional interest in nature such as mountaineers and hobby botanists, came up with more or less concrete descriptions and definitions of biodiversity such as;

- *“Where I live in the South, the main crop is rapeseed so there is just acres and acres of yellow. That is the opposite of biodiversity...”*
- *“but diversity as well, not just numbers. Different types of plants, animals, geology”.*

A second group of participants, mainly the tourists and college students, expressed confusion regarding the term:

- *“What does that mean... I don’t really understand... what is biological diversity?”*

This confusion did not always coincide with the detailed description of diversity and the links between elements of a system that the same individuals had given earlier in the discussion when describing their experience in the National Park. This implies that many people – though maybe not familiar with the technical term “biodiversity” – might have a rich complex of mental concepts relating to diversity, ecosystems and food-webs.

However, when given an explanation of the term, most people found it easy to relate to it, and it was immediately adopted in the vocabulary and referred to subsequently in the discussion (see also Section 4.5). We can thus conclude that it was the term rather than the concept which was unknown to people and considered confusing.

A third group of individuals that dealt with management of natural resources in a professional and semi-professional basis, for example foresters, expressed frustration about the lack of



substance and the impact that the term “biodiversity” has had on management approaches and policies:

- *“biodiversity is just a fancy word for nature”*
- *“It has become a buzzword... there are other ways of putting it, other approaches, and they are just being blanketed out because it is not in the word”.*

### ***The Slovak case***

In the Slovak case study we could identify different understandings of the concept of biodiversity according to professional backgrounds and personal interests.

The term biodiversity itself was well known by all ecology students; however some of them mentioned that *“the first time I came across the term was during the entrance test at the university”*. From this quotation it is clear why the typical answer of students of arts was *“never heard it before”* or *“I have heard it, but have no idea what it means”*. Respondents other than the university students encountered the term in the media or at work. They knew the term, were able to use it, but the concept of biodiversity shifted according to one’s professional background or interest. A respondent from the Poloniny Biosphere Reserve observed: *“it was always here, but now we call it differently”*.

### ***The German case***

In the Leipzig sub-sample (see Table 7.1 in Annex) “biodiversity”, “natural diversity” and “diversity of life” as concepts seem to be little known among the participants of the focus group discussions – the knowledge associated with these concepts was rather vague. In many discussions we decided to use the term “natural diversity” as “biodiversity” was even less well understood.

We could differentiate two main groups. For the first one, everything is part of “diversity“, the interviewees do not exclusively refer to wild nature when speaking of natural diversity. Instead, they include man-made areas like parks and gardens. Repeatedly, intra-urban green areas were referred to, such as those established in Leipzig, in the context of urban structures renewal.

For a second group diversity is both a biological and an aesthetic concept. Generally, the term refers to the diversity of animal and plant species, sometimes to habitats and ecosystems as well. In the aesthetic sense, diversity is associated with beauty and variety, and with recreation values. The interviewees from disadvantaged social strata primarily refer to the diversity of animal species, whereas habitat diversity is rarely named. The aesthetic meaning of natural diversity is omnipresent. Invisible or unattractive species such as bacteria or insects are also recognised as relevant for the concept.

### *The Romanian case*

In analyzing the understanding of biodiversity as revealed by “relevant biodiversity issues identified” at local (for lay people) and regional (for expert secondary users) levels, the following provisional conclusions may be drawn:

- The primary stakeholders (experienced and less experienced fishermen) tend to take into account mainly the “variety of species” dimension of biodiversity. Issues like “diminished fish resources”, “deforestation”, “diminished pest control”, “eutrophication”, “reckless use of polluting chemicals” are identified either as concrete situations or as causes for the loss of species variety;
- Secondary stakeholders (representatives of organizations with statutory responsibilities for biodiversity conservation or representatives of local business community) tend to take into account supplementary dimensions of biodiversity, like ecosystems diversity, landscape diversity and even cultural diversity (“clogging of lakes in floodable areas”, “damming of floodable areas”, “agricultural and forestry practices with negative environmental impact”, “overexploitation of some categories of natural resources”, “lack of understanding by the general public of the need for biodiversity conservation”);
- There seems to be a positive correlation between the education level and the complexity of the biodiversity concept;
- There seems to be a negative correlation in the case of primary stakeholders (“lay people”) between age and the complexity of biodiversity concept: older people seem to have a less complex concept of biodiversity.

### *The Balaton Uplands case*

Environmental science students at the university distinguished between genetic diversity, ecological diversity and taxonomical diversity, defining biodiversity as the variety of life.

Secondary school students knew less about biodiversity, but were able to describe the term and distinguished only the taxonomical diversity. They were not sure what biodiversity meant, and if there was any threat to it in their region.

Both groups of students perceived biodiversity as different types of plant, animal species taxa and different types of landscapes such as forests, swamps and wetlands.

### *Summary*

The participants of the deliberative events revealed a wide range of notions and mental associations related to biodiversity. Although many of the respondents who are not involved in environmental issues in their jobs or other activities did not seem to be familiar with the

term “biodiversity” itself, they could easily relate to concepts of biological diversity and its role in ecological contexts, as well as to the aesthetic aspect of diversity. Correspondingly, explicit verbal definitions, if given at all, often went beyond the description of biodiversity as the diversity of species or other taxonomic groups: Descriptions referred also to the diversity of shapes, colours and smells in the natural environment, and to the diversity of habitats and ecosystems within an area. The latter were often given by individuals with a more professional relationship to the natural environment. Some respondents included the diversity of cultural features into their understanding of biodiversity, and for many the concepts of nature, landscape and biodiversity were very closely related with each other. However, some respondents, especially professionals working in related areas, explicitly expressed criticism with regard to the often strategic application and the overall usefulness of the term “biodiversity”.

### **3.2 Attitudes towards biodiversity management measures**

Biodiversity management measures proved to be of high relevance to the participants of the deliberative events: This was, for many, a more tangible and concrete way of discussing biodiversity issues, and where people could relate to biodiversity science and policy based on their everyday experience and media coverage on these topics. Consequently, a greater part of the events dealt with questions of biodiversity management and the participants’ attitudes towards management measures and their implications.

Our initial research questions included the following ones:

- To what degree are biodiversity management measures socially significant?
- What are the participants’ attitudes towards particular management measures?

The following paragraphs summarise results from the different case studies. For more information please see the case study reports (Section 4).

#### ***The Drents Friese Wold case***

In the Drents Friese Wold case, attitudes towards the protection of biodiversity cannot be separated from attitudes towards the protection of nature. Protection of nature in the National Park is hardly contested. Support on this issue is very high and all residents in our groups express strong involvement with the area, especially as their daily environment.

The specific goals in the protection of biodiversity, however, are more contested. A substantial group seems to support most of the measures, but has comments on some details of the measures (e. g., on the eradication of exotic trees like the American Oak). Another substantial group expresses serious discontent with most of the measures.

Support for the different goals and related management options seem to be related to the different values and functions connected to biodiversity and the National Park. The group of critical residents often viewed the protection of biodiversity as potentially opposed to protection of the kind of nature they prefer, for example an attractive landscape. Attitudes towards management measures are very differentiated. Many measures seem to be supported by a large group of respondents. Some measures are highly contentious, like cutting trees and closing off areas for visitors.

With regard to possible conflicts between biodiversity and nature as a “lifeworld”, several subgroups can be discerned:

- A. Protection of biodiversity (global *and* local) is considered important and an important goal of nature conservation.
  - a. *Some* conflicts between biodiversity and lifeworld-nature are perceived (e.g. accessibility of area) but mostly accepted (intrinsic values recognised)
  - b. No possible conflicts are perceived.
- B. Protection of biodiversity on a global level is considered important, but in the local context protection of nature as an attractive lifeworld is more important (biodiversity not contested as main goal of nature conservation)
- C. Conflict of interests: Globally, the protection of biodiversity is considered important, but in the local context seen as practically impossible. Other issues are seen as more important, for example economic aspects, urbanisation and accessibility for recreation.
- D. Biodiversity as a goal in general is contested but always on the local level, not on the global level.

### ***The Cairngorms case***

In the Cairngorms case, the vast majority of participants coincided in their view that the Cairngorms could hardly be considered a wilderness, and that nature in this area needed to be managed by humans. However, the focus of management measures and the degree of interventions that were advocated differed considerably between the groups, as well as the time scales that were considered, with the foresters taking into account long-term perspectives to a much higher degree than the other groups.

Biodiversity management proved to be a highly contentious issue. In the local residents and regular visitor groups, the National Park designation and the respective management plans was at the centre of a heated debate. Most of the tourists, in contrast, were not aware of the National Park status. They frequently discussed biodiversity management measures in a broader sense. Nonetheless, very strong views about ownership, perceived property rights, access regulations and European level legislation were expressed by all of the groups.

In nearly all groups, the designation was seen as a marketing ploy, with conservation often making way for other economic interests. Most of the discussion revolved around threats posed by increased tourism and high levels of management.

### ***The Slovak case***

In order to learn more about public attitudes towards biodiversity management measures we concentrated our research on the following questions:

- What is a respondent's personal view on an "ideal" way of managing biodiversity?
- Who is seen as responsible for biodiversity management?
- Who do they trust?
- Who is seen as the most active (organisations, persons, etc.) in biodiversity protection?
- What is a respondent's opinion about current protection measures?

During discussions, biodiversity protection was difficult to differentiate from nature protection. Different views were expressed by the different groups of respondents, for example those who are responsible for biodiversity, such as accountable civil servants in Poloniny and Trnava regions and employees of the National Park (NP) and the Biosphere Reserve (BR) Poloniny, and those who are affected by the protection measures, i. e., the residents living in the BR, mayors of the affected villages, people working for the local forest company and local tradesmen. For example, a representative of the NP Management said: *"The public trusts foresters to a higher degree. This is connected with the fact that foresters provide work for people. People usually scold us, because we only prohibit or command. If we followed the Polish example and foresters were part of the National Park, then the situation would be completely different."* Examples from the residents included: *"... people from the National Park cause harm to us... somewhere should be the border, in order not to restrict people who are living here"* or *"We protect everything, finally, we don't let anyone into the Park... for whom does that National Park serve? For the next generations or for those who are living now? I give you an example: a bear is allowed to pick fruits in the NP, a man is not allowed to. I ask myself, who do we protect? Bears or men? Who is valued higher?"*

### ***The German case***

Generally, the participants argued in favour of stricter protection regimes for biodiversity, however, they were not inclined to support this by means of personal contributions, taxes or similar measures. Nature conservation is considered a government or municipal task, but this attribution of responsibility is done pessimistically, often referring to the politicians' hidden agenda. Equally sceptical were the interviewees with regard to conservation initiatives by the

private sector (e. g., Krombacher Beer, a company that buys rainforest with parts of its profits). Conservation and environmental NGOs were not discussed in this context. Overall, the interviewees showed little interest in becoming active themselves: either the State should do conservation, or professionals should use donations for it.

Nevertheless the measures for the protection of biodiversity are considered insufficient. The interviewees argue for taking more drastic measures and for (more) rigorous laws. In the conflict situations protection should be enforced even against basic social issues. For example, the participants wanted to see more drastic measures against the industry sector concerning emissions. These sometimes drastic claims, however, are not applied to the needs of leisure and recreation: nature conservation should not exclude human activities per se. The interviewees argued for the right to walk or hike in protected areas. Protected areas should be of some human benefit. Furthermore the need for the development of infrastructure (for example the construction of important motorways) seemed to be of more importance than nature conservation.

### ***The Romanian case***

In analysing the attitudes towards biodiversity management measures, as revealed by “causes and consequences” of “relevant biodiversity issues identified” at local (for lay people) and regional (for expert secondary stakeholders) levels, the following provisional conclusions may be drawn:

- both primary and secondary stakeholders have negative attitudes towards land use management practices of the old communist regime (i. e., damming up floodable areas, deforestation of the “cereal agricultural” areas, intensive use of chemical fertilizers)
- both primary and secondary stakeholders have positive attitudes towards the needed, but still not implemented management measures to correct the current situation (i. e., unclogging works, control of the locks and dams construction based on hydrological studies, raising public awareness on the consequences of biodiversity loss, etc.).

### ***The Balaton uplands case***

Biodiversity management measures proved to be significant mostly for graduates or for those university students who perceive the outcome of biodiversity measures through scientific studies they learn about at university. Do people perceive losses of biodiversity and what do they consider as causes? What are their attitudes to particular management measures and conservation?

All students who learned or heard about the concept perceived losses of biodiversity. In their view, the causes for biodiversity loss include the growth of inhabited, agricultural or industrial areas, more intensely used agricultural land, more mines and smaller forests. They emphasised that specific management measures and conservation were very important and required in order to maintain biodiversity.

Both groups of students knew little about biodiversity protection, but indicated that human activity should be restricted further, not only in protected areas.

### ***Summary***

The participants of the deliberative events seemed to have clear positions on the management of biodiversity-related issues. The majority of people seemed to accept active management of biodiversity or even expressed that it was urgently required. However, views diverged considerably about the specific objectives and the methods of biodiversity management. Issues raised included, for example, the reintroduction of particular animal species, invasive species and the role of agriculture in promoting or limiting diversity, but also more generally related topics such as deforestation and degradation of habitats and natural resources like bogs and moorlands. In the Dutch case, some individuals distinguished between management of their natural environment and management of biodiversity, which was seen as opposed to each other.

Participants' statements relating to biodiversity management can also tell us something about how people see the role of humans in nature, what they value about their natural environment, and why they prefer certain ways of biodiversity management over others. These questions will be addressed in future publications on our work.

## 4 Case study reports

### 4.1 The Netherlands: Drents Friese Wold National Park

#### *Method and study site*

In the Netherlands we conducted five focus groups (four groups with residents and/or tourists and one group with experts not involved in the area), three interviews with experts from the conservation organizations owning most of the National Park and 12 interviews with lay people. The lay people were mainly residents living around the national parks and tourists visiting the park on a rather regular basis. The focus group discussions lasted from 75 to 110 minutes. Very often people carried on with discussing, long after the official group discussion was over.

The Drents Friese Wold National park is situated in the north eastern part of the Netherlands. It is constituted of 6100 ha of forests, moorland and drift sand areas (see Fig. 3). Several small brooks spring in the area and some agricultural enclaves are still present. The area is one of many touristic areas in the provinces of Drente and Friesland and popular as a short holiday

**Fig. 3: Case study site Drents Friese Wold**



destination. Tourism is therefore an important economic activity. The ownership of the area is split between different nature conservation groups. The biggest owner is SBB (the former forestry agency of the Dutch government) with 4150 ha. Two other important owners are Natuurmonumenten (the biggest nature conservation NGO in the Netherlands) and Drents Landschap (a regional nature conservation group). When the National Park was established, a general consultation group was also formed, consisting of many institutional stakeholders in the area.

All focus groups and interviews were transcribed (in Dutch), coded and analysed using ATLAS.ti software. We used the common coding scheme (see Annex Section 7.4), with some adjustments on detailed codes. In this report we describe views and opinions of the respondents. Due to the scope of this research, we cannot conclude on actual percentages for specific typologies or support for specific measures.



***Biodiversity as specification of the concept of nature***

It is clear from any discussion that the concept of biodiversity (BD) is very hard for lay people to grasp. Most people have heard of it, but many have difficulties defining it. Most people almost immediately turn towards the more general concept of nature. Among some lay people biodiversity is a contested concept. For them biodiversity seems a concept for and from ecologists and conservationists, and it appears to contradict their own concepts of nature. Although the concept is also hard to grasp for other lay people, those people do not express distrust in the use and definition of the concept. Surprisingly, some professionals claim BD is mainly a communicative device to communicate with people, while in our discussions with lay people, they either define BD as a political term (from conservationists to promote their conception of nature) or as a difficult term.

Three different definitions of BD are often used in the discussions:

- A. BD as an *ecological concept*. The variety of species, with special attention to endangered ones
- B. BD as a *biological concept*. Existence (visibility!) of different general species
- C. BD as a *perceptual concept*. Variety and diversity of landscapes, including different agrarian crops.

B and C might both be defined as *aesthetical concepts*.

Lay people make no references to ecosystems, while professionals claim the concept to be directly linked to specific ecosystems.

The concept of biodiversity is very much under discussion, and closely related to the concept of nature. The definition of nature is important for the support of different measures. People who define nature as “everything not influenced by man” are often opposed to specific measures to increase biodiversity. Depending on the specific concept/definition of nature people adhere to, biodiversity and nature protection are either conflicting or amplifying values. For a substantial group, biodiversity is opposed to nature. This is the group who defines BD mainly as aesthetical or perceptual concept. Their definition may be part of the strategic discourse to support their specific view on nature conservation.

Concepts of nature expressed can be viewed as lying on a **linear scale**, with some people very much on the “pristine nature” end and some on the “everything is nature” end:



These definitions correlate strongly with attitudes on biodiversity measurement. People with a narrow definition of nature (nature not influenced by man) express strong resistance against

many measures that are meant to increase BD. The causal relationship between these two is hard to decipher.

### ***Attitudes on the protection of biodiversity***

Attitudes on the protection of biodiversity cannot be separated from attitudes on the protection of nature. Protection of nature in the National Park is hardly contested. Support on this issue is very high and all residents in our groups expressed strong involvement with the area (especially as their daily environment). The specific goals in the protection of biodiversity are more contested, with a high proportion of respondents expressing discontent, sometimes in an insider-outsider context: the intended kind of nature is perceived to be only for ecologists and other professionals. Support for the different goals and related management options seem to be related to the different values and functions connected to biodiversity and the National Park. Many view protection of biodiversity as being opposed to the protection of the kind of nature they prefer (e. g., attractive landscapes).

On possible conflicts between BD and nature as living environment (or lifeworld), different subgroups can be discerned:

- A. Protection of BD (global and local) is considered important and an important goal of nature conservation:
  - a. Some conflicts between BD and lifeworld-nature are perceived (e. g., accessibility of area) but mostly accepted (intrinsic values recognised)
  - b. No possible conflicts are perceived.
- B. Protection of BD global is seen as important, but in the local context the protection of nature as an attractive lifeworld is more important. (BD not contested as main goal of nature conservation)
- C. Conflict of interests: Protection of BD global is considered important, but in the local contexts seen as hardly realistic. Other functions and values are seen as more important (e. g., economic activities and urbanisation)
- D. BD as goal in general is contested, but always on the local level, not on the global level.

### ***Biodiversity management***

Attitudes towards management measures are very differentiated. Many measures seem to be supported by a large group of respondents. Some measures are very much contested, like cutting trees and closing off areas for visitors.

#### ***1) cutting of trees for different purposes (brook restoration, sand dunes, diversity of tree species)***

Attitudes vary significantly between participants being completely opposed to tree cutting, to participants agreeing with this practice. Much of the discussion centres on

the effect of the measures. Cutting of trees in general provokes quite a lot of resistance. A minority trusts it is for the benefit of the park. For others, the impact on the visual landscape is negative. Also for many people, this type of conservation is not in line with their image of nature, in which the natural processes of nature are more important than specific management goals.

## ***2) Closing of areas for visitors***

Many people are opposed to the closing of paths or dirt roads for (walking) tourists. The measure is also used as an example of the insider-outsider view on the area: “they” (=conservationists) want to close it, to have it just for themselves in order to carry out their experiments.

Attitudes on management measures seem closely connected to:

- **values** (importance of BD protection related to importance of lifeworld-nature)
- **images of nature**
- **knowledge and ecological references.**

The relationships between attitudes on measures and knowledge, values and images of nature are very closely connected and some arguments may be strategic. For example, the contestation of expert knowledge is often used as a strategic argument in discourses. Deconstructing these relationships is very hard, in part due to the somewhat disorderly nature of focus groups.

The attitudes on the effects of measures differ between people. Many individuals see improvements in the field; whereas others see little if any concrete differences, but believe that overall positive effects can be seen. Many express serious doubts about the effects of measures. There is a clear relationship between attitudes towards the effects of measures and attitudes towards the measures themselves. The two are closely interwoven with each other. Doubts about the effects seemed to occasionally influence the attitude on the measure itself and seemed to be a clear strategic stand in grounding one’s opinions about the measures.

## **4.2 Germany: Südost-Rügen Biosphere Reserve and Leipzig**

### ***Method and study site***

A total of 15 focus group discussions were carried out in Germany:

- 8 groups in the city of Leipzig (women, retired women/men/mixed seniors, older secondary school pupils , young women/men/mixed)
- 7 groups on the island of Rügen (conservationists, tourism industry, local residents, tourists, farmers (2 groups) and fishermen).

The duration of the group discussions was between 30 and 90 minutes. There was a variety of opinions and views within and between the groups. The main difference between the groups was the debate regarding the conflict surrounding the Rügen biosphere reserve which, as a matter of course, dominated the discussions that took place on the island.

The interview phase was completed by October 2005 and we started the transcription of the interviews. We prepared our coding scheme and conducted a test coding using MAXqda2 software, which performs qualitative data analysis.

The “South-East Rügen” biosphere reserve lies on the island of Rügen and is surrounded by the Jasmund and Vorpommersche Boddenlandschaft national parks. The total area of the reserve consists of 23,500 ha (9,500 ha terrestrial and 14,500 ha marine area), an area smaller than the minimum size stipulated by the UNESCO criteria (30,000 ha). The reserve includes the island of Vilm, in GDR-times a “forbidden island”, the holiday area of the party and state’s leadership. The core zone is about 350 ha (1.5%), the care zone about 3,200 ha (13.5 %) and the development zone about 19,950 ha (85%). Wetlands of international importance and a European bird sanctuary are situated within the reserve.

The approximate population is about 11,500 inhabitants in 10 communities with currently no negative trends as commonly observed in other parts of Eastern Germany. The region has a rural character, but because of the economic transformation after German unification there was a decline of agriculture. Tourism became the most important sector and offered new jobs. Tourism also resulted in the construction of new hotels, guest houses and holiday parks, with more than 200,000 visitors and tourists visiting the area every year.

The biosphere reserve was established in 1993 followed soon after by a conflict regarding the new management framework. Key conflict areas were the extension of the entire reserve in general and more specifically that of the core zone. Key conflict actors are conservationists and the reserve administration on the one side and farmers, fishermen, hoteliers and restaurant owners on the other side. There is an informal group of opponents, but no public protest. Our partner in conducting the group discussions, the “Büro für Landschaftskommunikation” seeks to initiate a mediation process to solve the conflict.

This report includes the results from 8 focus-group discussions conducted in the city of Leipzig (n=62, see Annex 7.1).

### *Understanding of biodiversity*

It is important to mention that “biodiversity”, “natural diversity” and “diversity of life” as concepts are little known among the participants of the Leipzig focus group discussions – the information and the knowledge associated with these concepts is rather vague. In many discussions the term “natural diversity” was used, as “biodiversity” was even less well understood.

In the Leipzig case we can identify two main groups. For one group everything is “diversity“. These participants did not exclusively refer to wild nature when speaking of natural diversity. Instead, they included man-made areas like parks and gardens. Intra-urban green areas were repeatedly referred to when discussing biodiversity, such as those established in Leipzig during urban structures renewal programmes.

For a second group diversity is both a biological and an aesthetic concept. Generally, the term refers to the diversity of animal and plant species, although sometimes to habitats and ecosystems as well. In the aesthetic sense, diversity is associated with beauty and variety, and with recreation values. The interviewees from disadvantaged social strata primarily refer to the diversity of animal species, with habitat diversity rarely referred to. The aesthetic meaning of natural diversity is omnipresent. Invisible or unattractive species (such as bacteria or insects) are recognised as relevant for the term.

The participants had difficulties in identifying the benefits of natural diversity for society. Natural cycles are mentioned in a general manner, it is asserted that somehow, everything is “important”, interconnected and “in equilibrium”. In addition, several remarks of the interviewees pointed to the importance of natural diversity for the survival of mankind and of human society (the production of oxygen was often mentioned as an example). Other aspects considered were the food chain, healthy nutrition and the protection of habitat for its own sake (“animals need to rest as well”).

Biodiversity does not play a part in the daily life of the respondents, and if it does, it is only a marginal role. The interviewees rarely give examples from their daily life, with only a few mentioning that they had observed fewer birds or fewer wild flowers in meadows. Some did not perceive any signs of biodiversity. In a few cases people notice the increase of natural diversity in their own surroundings, for example the greening of cities or the re-cultivation of open-cast mining.

The reduction of biodiversity is perceived, but principally through the media (programmes on species loss, whaling and logging of rainforests, etc.). This is broadly comparable with other risks, such as biotechnology or nuclear energy, where knowledge on the topic is purely media derived. Species loss is not observable for the urban lay person.

Nearly all participants stated that the diversity of species in the “South” is higher (however some made the exception that biodiversity in Southern countries is not comparable to biodiversity in Germany) and argued in favour of conservation and therefore interventions in the Southern countries. They argued: “*We do have the knowledge and we have to make clear to the people that they must not cut down the rainforest.*” Some argued against: “*People in poor areas do not have other possibilities of ensuring their basic needs.*”

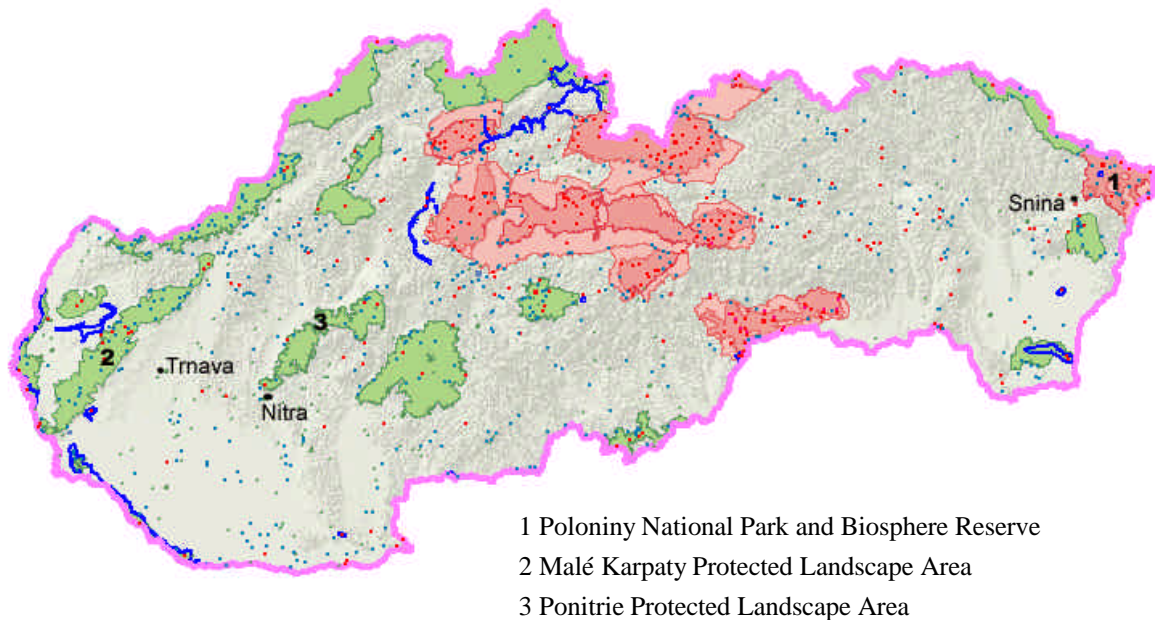
### ***Attitudes towards biodiversity management measures***

Generally, the participants argued in favour of stricter protection regimes for biodiversity, however, they are not inclined to support this by means of personal contributions, taxes or similar measures. Nature conservation is considered to be a government or municipal task, but this attribution of responsibility is done pessimistically, often referring to politicians’ hidden agendas. The interviewees were equally sceptical with regard to conservation initiatives by the private sector (e.g., Krombacher Beer, a company that buys rainforest with parts of its profits). Conservation and environmental NGOs were not discussed in this context. In general, the interviewees showed little interest in becoming active themselves: either the state should do conservation, or professionals should use donations for it.

Nevertheless the measures for the protection of biodiversity are considered insufficient. The participants argue for taking more drastic measures and for (more) rigorous laws. In conflict situations protection should be enforced even against basic social issues. For example concerning CO<sub>2</sub> and other emissions, the participants wanted to take more drastic measures against the industry. These sometimes drastic claims are somehow disconnected from the needs for leisure and recreation, with an underlying feeling that nature conservation should not exclude human activities per se. The interviewees argued for the right to walk or hike in protected areas and for protected areas to be of some human benefit. Furthermore the need for the development of infrastructure (for example the construction of important highways) seemed to be of more importance than nature conservation.

### 4.3 Slovak Republic: Poloniny Biosphere Reserve, Nitra and Trnava region

#### *Study sites and method in Slovakia*



**Fig. 4: Location of study sites in Slovakia**

The research in Slovakia was carried out in Poloniny Biosphere Reserve, in the Nitra region and in the Trnava region (see Fig. 4). We selected localities that we considered examples of the contemporary Slovak society:

- Poloniny Biosphere Reserve is a marginal region with a specific cultural and socio-economic background in the far east of Slovakia
- The Nitra region is a typical urban west-Slovakia region, close to Ponitrie protected area,
- The Trnava region is a typical region that is currently changing from an agricultural area into one with modern industrial areas. The Malé Karpaty protected area is nearby.

We decided to carry out face-to-face interviews for several reasons: In an early stage of the research we intended to collect as many opinions, concepts and attitudes concerning biodiversity as possible. For this reason we used written questionnaires. Unfortunately, this method of data collection did not produce satisfactory results. We also had to reject the idea of group discussions because of negative experiences from earlier discussion meetings where participants did not always turn up, and others were unwilling to talk or express their opinions in a group discussion.

We interviewed 66 respondents aged between 19 and 58. Interviews took between 15 and 30 minutes, depending on the interviewees' willingness to talk and personal interest in biodiversity issues, mainly management issues. We interviewed natural sciences students and arts students in the Nitra region and stakeholders, mayors, residents, a parson, representatives of national authorities, representatives of state protection organisations, representatives of NGOs, teachers and tradesmen in the other areas.

Each interview had three parts:

- (i) personal data (sex, age, education level, profession, place of residence)
- (ii) eleven general biodiversity questions
- (iii) twelve site-specific biodiversity questions.

All interviews were transcribed and then analysed using MAXqda2 software. Two parallel analyses were done and then consulted for more objectivity.

### ***Concepts and values related to biodiversity or nature***

Discussing images and concepts of biodiversity usually meant discussing images and concepts of nature as a whole. For lay people it seemed more natural to talk about nature than to talk about biodiversity, as the concept of biodiversity seemed to cause confusion. Also the concept and the term itself is not common in the media, with scientists tending to use scientific language that is distant to that of lay people.

We found that the concept of nature individuals had in mind was closely related to the values they related to nature. In the interviews we identified the following basic values:

- harmony and equilibrium, e.g., "*Biodiversity is important for harmony and equilibrium in nature*" and "*... otherwise it wouldn't work, all those processes in nature ...*"
- intrinsic value and human survival, e.g., "*we cannot live without it, because we came out of it*" and "*it is important for our being*" or "*man is a part of nature and from its state unreels also human existence*"
- uniqueness, e.g., "*... important that everything is not monotonous...* "
- ecosystem stability, e.g., "*Biodiversity means diversity of species of animals or plants in an ecosystem. The higher the species diversity, the more stable the ecosystem.*"
- food chain, e.g., "*... if any species die out, the cycle will be disturbed, the food chain will be disturbed, it would be poorer ...*"
- gene pool, e.g., "*... for me it is important to preserve the gene pool because when one species is eliminated whole population is changed and quality of living environment is worse*".
- aesthetic value, e.g., "*A meadow is nicer when there are more flowers*" or "*I am fascinated by nature's creations*" or "*It makes my life manifold.*"



### ***Changes and threats***

The closer the participants lived to nature; the more sensitive they were to changes. In Poloniny and Malé Karpaty (Trnava region) people were able to talk about perceived changes in nature, but only very few students in Nitra noticed any changes in nature.

In Poloniny where people are living “in nature’s lap” they recently observed higher numbers of bears, foxes and boars and introduced beaver. Foresters found that “*maples and ash trees are decreasing.*” The influence of pollution and resettlement was also discussed: “*As a child I dreamed that I would be a fisherman, but many species disappeared. It is a big signal of pollution. Also, the number of swallows decreased, a fact that is connected with resettlement. On the contrary, European bison and wild ducks increased.*” Land use changes were mentioned as very important changes: “*In the time of socialism there were recultivations, collectivisations, everything was put into one unit and nowadays it is disuse of agricultural land. Also, the forest cover in Poloniny increased. After the war in the 60s, 50% of the area was covered by forests and 50% of land was used by local peasants in a traditional way. This was the peak of biodiversity in the area. Nowadays, the forest cover is 90%, so the biodiversity is declining. Some species disappeared.*”

In Malé Karpaty some people think that “*number of species increased*”, but others think that “*more likely, more species disappear than appear*” From examples we knew that “*pasqueflower disappeared*”, “*hare and pheasant decreased, but now are increasing*” and that “*eagle appeared again after four years and also some species of amphibians and salamanders.*” When talking about biodiversity in a local context people perceived positive and also negative trends in biodiversity.

The main threat to biodiversity, mentioned by all respondents, was “*man*” and his “*activities*”. As other threats respondents mentioned, for example, urbanisation, industrialisation, logging, desertification, air pollution, but also “*human ignorance*” and “*human desire for growth*”. Human activities were not seen only as a negative factor, but also a “*missing man*” was seen as a threat: “*In small amounts men are positive for nature, because they keep the balance in nature. Man and nature – it is a bond that has its history.*”

### ***Biodiversity management***

The respondents referred to biodiversity management practically exclusively at the local level. Only occasionally respondents talked about the global protection of biodiversity. “*Public education*” was considered as the most important issue by most respondents from the students’ sample and Trnava region. According to the respondents, more weight should be given to public education in schools, information dissemination directed towards the public and involving the public into biodiversity protection. Many respondents also favoured strong legislation and strictly enforced rules as a means for biodiversity management. The importance of protected areas was stressed. The situation in Poloniny where people are directly affected by the legislation and nature protection was different. Here, people showed a

preference for protection to be restricted to really important and rare areas, as opposed to the entire area as it is now. Quoting from Poloniny interviews: “... *there is too much of protected area, I would decrease it ...*” or “... *those areas should be protected where the biodiversity is highest, also in the scope of the whole of Slovakia, though not so strictly, that would be beneficial...*” Nature protection is seen as being in conflict with local socio-economic development: “*For those who are living here, the NP only makes it more difficult ... Poloniny restricts people. There is no signal for mobile phones here; mobile signal towers couldn't be built, because everywhere is something protected. Pathways, roads couldn't be repaired, because everything is protected ...*”

#### 4.4 Romania: “Insula Mica a Brailei” protected area and Braila

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The Inner Danube Delta<sup>9</sup> was, between 1960 and 1970, included in a management programme for substitution of the natural wetland zones with agricultural systems. From the total Inner Delta area of 2143 km<sup>2</sup>, only 20% remained under natural flooding regime.

Among these areas is the “Small island of Braila”, located between km 175 and 237 of the Danube river (see Fig. 5). This is the second largest area, after the Danube Delta, with characteristic systems for the former Inner Delta and the Danube Floodplain. The area was designated by law as a Natural Park in 2000, declared a RAMSAR site in June 2001 and subsequently integrated in the SPAs Network and LTER Network.

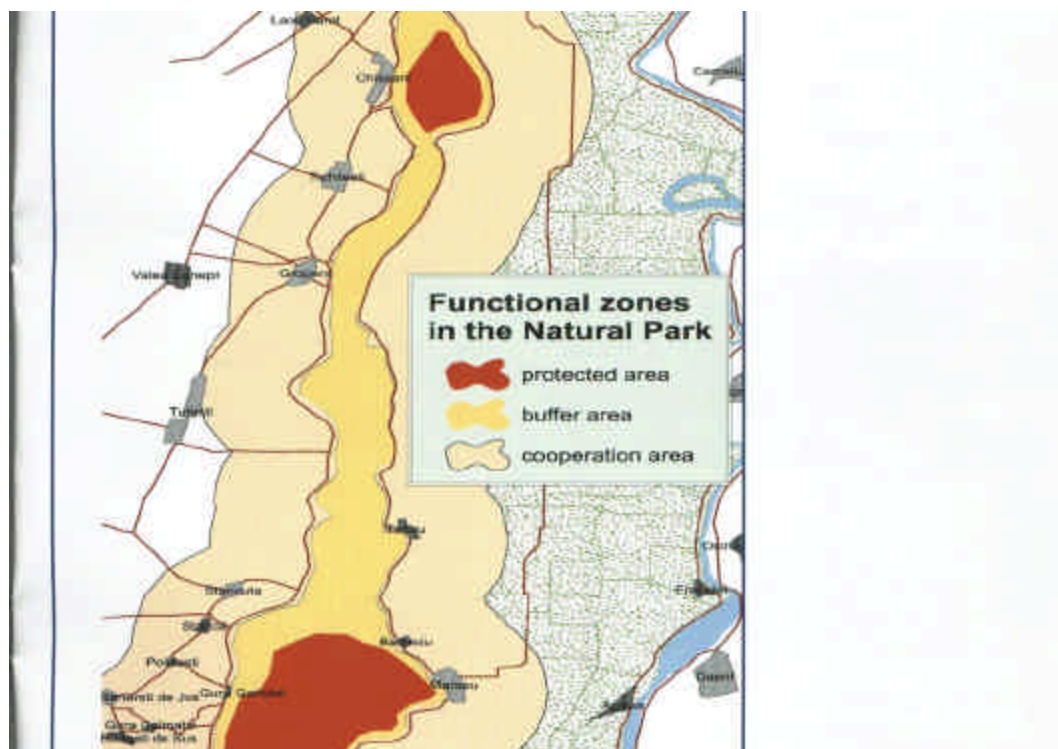


Fig. 5: Map of the study area: Insula Mica a Brailei

The Natural Park covers an area of 21,074 ha (including channels and Danube arms). The area has 147 plant species, 136 bird species, 11 mammal species and 13 amphibian and reptile species.

After debating on the use of focus groups as a method to collect research data and engage participants in meaningful debates, the University of Bucharest working group decided to

<sup>9</sup> This brief presentation of the protected area is based on the *Life Natura 99 NAT/RO/006400* project presentation booklet.

adapt the Values Grid and Values Ranking methods for the RA5 work package objectives and to conduct eight deliberative events using these two methods. The focus of this effort was mainly to test the strengths and limitations of the methods, rather than drawing conclusions about perceptions and attitudes towards biodiversity.

### *Using the Values Grid method*

#### *Participants*

Four Values Grid sessions were carried out. For two of them, the groups of participants consisted of “debutant” (under 5 year experience) and “experienced” (over 10 year experience) fishermen from the “Insula Mica a Brailei” Protected Area in the eastern part of Romania. Two separate sessions were carried out on the same day, with each session engaging one of the two “contrasting” groups. The two groups comprised of 17 and 18 participants respectively. All participants were male, aged between 20 and 70.

For the two other sessions, the participants were “experts” (representatives of organizations with statutory responsibilities for biodiversity conservation), and “local, non-expert” (representatives of private businesses) “secondary stakeholders”. Two separate sessions were carried out on separate days and in separate locations, one in Braila, the county capital city and the other in Stancuta, a village in the “Insula Mica a Brailei” Protected Area in the eastern part of Romania. The two groups consisted in 18 and 2 participants respectively. The gender distribution of participants was 11 female and 9 male. The participants were aged between 20 and 70.

#### *Format*

Each Values Grid session had three different stages of communication and individual work:

1. Working documents are provided for participants, in order to make some group decisions and prepare for the next stage.
2. Participants work individually as instructed
3. Participants split into discussion groups and debate a topic selected from those decided by the whole group as relevant for biodiversity.

### *Aims and objectives*

Each session aimed to:

1. Test the potential of the method that has originally been developed for moral education purposes, to be used in engaging the public in debates on biodiversity
2. Help participants to understand what steps they must take in order to develop a clearer and stronger set of values related to biodiversity.

The objectives of the event were:

1. to collect information on issues related to biodiversity that were relevant for the community
2. to collect information on the positions of participants on biodiversity issues;
3. to use the information to engage participants in debates on biodiversity issues relevant for the local community
4. to clarify participants' sets of values related to biodiversity
5. to develop communication skills of participants in group situations.

Note that it was not a primary objective of this exercise to produce data that are directly comparable to the data on attitudes collected through focus-groups and personal interviews.

### *Summary description of a typical deliberative event (Values Grid approach)*

Written instructions including an overview on biodiversity and the ongoing session are handed to participants, together with a Values Grid form and a personal factual data form. The moderator provides information on the forms and the event structure and encourages participants to interact and agree on a number of three to six biodiversity-relevant issues in their community. The issues that participants agree upon are written on the flipchart and then on each participants' Values Grid form.

Each participant privately writes a few key words to summarize their own position on each issue. Each participant then answers seven questions about their own position on each issue. If the answer is "Yes", they check the appropriate box on the Values Grid form. If the answer is "No", they leave the box blank. Each participant fills in the "personal factual data form".

The seven valuing questions are:

1. Are you proud of (do you prize or cherish) your position?
2. Have you publicly affirmed your position?
3. Have you chosen your position from alternatives?
4. Have you chosen your position after thoughtful consideration of the pros and cons and consequences?
5. Have you chosen your position freely?
6. Have you acted on or done anything about your beliefs?
7. Have you acted with repetition, pattern or consistency on the issue?

After they have completed marking their grids, participants are encouraged to cluster in groups of three to six persons. Each group selects one of the issues that have already been brought forward and discusses the group members' positions on the issue as well as the firmness of the individual positions. At the end of the session the moderator collects the documents from the participants and encourages them to informally interact over refreshments.

*Data collected*

As can be seen in the example below, the pre-debate section of the deliberative event may provide, by content analysis of documents filled in by participants, **a profile of biodiversity issues relevant for the local community** as perceived by the group involved in the deliberative event.

A content analysis of the lists of key words written down by participants on the Values Grid forms enabled us to identify three domains of contents:

- (i) **causes** perceived by the participants as leading to the identified issues
- (ii) **consequences** of these issues
- (iii) **remedial actions** thought necessary by participants (see Table 3).

**Table 2: Content analysis of positions written on Values Grid forms by “experienced fishermen” group**

Group	n participants	Identified issues
Experienced fishermen (over 15 year experience in fishing)	18	<b>Diminished fish resources (both quantity and species)</b>
		<b>Deforestation</b>
		<b>Illegal hunting and fishing</b>
		<b>Diminished pest control</b>
		<b>Reckless use of polluting chemicals</b>

**Table 3: Positions of experienced fishermen on each identified issue**

<b>DIMINISHED FISH RESOURCES (BOTH QUANTITY AND SPECIES)</b>		n participants expressing position
Categories of position statements	<i>Specific positions</i>	
<b><i>Causes</i></b>	Poaching:	12

	By traditional methods	4
	By electrocution of fish	12
	Habitat change	4
	Pollution	14
	Lack of repopulation programs for fish species	6
	Defective legislation	2
<b><i>Consequences</i></b>	Economic problems	2
<b><i>Remedial actions</i></b>	Better legislation	2
	Attitude change	4
<b>DEFORESTATION</b>		
<b>Categories of position statements</b>	<b><i>Specific positions</i></b>	
<b><i>Causes</i></b>	Poor land management:	10
	Using land for agriculture	1
	Pollution	4
<b><i>Consequences</i></b>	Reduced quantity of oxygen	2
<b><i>Remedial actions</i></b>	Better management	3
<b>ILLEGAL HUNTING AND FISHING</b>		
<b>Categories of position statements</b>	<b><i>Specific positions</i></b>	
<b><i>Causes</i></b>	Corruption	8
	Poaching	8
	Diminished natural control of some species of birds of prey	4
	Bad legislation	3
<b><i>Consequences</i></b>	Diminished species diversity	3
<b><i>Remedial actions</i></b>	Enforcing better legislation	2

<b>DIMINISHED PEST CONTROL</b>		
<b>Categories of position statements</b>	<b><i>Specific positions</i></b>	
<b><i>Causes</i></b>	Diminished funding for pest control	4
	Poor management	3
<b><i>Consequences</i></b>	Noise pollution	1
	Crop and livestock loss	2
	Diminished species diversity	11
<b><i>Remedial actions</i></b>	Integrated pest control	4
<b><i>Pest species nominated</i></b>	<i>Corvus cornix, Pelecanus onocrotalus</i>	3
<b>RECKLESS USE OF POLLUTING CHEMICALS</b>		
<b>Categories of position statements</b>	<b><i>Specific positions</i></b>	
<b><i>Causes</i></b>	Misuse of fertilizers:	1
	In agriculture	2
	In other activities	2
	Poor management of chemical substances usage	6
	Poor training in chemical substances usage	7
	Uncontrolled disposal of:	1
	Biological waste	3
	Industrial waste	2
	Changes in land ownership	2
<b><i>Consequences</i></b>	Land degradation	4
<b><i>Remedial actions</i></b>	Management of polluting chemical usage	5

Tables like these (see Tables 2, 3) were generated after content analysis for each of the participant groups. It became apparent that, should the method be used in large scale



comparative research, it could provide a cross-European picture of biodiversity-related issues perceived as relevant, as well as the dominant positions of local communities on these issues.

#### *Testing the Values Grid method: conclusions*

- The method is very effective in both a) collecting information that can be statistically analysed and used in comparative research and b) engaging participants in debates potentially leading to values and attitudes change – although the latter was explicitly *not* the aim of the approaches chosen in the other country case studies.
- The method is also cost effective, as relevant information can be collected in written form, as opposed to recording debates, transfer audio content into written format and then executing content analysis or “coding” the transcripts.
- The method facilitates identification of issues of interest for participants (as opposed to a pre-determined set of questions).
- Aggregating group profiles at regional or national levels for comparative research seems to be feasible with reasonable costs and accuracy.
- Additional qualitative information can be collected from transcripts of debates in groups.
- The method develops communication skills of participants in group situations.
- The method generates an exceptionally high level of participation. One of the problems that organizers had to face was bringing the debates to a conclusion within the allocated timeframe.

#### *Using the Values Ranking method*

##### *Participants*

Four Values Ranking sessions were carried out. For two of them, the groups of participants included “small” (under 5 hectares) and “large” (over 50 hectares) farm owners living in the “Insula Mica a Brailei” Protected Area in the eastern part of Romania. Two separate sessions were carried out in the same day. Each session engaged one of the two groups. The two groups comprised 19 and 16 participants respectively, all of which were males aged between 20 and 60.

For the remaining two sessions, the participants were “expert” (representatives of organizations with statutory responsibilities for biodiversity conservation), and “local, non-expert” (representatives of private business) “secondary stakeholders”. Two separate sessions were carried out on separate days and in different locations, one in Braila, the county capital city and the other in Stancuta, a village in the “Insula Mica a Brailei” Protected Area in the eastern part of Romania. The two groups consisted of 18 and 2 participants respectively. The gender distribution of participants was 11 female and 9 male. The participants were aged between 20 and 70.

The format, aims and objectives and session objectives were exactly the same as for the Values Grid approach.

*Summary description of a typical deliberative event (Values Ranking approach)*

Written instructions including an overview on biodiversity and the ongoing session are being handed out to participants. They are also provided with the list of questions, each with 3 alternative answers (“consistent with biodiversity conservation”, “inconsistent with biodiversity conservation”, “neutral”), and the personal factual data form. Instructions are provided by the moderator. Each participant privately ranks answers and fills in their personal factual data form. The following table shows a typical example from the list of questions:

1. Should you have current financial resources and predictable future large income, where would you prefer to buy a house?

_____	In the central area of a large city.
_____	In the area of a mountain or seaside resort.
_____	In an area with little or no pollution, nearby a lake or a forest.

After the participants finished ranking alternative answers, the moderator writes each of the questions on the flipchart and encourages six to eight participants to communicate their rankings. For some or all the questions, the moderator may want to give his/her own rankings.

During this stage, the moderator has to ensure that:

1. Participants rank all alternatives (as opposed to just naming the alternative ranked first);
2. Participants name the alternatives (as opposed to just referring to the current and own choice position);
3. Avoid saying “the same” and rename choices even if they are identical with to the ones made by the previous participant.

After this phase, participants explain their choices in ranking the alternative answers for each question in small groups of three to six individuals and discuss these choices within their group. At the end of the session the moderator collects the documents from the participants and encourages them to informally interact over refreshments.

*Data collected*

The pre-debate section of every session provides indications on the distribution of favorable, neutral or hostile attitudes regarding various dimensions of biodiversity conservation.

Participants were asked to allocate “3 points” for the alternative closest to her/his way of thinking, “2 points” for the second choice and “one point” for the third choice.

Average scores can be then computed and rankings at group level established as shown in Table 4.

1. Should you have enough money and assured income sources for the future, where would you buy a house?

Type of attitude towards biodiversity	Medium	Rank	Alternative answers
Against	1.24	3	In a central area of a big city.
Favorable	2.47	2	In a green, unpolluted area, with some wet and forest area populated with birds and animals.
Neutral	2.29	1	In a mountain or sea-side resort.

**Table 4: Ranking of alternative answers for question 1 by “expert secondary stakeholders”, Braila**

Average scores and group level rankings were computed for each question and every group of participants. It became apparent that the method, if applied on a European scale, might provide data on “favorability indices” for various aspects of biodiversity, such as genetic, species and landscape diversity, and for biodiversity as an overarching concept.

#### *Testing the Values Ranking method: conclusions*

The advantages of this method are similar to the ones of the Values Grid approach. In addition,

- the method engages participants in making, explaining and defending choices on issues related to biodiversity conservation,
- the method helps participants to understand the ramifications and possible impact of own choices on biodiversity,

#### *General conclusions resulting from testing the methods*

Both tested methods seem to be viable alternatives to the Focus Group method. There are some aspects in which both methods seem to perform better than Focus group method:

1. cost effectively collecting data from participants;
2. cost effective, less complicated and more reliable training of moderators and assistants for deliberative events;
3. providing a structured framework for aggregating research data at regional and national levels for comparative research.

When comparing the two alternative methods, it seems that while the Values Grid method seems to be equally effective with all kinds of participants, the Values Ranking method seems to work better with more educated, “expert” participants.

### ***Conclusions on understandings of biodiversity and attitudes on biodiversity***

In analyzing the understanding of biodiversity as revealed by “relevant biodiversity issues identified” at local (for lay people) and regional (for expert secondary users) levels, the following provisional conclusions may be drawn:

- The primary stakeholders (experienced and less experienced fishermen) tend to take into account mainly the “variety of species” dimension of biodiversity. Issues like “diminished fish resources”, “deforestation”, “diminished pest control”, “eutrophication”, “reckless use of polluting chemicals” were identified either as concrete situations or as causes for diminishing species variety;
- Secondary stakeholders (representatives of organizations with statutory responsibilities for biodiversity conservation or representatives of local business community) tend to take into account supplementary dimensions of biodiversity, like ecosystems diversity, landscape diversity and even cultural diversity (“clogging of lakes in floodable areas”, “damming of the floodable areas”, “agricultural and forestry practices with negative environmental impact”, “over exploitation of some categories of natural resources”, “lack of understanding by the general public of the need for biodiversity conservation”);
- There seems to be a positive correlation between the education level and the complexity of biodiversity concept;
- There seems to be a negative correlation in the case of primary stakeholders (“lay people”) between age and the complexity of biodiversity concept: older people seem to have a less complex concept of biodiversity.

In analyzing the attitudes towards different dimensions of biodiversity, as revealed by ranking the answers to predefined questions, the following provisional conclusions may be drawn:

- The Values Ranking method allows identification, for various groups of stakeholders, of differences in positive vs. negative attitudes towards different dimensions of biodiversity (species diversity, genetic diversity, ecosystems and landscape diversity, cultural diversity);
- Collected data can be processed and aggregated up to the point that attitudinal profiles could be generated and compared at regional, country or European levels.

## 4.5 Scotland: Cairngorm National Park

### 1 Area and method

A total of eight focus groups were carried out in the Cairngorms region of Scotland (see Fig. 6). The Cairngorm area was designated a National Park in 2003, and the establishment of the park as well as the development of management plans is still ongoing. The Cairngorms are the largest area of montane habitats in the British Isles featuring, for example, native woodland and heather moorland, and are home to 25% of the UK's threatened bird, animal and plant species. Tourism-related businesses account for about 80% of the economy.

**Fig. 6: Study site Cairngorm National Park**



The discussions were carried out according to the common discussion guide (see Annex 7.3), however, the order of the questions was flexible, in most cases starting with the perception and the personal experience of the participants with the Cairngorms region, then leading on to a more targeted discussion on biodiversity. As many participants struggled to respond directly when asked for their concept of biodiversity though many of them had

shown ample knowledge when asked indirectly, we found it useful to ask participants to draw a visual representation of biodiversity. This tool was surprisingly well received in seven of the eight group discussions and enabled further discussion and more in-depth understanding of participant concepts and attitudes. Other themes explored during the focus groups included the value of biodiversity, threats to biodiversity and attitudes towards biodiversity management measures. In this report, we briefly summarise results with respect to the understanding of biodiversity and nature concepts, perceived changes and threats and biodiversity management issues. A more detailed analysis will be reported elsewhere.<sup>10</sup>

### 2 Sample (see also Annex 7.1)<sup>11</sup>

- 8 focus group discussions
  - tourists (2 groups)
  - mountaineers in Aberdeen and Glenmore (1 group each)
  - foresters

<sup>10</sup> Please contact Juliette Young [jyo@ceh.ac.uk](mailto:jyo@ceh.ac.uk) or Anke Fischer [a.fischer@macaulay.ac.uk](mailto:a.fischer@macaulay.ac.uk) for references.

<sup>11</sup> **DISCLAIMER:** Please note that respondents participated as private persons, not as representatives of the organisations they might belong to. The views expressed thus do not necessarily represent the standpoints the respective organisations.

- local residents
- members of a bird conservation organisation
- agricultural college students
- 2-10 participants per discussion (n=43)
- targeted groups:
  - rural vs urban dwellers (eg. residents of Ballater vs Aberdonians)
  - users vs non-users (eg. mountaineers vs agricultural college students)
  - experts vs non-experts (eg. foresters vs tourists).

### 3 Results

#### 3.1 Understanding of biodiversity

Results from the focus groups carried out around the Cairngorms area show that most respondents when confronted with the term “biodiversity” expressed clear concepts (bird conservationists, foresters, most of the Ballater local residents, Aberdeen mountaineers): *“Different types of plants, animals, geology”, “it is also the number and quality of habitat as well as number of species”, “biodiversity to me is a habitat, a populated habitat.”* The participants of the two tourist groups, the agricultural college students, and most of the mountaineers at the training course in Glenmore however had not heard of the term before.

After they had heard a definition of the term however, most of them were immediately able to relate to the concept and used it frequently during the following discussions. When asked directly, many participants offered vague, all-encompassing descriptions of the meaning and importance of biodiversity: *“It is absolutely everything”*. Indirect questions, in contrast, often revealed that also those individuals who had not heard the term before still took notice of, and greatly appreciated the diversity within their environment (*“So we have seen quite a lot of different grasses”; “I have been looking for many years at different things... those tiny ferns and mosses”*).

In addition, the visual representation of the term enabled participants to take time to think about the concept, express some of their thoughts and discuss these with other participants.

The concepts nature, landscapes and biodiversity are perceived as being closely related with each other: *“I tend to think biodiversity is just a fancy name for nature.”* The close links between those concepts is underscored by the fact that the majority of drawings are visual representations of landscapes, with the landscape often hosting a diversity of species and other elements. Natural elements also became a recurrent feature in drawings, with water for example (represented by lochs, rivers, but never the sea) occurring in over half of the drawings. Individuals who chose to depict single elements as representatives of biodiversity tended to draw either specimens that they found surprising, that had so far been unknown to them, or species that they happened to know by name. The latter category includes species

like rabbits which individuals felt comfortable drawing, but also species they had learnt about at a guided walk (“I have drawn the only plant that I know by name, club moss”).

Biodiversity for many groups of respondents encompassed both biological and cultural diversity such as castles, farms and stonedykes, with man-made features frequently appearing in drawings and discourse. Domestic animals were in almost all groups included in the considerations, especially by the tourist and agricultural college students. The link between cultivating activities and biodiversity was emphasised by the students: “Yeah, if you didn’t have farming you wouldn’t have the different habitats.”

It appears that overall, participants tended to underestimate their own knowledge on biodiversity, giving vague responses when asked directly. However, conceptually rich insights were revealed indirectly during the discussion and drawing exercise.

### 3.2 Nature concepts

The group discussions gave also insights into the participants’ images and concepts of nature. Biodiversity as an aspect of nature was seen in very different ways by the various focus groups we engaged with. Many participants emphasised that they perceived biodiversity to contribute to a *balance* between elements which are closely interlinked. The tourists tended to see the fragile side of this interlinked system, “*you lose one species and everything is interdependent. Lose one species and that’s going to have a knock-on effect.*” This contrasted with the view expressed by some foresters and farmers, who emphasised the robust and adaptive nature of biodiversity “*Rubbish! It’s not fragile, it’s extremely robust and if something does go something else will take its place.*”

Most respondents apart from one member of the bird conservation group agreed that there was no *wilderness* left in the UK, although many respondents mentioned the unspoilt, open and quiet qualities of the Cairngorms: “*the thing that gets you is the wide openness, there is no sense of space*”, “*the Cairngorms is emptiness.*” Wilderness was perhaps less of an issue for the agricultural college students, who saw nature as a well-structured (agri-) cultural environment.

The *role of man in nature* was debated amongst several groups: “*we are part of the environment.*” Some members of the mountaineering groups, bird conservationists and local residents held the belief that man had a responsibility, as a consequence of previous human interventions, to promote biodiversity “*we have a responsibility because we have found the land in a balanced state and unbalanced it*”, “*man has destroyed it in the first place but if man can come back and clean up those waters and reintroduce the otter and get that flow going again, there is no reason why we can’t do that*”; “*I feel we should be custodians; surely we want to hand it on to the next generations and the generations after that*”; “*we don’t own the land and it has been given to us as trust to pass on to our children and our great*

*grandchildren. I think biodiversity and other elements like that are important in shifting the focus off us owning the land and being caretakers of it and there is a responsibility to look after it because it is not just for us, it is for all the future generations to come."*

Many expressed the view that humans should respect biodiversity and nature in general rather than interfere: *"it is the kind of place that would bite you if you relaxed your vigilance too much"; "It's nature's way, and evolution and that of species getting wiped out and changed and that, and we shouldn't be meddling with that."* The wish to exclude people from nature and at the same time, the desire to visit these places, and to shape them through management, often collided: *"I think a large lump, possibly the higher parts of the Cairngorms, ought to be banned to people."*

Participants expressed strong views on the **"right" or "wrong"** state of nature, and "right" or "wrong" species in the landscape. However respondents rarely indicated the reasons shaping these evaluations. *"Or the thistles. They are part of it, and it should be like that"* *"Bringing something across and planting it isn't a natural process. That is man doing it"* *"the unnatural species like sheep and deer would have to be culled out or culled right down."*, *"But if anybody is going to plant trees they should be natural trees surely."* Most comments dealt with the topic of naturalness, with invasive species seen in a negative light. However, the concept of "naturalness" and ideal states of nature in the Cairngorms were not explicitly addressed in most cases. Only the Aberdeen mountaineers reflected on these topics, *"what would we therefore deem to be appropriate landscape? Who is judging this? At what point are we going to go up to the Cairngorms and say we have got a nice landscape?"*

Participants acknowledged the **relativity of values**: *"...because I do think sometimes that people get obsessive with a particular thing. Maybe sometimes we get obsessive with trees. Sometimes you've got to stand by and see there are other things around about you"*, but expressed values related to:

- aesthetics; perhaps expressed most explicitly by the tourists and maybe also the agricultural college students: *"you have it right with your first statement: it's beautiful"*, *"if everything was of the same colour that would be boring"*;
- monetary value *"Tourism is good because it brings in money but it does eventually commercialise and kill the reason why it [the National Park] became popular in the first place"* *"The amount of deer that you have is linked directly to the value of your land"*;
- intrinsic values *"Those plants, those things there, have their own value. You can't say 'Oh, it's worth £5', but it does have a value. You can't really measure it that well, but just because you can't measure it that doesn't mean you can't or shouldn't keep it."*



### 3.3 Changes and threats

All groups had observed changes in species or habitats, and all perceived generally negative trends in biodiversity brought about by anthropogenic factors: *“Every time I go to the hills my heart sinks a little bit because I can see the damage!”*; *“the environment we are living in is getting worse”*; *“Well, it’s happened in a few decades, what took thousands of years to form.”* The Glenmore mountaineer group and local residents discussed the concepts of changes and threats in most detail. Changes and threats were mostly discussed in a local perspective. Only one participant, from the foresters group, discussed the inevitable nature of changes in the long-term, and the associated adaptation of species and humans to these changes. It seemed his perception of change was more long-term and perhaps less negative than changes expressed by other participants.

The main threat to biodiversity, mentioned in almost all groups, was seen to be recreation and tourism: *“People’s feet seem to do as much damage than anything else in these sorts of places.”* Interestingly, there seemed to be a distinction in the birders’ group of who should be “allowed” into the Cairngorms, depending on your level of knowledge and appreciation of the area *“the wildlife will be gradually worn away by all these people coming in and they won’t give a damn!”*, although, when asked directly, the bird conservationists agreed that access restrictions should apply to themselves as well.

Other threats include the introduction of invasive alien species *“Things can dominate. Look at your example, look at rhododendron. If that takes over that takes over and there’s nothing else that grows near it”*; *“we have got some pretty disastrous foreign introductions. Mink! Rhododendron! Two of the species that degrade our hills most”*; intensive agricultural practices *“you go to places that are overgrazed and there is nothing there but coarse grass”*, pollution *“the river system is just an open sewer now”*, hunting etc. Both mountaineer groups mentioned the irreversible nature of biodiversity loss *“the loss of species, once they have gone they are gone.”*

Although all groups listed perceived changes and threats without much prompting, and all acknowledged a general loss of biodiversity, it was much more difficult to gather their perceptions of the consequences of biodiversity loss. There seemed to be a general feeling that loss of a particular species would have knock-on effects on other species and humans, but what these effects were was not at all clear *“It would break a certain part of the food chain and more and more things would disappear”*. It was also clear that biodiversity loss would have serious consequences *“but without it we aren’t here, so, you know diverse or not, if it is not there we are not here either”*, however it seemed a very difficult topic for participants to discuss in further detail, and practically impossible to determine what the consequences biodiversity loss would mean to them personally: *“Because anybody who likes wildlife would want it preserved.”*

### 3.4 Biodiversity Management

Most local residents (Ballater local residents, foresters, Aberdeen mountaineers, bird conservationists) knew of the National Park designation, as well as management measures in place in the park and often had very strong views on the management measures themselves and on the potential effects these measures were likely to have on the local area: *“The Cairngorms is the worst managed area there is probably in Europe”*; *“They said they were going to integrate conservation, shooting, farming, tourism and all these things and it is not happening, it is very much biased towards the shooting fraternity, I feel”*; *“It’s about education; I think it’s about real education of the public. To say ‘this is worth keeping’”*; *“I would like to see it managed to allow natural processes to take place. Not for us to decide what the outcomes of those processes are going to be”*; *“You don’t want it to stand still.”*

Regarding ownership and responsibility for biodiversity management, most respondents agreed that nature should not be owned by individuals, though they acknowledge that this was perhaps the case in the Cairngorms. For the bird conservationists, a strong governmental hand seems crucial, *“If it’s going to be a national park, that’s what they should be national property. With the government looking after it and then you would have a chance of doing something.”*

The other groups (the two tourist groups and mountaineers at the training course in Glenmore) had either not heard of the designation at all, or had heard about it just before or as they arrived in the area. The designation did not appear to be a prime reason for visiting the area. The latter group also had a more limited knowledge of the management measures in place in the Cairngorms and frequently discussed the biodiversity management measures in a broader sense. Nonetheless, very strong views about ownership, hunting and European level legislation were expressed by this group: *“you need to fence off areas unfortunately if you are replanting Scots Pine you definitely need deer bags around it to stop deer or sheep going off”*; *“if you want to get a proper balance back and bring back woodland and things like that you would have to introduce a large carnivore, or several large carnivores or whatever, to ape that”*; *“It is wrong that anyone can or should own such a beautiful bit of area and it is even more wrong that if one person does think they own it that they should think of selling to whoever.”* When the Cairngorms National Park was mentioned, it was often in comparison with other (more established) National Parks in England, Wales or other countries such as the United States.

In nearly all groups, the designation was seen as a marketing ploy, with conservation often making way for other economic interests. This was in all cases considered negative: *“I think it is helpful... very helpful, because the paths are very well developed, even for wheelchairs, and they do everything for kids here anyway, and if people stay on the paths, which they normally do, most of the time, then it is helpful for nature, and moreover money flows into the*

*area which they can use for the park, which is very important*". Most of the discussion revolved around threats posed by increased tourism and high levels of management: "My personal perception of the Cairngorms National Park, or the area within that is that it's too well managed, that nature conservation there it isn't natural enough."

There was often a dilemma over what aspects of biodiversity should be protected: "you can't draw lines and say 'these species are expendable and these species are not.'" For the agricultural students, biodiversity is acceptable as long as it does not interfere with farming: "Well I mean songbirds don't really do much harm do they?", "... as long as there's some there, I suppose, and you are not wiping out the entire species. They don't do any good so there's not really any major incentive of having them."

## **4 Conclusions**

### **4.1 Main conclusions**

Concepts of nature, biodiversity and landscapes were discussed extensively in all groups. For the most part, focus group participants underestimated their knowledge of biodiversity. All groups mentioned numerous threats to biodiversity, but the general feeling regarding biodiversity trends was one of biodiversity loss due to anthropogenic pressures. On the issue of biodiversity management, most participants acknowledged the fact that no area of wilderness remained in the UK. However the discourse regarding the intensity and focus of management varied greatly amongst and between focus groups.

### **4.2 Comments on the methodology**

The focus group method proved very effective at this early stage of research, where the main aim was to gather a broad understanding of people's attitudes to biodiversity. All participants appeared comfortable with the methods used and were often very enthusiastic about the themes selected for discussion. The use of drawings proved particularly useful by providing participants with a different medium for expressing their attitudes. A few difficulties were encountered in larger groups where some of the less vocal participants could become overshadowed by others.

### **4.3 Open questions**

Perceptions of the consequences of biodiversity loss would be an interesting aspect to further explore. Although most respondents mentioned threats and changes in biodiversity, the exact reasons behind the desire for biodiversity conservation were often unclear, despite the fact that biodiversity seemed to be important for respondents.

Another issue requiring more research is the issue of prioritisation of species conservation. In the case of the Cairngorms for example, invasive species were often seen as a very negative

component of biodiversity, which had to be controlled and often eradicated. There is an evident dilemma: on the one hand, diversity as such is considered as positive and desirable; on the other hand, many individuals express clearly that they value certain species particularly highly, whereas others such as invasive species are considered as undesirable. Further research could help to identify the factors that underlie this apparent dilemma, and draw conclusions for biodiversity management strategies.

## **4.6 Hungary: Balaton Uplands National Park**

Two focus groups discussions were carried out, both with residents of the Balaton Uplands National Park (BUNP) area in Hungary. The participants of the two focus groups differed in age and education as well as cultural background.

The first group comprised 11-12<sup>th</sup> class students of a secondary school (“Gymnasium”). This group consisted of 18 students ranging in age between 16-17 years. Out of the 18 students 68 % were girls. Out of 18 students 100 % were born and still resident in the area.

The second focus group was composed of thirteen (2 boys, 11 girls) 22-23 year old 4-5<sup>th</sup> year environmental science students at the county university. Out of 13 students only 70 % were born or lived in the region. As our research was our first one in this field we were interested in gathering attitudes and opinions on biodiversity in the National Park area in an informal way. Research questions focused on the understanding of the biodiversity concept, people’s values with regard to biodiversity in the BUNP, perceptions of biodiversity and the factors influencing people’s understanding and attitudes. The rest of the themes explored during the focus groups were background questions underlying the research such as evaluative aspects, understanding and perceptions.

### **Understanding of the concept of biodiversity**

University students (US) appeared to have some understanding of the biodiversity concept and distinguished between genetic diversity, ecological diversity and taxonomical diversity. They said that biodiversity was the variety of life.

Gymnasium students (GS) knew less about biodiversity, but were able to describe the term and distinguished only taxonomical diversity. They were not sure what biodiversity meant and if there was any threat to it in their region.

When students were asked to describe the value of biodiversity, it turned out that the university students grouped the values into beauty and economic values. For Gymnasium students, the beauty of the National Park would provide them with an incentive to visit the area. However, if it was necessary to contribute to reconstruction work in the National Park, all of them would contribute some money for the protection of the area.

Both the US and the GS group perceive biodiversity as different types of plant, animal species taxa and different types of landscapes such as forests, swamps and wetlands. The secondary school students know that biodiversity is important but they do not know exactly why.

The understanding in both groups US and GS is influenced mostly by education, media and family: what they directly or indirectly learned from their parents and grandparents, how they deal with nature, plants and animals. However, the secondary school students’ understanding

of these concepts seems to be affected by the lack of compulsory ecological subjects in the school programme.

Biodiversity management measures are significant mostly for the graduates or for the university students who perceive the outcome of biodiversity measures through their ecological studies.

Do people perceive losses of biodiversity and what do they consider as causes? What are their attitudes to particular management measures and conservation?

All students who learned or had heard about it perceived losses of biodiversity. Perceived causes include the growth of inhabited, agricultural or industrial areas which imply bigger cities, more intensely used agricultural land, more mines and smaller forests. They think that specific management measures and conservation are very important and needed to maintain biodiversity.

Both groups of students think that it is important to keep our planet for the next generation in the way we have got it from the previous generation, or in a better shape, so that they can also enjoy its values. They prefer aesthetical values. University students say that it is in their hands to keep biodiversity, to protect nature; that is why they are studying environmental sciences.

Both groups of students know little about biodiversity protection. But their opinion is that human activity should be restricted further and not only in protected areas. On the issue of how they gathered their knowledge reflected in their answers, the primary source was their, scientific studies and work, followed by scientific newspapers and media (TV).

## 5 Conclusions

This exploratory research activity had two main aims: to gain an understanding of the public perception of biodiversity, its changes and management in a range of European countries and to test different methods for engaging the public.

With regards to the first objective, namely to “gain an understanding of the public perception of biodiversity, its changes and management in a range of European countries”, the deliberative events uncovered a number of issues, which could potentially inform the development of subsequent research within the ALTER-Net RA5 working group, and influence the way scientists and science communicators within the network and beyond engage with the general public with regard to biodiversity-related topics.

The first topic explored was the *understanding of biodiversity*. Our basic assumption was that individuals’ understanding of biodiversity has been and is constantly being constructed in interaction with their social and natural environment. We thus believe that there is neither a “correct” nor a “wrong” understanding of biodiversity, we rather wanted to explore how people think about it, how they perceive it, and why. Our results indeed show a wide range of notions and mental associations related to biodiversity.

Many participants responded to the *term* biodiversity with a certain degree of vagueness, and a small but vocal minority explicitly doubted the actual usefulness of the term. Often, the term was closely associated with other terms such as landscape and nature. It is thus interesting to conjecture about the wider relevance of the term, perceived by both scientists and the general public as overly complicated and jargonistic.

Most respondents were more explicit in describing the *concepts* of biodiversity they had in mind – not necessarily linked to the term itself – but often embedded in considerations of a balance of nature and food webs. Although the knowledge of biodiversity appeared to depend largely on personal experiences, interests and personalities, the exact source of knowledge was often unclear, indicating that environmental education has at least in some countries achieved to convey metaphors such as food chains quite widely. The importance of biodiversity for humans and the consequences of biodiversity loss were discussed by only few participants in any detail, although a general feeling of the importance of biological diversity did seem to exist.

It was also apparent from certain participants that trust (or mistrust) in information sources could have direct impacts on their perception of biodiversity and its conservation.

Values were often found to be aesthetic, particularly in the view of tourists and recreational visitors to an area, whereas respondents with a conservation background emphasised the existence value of diversity. Between the Scottish and the Dutch sample, for example, we found differences in the perception and evaluation of introduced species. A more in-depth study of the type of biodiversity people value, and the links between values and attitudes is a

potential area for future research, as well as the question if and how perceptions and values related to biodiversity translate into actual behaviour. Another interesting issue for future research is the role of discourses, including the strategic use of language, in public deliberation on biodiversity-related topics.

In terms of *biodiversity management*, respondents usually expressed positive sentiments regarding the overarching movement of conservation; however, specific conservation measures were often highly contested. Topics raised included, for example, the reintroduction of animal species, invasive species and the role of agriculture in promoting or limiting diversity, but also more generally related topics such as deforestation and degradation of habitats and natural resources, for example bogs and moorlands. Conflicts of interest also occurred, especially among participants who felt conservation of biodiversity was in some way interfering with other activities, including in the Dutch case the conservation of nature as a “lifeworld”. The links between participants’ values, knowledge and attitudes were not explored in any great detail, and might be developed more in future studies. In many cases, participants felt that conservation measures were insufficient, however, the links between the attitudes towards conservation measures and action supporting these attitudes is still unclear.

With regards to the second objective, a number of different *methods* were tested at this initial stage of research including focus group discussions, face to face interviews and value clarification techniques. Initial observations from the methods adopted in this initial phase (following a SWOT analysis) reveal that each technique had advantages and disadvantages in relation to the aims of the research criteria. Their suitability of each method will ultimately depend on the purpose of the research and the expected outcomes. Focus groups proved an effective method at this early stage as a first step towards exploring a complex subject area, while interviews were useful in gathering more in-depth information regarding values and attitudes. Both the focus group discussions and the values clarification methods were successful at engaging the public in lively debates about aspects of biodiversity, as applied in a known context. Having said this, issues of representation, and of facilitating heterogeneous groups are contentious within these methods. The expected outputs of the research will also determine which method is applied, with values clarification methods leading mostly to quantitative data, and focus groups and interviews leading to qualitative data. Following on from these initial conclusions, the general feeling is that combining different methodologies that could complement one another may be a better alternative to developing one common methodology.



## **6 Acknowledgements**

The authors would like to thank the ALTER-Net Network of Excellence for funding and all the participants of the deliberative events for their time, effort and trust.

Juliette Young and Anke Fischer are particularly grateful to the participants of their focus-group discussions and all the people who helped organising the discussions, as well as to Jamie Watt and Lynne Robinson for helping with the transcripts.

Arjen Buijs would like to thank all the participants of the interviews and focus-groups conducted in the Netherlands as well as Josine Donders for her assistance in various matters.

## 7 Annex

### 7.1 Table: deliberative events conducted

Country Group and place	Date	N	Technique	Age range
<b>The Netherlands</b>				
Residents	May 2005	8	Focus-group	35-70
Residents and tourists		6	Focus-group	35-70
Residents and farmers	Sept 2005	4	Focus-group	35-70
Residents and tourists		7	Focus-group	35-70
Experts		4	Focus-group	20-30
Interviews experts	Oct 2005	3	Interviews	
Interviews residents and tourists	Oct 2005	12	Interviews	
<i>S</i>		44		
<b>Germany</b>				
Seniors (mix.), Grey Lions Leipzig	May 30	8	Focus-group	66-83
Senior women, Leipzig	May 10	6	Focus-group	67-90
Senior men, Leipzig	Sept. 14	9	Focus-group	54-69
Women, Leipzig	April 18	4	Focus-group	31-61
Young men, Leipzig	April 27	7	Focus-group	19-25
Young women, Leipzig	May 10	6	Focus-group	18-22
Young people (mix.), Leipzig	May 10	7	Focus-group	17-19
Pupils, Leipzig	May 13	15	Focus-group	11 <sup>th</sup> class 16-17
Conservationists, Granitz, Rügen	Sept. 8	5	Focus-group	34-69
Tourism-related businesses, Baabe, Rügen	Sept. 12	5	Focus-group	44-65
Local residents, Putbus, Rügen	Oct. 5	4	Focus-group	56-66
Tourists, Dummertevitz, Rügen	Oct. 8	4	Focus-group	34-59
Foresters, Prora, Rügen	Sept. 8	2	Focus-group	45, 64
Farmers, Zirkow, Rügen	Oct. 7	2	Focus-group	37, 44
Fisherman, Thiessow, Rügen	Oct. 7	1	Interview	72
<i>S</i>		85		

<b>Slovak Republic</b>				
Nitra: ecology students	June 2005	24	interviews	20-24
Poloniny: stakeholders, residents	April 2005	10	interviews	33-58
Trnava region: residents	June 2005	24	interviews	19-58
Nitra: students of arts	Oct 2005	8	interviews	21-23
<i>S</i>		66		
<b>Romania</b>				
Stancuta	March 2005	35	Values Grid (2 sessions)	20-70
	June 2005	35	Values Ranking (2 sessions)	20-60
	October 2005	4	1 Values Grid session, 1 Values Ranking	20-70
Braila	October 2005	18	1 Values Grid session,	20-70
	October 2005	18	1 Values Ranking	20-70
<i>S (some ind. double-counted)</i>		110		
<b>Hungary</b>				
University students	Oct 20	13	Focus-group	22-23
Secondary School students	April 19	18	Focus-group	16-17
<i>S</i>		31		
<b>Scotland</b>				
Tourists Aviemore	May 16	2	Focus-group	46-53
Tourists Aviemore	May 16	2	Focus-group	44-47
Mountaineers Glenmore	May 20	6	Focus-group	32-45
Mountaineers Aberdeen	May 31	4	Focus-group	37-68
Local residents Ballater	June 8	10	Focus-group	21-76
Foresters	Sep 13	4	Focus-group	35-55
Birdwatchers Aberdeenshire	Oct 7	6	Focus-group	49-70
Agricultural college students	Oct 18	9	Focus-group	19-20
<i>S</i>		43		

## 7.2 Research questions

**Main objective of the deliberative events:** Capture and assess the diversity of attitudes to biodiversity in Europe – common trends?

### Research questions

Main research questions to be addressed by the deliberative events

1. How do people understand the concept of biodiversity? (→ understanding)
2. What is it that people value about biodiversity? Do they actually value biodiversity? (→ evaluative aspects)
3. How do people perceive biodiversity? What do they perceive as relevant issues?
4. What are the factors that influence
  - i. people's understanding
  - ii. people's attitudes
  - iii. values?Factors considered:
  - communication (media, education...)
  - demographic factors
  - prior experience
  - prior knowledge?
5. To which degree are biodiversity management measures socially significant? Do people perceive losses of biodiversity and what do they consider as causes? What are their attitudes to particular management measures and conservation?

Questions to be addressed indirectly through analysis

1. How do scientific concepts of biodiversity relate to people's concept of their natural environment?

### Background questions underlying the research

Evaluative aspects

- (Why) do people care about [bio-]diversity?
- How much do they feel affected?

Understanding

- Is there any understanding of "biodiversity"?
- How much do ecological concepts shape the perception of biodiversity?
- Spatial/temporal scale of biodiversity: On which scale do they relate to it?
- functional aspects of biodiversity
- What levels of biodiversity are mentioned?

Perceptions

- What are daily-life or traditional perceptions of biodiversity?
- Institutional knowledge
- What do people know about biodiversity protection?

Communication

- How much are different knowledge sources reflected in the answers (newspapers, schools, own experience, scientific work, ...)?

Relations between people

- How do people refer to each other? How do people perceive each other?

### **7.3 Discussion guide for deliberative events**

Note that the order of questions is flexible → adaptable to local contexts, type of respondents etc.

- 1. What are your experiences with nature in this area?**
- 2. Thinking about the nature here – what issues do you consider most important?**
  - Referring to a particular area: What do you consider as the important gains and losses, threats and consequences of biodiversity change in this area? Do you think that some species have appeared or disappeared?
  - How do you know?
  - More generally: Do you think that levels of biodiversity are changing? In which direction? What does that mean to you?
- 3. What does biological diversity mean to you?**

*Optional information: “Biodiversity (short for biological diversity) means the variety of life. Biodiversity includes all living things and the environment of which they are part.”*

**What comes first to your mind?**
- 4. Do you think should biodiversity be preserved/managed/maintained? Why?**

**Do you think biological diversity is important for you/for human beings? Why?**
- 5. How do you think wildlife/nature could best be dealt with?**
  - Do you know any measures currently used for the protection of biological diversity? If yes, which?
  - How useful are the existing measures? Why?
- 6. How does biodiversity in this area/ our country compare to biodiversity in other regions?**
- 7. If you have to draw a symbol for/a diagram representing biological diversity: what would you draw in it?**

*If possible/appropriate: let people actually draw things!*
- 8. What is your favourite plant or animal in this area? Which plants and animals do you dislike? Which do you think are key animals or plants in this area?**
- 9. Would you like to add anything?**

## 7.4 List of codes

### 1 CONCEPTS

- **Understanding of biodiversity** (*definitions and concepts of biodiversity*)
- **Images of nature**
  - **Concepts of nature** (*e.g. definitions of nature, perception of possibility (NOT DESIRABILITY!) to control/guide nature*)
  - **View of nature** (*Role and place of man in nature*)
  - **Values of nature and/or biodiversity** (*any reference to reasons WHY people value nature/biodiversity*)
    - **Attitudes on protection**
    - **Intrinsic values**
    - **Beauty**
    - **Recreation**
    - **Economic (agriculture/tourism)**

### 2 BIODIVERSITY MANAGEMENT

- **Knowledge of management measures**
- **Discursive use of knowledge** (*the strategic use of different kinds of knowledge to support one's view*)
  - **ecological/theoretical knowledge**
  - **experience knowledge** (e.g. "seen with own eyes")
- **Attitudes towards management measures**
- **Attitudes towards the effects of measures**

### 3 CHANGES AND THREATS

- **Changes of biodiversity**
- **Threats to biodiversity**
- **Consequences of biodiversity loss**

### 4 BIODIVERSITY LOCALLY

- **Attitudes on protection of biodiversity**
  - **Local**
  - **Global versus local** (important, but not here)
  - **General versus rare species**
- **Values connected to the area**

- **Expectations and associations** (*references to the expectations that people have with regard to nature in the study area, whether based on own experience or not*)

## **5 OTHERS**

- **Knowledge on biodiversity** (*biodiversity-related observations, comments on biodiversity in the study area*)
- **Protection of biodiversity – global**