Personal meaning in the public space: the bureaucratisation of biodiversity data in the UK and the Netherlands[1]

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Abstract

Public access to environmental information requires availability in a shared space. Useful biodiversity databases result from the interface between large numbers of (usually unpaid) natural historians, and the state, mediated through an institutional landscape of NGOs and government agencies. On one side lies the state's appetite for standardised, objective data. On the other are individual humans enacting a relation with nature through their conscious and unconscious choice of species and location, observation, recording and sharing of results.

We analyse the cultural interface between state and amateur naturalist as a basis for understanding emerging patterns of information flow and resistance, by comparing the systems –that have evolved in the UK and the Netherlands. The two countries share a similar history and culture of natural history. However, whilst in the UK top-down efforts to standardise and provide access to data have met with resistance from the grassroots, it was the NGOs themselves who organised to form a platform for data collection and control, in the Netherlands. Drawing on theories of rationalization, we explore the interactions of values and meanings that take place at this interface and the consequences for public access to data.

Introduction

Much of the academic debate about Aarhus revolves around interpretations of participation, a debate which is rather exhausted in the literature (e.g. Halvorsen 2003) but which never seems to be concluded in practical terms. The focus is consequently on aspects of democracy and justice (Hartley and Wood 2005; Lee and Abbot 2003; Rodenhoff 2002). There is little focus on the first pillar of the convention, access to information. Where it is discussed, information is treated as an objective commodity, and use of data is seen as instrumental and unproblematic (Hartley and Wood 2005).

In contrast to what the Aarhus convention seems to imply, public access to or use of information is not self evidently 'a good thing' or unproblematic. First, as has been shown by the field known as the sociology of scientific knowledge (SSK) (e.g. Collins 1982; Collins and Pinch 1993), the data itself are value laden and constructed in social processes. Weiss (1991) has suggested that in fact instrumental (direct and straightforward) use of knowledge is rare and that knowledge is more often used in

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the form of ideas which enlightens the users more indirectly. Collingridge and Reeve (1986) have argued that knowledge is strategically used or rejected depending on vested interests. Furthermore, studies of the production and use of ecological indicators (Turnhout 2003), of policy implementation (Garritt 2001) and of terms used by forestry professionals (Hull *et al.* 2003) have drawn attention to the context dependent interpretations and renegotiations that take place when things (numbers, indicators, policies, terms) are transported from one context to another.

The treatment of data can be understood in the context of a Weberian analysis of rationalization (e.g. Weber 1903-1917 (1949); Weber 1904/1930.). The large-scale administration of modern societies requires the machine-like, depersonalised treatment of information about that society. Goal-oriented behaviour is explicitly contrasted with value-motivated, or emotion-motivated behaviour (Elwell 1996). Adams (1997) has shown how the development of conservation institutions and ideologies are a dimension of that process of rationalization, providing intellectual strategies for classifying and objectifying nature, and the knowledge base for the control and management of nature.

Recording natural history data as well as using them in policy can be understood as processes of rationalization, of stripping out the underlying values and motives until we are left with the 'raw' data. Although these 'raw' data might provide common ground and enable interactions between recorders and users of natural history data, what it is that is being rationalized may very well differ as different values and motives are involved in recording and using natural history data. Particularly when volunteers are involved, in a form of 'citizen science' (Irwin 1995), we see individual humans enacting a relationship with nature through their conscious and unconscious choice of species and location, observation, recording and sharing of results (for which see Lawrence 2005). Although in the process values and motives may seem to become invisible and extracted from the data, they do not disappear. At the interface between recording and policy where, through the data, the different processes of rationalization meet and interact, diverging values, motives and interpretations can be expected to emerge.

What, therefore, happens to such data as it is gathered, stored and redistributed for public access as proposed under Aarhus? Aarhus is new, but many of the issues it raises in regard to biological data can be understood in the light of existing experience as natural historians have produced, and institutions have processed and used, data. In our paper we therefore aim to address this question by first exploring the different actors' values, motives and interpretations and the interactions between them at the interface between natural history (production of data) and bureaucracy (use of data). From there we draw out the implications for the transformation of data at this new interface created by Aarhus. The comparison between the UK and the Netherlands provides an opportunity to explore this interface in two contexts, although we are cautious about attributing those differences to any definitive difference in 'national styles' or culture between the two countries. This caution is warranted as within countries styles can differ significantly between different policy fields, and furthermore within policy fields, styles can be remarkably similar between different countries (Halffman 2003).

Our paper is based on a series of open interviews with key members of recording organisations. In the UK, one of us (AL) interviewed two Local Biodiversity Action Plan officers, two national and three county level coordinators of recording societies, two managers of Local Record Centres; conducted two focus group discussions with recorders working at county level, and participated as an observer at two annual recorders' conferences. In the Netherlands we jointly interviewed two national coordinators of recording societies, one coordinator of the national platform for the recording societies, one coordinator of Nature's Calendar, and one civil servant responsible for access to the data by government and the public. While the focus was on the organisation and communication of the data rather than motivations for collecting it (for which see Lawrence 2005) many of our respondents were both coordinators and recorders. It is an important aspect of the culture of recording that, with a few important exceptions, officials within the recording structure come from a shared background with the volunteers.

Context: biological recording and the Aarhus Convention in the UK and Netherlands

We are interested in comparing our two countries to explore both similarities and differences in context. The UK and the Netherlands are two of the most densely populated countries of Europe. Both have extensive experience of voluntary data collection on biodiversity distribution and abundance (Lawrence and Gillett in prep.), built on more than two centuries of natural history and amateur science, within a complex network of informal and formal structures of data collection and sharing; and increasing state interest in this data has led in the last decade to centralisation of data storage, with concomitant demands for uniformity and standardisation.

Strong similarities might therefore be expected. Yet others have also highlighted the differences in relations between society and government, which could be relevant in considering the treatment of volunteer-collected data. Writing specifically about biological recording, one of the founding fathers of birdwatching in the UK, Max Nicholson, wrote 'In … Holland and elsewhere a clearing-house for research is provided by the state: in this country such a solution would be uncongenial and we must look for some alternative centre of national scope not imposed from above but built up from below' (Nicholson 1931). The work of Burgess and colleagues (1998) finds a stronger belief in scientific rigour, clarity and authority among Netherlands residents, contrasted with support for more participatory approaches (knowledge- and power-sharing) in the UK. This may, for example, explain different responses to the UNCED 1992 decisions: the UK has responded with enthusiasm to the potential for local partnerships through Local Agenda 21 (Burgess *et al.* 1998) and Local Biodiversity Action Plans (Evans 2004), while environmental planning remains centralised in the Netherlands and bureaucrats seem more reluctant to encourage participation (Smit 1993).

Within the EU, the Aarhus Convention has come into law as Directive 2003/4/EC on public access to environmental information, which each member state was required to bring into force by 14 Feb 2005. In the UK the relevant legislation, the Environmental Information Regulations, came into force on 1 January 2005, to coincide with the Freedom of Information Act. To implement the Aarhus convention, the Dutch government has decided on changes in the Environmental Act, the Act on the

Publicity of Government and several other laws, which will be put into action by 14 February 2005 (Staatsblad 2005).

The structuring of natural history in the UK

Natural historians have been around in the UK for at least two centuries. They began by collecting specimens and data, often without a concern for the wider scientific implications. As (Palmer 2004) laments,

'Many is the time that a collection manager or visiting researcher is frustrated by a lack of information accompanying an apparently important specimen in an older collection. Sometimes the information will have been lost altogether, … but often it was never there in the first place – the specimen was only collected for its *intrinsic appeal*.' [emphasis added]

Numbers grew in the 1930s, and birdwatching in particularly was given a huge stimulus with the invention of the field guide and binoculars (Bildstein 1998). Learned societies (e.g. The Botanical Society of the British Isles, the Bryological Society etc.) were founded in the nineteenth century each with a focus on a particular taxon. These have evolved into recording societies which have self-organised to cover a given taxonomic group, to ensure geographical coverage, and to ensure scientific validation of data collected, through a self-regulated system of County (or Vice-County) recorders. For example, the British Trust for Ornithology was founded in 1932 as a 'clearing-house for bird-watching results' to be 'built up from below [not] imposed from above' (Nicholson 1931).

Later additions were made to the natural history landscape with the establishment of more conservation-minded Wildlife Trusts in the early to mid-twentieth century; and most recently, the policy-oriented, proactively conservationist and education oriented organisations such as PlantLife International. Each supports the collection of natural history data for management, campaigning or educational purposes (Gillett and Lawrence under review). All are dependent on their volunteers for data collection which would otherwise be prohibitively expensive. The result is a complex landscape of national, taxon-specific NGOs, local (often county level) place-specific and land-owning NGOs, and others over a range of scales which focus on environmental education and campaigning.

In the last decade, new policy developments have drawn the government's attention to this data, and its channelling for planning and compliance purposes. The result has been the addition of two more layers to the structure of natural history: the local record centres (which provide data in response to planning applications), and the National Biodiversity Network (which has attempted to collate and use records at national level, to provide inform monitoring reports to the Convention on Biological Diversity).

Local Record Centres (LRCs) are defined as a 'not-for-profit service run in partnership for the public benefit, which collects, collates, manages and disseminates information of known quality relating to the wildlife, wildlife sites and habitats for a defined geographical area' (NFBR 2002). While they are not statutory functions, most local authorities now support them as a response to 'policy guidance implying the

need to collect biological data to support [planning] decisions' (Palmer 2004). However they generally suffer from low levels of financial support, and many are funded jointly by local authorities and a range of NGOs with biodiversity interests. Biological data used in this way can help, for example, in the identification of protected areas, or to prevent an inappropriate housing development (Key 1993).

The NBN was set up jointly by its founding partners, involving both government and non-government organisations, partly in response to a major report on "Biological Recording in the UK" (Burnett *et al.* 1995)[4], and partly as a means to deliver one of the requirements of the UK BAP (which itself stemmed from the Convention on Biological Diversity). In many ways the NBN's attitude to data reflects the same belief in its non-controversial, objective status as does the Aarhus Convention:

The principal aim of the NBN is to communicate data. It aims to make as detailed data as possible available to users. (Matthew[5])

But as we show below this approach has come into conflict with the value systems of the recorders. We can see within the UK a pattern of data accumulation through processes of increasing scale and rationalisation which remove control of its meaning and use from the recorders. Nevertheless what makes the case of biological recording interesting is that rules for recognising such values have had to be negotiated, partly because the recorders did not acquiesce in the rationalisation, and partly because many of the bureaucrats are themselves recorders.

The structuring of natural history in the Netherlands

Although as in the UK, natural history has a long history, the start of what we currently understand as natural history in the Netherlands can be dated around 1900. In that time people interested in natural history began to come together and organise themselves.[6] In 1901, this lead to the foundation of the 'Nederlandse Natuurhistorische Vereniging' (KNNV, Dutch Natural History Society). From this organisation in 1920 the 'Nederlandse Jeugdbond voor Natuurstudie (NJN, Dutch Youth Society for Natural History) was founded. To date, these are the most important organisations dealing with the broad field of natural history.

After the Second World War, Dutch natural history specialized. Several specialized 'Particuliere Gegevensbeherende Organisaties' (PGOs, Private, Data managing Organisations) were founded, each aiming at different biodiversity categories (birds, plants, arthropods, marine ecology, mosses and likens etc).

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[4] The report Burnett, J., Copp, C. and Harding, P. 1995. Biological recording in the UK: present practice and future development. Vol 1, Full Report; Vol 2, Appendices; Summary Report Coordinating Commission for Biological Recording, Ruislip, England. pp. includes amongst its recommendations: '1.2 Secure the recognition of the need for a national system .. 4. Establish methods to control the quality of data … 6.1 Prepare design specifications for a metadatabase of biological recording based on standardised metarecords.'

[5] Matthew (not his real name) works in the NBN Trust, the body set up in recognition of the need for the Network to be overseen independently from any of its founding partner organisations.

[6] The journal 'De levende natuur' (Living Nature), which was started in 1896 by Jac. P. Thijsse & Eli Heimans, the founding fathers of Dutch natural history, and which still exists today, played an important role in that

In the late 1980s, in response to the increased demand for natural history data resulting from the introduction of the Environmental Impact Assessment (EIA) regulations in the Netherlands[7], the PGOs started to professionalise[8] and cooperate. To take full advantage of the opportunities created by EIA, a platform organisation was erected called the 'Vereniging Onderzoek Flora & Fauna' (VOFF, Society for Research into Flora and Fauna).

In response to a demand from construction companies, which require distribution data on species that are protected with the Dutch flora and fauna act or fall under the EU Birds and Habitats directives, another organisation 'Natuurloket' (Nature Box-Office/Counter/Desk), was installed. This organisation functions as an intermediary between those companies and the PGOs and serves as counter for the sale of distribution data.

The PGOs and their approximately 15.000 volunteer recorders form the most important source of natural history data in the Netherlands. Besides this, many local groups are active, some regional governments do their own species inventories and there is a lot of recording going on in commercial ecological consultancy companies. Also, there are several projects that specifically aim for the involvement of the larger public. The KNNV has annual projects where the public can submit records on particularly conspicuous species such as the fly agaric *(Amanita muscaria)* and the stag beetle *(Lucanus cervus*). Another interesting project is Nature's Calendar, or, the Dutch phenological network[9]. Especially because of the cooperation with a well known radio program called Early Birds, Nature's Calendar has been able to attract a large number of people.

The growing demand for natural history data since the late 1980s can be seen as part of a broader trend towards increased accountability, efficacy and efficiency of government and policies (also see Turnhout 2003). Nature conservation policies needed to be evaluated, policy goals needed to be concrete and measurable and the quality of nature needed to be assessed. During the 1990s, several actions were taken to achieve this, leading to increased reliance of policy on natural history data. A very important one was the development of the Network Ecological Monitoring (NEM), which started in 1995. The NEM is a collection of different monitoring networks for different species groups. For each of these monitoring networks a contract is signed between the ministry of LNV and the actor that is going to do the monitoring (often a PGO). For the involved PGOs, the NEM also provides some degree of funding. Also of relevance is the installation of the nature conservation policy assessment office was installed. This organisation, independent by law, is responsible for the evaluation of nature conservation policy. Their reliance on natural history data is very strong as the assessment of the current state of nature is a very important ingredient of their policy evaluations. In addition, the European Union is a very important data demanding institution. Natural history data are required on the species that are protected under the

[7] Under EIA law, companies had to make assessments of the effects of their plans on nature and environmental quality and for that they among others needed data on species distribution.
[8] Van Swaay (1995) notes the growth of the butterfly PGO from a 'small group of enthusiastic volunteers' in 1983 to a foundation employing 12 staff in 1995.
[9] Phenology is the yearly recording of first observations of species or natural phenomena (first flowering of a plan species, first observation of a migratory bird etc).

Habitats and Birds Directives for the reports to the European Commission. It is the ambition to have all these species included in the NEM.

In the case of the Netherlands, the current situation is the result of interactions between production and use of natural history data. Species were used in the Nature Target Type handbook or in the NEM for which the PGOs had data available. Van Swaay (1990) recognizes this when he argues that the existence of historical data makes butterflies an important and policy-relevant indicator for nature quality in the Netherlands. To a large extent, the species that are used in policies are determined by data availability and therefore, by the values and preferences of the recorders. But it is not just a one way street. First of all, the demand for data has affected the PGO structure and has lead to increased professionalisation and cooperation. Furthermore, at present, the European Union to a large extent prescribes what data are policy relevant. Recognizing that production and use of natural history have evolved in dynamic interactions suffices here. Further research on this issue is required to elaborate on the different ways in which natural history and nature conservation policy have in fact coproduced each other.[10]

Personal meanings in biological recording

Values and motivations in recording natural history

Why do natural history recorders go into the field and do recording? In England, one of us found volunteer recorders expressing a deep love of nature and a need to find excuses to engage with it (Lawrence 2005). The volunteers were deeply ambivalent about the world and its future, but appeared to turn to science (or citizen science) for security. Science, or the structured methodology required of surveys, provides at least the illusion of a framework of rules and procedures. Recording also helps them link up with other people through that shared sense of meaning. However the recorders represented in this paper are on the whole more experienced, more responsible (for other recorders) and in many cases coming from a background with scientific training. Concerns with the use of data, we found, sometimes took precedent over the expression of love of nature.

On the question of motives, we found similar responses in both countries. Recorders like to be outside in nature. Jan's[11] reflection was typical:

"Well first of all, I just like to be outside. Sometimes it gives me an excuse to go outside".

Ria's[12] motivation also shows a strong sense of place; especially nature that is close to where she lives seems to function as a sort of second home:

"I like it because it is my surroundings; it is a way of being outside and being connected with nature".

[10] See Shapin, S. and Schaffer, S. 1985. Leviathan and the air-pump: Hobbes, Boyle and the experimental life. Princeton Unversity Press, Princeton, Oxford. pp. for a well known account of the coproduction of science and policy

[11] Jan (not his real name) works for the PGO on butterflies and is a volunteer recorder of butterflies

[12] Ria (not her real name) works for the VOFF and is a volunteer recorder of plants

This connection with place was also emphasised by British respondents, many of whom presented recording as an excuse that gave them 'permission' to gaze at a hedgerow, or visit a nature reserve repeatedly. Fiona[13] highlighted the importance of her local county:

"well I don't think [a national survey] would have the impact, these things can be a bit dry when they're national, I think for most people it would be better to make things more local".

But why do natural history recording? For several, in addition to the enjoyment of being in nature, the perceived importance and value of the data form an important motivation. There are at least two aspects to this: the personal value of data in increasing the recorder's understanding of the ecosystem:

"It has something to do with understanding what you daily see around you. [...] The biggest contribution [...] is to clarify what is there [...] on groups nobody is working on. [...] You can only understand relationships like between biodiversity and ecosystem functioning and ecosystem stability if you know your species". (Kees)

"I like to see how it all fits together, … you can put it into context, you can understand why it's there, what its role is in the bigger picture" (Patricia[14])

And second, the possible contribution to the conservation of nature. Most PGOs and also the VOFF have some lines about conservation in their official regulations and it also came out in our Dutch interviews. For example, when Karel[15] tries to explain his motivation for doing this, environmental concerns play a very important role:

"First of all is the worry about what is going to change with a changing climate. [...] I want to make people aware. [...] Also to improve the sense of urgency with the public so that they know what is going on so they are better motivated to reduce their carbon dioxide emissions. [...] And [...] to influence or inform the government".

Jan is concerned about biodiversity in the Netherlands:

"Agriculture is very industrialized here. Too far. So more or less all butterflies are restricted to nature reserves. [...] Real agricultural land is sterile here. [...] You can forget about [agricultural lands contribution to butterfly conservation]

Many of the English respondents shared such concerns, although on the whole felt rather powerless to actually influence change; they also felt a distance from average members of the public (Lawrence 2005). David[16] put it particularly strongly:

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[13] Fiona (not her real name) is a volunteer recorder, and unlike many of those interviewed here is not coordinating other volunteers

[14] Patricia (not her real name) is a volunteer recorder and specialises in data entry, in a wildlife trust in southern England

[15] Karel (not his real name) is the coordinator of Nature's Calendar in the Netherlands. As a result of doing this, Karel has also become active as a recorder.

[16] David (not his real name) has 50 years of recording experience in central England and has expanded his area of expertise from birds to insects and plants.

'I think the whole purpose of my existence is a way to improve or at least prevent certain things happening, and you know, when you look back over a lifetime and can see so many losses, things that you've lost, often with no real need to have lost them, you know, often through wrong decisions having been made at some point in time, and it appals me.'

Feelings of pride and achievement are also involved in natural history recording. Alice[17] made the observation that it was difficult for students to understand such feelings until they had themselves experienced data collection; only then would they encounter such feelings in their records. Adrian's[18] motivation of peer respect is related to this:

"I get a real buzz if a top botanist from the Natural History Museum rings me with a question, then invites me to go and look for a rare plant".

And although Alice said 'if you are going to be a recorder you have to dispense with your ego', Sarah's observation was the opposite – 'there are many egos round here … they are in love with biodiversity. It also gives them kudos.' And Marjory[19] put it more competitively: 'there is a terrific amount of rivalry'. Obviously, this combination of pride and a desire to make a difference and influence nature conservation policies, can lead to tensions when data is institutionalised. These tensions will be addressed in the next section.

To conclude, natural history recording can be understood as a process of rationalisation of a variety of personal motivations and values. Recorders enjoy being outside, they want to increase their understanding of nature, they want to contribute to science, they want to increase their connection with nature and natural history recording gives them a sense of pride and achievement. Generally, they are concerned with the conservation of nature and feel that they should contribute to that. On the whole, the natural history recorders we interviewed see themselves as part of a wider community that includes nature conservation policy and feel they have responsibilities in that wider community[20]. How do these motives and meanings affect the response to bureaucratisation of data?

Data sharing, ownership and commodification

In this section we will address some of the difficulties and tensions that emerge from this ambition to contribute to nature conservation through natural history data. Difficulties and tensions can be expected since the strong values involved in recording may result in a strong sense of ownership of the data by the recorders. Such feelings

[17] Alice (not her real name) is an experienced recorder and member of a national recording scheme in the UK; she also teaches biological recording skills to students.
[18] Adrian (not his real name) is the coordinator of a national recording scheme in the UK.
[19] Marjory (not her real name) has been recording in Scotland for more than 60 years, and is a vice county recorder for several biological groups.
[20] It is important to recognize that in the Netherlands, we have only talked to natural history recorders that were involved in the coordination of volunteers (either in PGO's or in the VOFF). It would be interesting to also research the feelings of volunteers that are not involved with coordination or that are not part of a PGO to see whether there are these individualistic hedonists out there.

of ownership might sit uncomfortably with making data available, a prerequisite of contribution to conservation.

Henk[21] recognizes the importance of availability and use of data:

"When their data are used, that is better for everyone, for [...] nature"';

According to Ria and Jan, most volunteers in the Netherlands are willing to give their data to the PGOs or even make them public[22]:

"Most volunteers don't mind if their data are public because they think [...] if they are public then it is in everyone's best interest and in the best interest of nature." (Ria)

"We make very clear from the beginning that if you send in data to us that we will use it for butterfly protection. And butterfly protection works the best if everybody knows as much as possible". (Jan)

However the willingness to share data is not without its limits. Sarah[23] describes the importance of personal relationships, and the delicate political balance in the UK:

"The way the biological record centres are organised, everyone knows everyone else ... This compares favourably with, say, the Civil Service. Recorders are happy to share information at the county level, but less so at national level …"

Her experience was one of coaxing data from recorders:

"People want to use data for their own publications too, they think if they give data to the [national] biological record centre it will publish before them".

Apparently, data sharing on the local level is less problematic than on the national level. Regarding the national level, two linked sets of issues have arisen in the UK: resistance to the NBN, which is perceived as undemocratic; and renegotiated relationships between the traditional recording societies and the LRCs. Dorothy[24] related how she saw the formation of the NBN:

"A little group of men all got together, and they formed a steering committee … and then one day the NBN was born, and they presented it, fully handed out to the record centres without any consultation and it pretty much said you will hand over all of your data to us … It was done the same way the whole CBD process [was done], top down, by people you can't contact that are scientists and professionals, and that you just don't know who's doing what".

[21] Henk (not his real name) works for the government and is coordinator of the NEM. He is not involved in natural history recording.
[22] Again, this might have been the result of the same phenomenon described under footnote 19.
[23] Sarah (not her real name) manages a biological record centre
[24] Dorothy (not her real name) is a Local Biodiversity Officer (responsible for coordinating the implementation of the Local Biodiversity Action Plan in her county). She is not a recorder, but interacts with recorders regularly and takes pride in being able to see things from both their perspective, and the perspective of the NBN.

Although she framed the issue as one of wounded pride, money came into the equation as well:

"Meanwhile, the record centres are all getting together saying the NBN has left us out – we're not going to play with them because they didn't listen to us, they didn't consult us … 'So why should we play? They've put no money into developing us, they've put millions into developing the NBN, but they've never given anything to us.' … [and they] turned round and said 'wait a minute, a third of our money comes from consultants, and consultants might get that data free off the net' No, the NBN can't have our data".

The reasons are a mixture of emotions relating to the data: both the love of nature that they represent, and the personal achievement in acquiring it. As a local level bureaucrat, Dorothy is in a good position to observe the consequences:

"We take photographs of people and things we love, and we cherish those photographs, well the records are the same thing […] I would never want anybody to draw moustaches on my photographs, you know, or to use them or not to love them … […] there's the recorder at the bottom going, but that was my photograph you've drawn a moustache on [...] And so they're emotionally attached to it, and I think that we lose that and we forget that".

The national recording schemes see it a little differently – Adrian even went so far as to say

'You could look at it as two separate worlds … LRCs are getting the lion's share of the funding, while traditional recording schemes are suffering.'

The NBN is acutely aware of these issues and perceptions:

The EIR [Environmental Information Regulations] cut across fragile and developing relationships between an already slightly sceptical voluntary sector and the NBN. Nevertheless, with our key data suppliers, we have, we feel, kept on track, despite the sledge hammer of the EIR! (Matthew)

And the National Federation of Biological Recording has expressed it more bluntly in print, indicating that the introduction of the EIR has shifted the conflict from LRC / NBN to LRC / government:

The fundamental cornerstone of [the LRCs'] ability to [make information available] is ***trust*** *between them and their data suppliers […] which is* ***in jeopardy …*** *There is a very real danger [of] wholesale* ***withdrawal of existing records*** *…* ***breakdown of trust between landowners and LRC's*** *[and]* ***wholesale plundering of data*** *for commercial purposes'* (NFBR 2004, emphasis in original)

These conflicts are not so marked in the Netherlands, and in fact the response to legislative changes brought by the Aarhus Convention is muted by comparison with the UK, even characterised by vagueness and indifference:

I must be very honest, I hardly know anything about that convention.[...] That was in

the UK a problem. [..] It's not something that is worrying me. I have read something about it. I don't know why it was- the final conclusion was that it wasn't a problem for organisations like us. I'm not 100% sure. (Jan)

For the government too, the new legislation does not seem to play a very important role yet:

It is coming! I don't know what effects it will have; whether I will have to make information available. It's a difficult matter for me, because the data is from volunteers; I am not the owner of the data. It's interesting. …I think they [the Ministry] didn't realise it was about nature too!' (Henk)

The fact that it is the recorders, the volunteers, who established the data-sharing platforms is a key difference in the Netherlands; the recorders established the rules, and do not have the same worries about loss of ownership of their data. Nevertheless here too there are limits to sharing. While according to Ria and Jan, the individual volunteers do not seem to be so worried about sharing data, as organisational representatives for the PGOs and the VOFF, they take a different view. The discontent is with the national nature conservation policy process in general, and with how policy makers treat them and their data. Kees feels that the government does not really appreciate all the hard work of the volunteers because they are reluctant to pay for them:

"They would like to have this data almost for free and we spend a lot of time and energy to get this data. You have to pay for it, very simple. [...] The government could appreciate a little bit more the data we have".

Ria adds to this and says that it is not only important but also realistic that they get paid for their data. She emphasizes that it is not about making a profit by selling data but about ensuring the subsistence of the PGOs. In response to our question on selling data, she protested:

"That is what people will tell you. But what we want is to have enough money for the coordination of our volunteers, for database management and to do some things [...] to make volunteers enthusiastic".

There is also some friction between the sorts of data required by the government and the sorts of data natural history volunteers would like to record and/or see used by the government. Kees for example would like to have more species groups in the NEM:

"My data is not used at all, if you don't belong to those groups [that are included in the NEM]. It is very hard to get other groups in".

Ria is dissatisfied by the government because increasingly they seem to want to do and know as little as possible:

"The only thing our government is interested in is [...] the minimum you need for staying out of trouble in the European context. The government now only wants to pay

for [...] species that are really in the habitats and birds directives and in the flora and fauna law"[25].

There is also another problem involved in sharing data. Ria is reluctant to make data available because that would make things very easy for the competition:

"It would be very easy for the competition [commercial ecological advisory bureaus etc] to simply download all the data and do their own thing with them, use them for commercial activities so that is why we don't want that."

The same issues have arisen in the UK at *local* level, which is where consultants are involved in EIA's and planning applications, and often buy their data from LRCs. This has filtered up to the national level, particularly in the wake of the Environmental Information Regulations:

the NBN supports the ability of data suppliers to make a charge for access to their data, if that is in the public interest […] The EIR have, to some extent, cut across this arrangement, especially for LRC's, which has resulted in many of them so far not supplying data through the [NBN] Gateway, partly because they have been uncertain about the effects on their current working practices. (Matthew)

To conclude, several problems are involved with sharing data. First of all there is the matter of whom the data is shared with. In the Netherlands, we have seen that volunteers might be willing to share data with the recording societies but that the recording societies are reluctant to share their data with policy makers. They are discontent with the way policy treats them and their data. The data are seen as valuable goods produced with love and hard work for which proper rewards are appropriate. Furthermore, they feel that policy, instead of doing as little as possible, should do more with the data and be more ambitious with respect to conservation. In the UK, we have seen a similar combination of ambitions to make a change, limited willingness to share data, discontent and distrust.

Ellis and Waterton (in press) have also noted such 'rumblings of discontent' about this recent commodification of natural history data. The rumblings of discontent we found can be understood by taking into account what has been suppressed through rationalisation in natural history recording. Although it might seem that the data are merely 'raw' data, the values and motivations involved in their recording are still attached to them. It is because these motivations and values are so strong, that problems regarding data-sharing could emerge. The natural history recorders have the sense that, although the government may be using the data, it is not adequately addressing the values, needs and ambitions of the recorders.

Bureaucratisation and the clash of rationalizations

In the process of bureaucratisation, natural history data are transported between different contexts, from the volunteers to the recording societies, from the local to the national levels. Nature (or at least a selection of those elements that the volunteers

[25] For Sandy, as a plant recorder, this is particularly disappointing as only four plant species are included in the habitats directive.

consider interesting, valuable and worthy of recording) is recorded on forms. Consequently, these forms are processed and computerized by the recording societies. Finally these data are used (or not) for nature conservation purposes. These processes of scaling-up, standardisation and bureaucratisation have brought a lot of benefits as they have enabled the transformation of nature into data, and its subsequent transport. However, there are consequences. In these process of transportation the data seem to have been stripped from the values and motivations originally involved in their recording. The use of standardized forms to be filled out by the recorders does a lot to enable this 'rationalizing away' these values and motivations and this is enhanced by putting the forms in computerized databases.

Below the surface, however, the values and motivations have not disappeared entirely. When it comes to sharing data, values and motives emerge again and as we have seen, this may cause problems. But not always. We have found that in the Netherlands, there is trust between the volunteers and the PGOs and they see themselves as part of the same group with the same culture and values. The values and motivations rationalized in recording match with those rationalized in the processing and computerising of the data done by the PGOs. In a similar vein, in the UK the transport of data between the volunteers and the local levels of bureaucracy is relatively unproblematic, relying on the efforts made by LRC managers, and recording scheme coordinators, to nurture relationships.

Things are different when we consider the transport of data between the PGOs and the VOFF and policy-makers in the Netherlands, and between the recording schemes, LRCs and the NBN in the UK. Here, we did found distrust and discontent. The differences with respect to values and motivations are larger, and as data moves up the scale, becoming more standardised and distant from the collector's meaning, the anxiety of the collector increases. Jan seems to recognise this, and highlights in addition differences of culture between volunteers and the PGOs on the one side and government on the other.

"Volunteers like to work with a group of enthusiastic people that they have the feeling that these people will work for them, understand them, they can call them, they can say 'oh I've seen a very rare species' then [...] I jump in my car, I want to see it right now. Of course[...] some kind of grey governmental building somewhere far away [...] it has not the same feeling".

The 'raw' data may have created a common ground and enabled interaction between recorders and government problems emerge because what is being rationalized differs. The values and motivations rationalized in natural history recording have been addressed in this paper, but what about the values and motivations involved in using natural history data? Further research on this is necessary, but at this point several things can be said about this.

The buying and selling of data means different things for both parties. While for the recorders and their coordinators, the money they receive for the data is a matter of proper compensation for hard work and is used for subsistence purposes, government is buying a product and wants good value for their money. In fact, Henk has expressed doubts about the quality of the product (volunteers are not reliable) and about the price (PGOs are monopolists):

"It is a difficult relationship because you pay for the coordination. They cannot give guarantees because you work with volunteers. The volunteer can be sick or doesn't like it anymore. [...] Also the problem in my point of view is they are monopolists. So you have to find a reasonable way to do business with each other".

Motivations for policy to use natural history data have to do with legitimising and rationalising political choices and with adhering to the political wish for increasing accountability and possibilities for policy evaluation. This is markedly different from recorders' motivations such as going outside. A value that both may have in common is the conservation of nature. However, what it is that is to be protected may differ. Although historically, there might have been data push in that policy relevance was at least partly determined by data availability, increasingly what data are required and on what species is increasingly determined by policy (reporting commitments for the EU for example). We have seen that the recorders and their coordinators are not content with the kind of data required by policy. And they have good reasons to be worried about that because it is not merely data, but nature itself that is at stake here. Nature is represented by and known through the data. The data determine possibilities and priorities for nature conservation and ultimately constitute nature. As Bowker (2000) has put it: "[data] will ultimately shape the world in its image [...] because only what is counted can be saved".

So what we see is not just a matter of bureaucratisation and of values involved in recording getting lost in the process, but rather a clash of different processes of rationalisations with different things being rationalised. First, motivations for recording differ from motivations for using data. Second, recorders' feelings of ownership and policy's plain economic reasoning lead to different ideas involved in buying and selling data. Third, recorders' feelings of responsibility for nature and policy's tendency to know and do as little as possible, lead to different expectations of nature conservation policies and data requirements. Ultimately, different ideas on what nature is and should be and how it can be conserved lie at the basis of this clash.

As we have described before, the demand for natural history data in the Netherlands grew with the EIA regulations, the nature policy assessment office and especially with the birds and habitats directives, while in the UK planning regulations and the need to report to the CBD were similar motives. The response to this growing demand was different in each country. In the Netherlands, the PGO's organised and the relations between the PGOs and the government professionalised, involving contracts and payments. Something similar happened at *local* level in the UK; the LRCs are often organised, funded and even hosted by NGOs. But at national level, as we indicate below, the response was at least perceived as highly top-down, and has undermined trust between the national recording schemes and the state.

What can we learn from comparing the UK and Netherlands?

Although in both countries we have observed considerable distrust, the existence of a more streamlined structure and the fact that it was the recording societies themselves who created the structures in the Netherlands seems to reduce those concerns. This may be related to differences in social and political culture (Burgess *et al.* 1998) which could influence the ways in which data is collected, communicated and used. Regardless of the different degrees of distrust, however, our study in fact emphasises

more similarities than differences at the level of the *recording* culture. Several respondents noted the close similarity between the recording cultures of the Netherlands and the UK. Jan characterises it as an open culture with many volunteers:

"[You have a] typical Western Atlantic zone [including the UK and the Netherlands…] where there are many volunteers, highly involved in everything, very open culture – for example almost everything is published quite openly".

Kees considers both the UK and the Netherlands to be on top when it comes to the high amount of data recorded and the high level of expertise:

"when you look at the countries in Europe and you look at the level of expertise we have … I think we can compete with England and I think we are more or less on the same level, but I think that's about it." I

Furthermore these similarities between the recording abilities of the UK and the Netherlands were framed explicitly in contrast to other parts of Europe, where volunteers are involved in natural history recording and its culture perceived as more scientifically elitist:

"the further you go to […] Eastern Europe, then it's hardly any people working as volunteers and it's still a bit the old Communist system. There are some people who do it as their job, they regard themselves only as a true specialist and they call the volunteers amateurs. I always find that as soon as they start calling them amateurs, which has a very negative sound, an amateur versus a professional. […] There's also this huge fear of publishing data. […] You make a mistake and they'll kill you […]. Well the natural reaction is not to publish, but to keep it for yourself […].It's just a different culture". (Jan)

Our respondents seem to think that actually the UK and the Netherlands have a lot in common that sets those two countries apart from the rest of Europe where there are fewer recorders, less data and where the cultures are much more closed, hierarchic and elitist. Nevertheless there were clear differences in the amount of anxiety caused by the Aarhus Convention and its legislative consequences in each country. Our tentative conclusion is that although the differences in *political* culture between the UK and the Netherlands observed by Burgess *et al.* (1998) may be real, when looking at the *recording* culture, within a wider European perspective, similarities outweigh the differences.

Conclusions

Recording fits the Weberian notion of bureaucratisation as data has been gathered together, standardised, and removed from collectors' control. The recorders' meanings of love for nature, concern for its protection, and pride in their data collection appear to become lost in the process. And yet two important features affect the outcome of this bureaucratisation. First, the personal relationships involved and the fact that the recording organisations are made up of, and represent, recorders, mean that they retain an interest in the fate of their data. Second, the data does not lose all meaning, but instead acquires new sets of meanings as it is selectively used in reporting processes, to prevent development plans, or to access vulnerable sites.

Values and emotions associated with recording become political when the processes of rationalization seem to threaten the meanings, control and intent with which the data was gathered.

The relationship between recording and political cultures seems to be relevant here. Recorders can appear to be playing a risky game as they *want* their data to be used, while taking refuge in scepticism about whether it will indeed be used effectively. This game seems to be more complex in the UK than in the Netherlands; the latter has a relatively clear structure of nationally organised recording societies that (directly or through the VOFF) deal with the national government and set the terms for data provision. Deeper mistrust of authority, a more complex and organic mix of recording organisations, and the perception of imposed structure, have led to more resistance in the UK.

These issues have arisen within the last decade, as the state's demand for biological data has grown in response to the Convention on Biological Diversity and more environmentally sensitive planning regulations. The Aarhus Convention, particularly in the UK, has added to the complexities by challenging the values of those collecting the data and stimulating a reaction which could include the reduction in availability of data. Whilst the aims of the Aarhus Convention are widely praised, our research does indicate that subtleties of meaning and value in relation to nature pervade the apparent abstraction to biological data, and throw into question the right of the 'public' to such information.

However, biodiversity data contrasts with much of the environmental information implicitly envisaged in the Aarhus convention, as it represents the 'positive' side of the environment, in contrast to data on pollutants and waste more often examined in case studies (e.g. Hartley and Wood 2005). Much of this biodiversity data collection represents real grassroots participation emerging from, or representing a newly discovered, love of nature (Lawrence 2005; Lawrence submitted), and our conclusions about it are quite different from those that might be learnt about the 'negative' environmental data.

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