

Volunteers and citizenship

Environmental citizenship in the making: the participation of volunteer naturalists in UK biological recording and biodiversity policy

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This paper documents research taking place in the midst of a series of shifts in biodiversity policy in the UK. It examines recent attempts to enrol volunteer naturalists and lay citizens into biodiversity action planning, suggesting that such attempts can be seen as a nascent form of environmental citizenship, which is based on the exchange of knowledge of nature among the different communities involved (policy makers, volunteer naturalists and lay citizens). By focusing on a range of knowledge practices, the paper explores the selective appropriation of some ways of knowing over others. It documents ways in which some actors involved are beginning to reflect on what it might mean for biodiversity policy to accommodate each others' knowledge and practices. The paper suggests that an increased sensitivity to the range of practices and knowledge embodied within these different domains may result in a redefinition and expansion of the category of citizen, and may in turn have implications for the way in which 'biodiversity' comes to be defined.

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THIS PAPER REPORTS ON an example of environmental citizenship in the making. Our study seeks to document how elite actors in UK biodiversity policy are currently trying to harness the knowledge of volunteer naturalists as part of an official UK endeavour to know and represent biodiversity.¹ These policy actors have formed a partnership consisting of the statutory agency for nature conservation, English Nature (EN), and the UK Biodiversity Group at the Natural History Museum (NHM) in London.

This initiative provides an interesting case study in the sociology of scientific knowledge (SSK), in that it attempts to understand the dilemmas associated with new models of participation in scientific and technical policy spheres. Like many other recent examples of civic inclusion in hitherto exclusively governmental processes in Britain, the case we examine is inclusive in both a social and an epistemic sense. That is, the initiative seeks to include not only new actors, but also the things they know and the ways in which they know them. In this paper, we explore the implications of those inclusions, both human and non-human.

Interactions between volunteer naturalists and the policy world are evolving in interesting and sometimes unanticipated ways, and the unanticipated can be uncomfortable for both participants. We ask what would need to be undertaken by both sets of actors to enhance each one's reflexivity, or critical self-awareness, as a precursor to meaningful accommodation of the knowledge/practices of the other. We suggest that such an 'opening up' of professional

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knowledge systems may lead to an expansion of the denomination citizenship in unanticipated and transformative ways.

An important aspect of citizenship is 'recognition' by actors in the policy domain, for example, recognition of participants' attachments to other intersecting communities that are often strongly constitutive of their identity (Taylor, 1992; Tully, 2000; 2002). Policy-makers are beginning to recognise a range of identities represented by volunteer naturalists and the significance of these for knowledge production and participation. When the kind of citizenship being envisaged is new, as in this context, recognition of such different affiliations and identities may need to be forged in new and innovative ways.²

It is the interaction of volunteer identities with those represented within the policy domain that most interests us. What constraints within the policy domain, for example, shape the accommodation (or not) of some unanticipated elements of volunteer identities? Where do volunteer and professional identities and expectations intersect or coincide? Where do they not? Most importantly, what do the negotiations between converging and diverging identities imply for citizenship in the context of biodiversity policy and practice?

Implicit in much research in the sociology of scientific knowledge is the notion that knowledge is framed and shaped through cultural processes within disciplinary or other forms of social organisation. Benedict Anderson's term "imagined community" (Anderson, 1991) is particularly useful in helping us to explore the idea that members of a community define themselves in relation to another. constructions of belonging, of identity and community (including notions of 'self' and 'other') are not only

relational but also normative in that they define appropriate behaviour and action within and among communities.³

This is particularly pertinent to the relationship between UK naturalists and conservation policy — a relationship that has been the source of many epistemic, institutional and cultural boundary conflicts since the late 19th century (Bocking, 1997, page 31; Allen, 1976; Merrill, 1989).

British naturalists come to know nature and to represent their knowledge of the natural world in many different ways. Inviting in the knowledge of naturalists into UK biodiversity policy means in practice that some forms of knowledge (and their representations) will be acknowledged, preferred and used, whilst others will be suppressed or discarded. Implicit in such selection processes, and of relevance to the newer civic participatory processes, is an interplay of assumptions that policy-makers and naturalists have made about each other — assumptions that, in turn, shape the interactions between them.

From the point of view of the volunteer naturalist community, their imagined vision of the conservation policy domain (as benign, 'useful' but perhaps rather distant) defines what it is they are being asked to contribute towards. By contrast, policy-makers tend to imagine naturalists as a cartographically dispersed task force willing to impart their knowledge of the distribution of species throughout the UK to serve a central policy mandate. As we suggest below, such projections of the other can be unstable and shifting.

The interactions designed by the policy community with citizen-naturalists are largely based on expectations of knowledge exchange. A good part of what policy-makers hope for from the community of volunteer citizens is to build up a common epistemic framework.⁴ This common frame necessarily, but not always explicitly, implies a selective appropriation of some ways of knowing over others; indeed it may involve an implicit suppressing or repressing of certain ways of knowing in favour of others.

In exploring some of the assumptions harboured by policy-makers and volunteer naturalists about themselves and the 'other', we suggest that these different communities may need to expand the 'imaginaries'⁵ that guide their interactions. On the one hand, this would mean acknowledging that there are multiple ways of knowing and representing nature. It would permit the selective appropriation of some points of knowledge over others for 'biodiversity' policy use, whilst simultaneously recognising the value and existence of alternatives. On the other hand, it would also mean investigating and bringing to the fore the expectations and visions of participation upheld by volunteer naturalists: what, for example, do naturalists imagine they are contributing to?

Yet, despite arguing for greater recognition of alternative (sometimes uncomfortable) identities and practices by policy-makers, we do not think that

such identities and practices can be directly or literally incorporated into policy. Instead, we highlight the need for a more sophisticated range of interactions that can make sense of, and recognise, the complexities of inviting citizens to become active agents in science and policy-making.

UK biodiversity and participation

The initiative launched by English Nature and the Natural History Museum forms part of the UK response to the UN convention on Biological Diversity, which emerged as an outcome of the Rio Earth Summit held in 1992.⁶ As part of the convention, over 150 national signatories were required to devise strategies, plans or programmes for the conservation and sustainable use of biodiversity within their territories. In January 1994, the British Government, as a front-runner in this process, published *Biodiversity: the UK Action Plan* (HMSO, 1994) — a blueprint on how to implement the UK's responsibilities under the convention.

Five years and many plans later, a number of documents (for instance, Avery *et al.*, 2001; DETR, 2001) shifted the emphasis in the UK Biodiversity Action Plan (BAP) away from an initially strong focus on habitat action plans (HAPs) and species action plans (SAPs), and stated the case for complementary 'needs' to be addressed. This shift reflected a broader debate in which the focus on species and habitats had come under criticism as being too narrow (Sergeant, 2000; Robertson, 2000). Newly identified 'needs' were to render the BAP process (and the concept of conservation as a whole) more dynamic⁷ and participatory.

These new priorities had international backing following the 1998 Meeting of the Parties to the Convention on Biological Diversity, which recognised that: change is inevitable in the natural world; and conservation involves societal choices, needing to involve all relevant sectors (POST, 2000). They are also consistent with national shifts within nature conservation policy during this period, arguably commencing with the disbanding of the Nature Conservancy Council in 1989–90, which occurred in part because of the Council's inability to accommodate human relationships within the project of nature conservation (Marren, 2002).

The UK BAP raised fundamental questions concerning what should be conserved, who should be involved in the conservation policy process, and how maximum participation could be achieved (Bartlett, 2000; Marren, 2000). These questions have come to have special relevance for the UK, where the impetus to broaden participation in conservation (JNCC 2003, Stone, 2002; Goodwin 1998), and environmental policy-making more generally, has risen to the top of many institutional agendas in recent years (Healey, 1998; Holmes and Scoones, 2000; Irwin, 2001; Irwin and Michael, 2003).

Moves to increase participation are also recognised as relevant in the context of the global BAP process, prompting government and the statutory and voluntary agencies to experiment in new ways with the social networks and knowledge that make up British biodiversity expertise. Hence the example of environmental citizenship in the making that we discuss here also has important resonances for global science and governance.

Natural History Museum–English Nature partnership

The shift away from an initial approach based on protection of specific species and habitats towards recognition of both humans and non-humans previously excluded from the BAP process prompted a re-evaluation of the potential contribution of various human communities that came to be seen as repositories of rich and detailed biodiversity knowledge. Many of these communities had historically been marginalised from 'policy' and even 'conservation' circles (Bocking, 1997, pages 13–37), and their knowledge of the natural world had effectively been 'unharnessed'.

A corollary of this early exclusion of important human actors was the corresponding marginalisation of certain natural (non-human) organisms that these actors cared for, such as the lesser known and lesser 'loved' species (Ajuha, 2001; Marren, 2002) that are sometimes difficult to identify, for instance, the cryptogamic (non-sexually reproducing) organisms (such as lichens, mosses, slime moulds, algae) and the invertebrates (a much larger group of insects). Their re-evaluation as life forms that should be known about, and documented, as part of the Action Plan means that the BAP process now seeks to embrace both human and non-human species previously on the margins of nature conservation.

The funding, since 2001, of two 'facilitator' posts by English Nature at the NHM⁸ is an explicit attempt to fill gaps in the BAP process. The facilitators are charged with spanning the divide between the naturalists⁹ and the statutory agencies that recognise the specialised, detailed and well documented character of volunteer knowledge. This harnessing approach is understood by the policy and scientific community

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to be ideal in that it ‘kills two birds with one stone’: it both fills knowledge gaps about under-recorded species and provides a way of including wider publics in generating biodiversity knowledge.¹⁰

However, the design also implies, in effect, a rendering of volunteer communities as specific kinds of knowledge-donating communities by a policy-making community consisting of English Nature, the Natural History Museum, the Joint Nature Conservation Committee, the Biological Recording Centre, the Department for Environment, Food and Rural Affairs (DEFRA) and various influential non-governmental organisations (NGOs). We explore below these actors’ visions of national volunteer participation in the BAP, as well as some of the internal policy drives that have framed ‘participation’ in particular ways.

Participation and the concept of ‘imaginary’

The conservation policy drive to harness new knowledge for the BAP reveals a number of interesting assumptions about the relationship between science and conservation and the role of knowledges. We describe below a number of the social, cultural and philosophical components integral to knowledge making by volunteer naturalists. Of course, a closer look at the policy world itself also reveals hidden complexities. In the making and application of policy, different ‘imaginaries’ and different policy identities and their alignment or misalignment with those of contributing naturalists are continually negotiated.

A visible backdrop to these negotiations is that the boundaries between volunteer naturalists and professional conservationists are neither clear nor fixed. Many policy actors slip in and out of both professional and volunteer identities, often ‘moonlighting’ as naturalists during time away from their office responsibilities. Indeed, one of the starkest motivating forces behind the sought-for engagement of specialist naturalist knowledge is the (somewhat nostalgic) recognition that, over recent decades, the concentration and quality of (scientific) expertise within the policy domain has dwindled.

Correspondingly, the wealth and quality of expertise residing in naturalist knowledge circles is sorely required by policy-makers to render decision-making more robust and credible.¹¹ At an obvious level, this recognition of need is closely bound up with a strong sense of regret, combined with empathy, and an in-house knowledge of what it means to be a practicing naturalist.

Bodies such as English Nature, and many (if not most) policy actors, appreciate the diverse ways of knowing nature represented by volunteer naturalists. Indeed they often feel that traditional naturalist pursuits and practices have been subordinated to the oppressive presence of a bureaucratic ‘audit culture’ that tends to measure progress (in meeting ‘conservation targets’, for example) in purely quantitative terms.

This tension surrounding the bureaucratisation of the way in which official institutions are expected to know and represent nature is picked up by authors such as Ingold (2000), who has suggested that the global language on biodiversity demonstrates a tendency to “expel humanity from the lifeworld” (Ingold, 2000, page 155).

The construing of biodiversity as a dehumanised or, conversely, as a human-rich concept, feeds into English Nature’s discussions about participation. On the one hand, data are felt to be urgently required to fill gaps in knowledge of under-recorded species. This imaginary of participation has led some actors within English Nature to see participating citizens are described as ‘automated data-drones’.

That label is contrasted with a simultaneous, alternative imaginary of the public as experientially engaged within the natural world. The latter construction of the public as contributing citizens yields less clear results. It presents problems for quantification and for a clear vision of what public engagement in fact affords for biodiversity policy. Remarkably, the relationship between data gathering, on the one hand, and the experiential vision of participation, on the other, is not clearly articulated in the policy process.

The policy imaginings of the way volunteer naturalists might contribute as participants are internally complex, therefore. We suggest that gradual shifts may be taking place within the policy domain as its actors gradually realise that contributing citizens cannot be imagined singularly, either as automated data-drones or as nature lovers. This phenomenon is perhaps best exemplified by small but significant shifts in the imaginings of policy actors who are at pains to render processes of engagement both more efficient and more meaningful to both volunteer and professional naturalists.

Naturalist imaginaries

Communities of volunteer naturalists are being targeted and effectively harnessed to policy in diverse ways. On the one hand, national species and habitat action plans have been drawn up by a range of governmental and non-governmental actors.¹² To fill known gaps in the understanding of the health and whereabouts of certain species, amateur naturalist societies are being encouraged by the NHM to record BAP-relevant species as part of their normal recording activities, and, crucially, to submit their records to the relevant recording schemes.

On the other hand, data may be generated and processed as part of locally-oriented planning requirements. As part of such surveys, BAP species found to be present on a particular site will be highlighted. The role of volunteer naturalists is usually central but invisible in such surveys, since, although surveys are carried out by consultants, volunteer naturalists are often the main contributors of records to the sources of data that consultants draw upon.

In these examples, naturalist knowledge inputs to biodiversity policy and planning take the form of cardboard or electronic records. Some, but not all, naturalists perceive the way in which the policy domain acquires data as predominantly extractive, which leaves open to question the extent to which data contributors feel adequately recompensed for their contribution.¹³ Most recently, increased commodification of biological records, combined with the selective payment of some data compilers and processors (consultants) and the assumption that data from naturalists generally require no financial recompense, has fuelled heated debate both within societies and between the volunteer and professional domains.

Another concern for many practising naturalists has been their alienation from the ends to which their data are processed and the feeling that they relinquish control over parts of their knowledge once it flows into the policy domain. The situation is, however, rendered more complex by the commitment many naturalists feel to the use of their knowledge towards conservation ends. Indeed many lament the fact that environmental planners may not consult naturalists at all during their decision-making. Hence a tension exists between the desire to contribute as good environmental citizens and the awareness of a lack of transparency concerning the ultimate use of data.

The following example illustrates a volunteer naturalist's struggles to make sense of what it means to be a good citizen. The narrative is local and ethnographic but is also representative of the feelings of many naturalists who belong to, and practice within, the amateur naturalist societies targeted by English Nature through their partnership with the NHM. This example fits best with the model of participation described above, which seeks above all to fill identified knowledge gaps with data. The problem identified by the volunteer bryologist¹⁴ is that this approach distances the data from the complexity of its provenance.

Participation through the recording of mosses

Judith is a volunteer bryologist and an active member of the British Bryological Society. She can be described as contributing to policy in two related ways. On the one hand, she records the presence of moss species. She transmits the data into the cogs of the biological recording machinery by passing it first to a referee and Lead Partner;¹⁵ from there it enters into the BAP reporting system. In effect, she informs policy by contributing data on species distribution and status from her own familiar patch. She has also contributed to a survey commissioned by a county council of a specific Site of Special Scientific Interest.¹⁶

A third way in which Judith could be involved in biodiversity policy, but has chosen not to be, is to take part in a formally organised national survey of arable bryophytes.¹⁷ This is specifically BAP-related

in that it seeks to galvanise bryologists all over the UK to record and monitor arable bryophytes, several species of which have been identified as being rare and of high priority for conservation.

Judith is highly ambivalent about her commitment to biodiversity conservation.¹⁸ In the past, she used to link her tireless efforts to know nature directly to the benefits she thought her knowledge might bring to biodiversity conservation. More recently, as she has been going out to record the mosses in her local 'patch', she has begun to feel a sense of alienation from the conservation world. A sense of resentment is gradually borne based on the recognition that her data have been passed through many hands and perhaps undergone a series of manipulations.

In helping to provide baseline material for a planning report, she notices that her data are being used more to raise the profile of a set of conservation professionals than for 'real' conservation. On a daily basis, Judith seeks to reconcile her passion for observing and knowing nature with these sad reflections. She has not lost all hope, however, and part of her still believes that her pursuits were worthy and not 'simply hedonism'.¹⁹

The ups and downs that Judith undergoes as a volunteer bryologist contributing to the policy domain are associated with her sense of identity as a practising naturalist. When she ventures into the hilly, bryophyte-rich woodland behind her house, she carries around her neck a hand-lens on a shoelace and a bulging canvas bag. The contents of the bag are many, but include objects that define both her disgruntled allegiance to, and her chosen marginality from, conservation policy and action.

The most obvious object of allegiance is a standardised bryophyte recording card, which she will fill out as she records bryophyte presence and distribution within her 'patch'. The data can be used both as part of a survey for planning reports and for the wider ongoing species reporting that enters more directly into the BAP. As she inscribes her observations, she muses that she no longer really understands the significance of such efforts: "Where does this information go, god knows!".

She then draws from her bag another object, this time a hand-sewn, vinyl covered booklet. The pages are crammed with scribbled notes and intricate hand drawings of bryophytes at different stages in their life cycle. As she leafs through the pages, her language expresses exhilaration and aesthetic appreciation. Hers is a sense of privilege at being granted unbridled access to nature's wonders, an access that only a few people demand, value or obtain.

Her language and posture smack of the subversive; her marginalised status she believes is two-fold. It places her in a unique alignment with(in) nature, something she cherishes and covets, but it is also a positioning that denies her control over the final processing and practical translation of her data.

Judith's story illustrates the peripatetic nature of volunteer identity as she navigates the spaces of

Volunteer identity has a peripatetic nature moving between responsible biological recording for conservation and passionate engagement with nature: the policy framework only demands a fraction of the total engagement with nature, being only interested in record cards

inclusion and exclusion in biodiversity policy. She moves in between a world of responsible biological recording in the name of conservation and a world of passionate engagement with nature. The policy framework only demands a fraction of her total engagement with nature in that it is ostensibly interested only in record cards and new data to inform the UK picture of the distribution of mosses.

Judith's passion and loyalty become a 'residue' that is left behind and ostensibly has no recognised function in the policy domain. Yet, whereas this residue initially appeared to be left literally unattended to, we later found that there were opportunities for the policy world to draw some informative content from the disgruntlements and emotions that do not fit onto record cards.

Participation through the recording of river flies

A human-rich conception of biodiversity would fully acknowledge the identities of contributing citizens as able to offer more than merely the inscription of a small part of nature onto a record card. A corresponding model of citizen participation would likewise place emphasis on the value of human experience within nature.²⁰

Building on such concepts and models, the NHM has spread its remit beyond the search for data from those already engaged in its production (such as Judith), to include other publics as part of a 'harnessing' initiative that aims to bring new networks of human observers into biodiversity policy-making. Whilst the main thrust of this approach is to broaden the range of publics actively involved in knowing and caring for biodiversity, a secondary hope is that from this wider engaged public will emerge a number of individuals who will equip themselves as specialist recorders.

This 'alternative' model embarked on through the English Nature–NHM partnership has involved the training of fly fishers: citizens who actively engage with nature but who are not naturalists involved in producing biological records. Anglers selected for their interest in river-fly decline as an indicator of water quality have participated in workshops

designed and organised by the NHM. The anglers, in this respect, constitute a fresh, untapped audience who may be harnessed as part of the BAP participatory process. Anglers are a particularly interesting sub-set of the general 'lay' public since they 'read the river'²¹ but do not process their 'river reading' knowledge into biological records.

A number of 'River-Fly Identification and Monitoring Workshops' co-ordinated by the NHM have set in train an apprenticeship system to teach fly fishers how to identify river flies — a process referred to as "capacity building" by the NHM coordinators. The organisers' expectations are two-fold and interrelated: on the one hand, professional natural scientists are expected to rally enthusiasm in fellow nature-lovers, seen as 'amateur scientists'. On the other hand, it is hoped that enlightened anglers will begin to contribute records to river-fly recording schemes, which at present enjoy very limited input.²² This initiative has been particularly attractive to fly fishers who have been involved over the past decades in attempting to lobby the Environment Agency²³ on declining river-fly populations as indicators of water quality.

Most anglers are willing participants within this structure. Indeed the policy and angling communities do, in part, converge in their expectations of participation as harnessers and as contributors (Waterton, 2003). As mentioned, the fly fishers' choice to participate is often informed by a desire to underpin their own lobbying activities regarding river-fly decline and water quality with 'hard science'. As one angler put it, he feels that when he stands up in court, only by "wearing a white coat" will he and his accounts be granted legitimacy by actors such as the Environment Agency. Fly fishers are intensely interested in river water quality in part because, without clean rivers, their sport would not continue.

However, as in Judith's story, the fly-fishers' tale encompasses more than such goal-oriented elements. As one angler experimented with river-sampling equipment, struggling to balance on slippery stones in a shallow but rapid river, he waxed lyrical on the relationship between anglers and fish, which develops by means of the gradual perfection of "stalking" techniques. Stalking is a finely tuned and gradually acquired art. It involves learning how to "read the river", allowing a multitude of minute observations to coalesce to a recognition of where the fish are, and which flies they would expect to encounter. These interactions among the fish, the river and the fisherman come to a head as the fisherman experiences an "indescribable sense of satisfaction" as the fish takes the fly. The satisfaction is all the more acute if the fisherman has hand-tied the fly himself.²⁴

The fisherman describes this relationship as a human–non-human contract predicated on mutual respect, which can only be gained through the perfection of stalking and fly-tying skills. For the

fishermen and women in the workshops, such a contract means that they are no longer looking at nature, observing it, or even quantifying it. Rather, when they enter into such a contract with the fish, they feel part of nature.

These accounts of human–nature ‘contracts’ substantially diverge from a formal description of riverfly identification and monitoring practices. Indeed it is difficult for the workshop organisers to draw any value from such experiential narratives in the context of recording invertebrate abundance and diversity. Yet, as we relate in the next section, there are emerging signs of recognition from the policy domain of the exceptional ‘perceptual skills’²⁵ of the fly fishers. These signs suggest an increased recognition that it may not be possible to invite citizen participation without embracing and negotiating the identities and practices of others. The way in which this might feed into a reconfiguration of biodiversity recording and policy, however, remains in question.

Reflections

These narratives are intended to provide the reader with a taste of the richness of the ‘ways of knowing’ nature presented by different participants in the English Nature–NHM ‘harnessing’ initiative. Both Judith the bryologist (simultaneously subversive and committed) and the fly fisherman (as ‘dwelling in’²⁶ nature) introduce ways in which the participants in the initiative potentially offer ‘much much more’ than mere biological record cards.

As we have already hinted, one version of the participatory models in which Judith and the fly fisher are taking part implies the need to draw on only a very small portion of their knowledge or experience of nature. Simultaneously in play, however, is a broader, more encompassing imagining of participation, which could potentially draw on a larger portion of the volunteers’ knowledge/experience of nature.

One of the ways in which the English Nature–NHM partnership seeks to harness amateur knowledge seems akin to a now rather dated model of participation predicated on an instrumental search for efficiency rather than on cognitive justice or the empowerment of marginalised groups and individuals (see Cornwall, 2002; Cornwall and Gaventa, 2002; Cooke and Kothari, 2001; Goodwin, 1998). In this model of participation, volunteer naturalists’ knowledge is sought and given space within a pre-defined matrix for knowing nature, in a channelled and selective sense.

The English Nature–NHM initiative thus presents an example of participation with an explicit and in-built emphasis on (a particular kind of) knowledge-making. Like many participatory initiatives, it contains within it something of a paradox: scientific definitions and expert opinions, in this case around specific species, are found to be insufficient to sustain important public policies, and so public support

and representations are also thought to be needed. Yet these representations are often elicited in the very forms that are simultaneously seen as being inadequately robust.

The value of invited knowledge is negotiated at specific sites of validation — sites where volunteer knowledge is offered and then scrutinised for its applicability to policy. This translation does not always follow smoothly, as we have seen. Records offered in good faith by practising naturalists may be discarded for a variety of reasons, including their alleged poor quality, lack of scientific rigour or simply because of inappropriate demands for payment.

Conventions surrounding the desired form of data may dictate that many of the contingencies and uncertainties surrounding data creation be jettisoned in favour of a clear data-set, presented in a form readily absorbable by existing BAP or other data flows. At this point, some of the diversity of the social/cultural epistemologies and ontologies underpinning data may be lost. The full inclusion of ‘lay’ or ‘citizen’ expertise may not be realised in practice; and the possibility of alternative knowledge opening out new spaces for dialogue may not be realised.

If the desired representation of human–nature interactions and understandings really are ‘as data’, this stipulation in effect determines the nature of inclusion and imputes to policy-makers a certain hegemony in defining what constitutes appropriate knowledge (Cooke and Kothari, 2001; Agrawal, 2002; Ellen and Harris, 1999; Agrawal, 1999; Posey, 1999; Leach and Mearns, 1996; Goodwin, 1998). Thus, ironically, a data-led participatory vision of biodiversity policy could deny understanding of the contingency and uncertainty of much scientific knowledge — qualities widely deemed to be in need of greater recognition as a basis for regulatory and other public decision-making (Jasanoff, 1987; 1990; Funtowicz and Ravetz, 2003; Shackley and Wynne, 1995; Wynne, 1996a; 1996b).

Such a vision of participation could likewise deny the social and cultural diversity of the epistemologies and perspectives recognised to be important in ensuring the robustness of policy (Gibbons *et al.*, 1994; Nowotny *et al.*, 2001). Furthermore, such a data-led vision of participation could neglect another much desired aspect of participatory schemes — the potential for feedback mechanisms that actively challenge some of the framing commitments shaping the way policy institutions construct scientific and policy knowledge (Arksey, 1998; Epstein, 1995; 1996; Irwin, 1995; Wynne, 1996a).²⁷

Room for manoeuvre

A data-led imaginary is, however but one conceptualisation of participation currently circulating within English Nature and the NHM. Alternative, more humanising discourses create greater scope for new alignments among naturalists, lay citizens and policy bodies. Judith’s concerns as to what purpose her data

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may serve, or the sense that lay anglers may harbour a deep connectivity to nature, are now perceived by some actors within the policy domain as a necessary, integral, and even informative part of the participatory dialogue.

Some subtle shifts in policy approaches to participation suggest that policy-makers may be prepared to consider the ‘co-production’ insight (Jasanoff, 2004) that reshaping communities of ‘knowers’ implies a subtle reshaping of both policy and naturalist cultures. Further attention to this point, we suggest, could facilitate important changes in the way in which participation in biodiversity policy-making is envisaged and practiced.

In practice this ‘room for manoeuvre’ has recently translated, for example, into the decision of policy actors within the bryological community to find ways of incorporating some of the socio-cultural components of volunteer epistemologies. Within the British Bryological Society, for example, participation now includes the practice of ‘buddying’ (apprenticing) novice bryologists with ‘real tigers’, that is, nationally recognised moss experts. So Judith, for example, has recently won the support of one of the top UK moss experts as a ‘Bryophyte Buddy’. This is, in effect, a recognition of the need to nurture both the natural and cultural components of knowledge, and to create a more fully engaged interface with those on the margins of participation.

A second signal of the potential for the policy domain to expand its model of participation was shared with us by one of the River-fly Identification Course instructors. Considered an expert on a particular group of river-fly species, he reflected on two ways in which he had learnt from the anglers during a workshop.

First, he noted that, although he had been observing caddis flies at different moments in their reproductive cycle for decades, he had never witnessed the ‘hatch’, the moment when adult flies emerge from their pupal stage. This is the moment that anglers, on the other hand, are most attuned to observing for the obvious reason that it is precisely what they mimic in their fish ‘stalking’ techniques. For the expert, the exchange with the anglers was inspiring and caused him to reflect on the relevance

of anglers’ knowledge as integral to informing his own teaching methods.

Secondly, he also observed that he had been unaware for several years of the aesthetic dimension of his own entomological activities. Working together with the anglers and informally sharing with them elements of their knowledge had reawakened in him a sense of wonder in nature that he had long suppressed.

The changes in policy provoked by these subtle shifts are fragmented and may be difficult to discern. The question as to what might be the outcome of a broader and more explicit recognition of volunteer identities and practices in the biodiversity action planning processes inevitably arises in research of the kind we have reported in this paper. However, as other commentators have noted, it is often difficult in practice to discern the impact of participation on policy and/or decision-making (Holmes and Scoones, 2000, page 43). Policy rhetoric suggests (and often assumes in good faith) that the participatory process feeds into an essentially linear policy process.

Yet impacts may occur in non-linear, unanticipated, longer-term, yet significant ways. Holmes and Scoones (2000, page 43) suggest, for example, that this was the case in a Lancashire County Council study that invited local people to take part in debates about sustainability and resulted in talking about ‘sustainability’ in utterly new ways. In such processes, Holmes and Scoones report, the creation of new networks of actors, new policy discourses, and the linking of these to different policy communities may be just as significant as more easily identifiable impacts.

Conclusion

We end this paper by taking a step back. The demand for biodiversity action planning initiated by the Rio Convention in 1992 prompted a very understandable reflex from the statutory conservation agencies of the early 1990s. What the UK palpably needed to do was to lead well on this project: to draw up plans, lists and processes by which species and habitat status might be documented and monitored.

A decade later the climate has changed. Agencies such as English Nature are now grappling with concepts informed by a need to embed science into society, to somehow build links between them and to reflect new, experimental practices onto engrained and institutionalised ones. Our research finds itself in the midst of these shifts.

A body of literature in science studies and related disciplines has begun to explore the politics of knowledge inherent in participatory models of science and governance (Arksey, 1998; Bloor, 2000; Epstein, 1996; Goodwin, 1998; Harrison *et al*, 1998; Irwin, 1995; Rip, 1995). This paper has described our attempts to understand in the context of new participatory encounters between ‘lay volunteer’ and professional conservationists, and scientists, in the context of biodiversity action planning. We have

tried to draw out the notion that what informs and underlies the emergent politics of knowledge in our case study is a constellation of different imaginaries of self and other.

As researchers multiply located within the context of these imaginaries, we can draw out accompanying understandings, meanings, embedded practices and even ontologies involved in knowledge-making aspects that many other sociological studies of scientific knowledge have also attempted to expose. Articulating such understandings, we feel, may also hold some potential for the way in which the participatory experiment might unfold.

Further acknowledgement of the humanness of biodiversity observations, data collection and processing, for example, might blunt the sense of asymmetry experienced by some naturalists with respect to their professional peers. Acknowledgement of what it is to observe, describe, learn about and experience nature in fuller, more connective, aesthetic or emotive ways might help to bind a new citizenry of conservationists, naturalists and lay people and to create new common axes among them (Verran, 2002).

We acknowledge in the paper that a selective appropriation of the knowledge of volunteer naturalists in the policy domain, so familiar to studies of participation in other contexts, may be an initial heuristic (Shackley and Wynne, 1995), which, given time, may expand to embrace a fuller range of participant identities, practices, and ways of knowing and being in nature. We suggest that it is not necessary for the policy domain to attempt to incorporate *all* the rich diversity of knowledge/practices amongst the contributing citizenry. It is important, however, that the policy domain find ways of recognising the selective nature of its appropriation of parts of volunteer identities/knowledge/practices. This is because such recognition itself would help to maintain the tenuous balance between subjective identities and the wider senses of belonging and constraint that make up 'citizenship' (Gadamer, 1989; Taylor, 1992; Tully, 2002).

Following from this, we should perhaps see the small and subtle acts of reciprocation and recognition that we have witnessed in this case study not simply as awkward juxtapositions to a growing body of biodiversity data, but as the potential building blocks with which a reconfigured, repopulated and rehumanised biodiversity might be constructed.

Notes

1. The research, "Amateurs as experts: harnessing new networks for biodiversity" (2002–2005) is an ethnographic study funded by the Economic and Social Research Council of the UK.
2. Here we draw on the work of Gadamer (1989, pages 359–360) on Hegel for a discussion of mutual or symmetrical recognition and the implications for subjective identity of asymmetrical recognition. Of relevance is his analysis of the understanding of self and other through dialogue, which he suggests can develop in unanticipated and transformative ways.
3. Dewey (1927), perhaps writing before his time on imagined publics, suggests that political orders, "impute a public only to support and substantiate the behaviour of officials" (page 117). In other words publics are imagined by 'officials', as a way of giving substance to, and legitimating, governmental systems.
4. The work of Haas (1990) on "epistemic communities" has obvious resonances here.
5. The sense we try to convey by using the term 'imaginary' in this paper is of grounded and projected visions that emanate from the constraints of present practice but that look into the future to convey new possibilities. In the paper we show how such imaginaries often reflect assumptions about others as well as tending to cast others in certain roles. Marcus (1995) on "technoscientific imaginaries" describes them as, "a socially and culturally embedded sense of the imaginary that indeed looks to the future and future possibility ... but is equally constrained by the very present conditions of scientific work" (page 4). Recent writings of Arjun Appadurai, Charles Taylor and Michael Warner have developed the idea of imaginaries as ways of conveying the circulating, non-fixed nature of modern forms of subjectivity in a post-nationalist milieu. See Hedetoft and Hjort (2002) for their uses of the term imaginary in the context of citizenship.
6. See Marren (2002, chapter 11) for a history of UK Biodiversity Policy.
7. Dynamic here implies becoming more open and responsive to the dynamism of natural forces and processes within the natural world.
8. The English Nature–NHM partnership is part of a suite of partnerships being forged in the policy world and conservation organisations, targeted at harnessing the enthusiasm of volunteers observing nature in the UK. Examples of similar posts can be found within the Royal Society for the Protection of Birds and the Biological Recording Centre.
9. The NHM is working both with members of amateur naturalist societies, estimated to number 100,000 people in the UK, and with wider communities of people interested in nature in different ways. Examples of the latter are rambblers, fly fishermen and farmers.
10. These twin preoccupations to garner records and to enthuse new communities of volunteer observers of nature are central to recent conservation policy as indicated by English Nature's 'People-and-Nature' programme. Both strands of activity can be simultaneously observed in the harnessing efforts of the facilitators at the NHM.
11. It is worth noting that the range of amateur naturalist societies in the UK presents a range of internal variations regarding lay/expert make up and their preferred and practised relationship to science.
12. This may take place at local level through Local Biodiversity Action Plans (LBAPs) or at national level through national BAPs. The English Nature–NHM initiative focuses almost exclusively on national-level BAP schemes and data flows.
13. See Ellis and Waterton (2004 in press), which describes in greater detail circuits of data exchange within and between naturalist and policy domains and documents notions of appropriate reciprocity.
14. A bryologist studies mosses and liverworts.
15. Lead Partners have been established as part of the BAP network as individuals expert in a particular range of species, who are responsible for validating records they receive and for processing these in a form compatible with the BAP reporting system.
16. Sites of Special Scientific Interest (SSSIs) are a form of designation of land, instigated by the Nature Conservancy in the early 1950s. Whilst intended initially to be a protective designation ensuring continuity of access for research for a new breed of ecologists and conservationists, the status of SSSIs was much eroded over the latter half of the last century and they are frequently under threat of development.
17. Arable bryophytes are moss species growing on cultivated fields.
18. The following description is based on recorded conversations that took place over a day of fieldwork in November 2002.
19. Interview with Judith, November 2002. Judith suggested in interview that to study mosses for their own sake and for the sake of knowledge accumulation alone would not be completely fulfilling — that would be 'pure hedonism' — whereas what she *is* committed to is a combination of pleasure, duty and utility in respect of her moss surveying practices.

20. This model is most comprehensively represented within English Nature by way of the 'People and Nature' Programme.
21. 'River reading' is a fly fishing practice that includes observing the river environment in intricate detail, often for prolonged periods of time, at regular intervals.
22. The three taxonomic groups that the workshops focus on are the caddis fly, may fly and stone fly. For each of these groups, there is a single national recorder. The situation at present is that these national recorders are the only real experts on their specialist groups in the UK. Very few records come from other people to contribute to the national level data they continue to procure through their own individual efforts.
23. The Environment Agency is the environmental statutory body responsible amongst other things for water quality.
24. Observations are taken from filed notes recorded at several River-Fly Identification and Monitoring Workshops over the period June 2002–September 2003.
25. Ingold (2000) refers to anglers and hunters as "perceptually skilled agents".
26. For more on a "dwelling perspective", see Ingold (2000).
27. An on-going debate surrounding the question of how much, and what kind of, decision-making power to attribute to participating subjects can be seen in Collins and Evans (2002), as well as the responses to this article by Jasanoff (2003), Rip (2003) and Wynne (2003).

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