



Conserving biodiversity that matters: practitioners' perspectives on brownfield development and urban nature conservation in London

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Policies designed to conserve sites of nature conservation importance are an important aspect of city planning in the UK. London has led the way in putting in place a spatial hierarchy of sites of nature conservation importance designed to protect wildlife habitats from development. Some wasteland habitats associated with derelict and vacant land receive protection in this way but development pressure on these so-called 'brownfield sites' is high and is likely to continue. This paper examines how conservation professionals in the private, public and voluntary sectors are responding to the threats of biodiversity loss and opportunities for habitat creation posed by re-development of brownfield sites. The study draws on in-depth interviews conducted with conservation professionals and the practices employed by ecological advisers employed by developers seeking to re-develop wasteland sites. It finds that practitioners are negotiating their role in the re-development process in different ways. Key issues relate to the role of ecological science in codifying wasteland habitats, uncertainties about how best to evaluate the conservation importance of such sites and the strategies and tactics employed by different practitioners as they seek to mobilise a range of knowledges and practices to secure ecologically sensitive proposals. Scientific knowledge about wasteland habitats has not stabilised in ways that can consistently inform conservation policy and practice. As a result biodiversity issues of wasteland sites are often discounted in the re-development process. Investment in studies of the basic ecology of urban wastelands could provide a firmer scientific foundation on which conservation policies could build. At the same time, many conservation professionals involved in urban re-development are struggling to promote a pro-active approach to secure environmentally sensitive development. The knowledge and co-operation networks being mobilised to support this approach are fluid and unstable, and favourable development outcomes as yet are few. Formalising these networks to achieve more effective engagements with developers and the construction industry could consolidate ecological practices designed to conserve and re-create the biodiversity of wasteland habitats.

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Introduction

January 2001 saw the launch of The London Biodiversity Action Plan (LBAP) sponsored by the

London Biodiversity Partnership (2001). It details plans to enhance the survival of rare and valued species associated with some 15 London habitats such as woodland, heathland, railway linesides, private gardens, cemeteries and wastelands. Giving official recognition to the rich and varied wildlife that resides in the capital city, the LBAP is confirmation that nature conservation is no longer just

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a countryside concern—urban nature too requires conserving. A shift in thinking has also taken place in respect of those sectors now thought to be responsible for delivering the action plan. Instead of relying on the public and voluntary sector to deliver nature conservation policies on the ground, the private sector has also been enlisted into this process. The cross-sector London Biodiversity Partnership is evidence of this new commitment. Significant too for the delivery of the actions specified in the BAP is the requirement under the terms of the GLA Act 1999, for the Mayor of London to produce and support a Biodiversity Strategy as an integral part of his development policies. Seemingly, the conservation of biodiversity and nature is to be placed on an equal footing with those economic and social concerns that have traditionally guided development in London.

At the same time that the conservation of urban nature appears to have gained political saliency, development pressures in the capital are increasing. The rising demand for new homes and general acceptance by central government that 60% of these homes should be built on brownfield sites (DETR, 2000a) including some sites of nature conservation importance, means that the conservation of urban nature will be contested terrain. So, although policies to protect urban nature have gained ground in the public sector, development threats are increasing especially on so called 'brownfield sites'.

The changing policy context has added fuel to a debate about the goals of nature conservation and biodiversity plans (Adams, 1997) and to debates about the most robust ways of valuing nature (Foster, 1997) and restoring it (Gobster and Hull, 2000). In urban areas debate has focussed on ways of valuing those 'wasteland habitats' most commonly associated with brownfield sites (Box and Shirley, 1999; Hunot, 1999; Urban Wildlife Partnership, 1999). The ambiguous aesthetic appeal of wasteland sites and their association with socially undesirable uses, can contribute to the low amenity and social value of such sites. Likewise, the dominant portrayal of brownfield sites as 'wasting assets' by the Urban Task Force (1999) and the Urban White Paper (DETR, 2000b), serves to reinforce this negative appraisal. As a result 'development' is seen as a means of bringing such land into 'beneficial' use. This dominant portrayal of brownfield sites as wasting assets discounts a more pluralistic understanding of brownfield sites as communal resources in which all sections of society have an interest or stake. From this more pluralistic perspective, brownfield sites represent examples of 'near natural' or 'wild' areas in the city and are

part of the 'unofficial countryside' celebrated by Richard Mabey (1973) and the 'urban commons' of Oliver Gilbert (1991, 1992). Through this lens, habitats encountered on brownfield areas are as much a part of our natural and cultural heritage as many other valued artificial habitats in the UK.

In taking forward the claim that some brownfield habitats are deserving of conservation, proponents have to address ever-present tensions between the scientific and social goals of nature conservation. In the context of an urban renaissance such tensions are brought centre stage both because 'nature' itself has to be re-classified and the legitimacy of conservation claims, well established in rural areas, has to be demonstrated anew. Moreover, some ecologically sensitive developments are being proposed and appear to offer 'gains' for wildlife where previously none were forthcoming. These ecologically sensitive proposals are beginning to mobilise new knowledges and alliances of individuals and groups who previously worked separately and often in opposition to each other. Our objective in this paper is to reveal how different ecologists in all sectors of the development process—public, private and voluntary, negotiate the new challenges provoked by an urban renaissance.

To date few studies have attempted to examine how professional ecologists and conservationists in different sectors and institutional settings address these tensions in their working practices. Some exceptions are Whatmore and Boucher's (1993) study of planning agreements and nature conservation with its focus on the views of planning officers; Cowell's (1997) study of a mitigation process in a rural setting, and studies of the discourses of conservation, development and regeneration provided by Rydin (1998) and Harrison and Burgess (1994) in the context of the east Thames corridor. However, few studies focus on the process through which alliances across sectors are forged, and the way that scientific, local and political knowledges are mobilised and contested within the re-development process. A focus on these networks positions the re-development process less as a concrete 'given' and more as an emerging process in which actors are enmeshed and within which differing understandings of nature, technologies and practices of nature conservation are enlisted (Burgess *et al.*, 2000). For example, amongst nature conservation groups operating in the context of urban rather than countryside locations, the local state has always been regarded as a strong ally (Goode, 1993). By contrast, the nation state has been something of an opponent, as for instance in their role as sponsors of several major infrastructure

projects such as 'the roads programme'. But, more recently new 'state' agencies with an environmental remit such as the Environment Agency have entered the arena and groups are still figuring out how to respond to these new, potential partners. Equally, environmental groups differ in the credence given to the potential of science and new technologies for delivering environmental 'gains'. Some regard these opportunities optimistically, others pessimistically. More generally in the UK, private utility companies have taken over responsibilities for air, water and energy, and specialist environmental advisers now reside within these companies. As a result environmental groups no longer have a monopoly to speak on behalf of the environment and forming new alliances seems an effective means of achieving both environmental protection and enhancement (Rawcliffe, 1998). A focus on the emerging networks being employed by a range of professional ecologists in the public, private and voluntary sectors, hence seeks to reveal how different practitioners are responding to both these structural changes and to calls for an urban renaissance.

The London case discussed here adds several dimensions to this analysis. The returns on economic development in the capital are potentially so high that as a result conservationists—broadly defined, have had to adopt new approaches to achieving both the protection of the environment and its enhancement. For example, latest estimates from the DETR (1999) suggest that 24 000 homes are expected to be built each year in London. Failure to meet the allocated number of homes within the urban area will add fuel to the brownfield-greenfield debate and the competing spatial and environmental rationalities of sustainable development underpinning it (Murdoch, 2000). The high pressure for development also means it is inevitable that some brownfield sites of nature conservation value will be threatened by development. Hence, the requirement for a robust process of identifying and protecting local 'brownfield' sites of importance for nature conservation (SINCs) is an urgent one (Box and Shirley, 1999). The method for identifying local sites of importance for nature conservation developed by the former London Ecology Unit (LEU) is thought to be one of the most successful in Britain and has gained international recognition (Dawson, 2000). Adopted by the majority of London boroughs, the LEU's spatial hierarchy of metropolitan, borough and local sites of importance for nature conservation includes several brownfield sites. But in practice, the political commitment of local authorities determines whether these policies are

upheld and unless such policies become mandatory under the Greater London Authority's spatial development strategy (GLA, 2001), it is likely that several valued sites are likely to be affected by development proposals. It remains to be seen whether the much heralded strategies being prepared by the new Greater London Authority—each of which is required to contribute to sustainable development—will give effective consideration to the nature conservation value of brownfield sites. The re-development process therefore is likely to be strongly influenced by local practices as well as by the relative importance given to economic, social and environmental concerns at the city-wide scale. Taken together, these dimensions of the London case mean that the capital has been a forcing ground for debate about nature conservation and the development of brownfield sites.

The study: conserving biodiversity that matters

The study we report on here seeks to contribute to the debate about biodiversity and the re-development issues in London in two ways. First, we provide an appraisal of key issues raised in interviews conducted with professional ecologists based in the public, private and voluntary sectors. These issues focus on the methods and processes that practitioners employ, and believe should be employed, to promote or accommodate conservation of nature and biodiversity in the re-development of brownfield sites. Second, we focus on those practices adopted by different ecologists as they begin to negotiate their involvement with developers and site owners who are beginning to take a more pro-active approach to ecologically sensitive development.

Respondents in our study were all familiar with the re-development process in London and the majority were actively involved in re-development projects on wasteland sites. By drawing on their experience of active development proposals, respondents were able to provide detailed insights about their working practices and in particular about what knowledges and co-operation networks they drew on. Structured interviews of an hour and a half were held with fourteen ecologists. Respondents included four private sector consultants, two conservation officers employed in statutory agencies with responsibilities for the London area, three members of voluntary sector trusts based in London and two naturalists who also

work as advisers to these trusts. Three public sector officers with responsibilities for ecology and nature conservation were also interviewed. Two respondents were based in local authority planning departments and one in the environmental strategy team of the Greater London Authority—formerly part of the London Ecology Unit.

The paper is structured in the following way. First we examine the role of science in codifying the biological status of brownfield sites as ‘wasteland habitats’ and in assessing their potential value for nature conservation. Our objective is to explore how the culture of ecological science shapes the form and content of applied ecology ‘in the field’. We move on to examine the rationales employed by ecologists when seeking to promote claims for a more pluralistic approach to nature conservation that positions nature conservation as both a scientific and social project. Here the question of how to legitimate these pluralistic claims is a key issue. Finally, we explore some of the strategies and tactics employed by ecologists as they seek to mobilise a range of knowledges in the re-development process. We conclude by highlighting issues raised by the study for policies and practices designed to conserve biodiversity of brownfield sites.

Brownfield sites as wildlife habitats: the scientific basis of classification and appraisal

All the respondents believed that the framing of brownfield sites in national debates as wasting assets failed to recognise both the existing and potential value of brownfield sites as wildlife habitats. However, there was less agreement about the form this characterisation process should take or, who should be involved in it. Much of the debate concerned the role of science and scientific experts in the codification of these sites as wildlife habitats and in assessing their importance for nature conservation.

Science as a basis of site inventory and appraisal

All respondents accepted that part of the site characterisation process need to be based within a scientific framework whilst rather less attention was given by private sector consultants to the need to identify the social and cultural character of sites.

Acceptance of the importance of a scientific approach to the ecology of urban sites meant that consultants most frequently adopted English Nature’s Phase 1 survey as the main approach to characterising sites. Such surveys are habitat inventories based on the presence and abundance of dominant plant species and associated species. Respondents recognised that in practice some consultants undertake rather cursory one-off site inventories that are neither sensitive to the exigencies of seasonal change, nor to the distinctive attributes of sites that relate to their urban context. The dilemma for ecologists is whether to accept a quick, but standardised inventory as an adequate basis on which to form a judgement about the potential conservation value of the site, or to accept that the ecology of urban areas is different and requires a new approach. For example, the high biodiversity of many wasteland sites in particular suggests that to proceed with a full species inventory of all major plant and animal groups might be desirable. However, given the time constraints under which most ecological consultants operate this is not likely to be possible and the dearth of urban ecologists capable of undertaking accurate inventories, militates against this approach. One consultant explained: ‘There’s a sort of ideal that you have to do everything and if you talk to some people in the Institute for Ecology and Environmental Management, they’ll tell you that on any site you’ve got to do everything from invertebrates to mosses where in reality you don’t. You target particular things related to protected species, the plant habitats and anything else which you come across, and you deal with them.’ Adopting an approach that is informed first by the needs of existing regulations and second by practical possibilities, this consultant argued for a pragmatic approach rather than one guided by high minded theoretical ideals that couldn’t be achieved. In part this response also reflects the failure of the state to provide minimum standards about the quality of information and practices required for nature conservation—unlike other aspects of the environment where minimum standards have been established (Oxford, 2000).

Notwithstanding the fact that only a handful of ‘urban’ ecologists work in the UK, reliance on the adequacy of vegetation inventories to characterise urban wasteland sites is also to ignore where the science of urban ecology ‘is at’. Two aspects of the state of scientific knowledge of urban sites were raised by respondents. The first relates to the need to keep abreast with scientific studies of the ecology of wasteland habitats and the extent to

which this knowledge is used and acted on in the development process. The second, relates to the kind of knowledge which resides with local specialists and enthusiasts and the credence given to this knowledge in the planning process. Both concerns relate to the extent to which ecological knowledge about wasteland sites has stabilised in ways that can be routinely applied in policy formation and the development process.

Keeping up to date with the scientific basis of urban ecology

There was broad agreement amongst respondents that urban sites were ecologically different from rural sites. Urban nature included native and non-native species and these unusual assemblages needed to be recognised and acknowledged in their own right. At the time of the study, the absence of any national inventory of vegetation communities in urban areas such as that provided for other community types by the National Vegetation Classification (NVC) was seen as a disadvantage by several ecologists. Thought to be useful as a means of codifying and communicating to others what vegetation communities are present on a site, the NVC however is not a classification designed to assess the conservation value of a site. It cannot be used to determine the representativeness or rarity of a community nor is it a prescriptive classification capable of determining what range of species a site should be expected to support (Shepherd, 2000). So, while the codification of habitats in a typology of communities assists with the inventory process assessing the conservation value of a site is a separate activity. Even then the task of generating a typology of urban wasteland communities had to confront a number of difficulties. As one consultant remarked, the sheer diversity of native and non-native species and the different social and economic histories of urban sites would seem to suggest that such a classification would prove impossible to achieve: 'Things are so city specific ... I can't conceive how a classification would be done ... I can't conceive how they've managed to give them assemblages, and those assemblages certainly won't carry any cultural overtones, I assume.' However, for another public sector respondent, the absence of such a framework meant that 'the ecology of wasteland sites is like where nature conservation was back in the 1970s—pre NVC; pre Ratcliffe 1977.' In other words, without an agreed typology the legitimacy of conservation claims is severely undermined.

Whilst the absence of a framework for codifying the vegetation characteristics of urban sites seemed to confirm the weak scientific base of urban ecology, respondents were aware that research studies had shown that site characterisations which rely on vegetation, such as NVC, are poor indicators of their associated fauna. One scientific study in particular had made an important contribution to the ecological understanding of urban sites. Gibson's study (1998) entitled *Brownfield: red data: the values artificial habitats have for uncommon invertebrates* was commissioned by English Nature—the public agency with statutory responsibilities for nature conservation. It demonstrated the importance of artificial urban habitats as reservoirs for several nationally scarce invertebrate species that were otherwise understood to be characteristic of rural habitats such as grasslands, heathland and coastal areas. This publication was referred to by several ecologists we interviewed. Whilst the focus of Gibson's study is on rare invertebrates, the burden of his argument is that existing survey methods are wholly inadequate for an assessment of artificial habitats such as wasteland. Pointing to their over dependence on vegetation and oversimplification of structural elements important to invertebrates, he identified several key components of inventory that need attention. These include an estimate of site age and succession rate, substrate material and pH, particle size, aspect and shelter as habitat components as well as evidence of clear limiting toxicity or pollution.

Gibson's study and the suggested additions it makes for improving approaches to the inventory of urban wastelands proved influential among several ecologists we interviewed. Respondents from the statutory agencies believed that this was the kind of routine inventory that should be conducted on all wasteland sites 'rather than meaningless lists of species', and one private sector ecologist talked about the impact this study had had on his own thinking: 'The theory was there were quite a few species that may have always been there (in urban habitats) and how they survived or adapted to these habitats, whereas in the wider countryside the use of chemicals had led to them dying out. So the idea suddenly became, "urban reservoir populations", which put a whole new conservation side on brownfield ecology from my point of view'. In his view scientific evidence provided justification for conserving brownfield habitats in their own right and convinced this consultant to adopt this new approach to site characterisation in his own work. However, as evidenced by other respondents this approach had not become routine practice. In other

words, there is little evidence that the standardisation of ecological knowledge about wastelands has been stabilised as an agreed typology that practitioners can apply 'in the field'. As a result, there is little agreement about what kind of nature urban wasteland actually is, whether it is a distinctive habitat to be codified like any other 'natural habitat' or whether it should be included in biodiversity action plans and nature conservation policies.

Coping with scientific uncertainties and the development process

Sitting uncomfortably with the desire to promote the standardisation of ecological knowledge required by a scientific approach is recognition that few general principles could be made about the likely composition of urban wildlife communities, their relationship with the physical habitat or their likely succession and developmental trends. Under these circumstances several respondents emphasised the importance of an 'experiential and experimental approach' to learning how urban habitats and wildlife communities function. Talking about the Thames and its urban habitats, one respondent said: 'You know a lot of work has been done on salt marsh on the coastline, and the transition of salt-marsh habitats, and nothing in an urban situation where you've got coastal screes, you've got encroachment, you've got high walls. So we literally learnt, myself, the biologists, the fishery officer just spent two or three days out on the river . . . , stopping off at every bit of foreshore and different habitats, and different tides, and looking at the invertebrates, and looking at where the fish fry were lying up, mapping plant species . . . So we did literally back of the beer mat science . . . to give us enough knowledge to sit down with the engineers and say: "OK, this is our best guess, but it's the best experienced scientific guess. We need these terraces at these heights. We want this size gravel—xyz—can you build it?"'

In a similar vein, one naturalist regarded by many to be 'the expert' on a nationally rare species put the tension between science and locally acquired knowledge like this: ' . . . if you're trained as an ecologist, you're trained in this kind of scientific thinking . . . and half the things I'm talking about and everybody accepts, well, I don't know whether it's going to work, I haven't got any idea if it will work, it's only subjective . . . actually a lot of ecology is subjective . . . ' The highly provisional nature of knowledge about urban ecology meant

that characterising urban nature, assessing its conservation status and determining the likely success of mitigation measures is a highly speculative process and not the predictable and deterministic one associated with a scientific approach. Seen from this perspective urban ecology is a 'soft' science rather than a 'hard' science to be applied through the use of concepts and theories. In much the same way Schrader-Frechette and McCoy (1994) emphasise that values rather than concepts and theories appear to determine what is important in ecology. Such views contradict the more widely held view that science brings objectivity to the analysis of environmental issues and their resolution. It also supports Yearley's observation (1991) that in the conservation policy arena, science is a 'double-edged sword' permitting claim and counter claim to be filed by 'experts'.

The poor state of scientific knowledge that resided in the statutory agencies was a concern to their employees and to the ecological consultants who seek their advice and guidance. As one ecological consultant put it 'if you look at an organisation such as English Nature . . . basically there isn't a sort of depth of analysis of nature conservation resources.' As a result, the comments of statutory consultees who were asked regularly to comment on development applications 'were often made in wishy-washy language which tends to sort of walk around the houses'. For two of the private sector consultants this seemed at least to under-utilise the power the state had invested in them as statutory advisers. In turn, this level of ignorance engendered a sense of inadequacy as well as frustration for employees of the statutory agencies. A sense that was heightened by a planning system that positioned statutory consultees as 'experts' and promoted an adversarial process that pitted one set of experts against another. As one public sector respondent put it: 'the planning system did little to promote or secure the conservation of sites of nature conservation importance'. Reflecting perhaps the more assertive stance of individual employees rather than the precise statutory remit of public agencies or their financial resources, respondents believed the Environment Agency to be most effective in providing critical and constructive ecological advice. In practice therefore, although the science base of urban ecology was weak, the culture of public sector science in statutory agencies also seemed to influence the form and content of science done in the field. It also influenced whether developers and planners were encouraged to adopt a proactive approach to the conservation of wasteland habitats.

The lack of authoritative comments from the statutory agencies meant that some private sector ecologists turned to local enthusiasts and natural historians as a source of expertise about urban sites. One private sector ecologist described this relationship in the following way: 'London is a big place, about a fifth of the British population, so there's a lot of interested people there who work on wildlife, and quite frankly one would be extremely arrogant to think that one could contribute to a process without tapping into that resource. Funnily enough though a large number of consultants do exactly that and never tap into expertise, they never really take things to the spirit of where the science is, they don't take it far enough at all, which may facilitate development with very little extra cost to the developer.' This approach however requires private sector consultants to tread a diplomatic line between using local wildlife experts as 'hired hands' to save the developer money, and acknowledging the contribution local enthusiasts make to the scientific base of urban ecology. Trained in a discipline that did not recognise the distinctive ecology of urban areas as worthy of study, some ecological consultants recognise that they were often highly dependent on local naturalists and other local professional ecologists to assist them in their work. In this particular case the consultant is prepared to admit that ecological knowledge residing with local natural historians is the basic knowledge science should build upon. But his view of science conflicts with the normative view of scientist as expert and is not one that is widely shared by other practitioners.

Another private sector consultant for example, was less convinced of the need to work routinely with local experts and wildlife trusts. In part this was because he felt it was up to other professionals to provide a clear framework within which ecological consultants should work. Placing the onus firmly on the local authority, he supported the efforts of one local authority officer to provide ecological guidelines aimed at the planning profession. 'It's like a series of check lists, you know, this is what should be done before your investigation, this should be done when you're considering giving planning permission, this is what should be done afterwards. It's very clear and it brings what is really a very complex discipline together.' The corollary of this approach is that with a clear set of guidelines about what ecological information is required of them by the planning authority, then consultants would be able to provide it without recourse to local wildlife groups or naturalists. From another perspective however, one public sector

ecologist believed that the check-list approach 'gives the impression that it's a case of destroying the enemy by picking off the soldiers one by one: no bats; no badgers; that little patch there is of negligible value etc, and you will find that the whole site has a very low value rating.' In his view, the ability of the check-list approach to offer the integrative and holistic appraisal the scientific discipline of ecology seemed to require, was itself a matter of dispute. One of the naturalists pointed to a related but slightly different problem. Planners often 'compartmentalised' biodiversity and nature conservation so that 'convincing planners and councillors that biodiversity is integral to the urban infra-structure is *the* problem ... they think we all want it to be a National Nature Reserve, but that's not what I'm after!'. A check list approach tended to reinforce this compartmentalised approach with its focus on sites rather than on functional attributes of the urban area as a matrix of habitats and corridors (Barker, 1997).

This check list approach to best practice has been supported by other sectors too, for example, the RSPB in association with WWF-UK and the Wildlife Trusts (Byron, 2000). Aimed primarily at planners and consultants such an approach suggests a confidence in these professions to acquire, interpret and apply ecological knowledge to brownfield sites that other respondents felt misplaced. As one other consultant put it: 'I think among planners there is a great gap, they don't perceive wastelands as having wildlife value'. Notwithstanding the fact that within the planning system there is general acceptance that 'there is nature in urban areas that is of value', acceptance of the proposition that brownfield and wasteland sites have wildlife value still demands a culture shift amongst local authority planners. Other respondents pointed out that, while planners were comfortable with the fact that 'woodlands are valuable wildlife habitats', this same appraisal did not extend to wasteland habitats. Being charitable to planners one environmental consultant suggested 'in fairness to planners, they're blind, they've had no exposure to it. They're not trying to be obstructive, they simply do not know ... There are a number of local authorities which have internal people who are ecologists, and quite a number of them have wildlife trusts attached to them, there's quite a close link, and so long as planners have rubbed up against that, they perceive that there might be an interest, but where they haven't had the opportunity to rub against that, they perceive that there is no interest, so it doesn't even cross their minds that they might need to call someone in.' Adding support to this interpretation,

one local authority ecologist admitted that it was not 'routine practice for planners to inform me when development applications on brownfield sites were being proposed or discussed'. In other words it was up to the ecologist to take the initiative to seek out development proposals and in most cases this meant that advice could only be reactive and not pro-active.

Taken together these responses suggest distinctly divergent voices among professional ecologists about whether a scientific appraisal is the most appropriate one to follow when assessing the conservation significance of wasteland sites. Likewise, practitioners are also not agreed about what kind of knowledge is admissible in this process. In summary, urban ecologists do not form a coherent epistemic or knowledge community with shared beliefs in cause and effect relations, validity tests and underlying principled values for pursuing policy aims. Hence some practitioners look to other professionals in the development process to provide ground rules for engagement with biodiversity in the re-development process. But it is equally clear that planners do not have an effective ecological knowledge network they can routinely mobilise. Hence it is difficult to assess how 'professional' the assumed professionalism of local planners is when it comes to advising developers or councillors about nature conservation concerns (Marshall and Smith, 1999). Likewise, 'Best practice guidelines' however authoritative cannot be acted on if their putative users are not competent to apply them. Under these circumstances local authority policies and practices for nature conservation are likely to be highly variable and expectations among practitioners about whether and how biodiversity issues are to be addressed in the development of wasteland sites are equally varied.

Wasteland habitats: the science of mitigation measures

Scientific studies of wasteland habitats point to their high species diversity but also to their transient properties. Left to themselves, the open and herbaceous communities of recently abandoned wasteland sites will be colonised by shrub and tree species such as buddleia and willow. As one professional ecologist put it 'every ecologist knows it's *that* transition that makes them of value'. Like many other artificial habitats such as heathland and chalk grassland, wasteland habitats require managing if their species complement is to be

maintained. Deciding which 'desired state' is optimal for achieving and maintaining high biodiversity would need to be informed by further detailed studies. For these reasons several professional ecologists recognised the value of wasteland sites as 'ecological laboratories' through which the 'status of wastelands ecologically would be raised.' Studies would contribute new scientific knowledge about how communities are assembled and the role of competition, isolation and urban micro-climates in explaining levels of biodiversity. As potential laboratories wastelands have intrinsic value but understanding and codifying their distinctive ecology is also the basis on which assessments of conservation value and damage associated with development are made. Certainly recommended protocols for assessing conservation status and determining mitigation measures expect comprehensive baseline studies to have been conducted from the outset (Oxford, 2001). However, without the wider ecological framework provided by scientific studies of wasteland, judgements about the conservation significance of particular wasteland sites will always be contested by other experts and knowledgeable local groups.

Concerns about how damage limitation and mitigation measures were to be assessed also focused on the transient nature of wasteland habitats and the need for management. Ecologically-informed advice to the developer would probably include a recommendation to reuse material that comprised the site substrate on site: 'that we scrape the site and make it safe and just leave it ... smash up the concrete—because I can see how a developer wouldn't want chunks of concrete 30 centimetres across—well, 2 centimetres, yes, you can live with that, so that's the kind of recommendation maybe we should be pushing harder for.' Such an approach is contrary to conventional landscaping approaches that often involve scraping the surface of the site, removing this debris and importing new topsoil. Likewise, management practices required to maintain the desired 'ecological state' are likely to involve scarifying the surface every five or six years and some hand pulling of shrubs and cutting back brambles. Our interviews with ecologists suggested that neither planners nor project managers of developments expect wasteland communities to be recreated as part of the development proposal. When such mitigation measures were addressed, as in one of our case study sites, these measures were based on a highly pragmatic and experimental approach. Of perhaps most significance however, was the fact that these measures were proposed for a former industrial wasteland site that had no

formally recognised importance for biodiversity or nature conservation. To all intents and purposes the local authority regarded the site to be a 'wasting asset'. In this particular case, the detailed ecological inventory undertaken by a team of local, urban ecologists who had been assembled by the developer's consultant, revealed the site to have high biodiversity. Several rare and nationally declining invertebrate species were recorded and the site was assessed as being capable of supporting breeding opportunities for a nationally rare bird characteristic of wasteland sites—the black redstart. Through a complex process of networking that involved the consultant in drawing on the experience of ecologists working in the public and voluntary sectors and with local naturalists, a series of mitigation measures were assembled that secured cross-sector support. Among several proposed mitigation measures, the development application included the use of crushed concrete derived from the original site to form re-created wasteland habitats that were to be sown with seed collected from the development site. Other measures included nesting boxes for bats and birds, green roofing material impregnated with *Sedum* species to serve as a roof top habitat for insects and birds, and soft-engineering approaches to the creation of marginal riverside habitats. Highly innovative in design and as the consultant put it 'claiming back space from the architects for ecology', the submitted proposal was one of the first to recognise the importance of urban wasteland as a distinctive habitat and worthy of conservation.

All the professional ecologists involved with this application regarded these measures as highly experimental and without any guarantee of success. In the words of the developer's consultant: 'habitat creation in urban areas can only be experimental—we don't have a Vymura book of options to offer the client or the public'. Furthermore as the borough's ecologist noted, without securing a commitment to managing the proposed re-created habitats in an ecologically informed way, many of the proposed benefits would be transient. Given these uncertainties it is pertinent to question whether mitigation measures can ever be the scientific project legislation and best practice guidelines require. As revealed through the work of practising 'field' ecologists involved in the re-development process, assessing damage and mitigation measures, like the process of codifying urban nature, is a craft to be learned not a science to be applied. So, while governments and environmental policy makers expect science to form the foundation of advice, the practices of professional ecologists

involved in the appliance of ecological science in the re-development process, reveal these foundations to be highly provisional. Such mitigation measures are 'propositions' that would not survive the close questioning of other experts in the quasi-legal forums of public enquiries where the authority of science dominates and where one expert is arrayed against another. Much better therefore to work pro-actively with developers so that desirable mitigation measures can be secured from the outset and without needing to seek the licence of science to certify them.

Social and cultural rationales for promoting nature conservation

One of the characteristics of the urban wildlife movement has been its engagement with social as well as scientific concerns (Cole, 1983). In London the spatial hierarchy of sites of importance for nature conservation developed and applied by the London Ecology Unit (LEU) is a deliberate attempt to ensure that residents have access to high quality natural environments. Their approach recognises 'areas deficient in access to wildlife sites' when a SINC cannot be reached within reasonable walking distance of the home. English Nature as a statutory agency with responsibility for nature conservation has adopted similar guidance in its own policies for urban areas (Barker and Box, 1998). Most private sector ecologists did not mention these aspects of assessing the nature conservation value of a development site preferring instead to be guided by national criteria that rely heavily on a scientific base (Ratcliffe, 1977). For members of the voluntary sector however, these social and cultural concerns were fundamental to what urban nature conservation was about, even though this emphasis often led to tensions with both their members, other naturalists and professionals. In particular, the question of how the legitimacy of these social and cultural goals of conservation were to be determined was a key concern.

In many respects local enthusiasts and volunteers provide legitimacy to the Trusts in their capacity of 'speaking on behalf of the community' in the planning process. Members of the voluntary sector argued strongly that this is a role that none of the statutory agencies or the LEU could legitimately play because 'they have little direct contact with local communities—staff in these organisations

seldom work at weekends or in the evenings'. So whilst statutory agencies and local authority advisers such as LEU are keen to advance policies of 'local sites for local people', voluntary sector groups see themselves as the only ones with a legitimate community base on which to build these claims. Acquiring this legitimacy brought frustrations too. For example, investment in community outreach work had declined during the economic depression of the 1990s as Trusts sought to improve their financial footing. Without the professional expertise offered by these outreach workers, professional ecologists who are employed by Trusts first and foremost because they are knowledgeable about the ecology of urban sites, are often ill-equipped to play a wider capacity-building role in the local community. This was especially true in the ethnically diverse communities of east London. As one voluntary sector employee put it: 'It's just hard, but even with us trying to get more volunteers involved—it's picking up, but it's a hard job, and we're not getting enough people from—I was going to say the ethnic minority—but it's like the ethnic majority in the area, they're not involved in doing the work.' Moreover, while the professed goal of urban nature conservation was to improve people's quality of life through improving accessibility to wildlife sites, this socially inspired goal does not always find support with some 'dyed in the wool and often long serving volunteers' who regard conservation as a single purpose activity.

The proposition that single interest groups like wildlife trusts should adopt a more active role in urban regeneration has been an ever-present one. In London it was one of the primary motivating goals of 'the young turks' (Smyth, 1987) who founded the London Wildlife Trust in the 1970s. But implementing this vision often proves to be one step too far for several conservative volunteers and some influential members of the wildlife trusts who believe that to seek wider social goals is 'too political'. This despite that fact that national funds are available to achieve this goal. The establishment of environmental regeneration trusts such as Groundwork Trusts and the changing role of other voluntary sector groups such as the British Trust for Conservation Volunteers, were cited by voluntary sector respondents as evidence of the opportunities such an approach offers. From this perspective, externally driven change and the reluctance of influential members of the voluntary sector to take advantage of these new funding opportunities had consequences for the role wildlife trusts could play in the planning process. As a result it seemed that the legitimate claims of the

voluntary wildlife groups to represent local people and to contribute considerable local knowledge about the ecology of sites would be marginalised and discounted (Murdoch and Clark, 1994). In this way, the authority of scientific expertise is re-asserted and the social goals of conservation undermined.

Our interviews suggest that several respondents believed urban nature conservation to be as much about social goals as about improving the future of wildlife, but the emphasis given to 'people' was often difficult to promote in practice. That having been said some respondents defined urban ecologists in terms of their ability to work across the natural and social sciences. For example, one public sector respondent explained what it meant to be an urban ecologist involved with wastelands: 'I like urban nature, I like to see how much nature has adapted to urban situations, but also how much diversity there is on these sites. That you can actually bring people into these sites who are living in the city, how people's life experiences are changed.' For this respondent, the scientific, social and cultural goals of urban nature conservation expressed through working with education projects concerned with wasteland sites seems to capture the essence of what being an urban ecologist and urban nature conservation means.

Other respondents whilst prepared to promote the conservation of wasteland sites and access to them for education and enjoyment also recognise the ambivalent attitudes such wastelands provoke. Aesthetically unattractive during the winter and giving the appearance of being uncared for at all times of the year means that it is difficult to displace the dominant cultural aesthetic which has traditionally placed high value on manicured and orderly landscapes in urban areas (Gilbert, 1991; Gobster and Barro, 2000). One consultant ecologist commented that while in the countryside 'people are more prepared to accept areas of rough grass in order to benefit wildlife and that this is perhaps one indication that these cultural tastes are changing. The same is not quite so true in urban areas.' Letting the wild into urban areas is always likely to be an assault on the gardenesque aesthetic that prevails. Countering this opposition would need thought and diplomacy especially as one public sector ecologist put it: '... now wastelands are seen as places for joy riders, drug takers, various other anti-social activities, certain dangerous places they go to, ... it's the last place that anyone would allow their kids to go, and it's totally understandable.' Raising the social profile

of wasteland sites meant emphasising their positive values: 'they are really colourful, they change through the seasons, the insect life is much more ... well things *happen* in comparison with a green desert.'

In this way several respondents favoured an approach to site appraisal that not only recognised the intrinsic value of wild organisms—the scientific approach—but also one that recognised the many different 'services' that were associated with these natural features. The task of capturing the multiple social and cultural values wastelands are invested with is problematic for most urban ecologists—including those with a social science background (Rodhe and Kendle, 1994). For the greater part this is because there is no agreed methodology for revealing or evaluating the multiple values natural areas are associated with. However, in London the experience of the LEU is a material consideration. The criteria used by the LEU to compare different sites include sixteen criteria, several of which give expression to social and cultural reasons for assigning importance to a site. Criteria include for example, use for education, research and quiet enjoyment of nature, aesthetic appeal, and cultural and historic character. These criteria have been developed and applied in a variety of urban contexts throughout London and have proved sufficiently robust in formal planning enquiries to prevent development on a number of SINC's (Goode, 1993; GLA, 2001). However, any system of evaluation that is expert driven will be contested by other experts, particularly in situations where the scientific basis of site evaluation is highly provisional and where a full range of stakeholders have not been included in the evaluation process. The expert approach also discounts consideration of common and familiar plants and animals and for many people it is this everyday nature that is enjoyed most (Harrison *et al.*, 1995). For these reasons members of the voluntary sector believe that, without a base in the community or an effective means of involving local people in conservation work, statutory and other public sector groups cannot legitimately claim to know what nature is valued by local communities or why it is valued. These concerns suggest that if urban nature conservation is to be seen as a quality of life issue—much as national, regional and local governments assert, then a scientific, expert led approach to environmental policy making on its own is insufficient to guarantee the legitimacy of these policies. Other more inclusive and community-led approaches to policy formation and delivery are required.

Partnerships, expertise and the re-development process

Given that the goals of nature conservation are many and the values underpinning them equally varied, it is easy to see why, when confronted by this multiplicity of arguments, even those local authorities most committed to nature conservation will be persuaded by the 'development imperative'. Coupled with the adversarial nature of the development planning process, several respondents felt that if nature conservation policies for wasteland habitats are to gain political clout then advocates need to share their knowledge and understanding in ways that transcend traditional allegiances. Either that, or members of these communities needed to work with developers from the outset—an action that runs the risk of 'capture by association' and alienation by their peers. One of the naturalists who had worked as a consultant with the voluntary sector and who had been approached by an ecologist working for a developer explained what these tensions involved. 'I talked with him and to be honest I said to him: "What you're coming up with struck me would be fine". *His* problems were with the developer ... So there's a case in point, of like, where you know, when somebody is genuinely pushing an argument and actually may be pushing to the point where it's actually getting near breaking point. And because of my role as a non-government officer, I tried to make it very clear that it could have been much better, but this was actually the second most positive scheme we had come across.' Finding himself in the role of 'salesman' [sic] this respondent was conscious of his role as a knowledge broker. His own 'expertise' had not been acquired through formal scientific training but on this occasion it could give authority to the proposals offered by a 'scientifically-trained consultant'. Such 'role reversal' is seldom given credence in the public arena of formal planning inquiries for example, where science and scientific experts are usually pitted against each other and the knowledge of local naturalists is discounted or admitted as just one of many local views.

Viewed from the public sector there is also support for a more collaborative way of working through which developers and land owners seek guidance from professional ecologists. 'Most recently, in fact it was the initiative of the site developers, not the house builders, they had discussions with the Environment Agency as well ... they are now sort of in a process of encouraging others

to come on board including the GLA to sort of work together for the best ecological possible plans about development. ... They're quite keen to sort of get things as good as they can for nature conservation.' The question of whether or not developers will take their own environmental responsibilities seriously remains to be seen. There is evidence that some developers are prepared to commission more ecologically sensitive development proposals both because they learn from the 'successes' of their competitors, and are reminded of the costly delays posed by direct action that has prevented some brownfield sites in London from being developed. Gargoyle Wharf for example, in the London borough of Wandsworth has remained 'un-developed' for several years through a combination of direct action taken by ideologically 'radical' groups and sustained opposition by local residents' groups. So, while working with developers early on in the development process is seen by many professional ecologists as a means of ensuring that biodiversity considerations are taken into account more effectively than is current practice, this approach may also be contested by other groups who seek radical and more locally-based solutions.

Conclusions

This analysis of the tensions experienced by ecologists and conservation professionals engaged in the re-development process of brownfield sites raises several unresolved issues. First, although the immense public appeal of nature conservation stems from cultural associations of nature, the practice of nature conservation has been dominated by the rationality of science (Adams, 1997; Gobster and Hull, 2000). As a result rationales used at a national scale prioritise scientific criteria for determining what nature should be protected. Consistent with this approach, scientific claims that wasteland habitats associated with urban brownfield sites are of intrinsic importance rest on the codification of these habitats as distinctive habitats characterised by suites of species and abiotic conditions that fulfill a range of scientific criteria. Conventionally such criteria relate to habitat and species diversity and to the geographical and biological status of species as 'rare' or 'declining'. In urban areas however, the poor scientific knowledge of wasteland sites, and in particular the absence of any systematic survey and evaluation of such habitats, means that these claims are difficult to substantiate. The standardisation of ecological

knowledge and its stabilisation through a typology of wildlife communities has not been achieved for urban wastelands. As a result, urban wasteland is not recognised as a distinctive habitat in national biodiversity action plans or in best practice manuals seeking to promote more environmentally sensitive approaches to development. Moreover, practitioners seeking to protect and enhance the biodiversity of urban wasteland sites find their activities frustrated and often contested by members of their own profession.

Second, much ecological knowledge about wasteland sites resides with amateur naturalists and enthusiasts whose working practices often fail to conform to scientific methods of recording and evaluation. The question then arises about what credence can, or should be given to other kinds of knowledge in determining the conservation status of brownfield sites—notably the value of wasteland habitats. As shown by this study most ecological scientists are not prepared to build on the knowledge generated by local naturalists but look instead to other professionals to support conservation claims. The reluctance of national conservation agencies to promote urban ecology and conservation exacerbates this position and means that some practitioners look to other professionals in planning departments to set the ground rules for assessing the conservation value of wastelands. This study suggests that many public sector professionals are not competent to provide or implement these 'rules' and as a result biodiversity concerns are discounted in the development process. Unless national agencies take the lead on urban conservation and undertake the basic research required to support it, biodiversity issues will be marginalised in the re-development process. Without a shared knowledge base, agreed values and policy goals on which to press their claims that wasteland biodiversity matters, urban ecologists speak with disparate voices and are unlikely to gain purchase on the policy process.

Third in the London case, the approach to nature conservation developed in the public sector by the London Ecology Unit seeks to ensure that the practice of nature conservation is both a scientific project and a social one. The Mayor's biodiversity strategy for example, seeks to ensure that all residents have easy access to high quality natural environments. Such an approach accurately reflects government advice, for example, PPG 9 Nature Conservation (DETR, 1994). However, many professional ecologists regard nature conservation as a scientific activity and not one that seeks to achieve social goals. Their practices are hence informed

first and foremost by national approaches which privilege a scientific approach. For ecologists who support the social goals of conservation, taking forward these goals into policy guidance also requires that the legitimacy of the criteria used to implement them, is addressed. In part this is because a criterion based approach to policy seeks to formalise and universalise reasons the public and not just experts give for valuing the kind of nature to be conserved. Without a process in place for seeking and determining what kind of nature the public value and for agreeing criteria that reflect their reasons for valuing nature, the legitimacy of expert claims cannot be assured. A more deliberative and inclusionary process for determining criteria generated and accepted by the public such as that provided by *Environmental Capital* (CAG/LUC, 1998), is one means of achieving greater legitimacy for these social policies.

Lastly, the requirement to mobilise diverse knowledges and collaborative networks during the planning process is an important one not least because some developers are adopting 'green credentials'. Regarded with suspicion by some conservationists as a means of pursuing a quick and least costly route to gaining planning permission, 'greening' often amounts to little more than 'cosmetic landscaping'. However, a few developers are seeking to address these concerns at the outset of the development process rather than as an outcome of it, and this pro-active approach poses new challenges. For the developer, accessing and mobilising local knowledge and not just expert knowledge is likely to be a requirement. Hence, naturalists and professional ecologists familiar with local conditions will find themselves being enlisted into this process. On the evidence of our study, ecologists negotiate their roles in this process of enlistment in different ways. In some cases where the development threat to valued local brownfield sites is regarded as being so potent and powerful, direct action such as site occupation by local groups seems one justifiable response. Other responses amongst professional ecologists include reliance on 'good practice guidelines' to inform the planning process that works in the 'public interest'. Yet other actors adopt a more flexible and pragmatic approach that eschews 'best-practice guidelines' in favour of more loosely formed 'alliances'. In all cases the mobilisation of networks of knowledge and practice plays an important part in how the re-development process unfolds. At present these networks are fluid, unpredictable and unstable and desirable outcomes of the development process are equally unpredictable. In many respects the activities of

the cross-sector London Biodiversity Partnership are an attempt to formalise these networks. The Partnership may well provide a congenial atmosphere in which to exchange knowledge about conserving biodiversity but unless the private sector takes its responsibilities towards conservation seriously, the Partnership will always be prey to the whims of developers. Unlike landscape architects, ecologists are not regarded an integral part of a developers' team and the ecological dimensions of site design and construction are often poor or missing. As a result, ecologists in the public and voluntary sectors often have to advise and scrutinize development proposals—something they are hard pressed to achieve without compromising their own independent position. If the conservation and re-creation of wasteland habitats is to be given due consideration in the development process then developers and the construction industry as a whole need to change their practices as well as their attitudes to biodiversity conservation. Formalising knowledge and collaboration networks will help in this process but so too would a more interventionist approach that inserted an ecological approach into building and design regulations.

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