

OBSTACLES AND SOLUTIONS TO MAXIMISING BIODIVERSITY IN MAJOR URBAN DEVELOPMENT SCHEMES

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ABSTRACT

The current rate of global biodiversity loss led many governments to sign the international agreement 'Halting Biodiversity Loss by 2010 and beyond' in 2001. The UK government was one of these and has a number of methods to tackle this, such as: commissioning specific technical guidance and supporting the UK Biodiversity Action Plan (BAP) targets. However, by far the most effective influence the government has upon current biodiversity levels is through the town planning system. This is due to the control it has over all phases of a new development scheme's lifecycle.

There is an increasing myriad of regulations, policies and legislation, which deal with biodiversity protection and enhancement across the hierarchical spectrum: from the global and European level, down to regional and local levels. With these drivers in place, coupled with the promotion of benefits and incentives, increasing biodiversity value ought to be an achievable goal on most, if not all development sites.

However, in the professional world, this is not the case due to a number of obstructions. Many of these tend to be 'process' barriers, which are particularly prevalent with 'urban' and 'major' development schemes, and is where the focus of this research paper lies.

The paper summarises and discusses the results of a questionnaire survey, regarding obstacles to maximising biodiversity enhancements on major urban development schemes. The questionnaire was completed by Local Government Ecologists in England. The paper additionally refers to insights from previous action research, specialist interviews, and case studies, to reveal the key process obstacles.

Solutions to these obstacles are then alluded to and recommendations are made within the discussion.

STRUCTURE

This paper focuses on UK (and particularly English) regulations and practices. However, obstacles and potential solutions to integrating biodiversity, which are discussed herewith, are generally transferable to different national scenarios.

The paper comprises five sections: The Introduction; The Wider Research Project; The Questionnaire; Discussion and Recommendations and The Conclusion.

As part of ongoing doctoral research, this paper summarises a key milestone based on a preliminary questionnaire survey.

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INTRODUCTION: The Current Situation

Global biodiversity loss and human density

We are currently living within the Holocene extinction phase, which most scientists list as the Holocene extinction as the 6th biggest extinction phase known to the globe (Eldridge, 2001; Wilson, 1992). This extinction phase is due mainly to anthropogenic activity which has been occurring for several thousand years, since the start of agricultural practices. However, extinctions and biodiversity loss has dramatically accelerated over the last 300 years during industrialisation and the situation has now become known as the 'biodiversity crisis' (Kirch, 2005).

The crux of the biodiversity crisis is the accelerating human population density. This is due to global exponential population growth, which leads to greater pressure on land for development activity coupled with other detrimental effects to biodiversity through development activities resulting in climate change, pollution, depleted resources, disturbance, fragmented habitats, etc.

Indeed, England already has the third highest density in Europe (390 people per km² (ONS, 2007), and this has been predicted to expand to a total population of 55 million by 2026 (Barker, 2006). Furthermore, the Office of National Statistics' (ONS) latest long-term forecasts envisage a total UK population of up to 85 million by 2081 (Gillman, 2007). These population forecasts illustrate the long-term, ongoing need for development (whether residential, services, infrastructure, or other) and the consequent impacts upon biodiversity, unless political measures are taken to address global population growth, which is unlikely, at least in the short term.

These cumulative impact of these developments will affect global biodiversity levels, and we therefore need to provide for biodiversity in all new development schemes.

Paradigm Shift: from 'protection and conservation' to 'increase, enhance and repair'

The paradigm shift in our understanding of how to tackle the biodiversity crisis, is reflected in the UK today, with a clear overlap within new national policies and legislation. Some still reflect the old paradigm of mere 'protect and conserve' e.g. the new Biodiversity Duty on Public Bodies (NERC, 2006), whilst others reflect the new paradigm of 'enhance, increase and repair' e.g. Paragraph 14 of PPS 9 – Planning Policy Statement 9 (ODPM/ DCLG, 2005).

Urbanism

The theoretical day, where global population became more urban than rural, was predicted as May 23rd, 2007 (Wimberley, 2007). See 'Rural and Urban Area Classification: An Introductory Guide', (DEFRA, 2004) for current UK definitions.

As urban areas grow, or new ones are created, it is critical to the health of the urban area and the communities of people who live within them, to allow for, and provide survival opportunities for biodiversity. Urban developments generally have much greater complexities, due to land pressure and more competing socio-economic issues, politics and policies, than their rural counterparts, which is why this paper and the wider research project is focussing on urban developments.

"Within cities worldwide, most residents are concentrated in neighborhoods of impoverished biodiversity. This pattern exists despite substantial biodiversity present in cities overall, and becomes more severe when only native species are considered. As humanity becomes increasingly urban, these findings have a tragic and seldom-considered consequence: Billions of people may lose the opportunity to benefit from or develop an appreciation of nature." (Turner et al, 2004)

It is therefore imperative that new developments incorporate biodiversity features and habitat opportunities to maintain and re-establish human connection of citizens to wildlife in cities.

The new paradigm of 'increase, enhance and repair' can be facilitated through urban development schemes - even where biodiversity baselines are zero (Barber, 2006; Barber et al, 2008). This can be achieved through, for example: actively encouraging species to re-colonise by providing habitat features; habitat creation; repair of fragmented links in green networks, and ecologically sensitive management. Cumulatively, these enhancements can help to slow and potentially halt global extinction rates. Thereby, assisting signatories to the international agreement to: 'halt biodiversity loss by 2010 and beyond' (CBD, 2002).

Biodiversity and the Development Process

New developments could become the biggest contributor to biodiversity improvements due to: supporting policies; the volume of developments (occurring and predicted); and the potential impact on a range of spatial scales.

The 'Barker Review of Land Use Planning', 2006, listed the development of biodiversity policy as one of the major challenges for planning policy and processes in England. It also stated that it was critical to the success and credibility of the system, that policies and processes deliver the right level of protection and enhancement to the natural environment (Barker, 2006).

The regulatory system is improving to support enhancement of biodiversity. This, coupled with the potential incentives and benefits available to developers for providing enhancements (e.g. reduced whole life costs of buildings with green/ vegetated roofs; reduced voids where buildings are not let/ sold; added value/ value added; marketing benefits; gaining planning consent and fulfilling other requirements), ought to equate to a relatively straightforward process of agreeing proposals for maximising biodiversity in developments. However, the protection and enhancement of biodiversity can be complex due to seasonal constraints, changing construction programmes and potentially intricate connections to other biota.

At present, most local policies do not adequately reflect national policies at a level of detail appropriate to the local scale. This is also being witnessed in Sweden, where researchers identified a lack of flow between national to local biodiversity policies. Repetitive and vague local policies, failed to add detail, rendering them relatively ineffective (Elander et al, 2005). Consequently, where proposals are initially agreed, they do not come to fruition due to various process obstacles (e.g. skills, knowledge transfer, communication, timing, project management, specification, organisational processes).

THE WIDER RESEARCH PROJECT

The wider research project focuses on maximising biodiversity within 'Major' and urban development projects in England. Key obstacles at key phases within a developments lifecycle are being researched and potential solutions are to be identified.

There are different definitions for 'major' development schemes. However, for the purposes of this research 'major' includes 'major' and 'large-scale major' developments which are defined by two government departments as: proposed building/s with a floor-space of 1,000 sq metres or more; residential uses of over 10 units, or; development footprints of 1 hectare or more (OPSI, 2006; DCLG, 2007).

The doctoral research method draws upon four different types of research:

- Questionnaire;
- Case studies - Site-based, and process-based cases have been studied, to identify different process obstacles and solutions at different phases in a development's lifecycle. A previous paper elaborates on these: 'Maximising Biodiversity in Development Projects: Competition and Partnership' (Barber et al, 2008);
- Specialist academic and professionals interviewed.

- The authors professional insights from over a decade of experience within the field of ‘biodiversity planning’ will be classified as ‘action research’. (Bazeley, 2007; Strauss and Corbin 1998);

This paper concentrates upon the results of the questionnaire.

QUESTIONNAIRE

The web based questionnaire was emailed to all members of ALGE (The Association of Local Government Ecologists) from a list of contact emails provided by the ALGE secretary. The questionnaire was sent out in February, 2009 and was closed at the end of March, 2009. In total there were 81 respondents, which represent approximately half of the contact emails, which did not ‘bounce back’ due to personnel changes. Each multiple choice and matrix question also had an ‘additional comments’ field, to capture additional insights.

The main objectives were to seek respondent’s views of development, in relation to:

- The key obstacles to maximising biodiversity, and at which stages they occurred;
- How ‘urban’ biodiversity was being tackled;
- Testing insights and theories generated from action research and research interviews. With regards to: recording, enforcement and common obstacles.
- Previously unidentified issues.

Below, is a summary of the findings of each of the 9 questions (percentages are rounded to the nearest whole percent).

1) **Professional Role** (81 respondents)

The distribution of the professional roles of the respondents is shown in Figure 1. No attempt has been made to explore whether or not the professional role influenced the response to any of the subsequent questions.

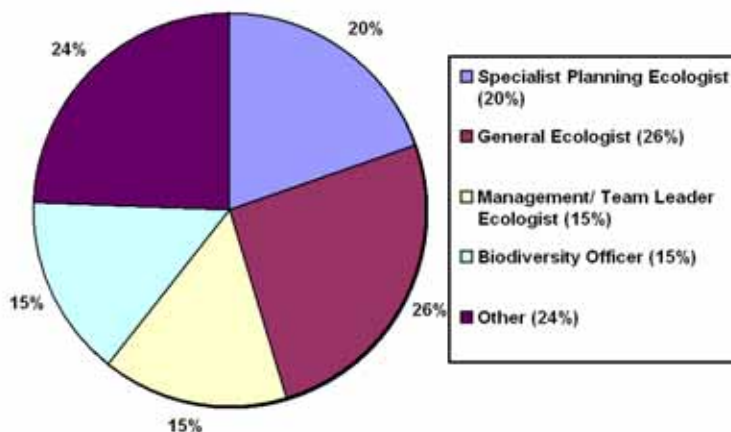


Figure 1: Professional role pie chart

‘Other’ related professions included: countryside officers; parks managers; a combination of ecologist with policy or similar; a countryside ranger; and a renewable energy project manager.

2) **Experience** (81 respondents)

93% of respondents had over 2 year’s professional experience; 91% have a degree/ higher degree and half are members of Professional Institutions. The majority of the respondent’s, who were members of professional institutions, were members of the Institute of Ecology and Environmental Management (IEEM), or the Institute of Biology. Out of the non ecology / biology memberships, the most common, with 7 respondents, were: chartered or associate members of the Landscape

Institute. These credentials give confidence in the knowledge and experience, upon which the respondents have based their answers to the questionnaire.

51% of respondents had professional experience in 'URBAN' ecology. This was an unexpectedly low result, as the vast majority of local authorities will have urban areas within their boundaries. The majority of developments occur within urban areas and advice relating to maximising biodiversity opportunities in and around developments, in paragraph 14 of Planning Policy Statement 9 (PPS 9) applies itself to urban, or rural situations (ODPM, 2005).

Two comments made in answer to question 9 (related to 'urban' biodiversity), admitted that DC (Development Control) officers were requesting urban biodiversity advice, but there was a lack of knowledge amongst ecology specialists on the subject.

3) **Planning Application Forms** (81 respondents)

"The Standard Planning Application Form (1APP) was introduced by Communities and Local Government and the Welsh Assembly Government to replace all existing types of planning application forms (except minerals) within England and Wales. (Planning-portal, 2008).

1APP was introduced in England in April, 2008 and has helped to streamline the planning system by giving planning applicants greater certainty of expectations. The new standardised '1APP' now contains questions on biodiversity in paragraph 14: Biodiversity and Geological Conservation, in the following format:

"Is there a reasonable likelihood of the following being affected adversely or conserved and enhanced within the application site, or on land adjacent to or near the application site?

a) Protected and priority species:

b) Designated sites, important habitats or other biodiversity features:" (Planning-portal, 2008)

The applicants are required to tick either: Yes or No, to whether there is interest 'on' or 'off' site. This then triggers whether ecological consultation or site surveys are required.

Respondents were asked how effective they thought the change to include biodiversity questions had been. Figure 2 summarises the response pattern.

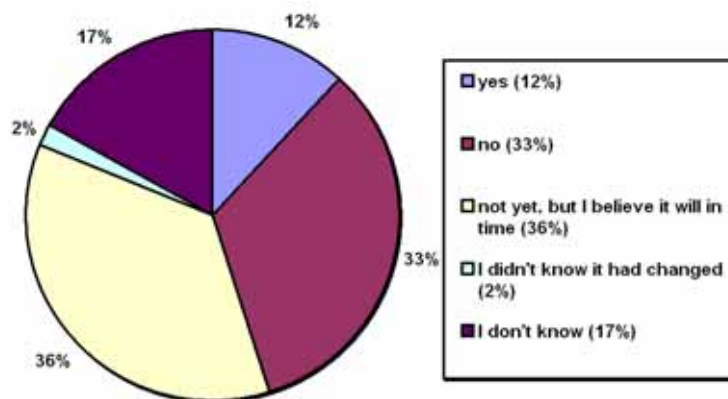


Figure 2: Pie Chart Illustrating Effectiveness of Standardised Planning Application Form

Further Comments (41 respondents):

16 comments related to planning applicants inaccurately ticking 'no', when there 'were' features on site, which could lead to inaccurate validation of applications. However, it appears that several local authorities are aware of this and are attempting to tackle the issue by producing guidance sheets. Additionally, ALGE has produced draft pilot guidance on validation, which is downloadable from their website (ALGE, June 2007).

Several comments related to: seeing some improvements in survey requests “*but these are still being done at inappropriate times of year etc.*”; the need for stronger enforcement and strategic awareness; or raised issues regarding those local authorities who had no in-house ecologist, “*...or at least a call-off contract with an ecological consultancy, have very little chance of preventing or even minimising negative impacts on biodiversity...*”.

4) Recording biodiversity agreements and proposals (64 respondents)

Respondents were asked to tick all possible answers (see key) with regards to ‘recording’ biodiversity agreements on individual development sites. Hence, giving the response pattern illustrated in Figure 3.

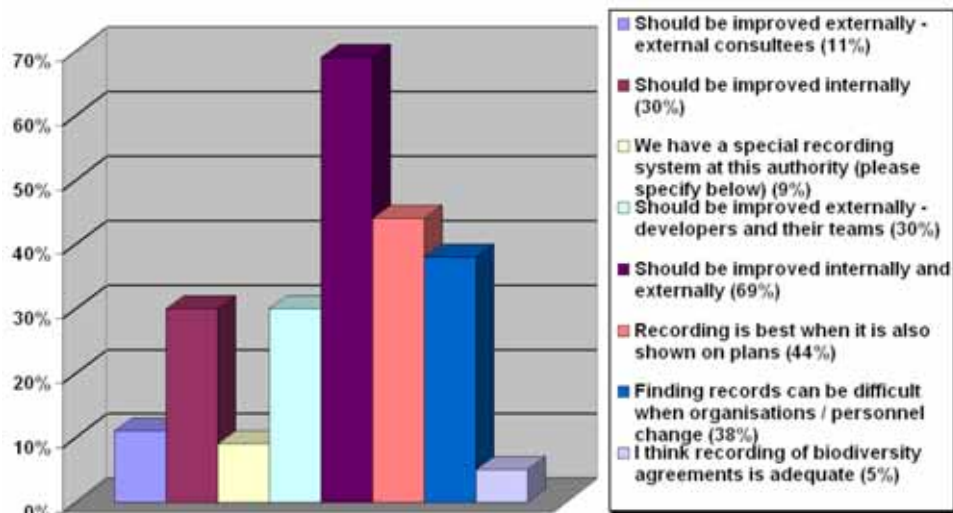


Figure 3: Bar Chart - ‘Recording of biodiversity agreements and proposals’

The results confirm that there is a significant issue in the way biodiversity proposals are recorded both externally and internally to the LAs.

Previous ‘action research’ particularly found issues during construction and management phases, where biodiversity features had not been implemented correctly, or at all, due to not being shown on site masterplans (as site staff did not possess, or had not read the ecological reports). It was therefore an unexpected result that only **44%** of respondents believed records of proposals were best when also shown on plans. However, the ecological profession does not have a culture of documenting or describing information through spatial or visual means on individual sites, as landscape architecture or architecture does, (although conversant with larger scale mapping e.g. GIS). In contrast, 6 of the 7 respondents who were members of the LI, agreed that also recording on plans would be better (**86%**).

Further Comments (19 respondents):

The majority of comments related to respondents declaring they knew that recording biodiversity agreements on development sites was failing in some way, but despite identifying some of the areas where the system was failing, it seemed too complex, or large a task to untangle with their resources.

Several respondents listed: the section 106 process; planning conditions; and the Development Control (DC) case file, as effective tools to record biodiversity agreements. Although others highlighted problems with not recording email agreements through these media, or information not being passed on to, or from: developers; their agents and occupiers.

Several further respondents were cynical regarding the follow up / monitoring and enforcement of agreements, which 2 respondents felt to be more critical issues than the recording itself.

Other insights included: the fact that long time intervals between approval and delivery makes recording difficult; That it is harder for any agreed mitigation to be ‘lost’ e.g. replacement bat roosts, if they are shown on the approved plans; That agreements can be well recorded internally, but once permission is granted they are not necessarily checked or followed up and externally the project may pass to people who are unaware of the planning conditions.

5) Three key obstacles to maximising biodiversity (64 respondents)

Respondents were asked ‘*If you had to choose, what would you rank as the top 3 obstacles to gaining biodiversity enhancements, which need to be solved?*’. They were given comments boxes, where they could write their: first (64 respondents); second (61 respondents); and third choices (57 respondents).

RESPONSES	ISSUE	RANKING	WEIGHTING
24	Reluctant developers: lack of incentives/ pressure	1st, 2nd & 3rd	to 1st choice (13)
22	Knowledge, commitment, attitude and priorities of planners	1st, 2nd & 3rd	to 2nd choice (12)
16	Cost/ finance/ perceived cost by developer	1st, 2nd & 3rd	to 3rd choice (9)
14	Lack of monitoring and enforcement issues	2nd & 3rd	to 3rd choice (9)
10	Stronger, more robust legislation and policy needed (or more definite wording of planning statements, or policies to determine level of enhancements)	1st, 2nd & 3rd	to 2nd choice (5)
10	Lack of understanding of biodiversity enhancements	1st, 2nd & 3rd	to 3rd choice (5)
9	Lack of in house planning ecologists, or specialist knowledge	1st & 2nd	even
9	Consideration not early enough / lack of design input	1st & 2nd	to 2nd choice (6)
9	Long term management issues (often difficult to establish/ agree / enforce/ fears of)	2nd & 3rd	even
7	Politics (conflicting policies / lack of will)	2nd	
7	Competing issues / biodiversity less of a priority in comparison to social enhancements	2nd & 3rd	even
5	Lack of time to initiate and implement	2nd & 3rd	even
5	Poor communication between parties (and lack of consistency)	1st, 2nd & 3rd	even
5	Need for some kind of standardisation / method of quantifying upfront what enhancements should be - what is reasonable to ask for	1st, 2nd & 3rd	even
4	Ineffective use of money for biodiversity enhancements / resource allocation. This related to too much money being spent on surveys at the sake of actual enhancements.	3rd	
2	No consideration unless already designated sites, protected species, or existing interest present.	1st	
2	Lack of options due to site restrictions	1st	

Figure 4: Table illustrating patterns in key obstacles to gaining biodiversity enhancement

This question revealed the complexity of the issue, as there were many far ranging reasons, which were related to different phases and different actors involved in developments. However, common obstacles did emerge (see Figure 4 above), as did some previously unconsidered points.

Other specific comments and insights related to:

Available information not filtering through, such as:

A general lack of awareness in the planning community regarding PPS 9 requesting biodiversity enhancements; Missing communication links between ecologists and builders; Inconsistent advice to planners / developers from LA and consultant ecologists, regarding enhancement requirements and priorities; and ecological recommendations not being incorporated within landscape schemes.

Strategic and procedural issues, such as:

The need for a strategic approach to secure improvements that deliver viable populations, or larger networks of habitat, across several developments; A “*Lack of model planning conditions to impose and implied lack of support from PINS [Planning Inspectorate] for specially worded conditions regarding biodiversity*” (name supplied, not to quote); and a lack of clarity regarding the extent that Circular 11/95 overrides PPS 9 guidance, regarding biodiversity enhancements being secured by conditions;

6. 'Which of the following, do you believe act as 'obstructions', to achieving biodiversity at different stages of development?' (64 respondents)

Respondents answered a matrix style multiple choice question, selecting as many boxes as relevant.

6. Which of the following, do you believe act as 'OBSTRUCTIONS', to achieving biodiversity at different stages of development? (tick all those which apply)										
	Lack of/ Late Ecological Consultation	Communication Issues Internally	Communication Issues Externally	Poor Records of Biodiversity Agreements	Competing Issues /Prioritisation of Biodiversity	Ineffective Reg's / Policies	Lack of Incentives to off set delays/costs	Lack of knowledge/guidance	Response Count	
Pre Application	86.7% (52)	46.7% (28)	36.7% (22)	10.0% (6)	65.0% (39)	28.3% (17)	33.3% (20)	66.7% (40)	60	
Planning Application	76.7% (46)	40.0% (24)	41.7% (25)	13.3% (8)	70.0% (42)	33.3% (20)	38.3% (23)	63.3% (38)	60	
Detailed Design	51.7% (30)	25.9% (15)	37.9% (22)	17.2% (10)	75.9% (44)	27.6% (16)	29.3% (17)	60.3% (35)	58	
Construction	27.6% (16)	20.7% (12)	43.1% (25)	36.2% (21)	46.6% (27)	32.8% (19)	44.8% (26)	63.8% (37)	58	
Completion/ Hand over/ Occupation	22.6% (12)	28.3% (15)	37.7% (20)	49.1% (26)	39.6% (21)	28.3% (15)	26.4% (14)	50.9% (27)	53	
Aftercare /Management	31.7% (19)	21.7% (13)	36.3% (23)	56.3% (35)	56.7% (34)	46.7% (26)	26.3% (17)	65.0% (39)	60	
Other (please specify), or elaborate answers view									16	
									answered question	64
									skipped question	17

Figure 5: Extract from 'survey results summary' for question 6

Figure 5 lists development phases and possible obstructions, which respondents had to choose from. Key obstructions were selected by the author based on insights reflected from both action research and research interviews. Results from the previous 'Question 5', reflect key obstacles listed in this matrix, assigning credibility to those initially selected.

In summation of the results shown in Figure 5:

- Lack of ecological consultation was highest at pre-app and application stages.
- Communication issues internally were significantly higher in the pre-app and application stages.
- Communication issues externally were not significantly greater for any particular phase of development.
- Poorest records of biodiversity agreements occurred between construction; completion/handover; and management phases. The management phase was associated with the highest recording issues.
- Competing issues / prioritisation was highest between pre-app and detailed design.
- Ineffective Regulations and Policy were relatively high issues throughout the development lifecycle. However, regulations and policy had a significantly higher number of respondents at the management stage.
- Lack of incentives to off-set delays / costs were highest during construction, although they were also relatively high at the pre-application and application stage too.
- Lack of knowledge & guidance appeared to be high across all phases

7. Enforcement (58 respondents)

This question assumed a negative stance towards biodiversity enforcement in order to test previous action research, and findings from research interviews with legal and planning professionals.

Prior to respondents viewing this question, many cited ‘enforcement issues’ as one of the three key obstacles in need of solving in answer to Question 5. This lends significance to the original statement.

The question began with the following statement: *“Enforcement relating to biodiversity and developments is not always effective i.e. sometimes no enforcement action is taken; sometimes the enforcement action is ‘dropped’; or even when enforcement action is fully taken, the resulting fines or procedures do little to put off offenders in the future”* Respondents were then asked to select as many of the possible answers as they felt relevant, from the choices shown in Figure 6.

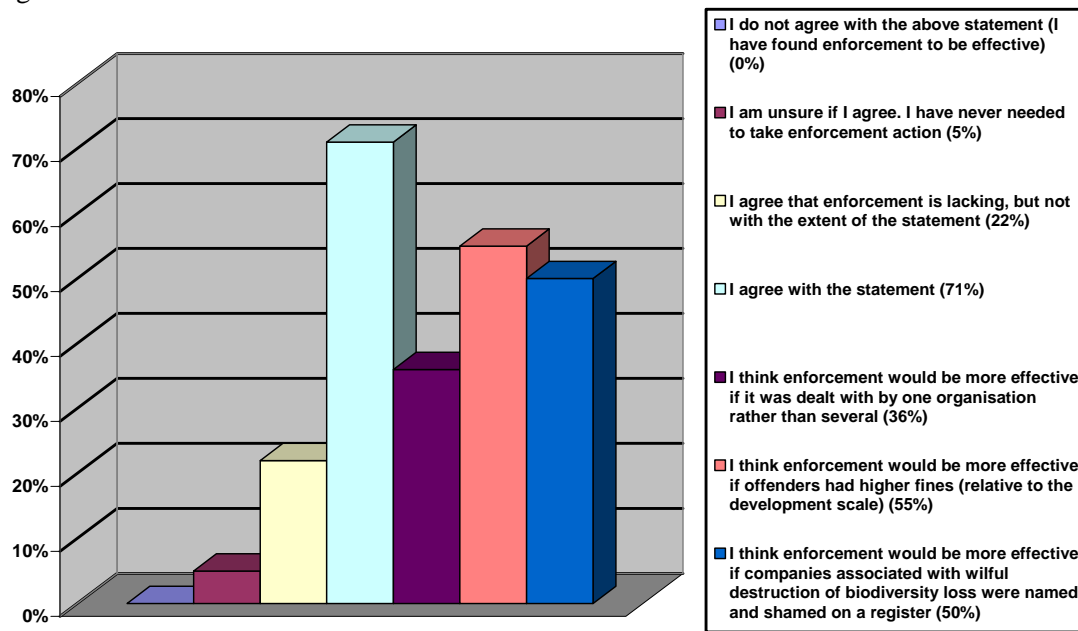


Figure 6: Bar chart illustrating the level of agreement with the enforcement statement

Further Comments Fields (14 respondents):

Five responses referred to a lack of resources of police and LA enforcement officers (financial and staffing), leading to low enforcement and monitoring levels. It was recognised that there were enforcement issues across all areas of planning, but it was generally felt that biodiversity (protection/ enhancement) was either: more difficult to enforce; or, suffered from a lack of will to enforce - more so than other planning issues.

Other comments related to enforcement action having been started, but issues (e.g. time to create evidence files / cost calculations / no punishment or adequate resolution) preventing the conclusion of any direct action, which would resolve the biodiversity issue, or punish the offender/s. Two comments related to the fact that prosecutions being time consuming and potentially costly, has resulted in statutory agencies and the police circumventing biodiversity enforcement, unless costs could be re-cooped through other issues.

As part of the wider research project a senior solicitor within the planning and environment field was interviewed (P. Harrow). Having worked at a number of LA’s, Harrow believed there maybe a flaw in the legislation, in that, the legal system (planning inspectorates and magistrates) tends to value biodiversity from a visual rather than a biological perspective. *“There tend to be better results*

in court when there is a link to visual amenity. Biodiversity tends to have to be linked to something else, before it is considered” (Harrow, 2009).

Harrow also stated that he felt biodiversity fines tended to be unduly low and that: “There is a wide variation in magistrate’s benches with regard to fines relating to biodiversity” (Harrow, 2009).

8. Are the developers and their agents who you deal with, generally able to provide 'URBAN' habitat/feature specifications to the standard you require? (58 respondents)

The response to this question, Figure 7, showed that there is a significant issue with obtaining urban habitat and feature specifications. Additionally, only 12% of respondents confirmed they did not deal with urban areas in this question, where as 49% of respondents in answer to Question 2: Experience, had no ‘urban’ biodiversity experience. This could indicate that ecologists are ‘dealing’ with urban biodiversity, but do not feel ‘experienced’ enough in the topic.

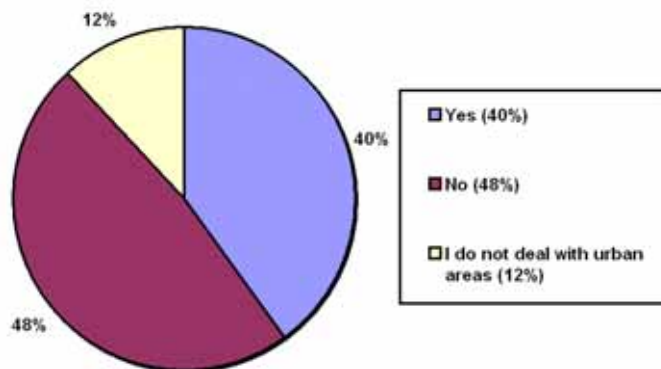


Figure 7: Pie chart illustrating satisfaction with urban biodiversity specifications.

In summation of the further comments (26 respondents):

Green infrastructure raises the profile, but a more strategic approach to biodiversity enhancements is needed; Developers and consultants experienced in previous urban habitat schemes illustrate a learning curve; Specifications need to consider what locally present species can be attracted to a site; Developers need to provide sufficient areas for habitat features; Due to the hierarchical approach to biodiversity, many developments affecting sites of local value, are covered by landscape architects with no involvement from ecologists; and the science of urban biodiversity is misunderstood even amongst ecologists.

9. How do you think the following groups understand 'URBAN' biodiversity and the potential for improvement and enhancement through new developments? (58 respondents)

9. How do you think the following groups understand 'URBAN' biodiversity and the potential for improvement and enhancement through new developments?						
	Unsure/I dont deal with 'urban' issues/ this group	Total lack of understanding	Could be a lot better	Recently improved/improving	Very good	Response Count
Developer / Developers Team	12.1% (7)	12.1% (7)	56.9% (33)	19.0% (11)	0.0% (0)	58
Members / Planning Board	10.5% (6)	12.3% (7)	66.7% (38)	10.5% (6)	0.0% (0)	57
Development Control Planning Officers	8.8% (5)	3.5% (2)	38.6% (22)	45.6% (26)	3.5% (2)	57
Forward Plans / LDF Policy Officers	8.8% (5)	1.8% (1)	45.6% (26)	33.3% (19)	10.5% (6)	57
comment further if you wish view						8
answered question						58
skipped question						23

Figure 8: Extract from results summary for question 9 of questionnaire.

Summary of results to question 9 are illustrated in Figure 8:

Forward plans /Local development Framework (LDF) policy officers were viewed as having the best understanding of 'Urban' biodiversity, out of the groups given in the matrix. This is probably attributable to their work with green-network maps and PPS 9 on a relatively frequent basis.

Developers/ developer's teams, and members/ planning board, were viewed by ALGE members as having the worst understanding of urban biodiversity.

However, insights from previous questions, as well as case studies and interviews in the wider research project, have demonstrated a 'learning curve'. For example, once developers have provided urban biodiversity enhancements due to the regulatory system, they tend to be much more approachable and likely to want to provide biodiversity enhancements on subsequent schemes, even in the absence of regulatory requirements (Reed, 2008; Westfold, 2008).

With regards to elected council members, who hold the power to grant or decline planning permission, the results correspond with findings from action research and research interviews e.g. *"Members do not always understand planning policy. Their knowledge can be poor, as it is a voluntary position. How democratic decisions are, maybe questionable for the same reasons. Enforced training [regarding biodiversity] would be helpful."* (Mansell, 2008).

Development control planning officers were seen as improving in their understanding the most. This is generally reflective of the findings of the wider research, which is encouraging.

Further comments fields related to: changing awareness; the need for better knowledge on urban biodiversity enhancements for all involved; and the need for biodiversity champions.

DISCUSSION AND RECCOMENDATIONS

The major obstacles to biodiversity enhancements in major urban development schemes can be categorised under the following headings:

Knowledge and Experience

Reviewing the literature there is an increasing quantity of information available on urban biodiversity (academic, and practical), so it appears the issue of lack of knowledge, which was raised in the questionnaire, may well be more attributed to the accessibility of this knowledge, or the need for specialist training for certain groups, rather than unavailable information.

The protection and enhancement of urban biodiversity is not a new concept. Indeed, further education modules covering the topic and influential textbooks, such as: *The Ecology of Urban Habitats*' (Gilbert, 1989) have been available for at least 20 years. In addition, a number of groups promoting the science and practical application of urban biodiversity, or biodiversity planning, exist, such as: the UK MaB urban forum (established since 1987); ALGE (who provide a number of downloadable resources) and others. Furthermore, an increasing number of LA's have local BAPs or Supplementary Planning Documents (SPDs), which cover urban areas and brownfield sites.

However, the results of the questionnaire clearly show that despite improvements, there is still a general lack of understanding and experience of urban biodiversity within the professions dealing directly, or indirectly, with biodiversity and development on a day to day basis (including approximately half of ecologists who answered the questionnaire). ALGE has proposed a web based 'biodiversity toolkit', to be hosted on the 'Planning Portal', which should alleviate some of these issues (although details were unavailable at the time of writing). Additionally, the Commission for Architecture and the Built Environments (CABE) advocates *"seeing urban development as an opportunity for enhancing biodiversity through good design of both buildings and*

spaces” (CABE, 2004). However, it would be helpful for CABE space to incorporate case studies and relevant links on their website to a variety of urban biodiversity enhancements, as many planners, urban designers and landscape architects refer to this website as an information resource.

Prioritisation

The level of citation throughout the questionnaire (Question 5 – found prioritisation to be the second most cited obstacle; Question 6 and 7 also highlighted issues), suggests that the low prioritisation of biodiversity generally within the planning field and local authorities, along with a lack of in-house biodiversity specialists, may be the root cause of many of the obstacles to maximising biodiversity enhancements.

Prioritisation of biodiversity is required at the chief executive level of LA’s, as effective change needs to be filtered down to all, to bring about a new understanding towards biodiversity significance (other than protected species and habitats). This is compliant with the biodiversity duty placed on all public bodies through the NERC (Natural Environment and Rural Communities) Act (NERC, 2006). ALGE has attempted to tackle some of these issues through their publication ‘Increasing the Momentum: a vision statement for biodiversity in local government (2004 – 2010)’ (Oxford, 2004). However, real change will require Government intervention coupled with training for planning officers and elected members who reside on planning boards. Training should focus on raising awareness of PPS 9, and what is feasible in terms of biodiversity enhancements on urban developments, in various development scenarios.

The Government response to ‘The Killian and Pretty Review’ highlighted that the ‘Local Government Association’ also recognised the importance of providing training and guidance [generally] to elected members to enable them to engage appropriately and effectively throughout the planning process, including the pre-application stage. (DCLG, 2009).

‘Biodiversity Champions’ are assigned amongst all LA council members in Wales, by chief executives / head of cabinets. Biodiversity training is provided and is supported by the Welsh Local Government Association (WLGA). The Countryside Council for Wales (CCW) have found this to be an effective process (Robertson, 2008). Replication of this process should be investigated within England.

Specialists

Nine different respondents listed the lack of in-house biodiversity planning specialists as one of the key major obstructions to gaining biodiversity enhancements. In the Governments response to ‘The Killian Pretty Review’, they acknowledged the need to address general labour shortages and skills in planning (ODPM / DCLG, 2009). Where financial resources may not stretch to the salary, training and office accommodation of a new member of staff, the potential to buy in specialist advice from appropriately qualified and experienced consultants on an ongoing contractual basis could be considered.

Policy

Policy must reflect the new biodiversity paradigm in clear, concise terms throughout all hierarchies. It is recommended that all LAs provide specific ‘urban’ biodiversity guidance to developers and write specific LDF policies with regards to biodiversity enhancements. LDF policies must be relevant and specific to the local context.

Misdirection of funds

In response to question 5, the need to improve the direction of biodiversity funds, to enable habitat enhancements, rather than just surveys was cited. The objective being to benefit many species, rather than only expensive translocations of small numbers of protected species (three comments specifically related to misdirection of funds due to Great Crested Newt requirements). Engagement with Natural England to discuss possible solutions would be necessary. For example, one

respondent to the questionnaire suggested: *“By presuming presence of protected species in appropriate circumstances, more money could be spent on habitat provision rather than surveys.”*

Recording and Communication

The questionnaire confirmed findings of the wider research project: that improvements need to be investigated for recording biodiversity agreements and proposals [question 4]. The questionnaire also highlighted that this is particularly necessary regarding developers handing over development sites after the construction phase [question 6]. Spatially recording biodiversity agreements on individual development schemes should also be considered [question 6 and insights in several other questions].

Greater partnering and co-operation between planners, council members, developers, ecologists and landscape architects is necessary. Ecologists maybe able to assist planners in making more favourable recommendations for biodiversity, by providing: a basic checklist of specific biodiversity features to select from; approximate costs - to assist in negotiations; a basic list and map of which species to encourage where (Local BAP's are often too large for planners to assimilate, along with the host of other guidance documents) and specifications for common habitat features (Mansell, 2008).

Enforcement

A significantly high proportion of respondents had experienced a range of obstacles to taking enforcement action for biodiversity related offences [question 7]. It is likely that the poor enforcement rates could also be correlated to poor developer incentives to provide biodiversity enhancements in the first instance.

The possibility for a lead authority to centralise all biodiversity enforcements should be considered, as should: magistrate training; greater fines; streamlining the evidence process and ensuring more effective monitoring of development sites at various phases.

Procedure

Early ecological consultation at the pre – application and application stage were highlighted as especially important within the questionnaire. The wider research also found with major urban developments, developers often invested so much time and effort in acquiring sites that they have to proceed with speed, in order to prevent cash-flow problems. If developers didn't build biodiversity into their plans from the start, then it is almost impossible to get any major amendments. (Frost, 2008). Procedures should be investigated to trigger earlier specialist consultation.

Many comments in response to question 5, and throughout the questionnaire generally, relate to either the knowledge of planning officers, or the importance of the use of planning conditions and improvements needed to standard and individual biodiversity conditions. It is therefore worth discussing one of the insights raised in question 5, with regards to circular 11/95:

Paragraphs 14 of circular 11/95 states that: *“...conditions should not be imposed unless they are both necessary and effective, and do not place unjustifiable burdens on applicants..”* The paragraph then lists six parameters for conditions. Whereas, paragraph 15 states that *“... authorities should ask themselves whether planning permission would have to be refused if that condition were not to be imposed. If it would not, then the condition needs special and precise justification....”* (ODPM / DCLG, 1995).

In a previous research interview Heeley highlighted the following: that *“writing specific biodiversity conditions can be difficult, as planners are not experts in this area - so they need assistance in writing the planning conditions, but there is often a lack of understanding from consultees on what can technically be said in a planning condition. There needs to be an understanding of one another's technical language”* (Heeley, 2009).

Often, biodiversity conditions do not become precise enough, or enforceable, due to lack of technical knowledge when writing the condition. It ought to be possible to justify most biodiversity conditions within the scope of the 6 tests, if planners and ecologists write standard and non-standard conditions together.

Paragraph 118, 119 and 120 of the same circular relate specifically to 'Nature Conservation' and 'Protected Species'. They discuss the use of conditions to prevent damaging impacts to wildlife, or where there are special sites, the need for conditions to be consistent with any provisions (sometimes statutory) for their protection (also referring to the old PPG 9). Paragraph 120 states that "*Local planning authorities should not refuse planning permission if appropriate conditions can be imposed or planning obligations entered into which are designed to prevent deliberate harm to the protected species*" (ODPM / DCLG, 1995). The new biodiversity paradigm, does not feature here, and old stereotypes (of damage limitation) are reinforced in this old circular, which is now outdated from a nature perspective, and does not cite the revised PPS 9.

The 'Killian and Pretty Review' advised Government to update the circular generally (Killian and Pretty, 2008). However, the Government's response to the 'Killian and Pretty Review' states that: "*The Government considers that the key tests in circular 11/95 for attaching **conditions to planning permissions** remain valid, although the guidance on model conditions does need updating. We will undertake a comprehensive review of this area,...*" (DCLG, 2009).

Improvements to model biodiversity conditions (standard and individual) should be sought through consultation on the revised circular 11/95 (expected in Autumn 2009).

Incentives and Promotion

'Lack of developer incentives and pressure' was cited as the most common key obstacle in question 5. Multifunctional benefits and other developer incentives should therefore be publicised and discussed in negotiations with developers during the planning stages of a new development project.

The 'learning curve' associated with developers and consultants implementing urban biodiversity enhancements, clearly indicates the benefits which the promotion of successful case studies and technical specifications would have to furthering urban biodiversity enhancements.

The questionnaire also revealed that greater incentives to off-set issues at the construction stage should be investigated.

CONCLUSIONS

The questionnaire has identified the 'key' and common obstacles to enhancing biodiversity on major urban development schemes. This supports the findings from the action research, case studies, and specialist interviews, undertaken as part of the overall research project.

The questionnaire also identified which stages within a development's life cycle the 'key' obstacles are most likely to occur (temporal scale), particularly in response to question 6. As well as some of the key professionals and non professionals who are involved (actors), particularly in response to questions 5 and 9.

This information helps to prioritise areas for possible solution finding and formulation of guidance, in the remainder of the wider research project. Further research, through case studies and specialist interviews, will therefore focus on furthering the provisional recommendations made during the course of the discussions above.

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