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## Obstacles and Solutions to Maximising Biodiversity in Major Urban Development Schemes

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### Abstract

Concern regarding global biodiversity loss led many governments to sign the international agreement 'Halting Biodiversity Loss by 2010 and beyond' in 2001.<sup>8</sup> The UK government, as one of the signatories, has consequently focussed its efforts by commissioning specific technical guidance and supporting the UK Biodiversity Action Plan (BAP) targets. The government's greatest influence on current biodiversity levels operates through the town planning system. The increased regulation pertaining to biodiversity protection and enhancement experienced over the last decade, combined with the promotion of associated benefits and incentives, should equate to the maximisation of biodiversity value as an achievable goal on most, if not all, development sites.

Successful practical application is rare, due to process obstructions prevalent within 'urban' and 'major' development schemes. A questionnaire survey completed by local government ecologists in England, together with insights from action research, specialist interviews, and case studies reveal the key process obstacles and lead to preliminary recommendations.

### Introduction

#### *Global biodiversity loss and human density*

The current Holocene extinction phase, the 6<sup>th</sup> biggest extinction phase known to the globe<sup>14,37</sup> is predominantly due to anthropogenic activity and has dramatically accelerated over the last 300 years. It is now known as the 'biodiversity crisis'<sup>21</sup> with the last 50 years having seen the most rapid transformation of the biosphere ever occurring in human history<sup>33</sup>. The crisis is driven the accelerating human population growth and related impacts such as land degradation through development activity, climate change, pollution, resource depletion, habitat disturbance and fragmentation.

England already has the third highest density in Europe (390 people per km<sup>2</sup>, ONS, 2007), and is expected to have 55 million people by 2026<sup>5</sup>. This growth gives rise to continuing demand for developments (whether residential, services, infrastructure, or other) whose cumulative impacts affect global biodiversity. Thus we need to provide for biodiversity in all new development schemes.

#### *Urbanism*

Around May 23<sup>rd</sup>, 2007<sup>2</sup> the global population became more urban than rural.<sup>38</sup> In addition to ecocentric or ethical reasons to halt global biodiversity loss, 'urban' biodiversity particularly provides humans with a range of ecosystem services.<sup>22</sup> Poor biodiversity in urban areas means that "Billions of people may lose the opportunity to benefit from or develop an appreciation of nature"<sup>35</sup>. Thus all new developments should incorporate biodiversity features and habitat opportunities for human well-being, and to sustain the connection between citizens and wildlife in cities. Tackling the biodiversity crisis -requires a paradigm shift from 'protection and conservation' to 'increase, enhance and repair'. Current UK national policies and legislation in part still reflect the old paradigm of 'protect and conserve', whilst others reflect the new paradigm of 'enhance, increase and repair'.<sup>4</sup>

The 'increase, enhance and repair' paradigm can be facilitated through urban development schemes - even where biodiversity baselines are zero<sup>3</sup>. Actively encouraging species to re-colonise by providing habitat features; habitat creation; repair of fragmented links in green networks, and ecologically sensitive management are examples of how this can be achieved. Cumulatively, these 'local' enhancements can help to slow and potentially halt 'global' extinction rates.

#### *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. Biodiversity policy could be one of the major challenges for planning policy and processes in England requiring policies and processes that deliver the right level of protection and enhancement to the natural environment.<sup>5</sup>

Improving regulatory systems and the demonstration of benefits to developers to support enhancement of biodiversity ought to equate to a relatively straightforward process of agreeing proposals for maximising biodiversity in developments. However, the range of temporal, spatial, organisational, and trans-disciplinary complexities means that where proposals are initially agreed, they often do not come to fruition. This paper addresses the nature of these



obstacles to maximising biodiversity in major development schemes on a local level.

### Research methods

As part of a wider research project employing questionnaires, site-based case studies, key-informant interviews and action research to focus on maximising biodiversity within major and urban development projects in England, a web-based questionnaire was emailed to all members of ALGE (The Association of Local Government Ecologists). The 81 respondents represent approximately half of the contact emails. Questions were either multiple choice or matrix questions, and also had an 'additional comments' field to capture additional insights.

The questionnaire's main objectives were to seek respondents' views of development in relation to: 1) the key obstacles to maximising biodiversity, and at which stages they occurred, 2) how 'urban' biodiversity was being tackled, 3) testing insights and theories generated from action research and research interviews - with regards to- recording, enforcement and common obstacles, 4) previously unidentified issues.

### Research results

#### Professional Role

Respondents were mostly general ecologists and biodiversity officers (41%) followed by specialist planning ecologists (20%), management/ team leader ecologists (15%) and then 'other' related professions (24 per cent). 'Other' included: countryside officers; parks managers; a combination of ecologist with policy or similar; a countryside ranger; and a renewable energy project manager.

#### Experience

The majority of respondents (93%) had over two years professional experience while 91% had a degree/ higher degree, and half were members of Professional Institutions (the majority being: the Institute of Ecology and Environmental Management, or the Institute of

Biology); this lends confidence to the knowledge and experience of respondents to the questions below. The non-ecology / biology institution memberships included chartered or associate members of the Landscape Institute (LI) (seven respondents). Whilst the vast majority of local authorities have urban areas within their boundaries, only half (51%) of respondents had professional experience in 'urban' ecology. Two comments on question 9 (related to 'urban' biodiversity), revealed that Development Control (DC) officers often requested urban biodiversity advice, but found a lack of relevant knowledge amongst ecology specialists.

#### Planning Application Forms

The Standard Planning Application Form 1APP<sup>1</sup> was introduced in England in April, 2008 and to streamline the planning system by giving planning applicants greater certainty of expectations 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?

1. Protected and priority species:
2. Designated sites, important habitats or other biodiversity features:"<sup>30</sup>

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. In the questionnaire respondents were asked how effective they thought the change to include biodiversity questions had been, to which 33 per cent indicated it had been ineffective and 36 per cent that it could be effective in the future (Figure 1).

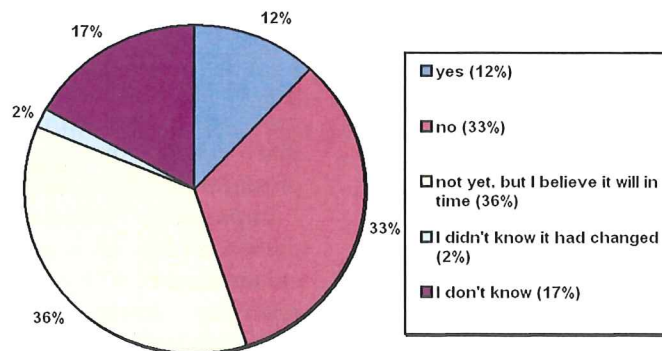


Fig. 1: Pie Chart Illustrating Effectiveness of Standardised Planning Application Form

Further comments (41 respondents) related to planning applicants inaccurately ticking 'no', when there 'were' features on site, which could lead to inaccurate validation of applications (16 comments). However, several local authorities are aware of this and attempt to tackle the issue by producing guidance sheets. Additionally, ALGE has produced draft pilot guidance on validation, available from their website.<sup>1</sup>

Other comments related to seeing some improvements in survey requests "but these are still being done at inappropriate times of year"; the need for stronger enforcement and strategic awareness; and

issues regarding local authorities with 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...".

### Recording biodiversity agreements and proposals

Respondents (64 respondents) were asked to tick all possible answers (see key, Figure 2) with regards to 'recording' biodiversity agreements on individual development sites (Figure 2).

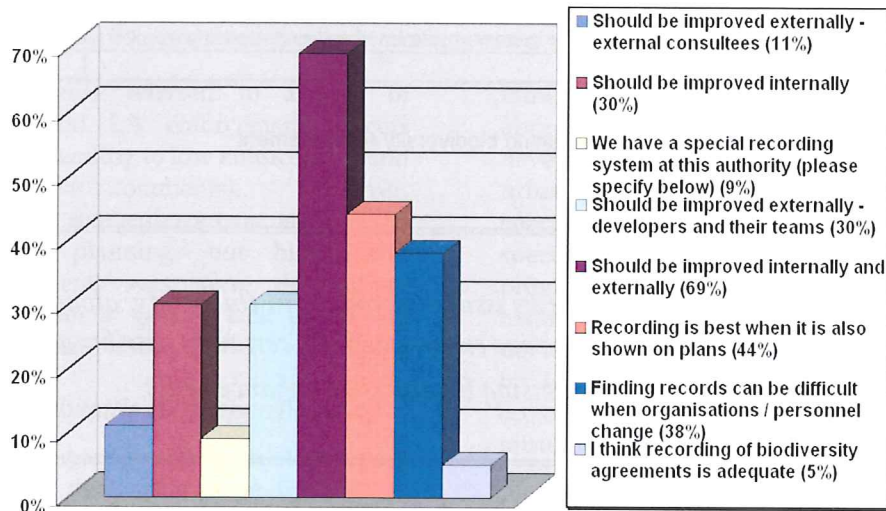


Fig. 2: Bar Chart - 'Recording of biodiversity agreements and proposals'

A significant issue arises 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 master plans (as site staff did not possess, or had not read the ecological reports). Unexpectedly, only 44% of respondents believed records of proposals were best when also shown on master plans. In contrast, 6 of the 7 LI member respondents agreed that recording on master plans would be better. Agreements lost, misunderstood, or forgotten agreements over time, were key recording issues, and sometimes related to personnel, or organisational change. While most respondents comments suggested they knew that recording biodiversity agreements on development sites was failing in some way, the task

seemed to difficult too untangle with available resources.

### Obstacles to maximising biodiversity and the key developmental phases in which obstacles occurred

#### Obstacles

Respondents (64 respondents) were asked 'If you had to choose, what would you rank as the top three 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) (Table 1). The reasons for the complexity were far-ranging being related to different phases and different actors involved in developments. However, common obstacles did emerge, as did some previously unconsidered points.



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	

**Table 1:** Table illustrating patterns in key obstacles to gaining biodiversity enhancement

*The generally low prioritisation of biodiversity issues uncovered in this study, along with a lack of in-house biodiversity specialists and ineffective enforcement, is certainly attributable to many of the obstacles to maximising biodiversity enhancements.*

### *Development phases and obstacles*

Respondents (64 respondents) answered a matrix style multiple-choice question choosing from a list of development phases and possible obstacles derived from the authors' experience. Results from the previous 'Question 5', reflect key obstacles listed here, assigning credibility to those selected.

To summarise: lack of ecological consultation was highest at pre-app and application stages, while 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. The management phase was associated with the highest recording 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 and/or costs were highest during construction, although they were also relatively high at the pre-application and application stage too. Lack of knowledge and guidance appeared to be high across all phases.

### *Enforcement*

Assuming a negative stance, 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 (58 respondents) were then asked to select as many of the possible answers as they felt relevant (Fig. 3).

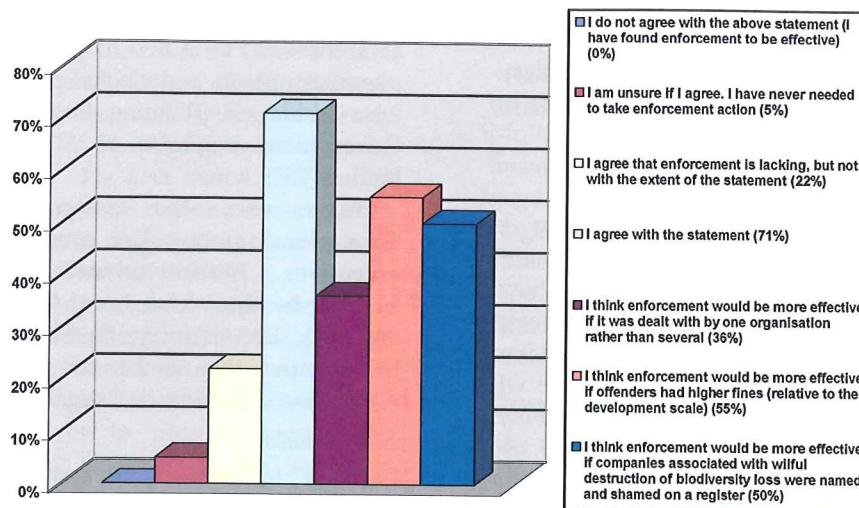


Fig.3: Bar chart illustrating the level of agreement with the enforcement statement

Respondents' comments referred to a lack of resources of police and LA enforcement officers (financial and staffing), leading to low enforcement and monitoring levels (five comments). However, respondents recognised that enforcement issues exist across all areas of planning, but biodiversity (protection/ enhancement) was more difficult to enforce or suffered from a greater lack of will to enforce than other planning issues.

#### Provision of 'urban' habitat/feature specifications

Of the 58 replies to the question: "the developers and their agents who you deal with generally able to provide 'urban' habitat/feature specifications to the standard you require?" 40 per cent answered yes and 48 per cent no, suggesting that there is a significant issue with obtaining urban habitat and feature specifications. Comments included: 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, urban biodiversity science is misunderstood, even amongst ecologists.

#### Understanding of 'urban' biodiversity

58 respondents to an 'urban' biodiversity question (Table 2) showed good knowledge by forward plans/LDF policy officers, probably because of their regular work with green-network maps and PPS 9.

Group	Respondents comments
1. Forward plans /Local development Framework (LDF) policy officers	Best understanding of 'Urban' biodiversity (out of all groups in the matrix).
2. Developers/ developer's teams, and members/ planning board	Worst understanding of urban biodiversity.
3. Development control planning officers	Improving in their understanding the most.

The encouraging improvement in Development control planning officers' knowledge generally reflects the findings of the wider research. Responses of elected council members (number 2 in Table 2), with the power to grant or decline planning permission, correspond to findings from action research and

research interviews. For example, a senior planning officer said "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." <sup>23</sup>



## Discussion and recommendations

### Major obstacles to biodiversity enhancements in major urban development schemes

#### *Knowledge and Experience*

Increasing theoretical and applied information is available on urban biodiversity. Protection and enhancement of urban biodiversity is not a new concept, influential textbooks, e.g. Gilbert<sup>16</sup> being widely available, while inextricable between human and societal processes and ecological systems are well understood.<sup>11,12</sup> Groups promoting urban biodiversity, such as the UK MaB Urban Forum and the ALG, are active. Many LA's have local BAPs or Supplementary Planning Documents (SPDs), covering urban areas and brownfield sites.

The lack of knowledge raised in questionnaire responses may be due more to the accessibility of this knowledge, or the need for specialist training for certain groups, than its unavailability. There is still a general lack of understanding and experience of urban biodiversity within professions who deal directly and indirectly with biodiversity and development (including approximately half of ALGE members who answered the questionnaire). A small proportion of respondents did not deal with urban areas (12%), while 49% had no urban biodiversity experience, indicating that ecologists are 'dealing' with urban biodiversity, but do not feel 'experienced' enough in the topic.

The 'biodiversity toolkit' to be hosted on the 'Planning Portal' proposed by the ALGE should alleviate some of these issues. 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*".<sup>7</sup> If CABE space incorporated case studies of urban biodiversity enhancements on their website, with relevant links, it would help professionals using the website for information. Research shows that successful 'learning curves' are evident, for example, once developers have provided urban biodiversity enhancements due to regulations, they are likely to want to provide biodiversity enhancements on other schemes, even when not required by regulations.<sup>31,36</sup>

#### *Prioritisation*

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 of biodiversity significance (other than protected species and habitats). This complies with the biodiversity duty placed on all public bodies by the NERC (Natural Environment and Rural Communities) Act<sup>24</sup>. ALGE has attempted to tackle some of these issues through their publication '*Increasing the Momentum*'.<sup>29</sup> However, real change will require intervention to foster better inter-governmental and societal perception and prioritisation of biodiversity

issues, coupled with national training raising awareness of PPS 9, and biodiversity enhancements for planning officers and elected planning board members who reside on planning boards, as stressed in the Government response to 'The Killian and Pretty Review'<sup>3, 10</sup>

Wales uses the assigning of 'Biodiversity Champions' among LA council members by chief executives / head of cabinets along with biodiversity training by the Welsh Local Government Association (WLGA). The Countryside Council for Wales (CCW) have found this to be an effective process.<sup>32</sup> Its replication should be investigated in England.

#### *Specialists*

Lack of in-house biodiversity planning specialists obstructs gaining biodiversity enhancements. This is part of general labour shortages and skills in planning (ODPM / DCLG, 2009). Where new staff members cannot be afforded, using qualified, experienced consultants could be considered.

#### *Policy*

Failure to develop local policies in sufficient detail to be effective occurs both in the UK and in Sweden.<sup>13</sup> Such local policies should reflect the new biodiversity paradigm in clear, concise terms throughout the hierarchy. All LAs should provide specific 'urban' biodiversity guidance to developers and write specific, relevant biodiversity enhancement requirements into LDF policies.

#### *Misdirection of funds*

Biodiversity funds should be used to facilitate habitat enhancements, rather than just surveys. This should benefit many species, not only expensive translocations of small numbers of protected species, such as the Great Crested Newt requirements.

#### *Recording and Communication*

Improvements need to be investigated for recording biodiversity agreements and proposals [question 4]. 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 from several other questions].

Greater partnering and co-operation between planners, council members, developers, ecologists and landscape architects is necessary. Ecologists could help planners to make more favourable recommendations for biodiversity, by summarising specific biodiversity features to select from; calculating approximate costs; listing and mapping the species to encourage in particular situations and technical specifications for common habitat features.<sup>23</sup>

#### *Enforcement*

A senior solicitor dealing with planning and the environment field, P. Harrow, interviewed in the research believed there may be 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".<sup>18</sup> He 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".<sup>18</sup>

A significantly high proportion of respondents had experienced a range of obstacles to taking enforcement action for biodiversity related offences [question 7]. Poor enforcement rates could also be correlated with poor developer incentives to provide biodiversity enhancements in the first instance. A lead authority could centralise all biodiversity enforcements. In addition there could be magistrate training; greater fines; streamlining of the evidence process; more effective monitoring of work on development sites.

### Procedure

Early ecological consultation at the pre - application and application stage, highlighted by the questionnaire and wider research is need, because once developers acquire sites, they proceed with speed, in order to prevent cash-flow problems. If developers do not include biodiversity in their plans from the start, it is almost impossible to get them added later.<sup>15</sup> "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".<sup>19</sup>

### Acknowledgements

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### 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 be publicised and discussed in negotiations with developers during the planning stages of a new development project. Promotion of successful case studies and technical specifications would further urban biodiversity enhancements. Greater incentives to off-set issues, especially at the construction stage, should be investigated.

### Conclusion

The survey questionnaire used identified the key and common obstacles to enhancing biodiversity on major urban development schemes. It also identified which stages within a development's life cycle the key obstacles are most likely to occur, as well as some of the key professionals and non professionals who are involved. The generally low prioritisation of biodiversity issues uncovered in this study, along with a lack of in-house biodiversity specialists and ineffective enforcement, is certainly attributable to many of the obstacles to maximising biodiversity enhancements. This information helps to prioritise areas for possible solution-finding and formulation of guidance for 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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## Notes

<sup>1</sup> "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).

<sup>2</sup> See 'Rural and Urban Area Classification: An Introductory Guide', (DEFRA, 2004) for current UK definitions.

<sup>3</sup> The Killian Pretty Review undertook a detailed review, from start to finish, of the process for seeking planning permission.

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## The importance of greenspace in towns and cities

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The attractiveness of towns and cities everywhere is enhanced by the style and spacing of their buildings and the arrangement and size of their open spaces. If those areas between buildings have trees, flowers and grass they draw even more people into them. Such pieces of "urban greenspace" are to be found throughout the Commonwealth, many of them were initially established as parks or gardens over 100 years ago, either as part of the planning of cities by governments, or on the initiative of key individuals who believed that parks were an amenity to improve the cities and the health and well-being of urban dwellers.

Through the Commonwealth, major cities have significant traditional parks, many founded over 100 years ago, such as Albert Park in Brisbane, Fitzroy Gardens in Melbourne, Hyde Park in Sydney, Mount Royal Park in Montreal, The Maidan in Kolkata, Uhuru Park in Nairobi, Lake Gardens in Kuala Lumpur. The Domain in Auckland, Central Park in Wellington, Victoria Park in Freetown and Albert Park in Durban, Botanic Gardens in Melbourne, Port Moresby Wellington, Freetown, Cape Town and Singapore and nature reserves in Mumbai, Lilongwe, London, Manchester, Birmingham, Edinburgh and Belfast are further examples of official managed urban vegetated spaces that are well used by the general public. To these must be added the huge variety of private

gardens, sports ground, golf courses, and heaths in towns.

People enjoy urban nature in many ways, from the passive enjoyment of parks and gardens to active involvement in wildlife conservation and the creative conservation of wildflowers. Yet nature poses many problems to people, from the predations of urban foxes to the bacteria that attack food and the vectors that bring diseases. To understand and manage the complexity of nature in cities requires knowledge of the dynamics of both ecosystems and social systems.

In the first decade of the 21st century, urban people became aware of the need for greater self-sufficiency, increased sustainability of lifestyles and more local food production. These three concepts are practical everyday realities for many of the urban poor in Africa, Asia and Latin America, but for most urban dwellers in Australasia, Europe and North America they require changes in ways of living and new thinking. Nevertheless, many people are putting forward new ideas and are making practical examples of ways of creating new opportunities for food production, for creating novel gardens and for using vegetation to make cities more liveable and to mitigate the impacts of climate change. Managing urban ecosystems in this way brings multiple benefits, from the practical control of storm runoff to the aesthetic enjoyment of pleasing landscapes.