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Local Geodiversity Action Plans - Setting the context for geological conservation

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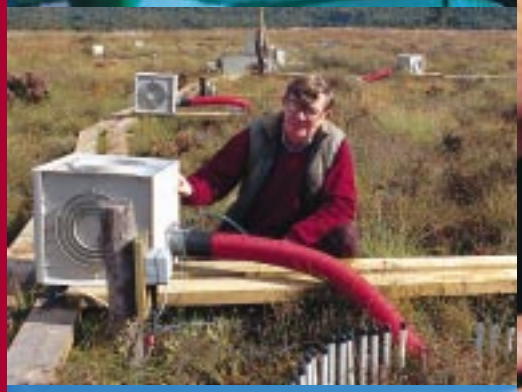

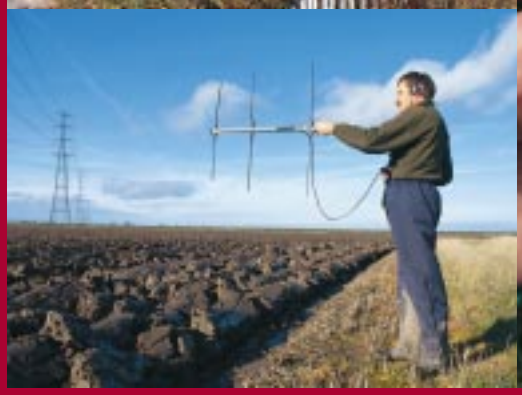

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Local Geodiversity Action Plans – Setting the context for geological conservation

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1 Setting a context for Geological Conservation - Local Geodiversity Action Plans (LGAPs)

1.1 Introduction

Revealing the true value of nature and wildlife has recently been highlighted in a report by English Nature (2002) and it was found that there is a non-use motivation behind nature conservation for many people. Although economic motives are often pushed to the front of the agenda by those in political and economic circles, it has now been recognised that people value the environment intrinsically. This notion has evolved from the traditional romantic environmental philosophy where nature is put on a pedestal and revered for its own sake. This was epitomized by John Muir in the US at the beginning of the 20th century. So, biodiversity is conserved for itself, over and above the market value. There is a desire from society to have nature conserved in its widest sense. However, although geodiversity is recognised to a limited extent as underpinning biodiversity, society's general perception of geology is different. Either it is seen as a destructive science or as a resource to be used, the traditionally imperialistic environmental philosophical view, and today this philosophy is still paramount. Stewardship, or in modern terms, sustainability is the order of the day for biodiversity and therefore this misconstrued perception of geology must be changed at all levels but most importantly at the local level. In order to do this Local Geodiversity Action Plans must be set up to safeguard and manage the geological 'resource' for tomorrow.

1.2 Terms of Reference - Local Geodiversity Action Plans

Before proceeding further, a definition of the terms in the above title must be undertaken.

1.2.1 Local

Local is difficult to closely define and in the context of Local Geodiversity Action Plans merely means not 'national'. Local could be at varying scales from regional, to county to parish.

1.2.2 Geodiversity

Geodiversity as a term was first coined in about 1991 at an international conference but the exact timing of the first use of the word is still under debate, (Stanley, pers comm). However, it has evolved in scientific circles to complement biodiversity. This latter term is starting to be recognised by most people as the diversity of life and is defined by the UK Local Issues Advisory Group as "the whole variety of life on Earth", (UKLIAG, 1995). If this is so, geodiversity must be accepted as "geological diversity or the variety of rocks, fossils and minerals and natural processes" (Prosser, 2002). In the first issue of Geodiversity Update in January 2001, it was defined as "the link between people, landscape and their culture: it is the variety of geological environments, phenomena and processes that make those landscape rocks, minerals, fossils and soils which provide the framework for life on earth". This is a slightly wider definition than Prosser (2002), as it encompasses soils specifically but perhaps is too specific for general usage. Another definition is that geodiversity comprises the abiotic factors, which together with biodiversity give a holistic view of the landscape.

This holistic approach to geodiversity conservation becomes important later in the discussion. Therefore the saying, "Geodiversity underpins Biodiversity" is a short snappy adage that could go a long way, (Burek, 2001).

Extensive discussion of geodiversity is provided by Gray (2004) in what is now a definitive text book.

1.2.3 Action Plans

Action Plans are about action not theory. They formulate a plan with objectives, targets, indicators, and then act on them. Quoting from the Guidance for Local Biodiversity Action Plans "The purpose of Local Biodiversity Action Plans is to focus resources to conserve and enhance biodiversity by means of local partnerships, taking account of both national and local priorities" (UKBG &LGMB, 1997a). Action Plans are discussed in more detail later.

If the action planning process is proving effective in delivering integrated conservation measures that benefit rare and threatened biological habitats and species at both the local and national level (Larwood, 2002), why does no framework exist for geological conservation? Throughout this report the term geological conservation is as defined by Prosser (2002). Geomorphology is implicitly included, as within the term geoconservation. The two can be used interchangeably.

One point to bear in mind is the difference between geodiversity *per se* and geodiversity conservation. The first is an assessment of the diversity itself (which would probably be theoretical to a certain degree) and the other is the action of conserving geodiversity for the future

2 Geoconservation context

2.1 Geological Conservation Review

Britain had a dominant influence on geology during the 19th century: many geological sites within our country are of international importance. We therefore have an international responsibility to conserve them.

Since 1949, (National Parks and Access to the Countryside Act), geology and geomorphology have been part of the government conservation agency brief "to preserve the best examples of the important geological and geomorphological phenomena, so that they can continue to be used by earth scientists for research, education and reference" (HMSO, 1949).

Between 1977 and 1990, the Geological Conservation Review (GCR) was initiated to reassess systematically all significant geological sites in Britain. GCR sites are the foundation of statutory geological conservation in Britain and form the basis for the geological Site of Special Scientific Interest (SSSI) network. The fundamental components of the GCR site series are summarised by Ellis and others (1996).

2.2 Geological conservation strategies 1990-2005

The NCC published their *Earth Science Conservation in Great Britain – a strategy* (NCC, 1990). This covered a period of five years and the main points are summarised below (Box

1). This is a milestone publication in British geoconservation. It covered the whole of Britain excluding Northern Ireland. Once the Nature Conservancy Council (NCC), had been split into its constituent parts in 1991, the strategies became nationally focused. Between 1995 and 2000 'Towards the Millennium' (English Nature 1995) (Box 2) brought in sustainable development and the challenge of the integrated approach to nature conservation (King, Prosser and Moat, 1996) with the development of the Natural Area concept (Duff, 1994; Prosser, 1995). Currently 'The past is the key to the future' (English Nature, 2000; Prosser and Larwood, 2000) encapsulates the strategic direction of English Nature.

Box 1 1990-1995

The *Earth Science Conservation in Great Britain - a strategy* (NCC, 1990)
This strategy identified for the first time the overall

- Needs of Earth Science conservation
- Means by which it could be achieved
- Bodies most able to take an active role

The strategy had six main themes

1 Maintain the SSSI network
2 Expand the RIGS network
3 Develop new conservation techniques
4 Improve site documentation
5 Increase public awareness
6 Develop international links

Box 2 1995-2000

Towards the Millennium – conserving England's Earth heritage (English Nature, 1995)

The strategy had five main themes

1 Managing and safeguarding the resource
2 Integrating Earth heritage and the holistic approach
3 Influencing the influencers
4 Raising awareness
5 Involving the public

Box 3 2000-2005

The past is the key to the future (English Nature 2000)

The strategy has three main themes

1 Learning from the past
- Promote a sustainable approach to the management of our Earth heritage – aiming to ensure that the resource available now will still be available in the future

2 Enjoying the present
- Further develop and exploit the links between Earth heritage landscape and wildlife and between our Earth heritage and the built environment

3 Influencing the future
- Continue to support and work with others involved in Earth heritage conservation, (including the RIGS movement, Geoconservation Commission, GA and RSNC), and strengthen our involvement with practitioners at a European level)

2.3 Regionally Important Geological and geomorphological Sites (RIGS)

Regionally Important Geological and Geomorphological Sites (RIGS), designated by locally developed criteria, are currently the most important places for geology and geomorphology outside statutorily protected land such as Sites of Special Scientific Interest (SSSI). The designation of RIGS is one way of recognising and protecting important Earth science and landscape features for future generations to enjoy. The concept of RIGS was first initiated by the Nature Conservancy Councils (NCC) publication Earth Science Conservation in Great Britain – A Strategy (1990).

2.4 The importance of 'local'

Local is important to all. The local scale is often most quantifiable and most relevant. People tend to engage more readily in initiatives that have a local (and therefore direct) relevance and impact rather than a less tangible national scale.

Thus when Agenda 21 was agreed at the Rio Earth Summit in 1992, embedded within it was implementation at the local scale. The implications of Local Agenda 21 have been discussed by Burek (1995, 2000) and Jarzembowski (1997) – the need for greater understanding of geoconservation is identified by both.

Three key points emerge:

- People have an intrinsic ownership of their local 'place'.
- Nature conservation has public support at all levels from national to local.
- Geoconservation must have a wider presence at all levels and learn from initiatives such as the biodiversity process and Agenda 21.

3 Introduction to Action Plans

Biodiversity Action Plans (BAPs), Species Action Plans (SAPs), Habitat Action Plans (HAPs) and Local Environment Agency Plans (LEAPs) are four examples of environmentally based action plans operating at both local and national levels. In the future, there may also be Company Action Plans. While BAPs incorporate SAPs and HAPs, LEAPs are part of a functional group of plans published by a single organisation to guide their own actions. Other examples might be National Park Management Plans, which can be crucial to the development of BAPs and LGAPs as they form an influential part of nature conservation.

A generic action plan comprises/requires:

- Resourcing
- Time framework
- Partnerships
- Quantifiable targets
- Monitoring
- Review
- Funding

It therefore follows that a Local Geodiversity Action Plan (LGAP) would incorporate all the above. At present, there is no mechanism in place to produce LGAPs. However, there is a potential role for action planning because it enables objectives to be clearly expressed and targets to be set within geological conservation.

In order to forward the project set up by English Nature, it was deemed necessary to look in detail at how the BAPs operated at the local and the national level.

3.1 Local Environment Agency Plans (LEAPS)

LEAPS are produced by a single organisation to guide its own actions (see figure 1). They are administered by the Environment Agency. A case study of the Weaver/Dane catchment area centred on Crewe, Cheshire highlights the mechanisms used to implement these plans.

The plan was published in May 1998 following extensive consultation and covered a period of two years to 2000, (Ager, 2001).

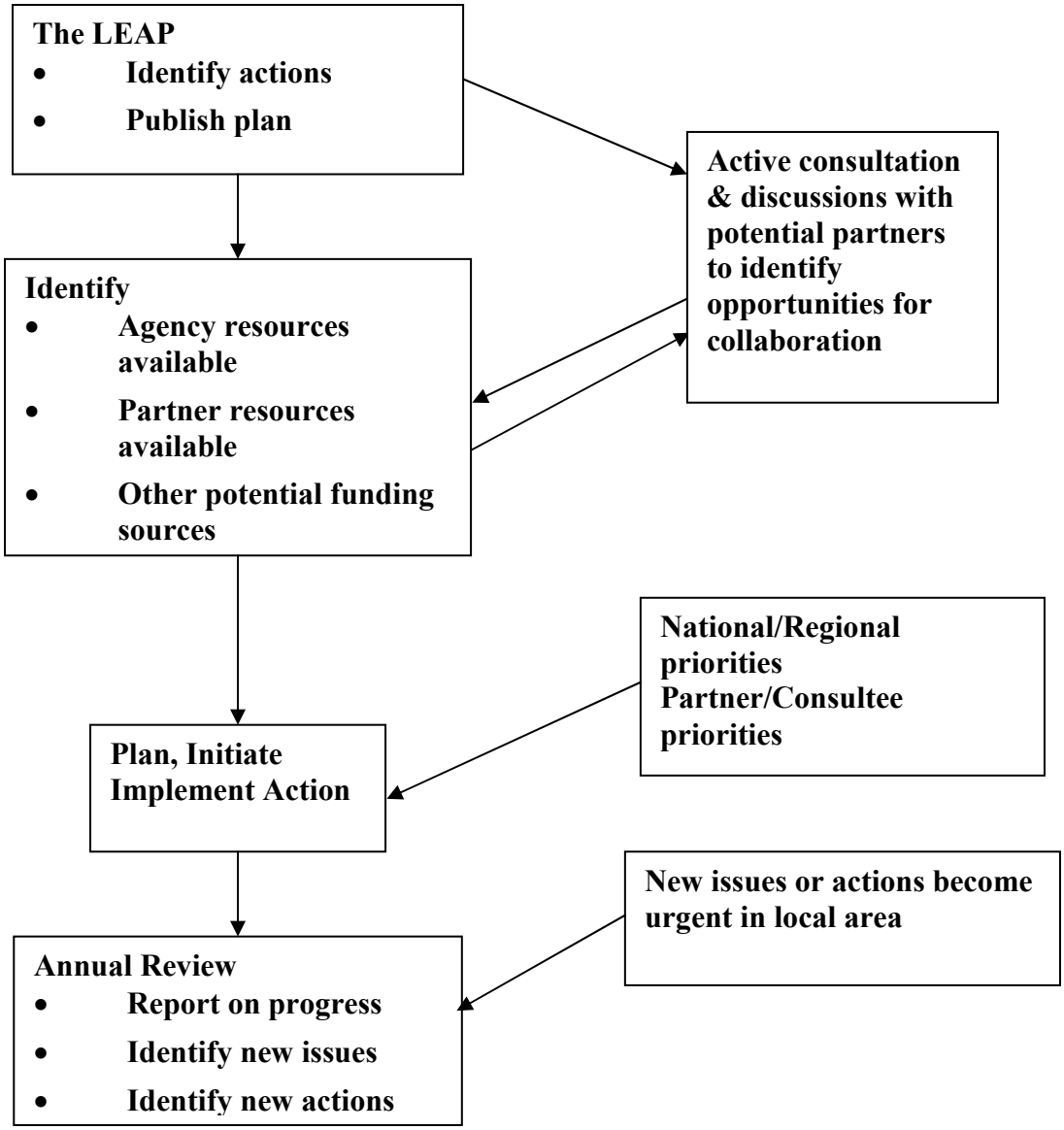


Figure 1 Process for developing plan into action

3.2 Biodiversity Action Plans (BAPs)

3.2.1 Legislation background

In 1992 Britain signed the Convention on Biological Diversity United Nations Conference of Environmental Development in Rio de Janeiro, Brazil. As a result of that signature, legislation was strengthened and given relevance to allow ratification in 1994. The legislation, gives firstly an infrastructure and strategic importance to identify and safeguard species and sites of biological interest in the UK and secondly a mechanism to produce Biodiversity Action Plans (BAPs), at both the local and national level, is now up and running.

3.2.2 Biological Conservation in the UK

Biological conservation in the UK was restructured in response to the publication of *Biodiversity – The UK Action Plan* in 1994 (UK BAP). This detailed the strategy that the UK Government would take to contribute to the conservation of global biological resources: a direct response to the ratification of the Convention on Biological Diversity. There were clearly stated principles to inform the delivery of conservation action towards the UK BAP (see Box 4) and a series of aims, referred to as the 59 steps. In 1995 the UK BAP Steering Group, a consortium with responsibility for taking forward the UK BAP, published a long-term strategy for the protection and enhancement of biodiversity (UKBG, 1995a). The preparation of action plans for targeted species and habitats of conservation concern (SAPs and HAPs respectively) was developed (UKBG, 1995b) and has become an important mechanism to focus conservation action, to allocate resources and to promote policy change. The use of a systematic action planning process was adopted to enable success to be clearly monitored.

Box 4 Principles of the UK BAP (from UKBG, 2001)

Partnership	Involving the range of statutory, voluntary, academic and business sectors nationally and locally
Actions and Targets	Addressing the priority biodiversity needs by establishing clear actions, measurable outcomes and accountability
Policy Integration	Recognising that significant shifts in policy are needed to reverse declining trends in biodiversity and to support sustainable development in all sectors of society
Information	Recognising that sound science and knowledge should underpin decisions and that new approaches are needed to fill information gaps and understanding
Public Awareness	Recognising that the changes needed to maintain biodiversity in the long-term must be supported by people's actions, attitudes and understanding

More broadly, the UK BAP aimed to deliver changes in attitudes and policy regarding biological conservation and to place biodiversity as an indicator of sustainable development. One major contribution to these broad aims of the UK BAP was the encouragement of Local Biodiversity Action Plans (LBAPs). In conjunction with the Local Agenda 21 Steering Group, guidance notes were developed and distributed to local authorities (UKBG & LGMB, 1997 a-e; EBG & CEE, 2000). LBAPs were developed to contribute to the delivery of national targets for species and habitat conservation and also to deliver targeted action relevant at the local level through a partnership approach. The functions of LBAPs reflect the UK BAP principles (Box 5); specifically they are charged to use a targeted approach to conservation practice at the local level, to operate as partnerships and to raise awareness.

Box 5 Functions of Local Biodiversity Action Plans (from UKBG & LGMB, 1997a).

- To ensure the national targets for species and habitats, as specified in the UK Action Plan, are translated into effective action at the local level
- To identify targets for species and habitats appropriate to the local area, and reflecting the values of the people locally
- To develop effective local partnerships to ensure that programmes for biodiversity conservation are maintained in the long-term
- To raise awareness of the need for biodiversity conservation in the local context
- To ensure opportunities for conservation and enhancement of the whole biodiversity resource are fully considered
- To provide a basis for monitoring progress in biodiversity conservation, at both a local and national level

3.2.3 Monitoring the progress of the UK BAP

The UK BAP identified the long-term strategy for biological conservation over a period of twenty years. In 1996, the Government agreed a mechanism to review progress towards the national aims at five yearly intervals by the UKBG. The first quinquennial review was published in 2001. As part of the review process, the UKBG also commissioned an independent assessment of the views of stakeholders in the biodiversity process (Entec, 2000). Both documents identified that the initial aims, presented as the 59 steps, were too disparate to be used to evaluate achievements. The independent review assessed the action towards biological conservation against twelve 'means objectives'. These were derived through consultation to cover the range of activities against which action was considered necessary over the first five years to contribute to the delivery of the UK BAP. The UKBG (2001) review concentrated on progress towards the actions and targets of individual SAPs and HAPs and put forward a revised series of aims and objectives for adoption by the Biodiversity Partnership: this is a body proposed to succeed the UKBG within the newly developing framework of devolved administration to the countries comprising the UK. From these and other documents, the strengths and weaknesses of the biodiversity action planning process and the recommendations for future action are summarised. Emphasis has been given to the roles of targeted action plans for species and habitats and LBAPs within the delivery of the UK BAP.

3.2.4 UK BAP achievements, review and change

Overall, the UK biodiversity process was considered to have made a significant difference to biological conservation compared to the nature conservation infrastructure previously in place (Entec, 2000). The biodiversity process was judged as successful in bringing together, over a short period of time, a wide range of organisations covering all sectors that have a major influence on biodiversity. The biodiversity process was considered to have provided, *inter alia*, a business plan for nature with a structured approach to deliver resources, a focus on relevant issues, increased awareness and enthusiasm and a mechanism to set priorities, actions and measure success (Entec, 2000). The principles on which the UK BAP were founded (see Box 4) were considered to still be relevant and they were identified as central to the continued delivery of a targeted Action Plan approach to biological conservation in the UK (UKBG, 2001). The UK Biodiversity Group suggested a revised set of aims and

objectives that could act as a focus for future conservation action (see Box 7). Indicators of the success of the UK BAP were also suggested that both monitored the achievement of the Action Plan process and the achievement of conservation targets. Concerns were raised regarding the bureaucracy of the administrative process at national level (Entec, 2000) and it was deemed important to maintain a flexible and dynamic framework to respond to new knowledge and changing pressures (UKBG, 2001). A modified administrative structure was proposed with an increased role for Country Biodiversity Groups in the increasingly devolved administration of the UK.

Box 6 Proposed aims and objectives for the UK Biodiversity Partnership (from UKBG, 2001).

Aims

To maintain and enhance biological diversity within the UK, paying particular regard to:

- Overall populations and natural ranges of native species and the quality and ranges of wildlife habitats and ecosystems.
- Internationally important and threatened species, habitats and ecosystems
- Species, habitats and natural and managed ecosystems characteristic of local areas
- Biodiversity of natural and semi-natural habitats where they have been diminished over past decades
- To contribute to the conservation of global biological diversity
- To increase public appreciation and enjoyment of biodiversity and recognition of its value wherever it occurs
- To integrate biodiversity fully into policies and programmes as part of sustainable development

Objectives

- To maintain and keep under review an overall strategy for the conservation and enhancement of UK biodiversity priorities of the four countries of the UK.
- To bring together all relevant sectors to work in partnership.
- To develop, implement and keep under review targeted action plans for the species and habitats most important for biodiversity conservation.
- To take direct measures to conserve species and habitat diversity. In particular through the conservation of threatened or protected species and important sites, and through the management or control of non-native species.
- To encourage the preparation, implementation and review of Local Biodiversity Action Plans to support national biodiversity objectives and to take forward local priorities for action.
- To take steps to minimise the adverse impacts of human activity on biodiversity, both direct and indirect.
- To take steps to understand the effects on biodiversity of large-scale influences such as ozone depletion and climate change and determine appropriate responses.

- To integrate biodiversity considerations into public policies and programmes.
- To encourage more integration of biodiversity considerations into business policies and practices to support the delivery of biodiversity objectives.
- To take steps to increase public awareness of biodiversity issues.
- To identify, undertake and keep under review research and monitoring to support implementation of other objectives.
- To develop and maintain comprehensive and accessible biodiversity information systems linking national and local records.

3.2.5 Review of Species Action Plans (SAPs) and Habitat Action Plans (HAPs)

A major success of the UK BAP has been the publication of targeted action plans for 391 species and 45 habitats (UKBG, 2001). The process of publishing the action plans has been praised for offering, for the first time, a clear definition of objectives and priorities, a focus for action and a good means of measuring achievements (Entec, 2000). Each plan is lead by a Lead Partner (SAP) or Agency (HAP) responsible for co-ordinating the implementation of the action plan and reporting on progress: a total of fifty named organisations are listed as Lead Partners or Agencies by the UKBG (2001) - The inclusion of a Species or Habitat Action Plan is based on the definitions of status as defined in UKBG, 1995a (Box 7).

Box 7 Criteria established for the definition of species and habitats for action planning (based on UKBG, 1995a).

Species	**Habitats**
Species that are covered by relevant Conventions, Directives and legislation	Habitats for which the UK has international obligations
Species in danger of extinction and which are unlikely to survive without remedial measures	Habitats at risk; such as those with a high rate of decline, especially over the last twenty years, or which are rare
Species that are likely to become endangered if the factors causing their decline continue	Habitats which may be functionally critical, ie areas that are part of a wider ecosystem but provide reproductive or feeding areas for particular species
Species with small populations but at present regarded as not under any threat	Habitats which are important for priority species

The main hallmarks of the SAPs and HAPs identified by the UKBG (2001) are:

- Each plan is agreed through a consultative process involving the organisations whose actions and policies could influence the status of the species or habitat concerned
- Actions are assigned to members of the partnership who are principally responsible for delivery
- Measurable, time-limited targets are identified
- A Lead Partner or Agency is identified for each plan
- Wherever possible the plans are costed.

Lead Partners and Agencies reported progress towards the conservation of species and habitats to the JNCC. From the analysis of these reports, the success of the approach can be assessed.

In general terms the implementation of action plans appears to be having a positive effect: species with longer-established plans are more likely to show signs of recovery and progress against actions which has a positive effect on the status of the species (UKBG, 2001). One trend to emerge from the data is a distinction between widespread species (more likely to have populations still in decline) and species limited to a narrow range (more likely to have populations that have stabilized or are increasing). This is believed to be the result of successful, targeted action at the site-based level for species of limited range and the need for broad sustainable development policies within the wider countryside.

The amalgamation of the Lead Partner and Agency reports into a large database is a key area of continuing development at a national level to enable future work planning, monitoring and reporting. It is clear that the effective use and handling of the information derived from the biodiversity process at both a national and a local level is a key area for continuing efforts for improvement. For example, Lead Partner and Agency reports stressed that for 17 per cent of habitats and 55 per cent of species there was insufficient information to establish the current status of the habitat or species or any changes to that status (UKBG, 2001). For those species and habitats without good baseline data, there has been less progress towards targets, reflecting the need for research and survey before other conservation actions can be taken (UKBG, 2001). This was the main constraint to progress towards conservation targets reported by 299 Lead Partners (see Table 1).

Table 1 The top twenty changes that would aid Action Plan implementation, as identified by Lead Partners for 358 plans (34 habitats and 334 species). The amount of information provided by Lead Partners varies, consequently in the less comprehensive reports some constraints to implementation may have not been identified, so the figures presented may understate the position. (From UKBG, 2001).

Requirement identified by Lead Partner	**Percentage of plans**		
	Habitats	**Species**	**Total**
Additional research and survey	87.5	83.2	83.5
Extra resources (funding and staff time)	91.7	46.1	49.2
Improved access to information (eg a national database)	83.3	44.6	47.2
Improved habitat and species management	87.5	44.3	47.2
Communication and publicity to achieve increased involvement and awareness among landowners, mangers and the general public	75	43.4	45.5
A need for *ex-situ* conservation and reintroduction programmes	0	29.6	27.7
Changes to agri-environment schemes	91.7	23.1	27.7
Habitat enhancement (increasing habitat area and/ or quality)	66.7	24.6	27.4
Increased protection on statutory sites (including designation of additional sites)	70.8	22.5	25.7
Legislation and policy changes	79.2	18	22.1
Changes in farming practice	58.3	18.9	21.5

Requirement identified by Lead Partner	Percentage of plans		
	Habitats	Species	Total
Improved management of freshwater systems	29.2	10.5	11.7
Improved conservation outside protected areas	41.7	9	11.2
Reducing the impact of tourism and human recreational activities	16.7	10.2	10.6
Changes to the common agricultural policy	62.5	5.4	9.2
Improved species-specific management (reducing the effects of competition, non-native species, hybridisation or disease)	20.8	8.4	9.2
Reducing pollution	20.8	6.9	7.8
Reducing the impact of building works and other human development	12.5	5.4	5.9
Ameliorating the effects of climate change	12.5	4.2	4.7

Similar constraints were identified by respondents to the Entec (2000) survey that canvassed the views of individuals representing bodies involved in the biodiversity process. The need for additional resources and/ or commitment in addition to key policy changes were highlighted and Entec recommended that the current HAPs and SAPs be reviewed to identify if there was a need to prioritise certain action plans or actions given the resource limitations. The issue of resources is addressed in more detail under the review of Local Biodiversity Action Plans.

3.2.6 Review of LBAPs

The development and implementation of LBAPs was vested in the Country Biodiversity Groups after the publication of the initial guidance notes in 1997. There are approximately 160 Local Biodiversity Action Plans in the UK (UKBG, 2001) covering all of Scotland and Wales and most of England. Complete coverage of England has been identified as priority target for the England Biodiversity Group. Northern Ireland has adopted a slightly different approach and is developing a countrywide biodiversity strategy. The success of LBAPs should be judged on their ability to deliver national and local species and habitat targets (UKBG, 2001).

There is evidently a need for clear and effective communication between the national/ county action plan process and the local level if LBAPs are to reflect and deliver part of the national strategy for biodiversity. A report compiled by the England Local Issues Group (ELIG, 2001) identified that LBAPs were more likely to have contacted other regional or local groups or other LBAPs rather than the national species or habitat action plan steering groups. 74 per cent of LBAPs who have contacted the national species or habitat groups had not received advice. Perhaps not surprisingly LBAPs identified a potentially important role for regional groups; although the ELIG report that the area would need to be explored further to distinguish the role of regional fora.

The UKBG (2001) identified a need to improve the communication between national and local action plans. The development of local biological records centres linked to a national biodiversity network to report the activities of LBAPs and the production of guidance by Lead Partners of SAPs and HAPs regarding which national targets are best delivered by LBAPs, are suggested priorities (UKBG, 2001).

LBAPs are also vested with the task of identifying locally relevant conservation targets and thus LBAP partners need to reflect the opinions and concerns of the local population (Figure 2). The development and implementation of a large number of LBAPs using the partnership approach is a success of the biodiversity process (Entec, 2000; UKBG, 2001). Local partnerships and plans were considered a major mechanism to engage a broad range of groups and organisations in biological conservation. The level of engagement of local people, businesses, local authority members and others has been very variable across LBAPs (UKBG, 2001) and the number of organisations involved in biodiversity partnerships has been identified as an indicator of future progress within the action plan process. The independent review of the biodiversity process by Entec (2000) and the ELIG (2001) survey of LBAP practitioners asked which sectors were least involved or needed to play a fuller role in LBAPs. The following points were raised:

- LBAPs are most successful when Local Authorities are involved but not necessarily leading (Entec, 2000) and would be stronger if the links to Local Agenda 21 were more explicit
- Where LBAPs have been led by NGOs there may be a lack of credibility: particularly if the process becomes one where conservationists talk only to other conservationists (Entec, 2000)
- Business is the sector most LBAP co-ordinators feel are least involved or could bring more to the LBAP process (ELIG, 2001) as there has been a lack of involvement from industry and other businesses (Entec, 2000)
- Lack of involvement from agricultural and fisheries organisations and of farmers and landowners (Entec, 2000)
- Community groups and landowners were highlighted as not yet fully engaged in the LBAP process by approximately one quarter of respondents (ELIG, 2001)
- The academic community and the statutory organisations were identified as being able to contribute more at the local level (Entec, 2000). How this might work is shown in Figure 2.

Finally the resourcing of LBAPs is a significant issue of concern to LBAP co-ordinators (ELIG, 2001) and the UKBG (2001) has identified a need at the country level to assess the funding needs of LBAPs in more detail. Just over half the LBAPs that responded to the survey employed a dedicated project officer in a funded post. The posts were usually very short-term and typically were funded from more than one source. This short-term approach is at odds with the twenty-year vision for national conservation delivery. Baker, Shepherd and Gillespie (2000) considered the effectiveness of existing cost estimates developed by the Targets Group in support of SAP and HAP to predict actual expenditure through a case study analysis of one LBAP and two HAPs in the East of England. They found that there were great discrepancies between the estimated and reported costs for the sample Action Plans. This was, in part, due to deviation from the predicted amount of progress towards targets achieved during the time period. The report also highlighted the need to make clear the mechanism for the delivery of targets as this will influence the resource needs.

3.2.7 Interaction between national and local biodiversity action planning

Within the UK BAP, it is difficult to distinguish what might have been achieved by LBAPs in the absence of the national SAPs and HAPs given the importance of the delivery of

appropriate national targets at a local level. LBAPs have almost certainly benefited from the broader approach to targeted species and habitats that has raised awareness of the need for biological conservation. The UKBG has suggested that the coverage of LBAPs might be an appropriate indicator of achievement of the UK BAP process and there are several other suggested indicators linked to SAPs and HAPs that might have relevance to LBAPs. These are:

- The proportion of Action Plans making progress towards their targets
- The number of priority species and habitats showing signs of recovery
- The proportion of Action Plan targets achieved and the number of organisations involved in biodiversity partnerships

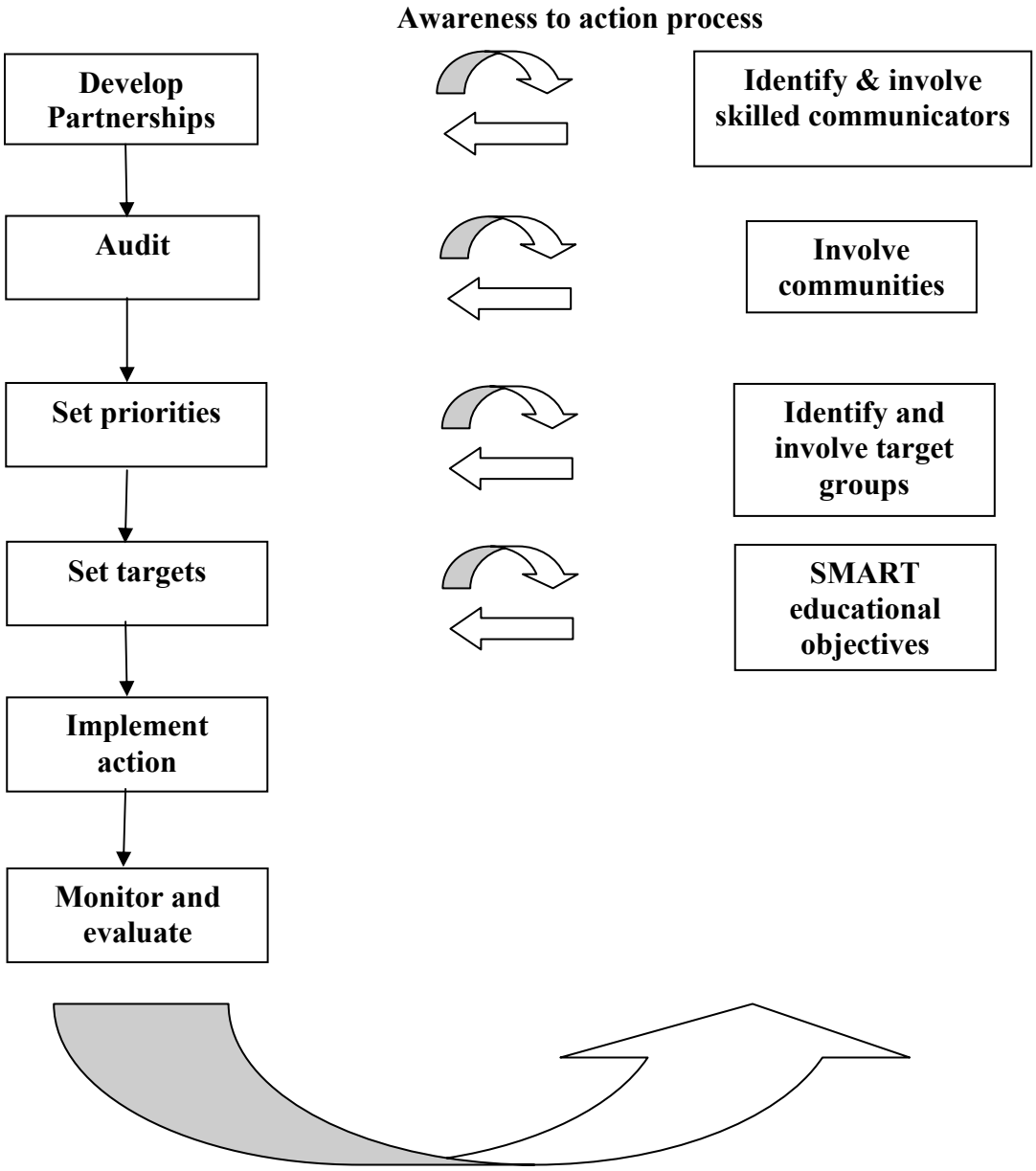


Figure 2 How a BAP framework might be used to inform educationalists and raise public awareness (adapted from UK Local Issues Advisory Group (2000), Guidance Note 6, DETR)

4 Consultation process for LGAPs

As well as investigating the framework for BAPs, a wider consultation process was undertaken. This took three main strands:

- Workshop
- LGAP Questionnaire
- Case Studies

4.1 Chester workshop

A workshop of about 25 invited participants took place on 15 January 2002, at Chester College. This think-tank was asked to first complete and bring with them an LGAP questionnaire and secondly to debate in depth the objectives, targets and indicators of geoconservation at the national and the local level. In the latter case, the participants were particularly asked to address the feasibility and mechanisms for doing this. The day was split into two. The morning re-appraised the national geological conservation objectives 25 years on from the start of the GCR process. The afternoon looked at delivering local geological conservation through LGAPs. Thus, the morning was set aside to address national initiatives of geoconservation in order to put the afternoon of LGAPs into context.

4.1.1 National objectives, targets and indicators

After splitting into several smaller groups and then amalgamating together, a consensus of the morning emerged shown below.

The national geological objectives

- To show the best examples that represent geological history in a scientific, educational recreational and cultural setting.
- To promote sites and make geoconservation relevant to people.
- To provide a national geoconservation framework in the form of a National GAP.
- To provide a geological audit and archive all sites.
- To influence planning policy guidance.

The national targets

- Identify and protect sites.
- Promote and interpret sites.
- Identify what users want.

One further national target was identified by one individual

- To put geology back into the national curriculum under its own name not under chemistry, biology, geography and physics.

The national indicators

- General usage especially by school groups.
- Inclusion in planning policy guidance and meetings.
- Site management plans.
- Local ownership demonstrated.
- Percentage of area reviewed within a time frame.

All groups stressed the need for a sharing of best practice and that everything should be action focused.

Identified problems

- The variability in RIGS groups development could pose a problem in areas where the group was weak or non existent as it seemed logical to ask RIGS to undertake the work perhaps in partnership.
- The need to raise awareness for protection especially among planners at both the national and local levels.
- The paucity of people with expertise willing to undertake the work
- The difficulty of implementing planning policy in this area. This was specifically identified later during one of the case studies by a planner.

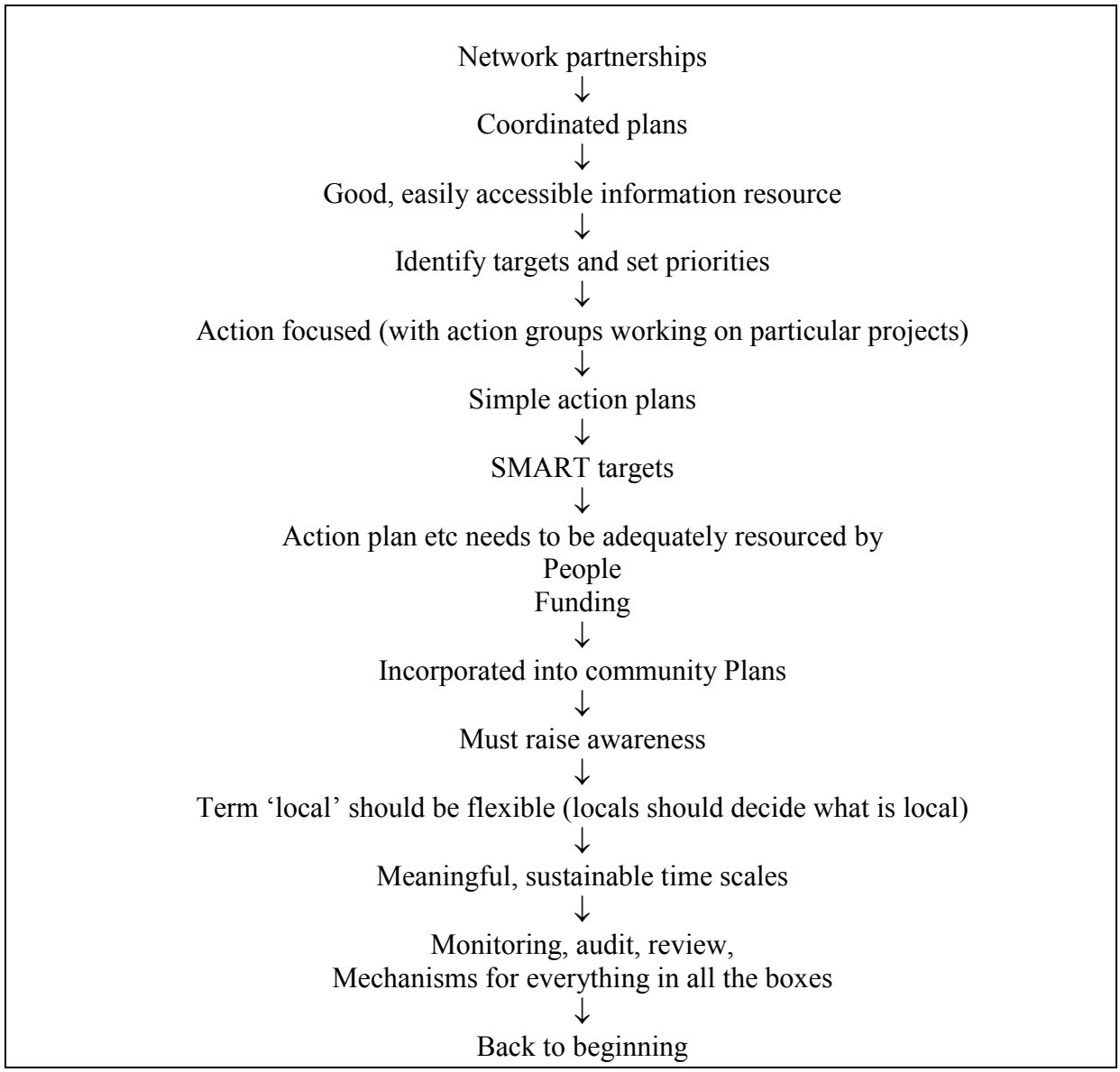
However, the main consensus arrived at by the workshop was the necessity for people, especially the local community, to be involved and available to take the initiative forward. Inevitably, funding was also an issue.

4.1.2 Local Geodiversity Action Plans

The afternoon session concentrated on mechanisms for local delivery. The LGAP questionnaires were used to focus discussions. Groups were asked to rank their ideals. Several groups found this impossible as they considered all issues to be important. Some felt that a plan was made up of parts all of which needed to be delivered. The RIGS groups were perceived as the deliverers of the LGAPs, but difficulties arose because of the different stages of their operations. However, all parties agreed that people must come first, a truly anthropocentric view!

Soon it was clear that two threads had emerged, one being an ideal process led action plan and the other a geologically-based set of targets. The former was put forward as the development process and is shown in Box 8.

Box 8 The development process for delivering an Action Plan.



This approach is seen as cyclic and is ideal. Comments were made that firstly it resembled a BAP. Doubts were cast on the prescriptive nature of the cyclic development process highlighted but it was stressed that this was based on experience (in Cheshire). A second point raised was that while it is ideal, it would not happen in practice.

This was seen by some members of the think-tank as incompatible with geological delivery. At the local level, this is largely done by volunteers who should have their say over how the plan should be approached and delivered. It will need to be relevant to them and locally focused.

The consensus that emerged from the Chester Workshop was that guidelines for LGAPs should include:

- Integrating interested parties across all disciplines, by having a structured steering group.

- Comprehensive site representation from International, National, Regional and Local designations.
- Data gathering standards.
- Defensible decisions.
- Proper resourcing, government driven but Unitary or Local Authority managed.
- Promoting as widely as possible the use of GIS, web sites, and maximising the benefits to communities.
- Establishing/maximising interpretation and offering guidance for educational uses.
- Focusing marketing in the local area and for local communities.

Later, guidelines should be provided for:

- Providing advice on appropriate site management.
- Establishing on going monitoring and research procedure.
- Linking datasets to BAPs.

The different stages of evolution, composition and information sources of the RIGS groups were again highlighted as a potential problem. LGAPs have to be delivered by the local people who know the local situation and they will be doing the local work. However to do this, there must be sufficient resources for both paid and voluntary helpers for it to work and this may be a problem.

The Statutory Agencies stressed the need to have national standards governing local work to give credence to the product, especially in the eyes of planning inspectors. National standards apply to quality, and standards of information, not the actual geological sites themselves that by the very nature of geology will be spectacular only in the local context. An example of this could be limestone pavements. The best in Britain lie in Yorkshire, Cumbria and Lancashire. However, the small ones lying in Denbighshire and Flintshire are very important to North East Wales, ie the local area.

In this way, LGAPs could resemble BAPs where national species are recognised but so are species of local importance.

Discussion on the timescales needed for plan production and implementation produced a mixed reaction with some participants looking at short snappy timescales and others being prepared to have longer ones. No consensus was forthcoming on this issue and it probably depends on the size and energy of the groups or partnerships involved.

4.1.3 What is 'local'?

The opening introduction mentioned the difficulty of defining local. Local merely means 'not national'. However, it could refer to regional groupings of for example RIGS groups or it could mean either county or district administrative areas. Perhaps the interpretation of local should be left to the individual areas. However, this could lead to gaps appearing in the national coverage.

4.1.4 Local Authority perspective

It is important to engage the local authority in the process of geoconservation. However to involve them fully it is necessary to see the wider context they work in. Much of the following is from Worton (pers comm), soon to be published in the UKRIGS fourth conference proceedings in 2002.

Because of their very nature Local Authorities have:

- Local focus.
- Political agendas.
- Local pride and strong opinions on this aspect of their work.
- Very limited geological experience in most cases.
- Plenty of other things to be involved in.

This wider context leads to the following typical perspectives from councillors. However it must be stressed that this is a broad-brush approach and there are many exceptions as highlighted in the following cases studies of Dudley, Chester, County Durham and Peterborough.

Box 9 Common Council attitudes towards geology

Passing / absent	As it is everywhere it goes unnoticed
Functional	Not Interesting
Problematic	Difficult, dangerous and expensive (eg mine collapse)
Distant	Irrelevant as it is elsewhere (eg Earth Story showed superb examples of geology but they were often in New Zealand, Antarctica, South America so not local)
Inconvenient	A long way from the car, In the wet
Not urgent	Quaint but not necessary

If typical perspectives of geology are as presented in Box 9, it is necessary to change these perspectives into positive actions. This is done in two ways either by:

a Making action obligatory - a duty.
b Making action wanted - a desire.

The first could be achieved by introducing legislation or planning guidance, the second by emphasizing the economic advantages perhaps in the guise of tourism and local distinctiveness. Both of these are shown to be valid in the case studies. It must be stressed here that it is the local, which is important.

4.1.5 'Local' geology

Another idea of local was to look at the geology itself. For example, the Permian limestone runs from Nottinghamshire to Durham. It is a local rock type with typical vegetation, building stone, agriculture and industry attached to it but this would be difficult if not impossible to

administer given the highly structured nature of Britain. Natural Areas were offered as a solution (Duff, 1994).

4.2 LGAP Questionnaire

LGAP questionnaires were devised based on the Ideal *** Inventory (Norton, 2001): an open-ended qualitative research tool that enables a rapid assessment of the views or beliefs of a large number of individuals when in-depth interviews are inappropriate or unfeasible. Questionnaires were distributed widely to act as a broad net to canvas the opinions of as many individuals as possible in a structured way. The questionnaire was available on the project website and was publicised in Earth Heritage in January 2002. It was also included in the January 2002 UKRIGS newsletter. Open University geology tutors, participants at the Chester workshop and other key individuals were also forwarded the questionnaire. The response rate to the questionnaire was very low with only eighteen replies received. However the interest its distribution created was wider, with many individuals contributing comments and views that did not conform to the structure of the LGAP questionnaire. Those views are embedded or represented elsewhere in this document. The views represented by the questionnaire respondents are considered separately. Their views are considered to be reasonably representative of conservation practitioners as the respondents are drawn from the private sector, local authorities, the statutory agencies, the RIGS movement and the university sector.

The questionnaire asks the individual to define characteristics of an LGAP in terms of an ideal/ not ideal dichotomy. The individual is then asked to rate each of these characteristics, where possible, in relation to their own experience of local geological conservation. In this way, both an ideal and actual description of each individual's perceptions are recorded. Each inventory is unique and there is a need to undertake an analysis of the content to produce a composite view of the ideal. This may be achieved by further consultation and discussion with the individuals who responded, either face-to-face or using internet discussion or may be undertaken by identifying broad headings and assigning to each the ideal characteristics described by individuals. The latter was undertaken in this case. The quantity of comments addressing each heading gives some indication of a relative ranking of the importance of this to the sampled individuals.

The seventy-six ideal characteristics identified by respondents were recorded within seven derived categories. The headings are:

- Personnel to deliver an LGAP.
- Geological sites.
- Information.
- Wider context of LGAPs.
- Public involvement.
- Aims.
- Planning.

Four characters are identified as fitting in two categories and are recorded twice. The number of responses within each category and the perceptions of respondents of their actual experience of geological conservation are summarised in Table 2. Overall it can be seen that

many of the ideal characteristics described were based on personal experience of geological conservation delivery. Nearly half the ideal characters described were very close or quite close to the respondents own experiences of geological conservation. It is clear that there is much good practice known to the sampled members of the geological conservation community and that this could inform the development of LGAPs.

Fourteen of the ideal characters were not ranked in terms of the respondents experience or the respondent was not able to summarise their experience on the questionnaire. The remaining twenty-seven ideal characters were linked to actual experience that was not ideal. It is hard to interpret the distribution of the actual experience of geological conservation across the seven derived headings with much authority owing to the low numbers of responses. However, cautious interpretive statements might include that there are relative weaknesses in current geological conservation practices within the categories of personnel and information and that relative strengths are in the categories of aims and public involvement.

Table 2 Numbers of ideal character responses per derived category from the content analysis of respondents LGAP questionnaires and the rating of respondents own experience of current geological conservation practice to deliver the ideals.

Derived Category	**Number of ideal characters**	**Perception of respondents experience of current geological conservation practice**				
		Close to Ideal (++)	Quite close to Ideal (+)	Unsure or no comment (o)	Quite far from Ideal (-)	Far from Ideal (--)
Personnel to deliver LGAPs	18	5	0	4	6	3
Geological Sites	14	8	2	2	2	1
Information	13	3	1	2	4	3
Wider Context of LGAPs	13	2	4	2	3	2
Public Involvement	13	4	3	4	1	0
Aims	9	4	2	0	2	1
Planning	5	2	1	1	1	0
Total	85	28	13	15	19	10

The largest number of characters submitted by the respondents described the personnel that would deliver an ideal LGAP. The comments are diverse but there are a number of general points that emerge. Firstly, that there should be an inclusive pattern of partnership and that the partners should include end-users of sites as well as bodies with an interest in the conservation of geology for intrinsic reasons. It is implicit in several of the characters described that there is a need for expert partners and that voluntary or unfunded support is insufficient. The latter two points are possibly interlinked. There is strong focus by respondents on the role of site selection, interpretation, management and monitoring. Site-related comments accounted for thirteen of the characters of ideal LGAPs and eight of these comments related to the need for stringent site selection criteria or offered mechanisms to identify sites for selection that would require detailed geological expertise.

There were thirteen and twelve characters assigned to the categories information and public involvement respectively. Within the information category, the need for an adequate baseline dataset that described the local geology was identified. Many characters of ideal LGAPs were defined in terms of the availability of that geological data, its' management and storage. Other characters in this category described the need for clear communication between members of the LGAP and the wider community. Here, there is some commonality with comments collected under the heading of public involvement. Of all the categories, the public involvement category shows least variance in the responses. The majority of the ideal characters described identify that the public should appreciate the local geological heritage, be engaged by the concept of geological conservation, be involved in geological conservation and take responsibility for geological conservation. The number and conformity of responses in this section is at odds with the description of the personnel that should be involved in LGAPs. There are only two ideal characters that specifically identify that 'people on the ground' or 'the general public' be involved in the LGAP partnership with a strong emphasis on the need for expertise to deliver an LGAP.

Twelve characters described the role of an ideal LGAP within a wider conservation context. These fall into two main themes. Five of the characters identify that an ideal LGAP would be well integrated with other initiatives, chiefly biological conservation, but also landscape character assessment, local building stone heritage, and environmental education. Across all these comments, there is a clear sense that the integrity of the geological conservation aims must be maintained.

The second theme to emerge is the role of LGAPs within a hierarchical structure of geological conservation. These ideal characters relate to the need for the general promotion of geoconservation to government and policy makers and the need for statutory authority support and guidance for non-statutory geological conservation at the local level. They also identify the need for interaction with other organisations at the local scale.

Nine ideal characters described either that an ideal LGAP would have clear aims and targets or gave detail on what those aims and targets might be. These characters are rather general and are not different to the aims and objectives elsewhere in the document. Finally, four characters are specifically related to the role of an LGAP to inform the planning process. There are other characters in other categories that also identify that the relationship between an LGAP and the local authority planning department is a critical one and some of the case studies that follow provide further evidence for this.

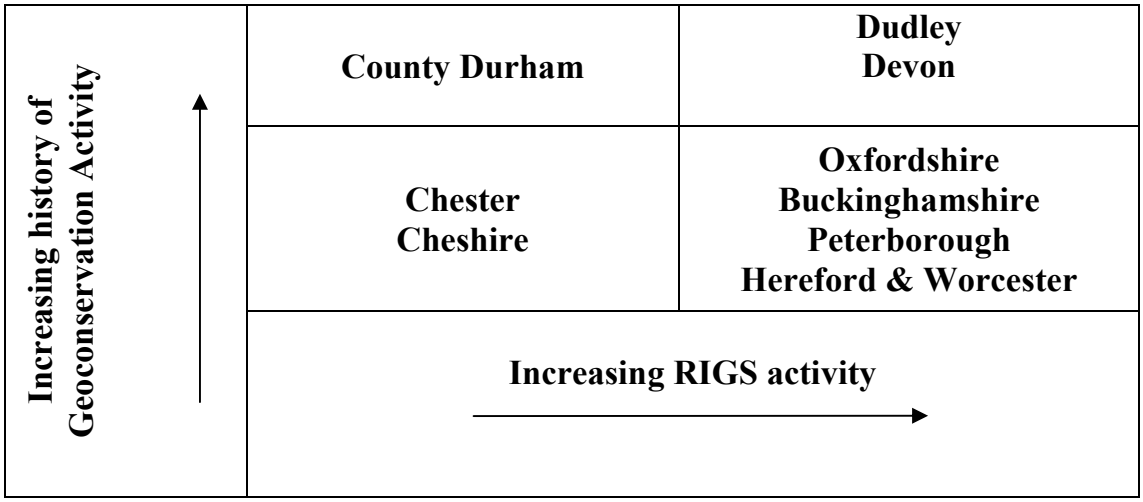
4.3 Case studies

In addition to the above wide consultation, it was decided to concentrate on several in depth case studies. These were selected based on different and novel approaches to local geoconservation. The present and absence of a RIGS group in the area was also of importance especially as at the Chester workshop it was consistently stressed that RIGS groups were at different stages of development but should develop or be part of delivering the LGAP.

It was decided to target four areas in detail, County Durham, Buckinghamshire, Dudley and Chester and highlight the work of several others where good practice could be shown. The four detailed studies all represented different cultural backgrounds, different RIGS

development and different geographical scales. This is represented in Figure 3 where the axes are RIGS development and geoconservation advancement.

Figure 3 Case studies within the context of the activity of geoconservation and RIGS.



4.3.1 County Durham

The history of geological conservation in County Durham is an interesting one especially as they have no active RIGS body at present. It also shows the importance of having the right person in the right place at the right time.

From 1974, County Durham had initiated second tier SPEIs (Sites of Particular Ecological Importance) beneath SSSIs within their planning system and this included a few geological sites. By 1991, RSNC was encouraging counties to adopt the name County Wildlife Sites (CWS) for their second tier nature conservation sites. County Durham decided to change the names but also decided to have a parallel set of County Geological Sites (CGS). A suite of CGS was approved by the Environment Committee in April 1993 (67 at that time). This was due to the influence of one person within the Authority. This ensured that the importance of geological interest would be highlighted within the planning system. The precedent had been set by CWS, which allows consultation on planning applications.

County Durham produced its Nature Conservation Strategy in 1993 and its Geological Conservation Strategy in 1994 (Durham County Council, 1994). There are four NNRs within the County and 18 SSSIs with geological interest. The strategy was seen as a first at the time and received much publicity (Anon, 1994). A number of meetings had been set up with local geologists, both academic and commercial, prior to publication and 66 further sites had been designated for their local geological interest. This number has now risen to 70 (Stobbs, pers comm). Reviews of CGS have taken place occasionally but increasingly biodiversity issues take precedent within the planning authority (Stobbs, pers comm). The RIGS process at the time was anticipated to take too long to produce the necessary agreements and documentation. Indeed only one RIGS site has been notified to date – Moking Hurth Cave.

The problem of land ownership also was identified as a major obstacle and this has been seen as a stumbling block elsewhere.

The document highlights three non-development plan policies:

- GCS 1 Maintenance of list of County Geological /Geomorphological Sites

  The County Council aided by expert opinion, will prepare a list of important geological and geomorphological sites in County Durham. The list will be maintained by the County Council and reviewed periodically in consultation with local experts.

- GCS2 Site creation

  The County Council will promote the creation of new geological sites at scientifically important horizons during the construction of major developments such as road building and improvements.

- GCS3 Education

  The County Council will assist in identifying and promoting suitable geological and geomorphological sites for teaching purposes

Under the section on management of geological/geomorphological sites, it states "the management of geological and geomorphological sites is often closely related to the wider system in which they are found and an integrated approach to their conservation as part of other land use management may therefore be required" (Durham County Council, 1994). The general principles applying to the maintenance of important sites are worth quoting in full (see Box 10).

Box 10 General principles of site maintenance (from Durham County Council, 1994).

1. Where a quarry floor is not part of the scientific interest, permanent developments can often be constructed without loss of interest provided they are located at least 5 metres from the base of the quarry face or any talus slope beneath it…..
2. Some clearance of vegetation and in certain instances, weathered debris (talus) may be required although the debris can in itself be of geological or archaeological interest. In limestone quarries which are also designated for their biological importance it is essential to ensure that any vegetation clearance will not be damaging to the site's ecological interest……
3. Interpretative tools such as leaflets, boards and guided walks will often play an important role in assisting visitors to have a better appreciation of the interest of individual sites.
4. Providing access to mining dumps etc. that can be periodically, "turned over" may well reduce the amount of hammering to which important *in situ* exposures are subject….
5. Where scientifically important sites that are also sensitive are involved, it may be necessary to restrict information solely to *bona fida* researchers…..
6. Periodic monitoring of key sites can often help to prevent further deterioration.

Thus, protection is in place in County Durham within the planning system but it is unlikely to expand further unless increased staff resources become available. Again, this highlights the importance of people taking the initiative when legislation is not in place to push it.

4.3.2 Buckinghamshire

In Buckinghamshire, the success of geological conservation is again down to one person. Here the Earth Heritage Action Plan was developed within the Buckinghamshire and Milton Keynes (Local) Biodiversity Action Plan 2000-2010. It has the same status as a HAP (Davies, 2002).

Within the Action Plan, there is a summary of the current importance of geology in the UK and in Buckinghamshire in particular. "Geology contributes in no small way to the shape of the human landscape and has guided many of its uses from the earliest times. Flint and clay for brick making, chalk quarrying and gravel extraction have all had significant effects on the County and its landscape" (Buckinghamshire Earth Heritage Group, 2000). The Action Plan also outlines the main threats to Earth Heritage Actions locally such as industrial and residential developments and lack of management but these threats could apply to sites anywhere. The legal status is also addressed with the RIGS sites managed by the Buckinghamshire Earth Heritage Group and the membership is detailed.

The Plan has four key objectives:

1 To introduce positive management to 10 sites with educational potential by 2005

2 To increase the knowledge and understanding of Earth heritage sites and generate 200 per cent increase in community involvement by 2003

3 To collate baseline data on the associated wildlife by 2005

4 To seek joint working between the geological and ecological communities.

These key objectives are then translated into the Action Plan. The detailed actions are costed with a lead organisation and target date given to each action. Each action is also cross-referenced to the key objective it serves. The target date ensures action or at least puts it on the agenda continually. Unlike many of the other HAPs in the BAP, assigning the lead partner was a relatively simple process, with the Buckinghamshire Earth Heritage taking the lead role. Oxfordshire RIGS group have also produced a costed action plan which is discussed later in this document. Table 3 is an example of part of the action plan.

Table 3 Earth Heritage Action Plan (Part of Buckinghamshire and Milton Keynes Biodiversity Action Plan 2000-2010)

Action	Lead	Partner	Target/ date	Level of action	Contribute to generic objective	Unit cost	Cost for plan (10 years)
Habitat safeguard & management							
2. Ensure nature conservation interests are taken into account in management	BEHG	WT, EN,	Ongoing	R	H4	Staff time	Staff time
Communication & Publicity							
9. Promote BEHG & seek 500 per cent increased members	BEHG	WT	2010	R, I	H2	£1000 pa	£10,000
15. Promote links between close RIGS groups	BEHG	WT	Ongoing	R	G8	Staff time	Staff time

H2 - To increase knowledge and understanding of EH sites and generate 200 per cent increase in community involvement by 2003.
H4 - To seek joint working between the geological and ecological communities.
G8 - To raise awareness of habitats and species. The plan includes actions, which seek to raise awareness of habitats and species conservation. It seeks to increase the number of people who are actively involved in nature conservation in the county and provide them with the necessary support. Increased awareness will help address issues such as balancing the needs of recreation and conservation and will encourage people to take a positive attitude to the need to conserve wildlife.
R - Regional
I – Individual

4.3.3 Dudley Borough Council

The Dudley area has long been involved with geological conservation. It began in the 1950s with the establishment of the Wrens Nest geological National Nature Reserve (NNR) and several SSSIs. (Box & Cutler, 1988).

The Black Country Geological Society had conservation on its agenda as early as 1975 as the primary purpose of the society was to campaign for protection and awareness of the local geological sites and other heritage such as museum collections (Worton, pers comm). The Black Country Geological Society and Dudley Museum and Art Gallery have a close affiliation, working together on geoconservation. The latter serves as the Geological Record Centre for the West Midlands. As such, it is responsible for representing geology at public enquiries through the curator(s) and answers general geological planning questions. Indeed the area's own industrial and cultural heritage is based on geology, so much so that until recently even the Town coat of arms had a trilobite, *Calymene blumenbachii*, as its emblem (Worton, 2000). The area has played a key role in the development of geology as a science. Although much of Dudley's resources are now depleted, the legacy left behind on the landscape need explanation and protection. This is done through a holistic approach for the visitor and professionals in development and planning alike.

The natural interest in the landscape heritage of the area has also led to the development of a holistic approach to planning within the Initial Draft Supplementary Planning Guidance as part of the Dudley Borough UDP Review 2011. The government advises separate Supplementary Planning Guidance (SPG) to supplement specific planning policies. In February 2000, the Economic Vitality Committee considered four separate parts of one document.

The Nature Conservation sections were developed by the Borough Nature Conservation Officer, within the Planning & Leisure Department and the Keeper of Geology within the Dudley Museum and Art Gallery respectively. The Historic Environment sections were produced by the Principal Conservation Officer & Borough Archaeologist within the Design & Development Division of the Planning & Leisure Department (Havers & Glaisher, 2000). So effectively, Dudley has linked together natural history, geology, landscape character and archaeology. This is a novel approach in an essentially urban area and little has been challenged on this approach during the last two years. The document is about to be launched on the council intranet site and the geological document to be published as a separate stand alone publication (Worton, pers comm).

The Borough has over 200 recorded sites including 6 SSSIs, 25 SINCs (Sites of Importance for Nature Conservation) and the first ever National Nature Reserve designated specifically for geology in Britain. This wealth of Earth heritage has made the Council Policy Requirements for geology quite strong. “Once inside the culture of the public organisation, geological conservation is far more sustainable” (Worton, pers comm). They have guideline policies to require:

- Conservation of existing designated geological sites.
- Conservation by record of temporary exposures.
- Geological assessment

The advice to developers (and here the guidance takes the widest possible definition of them and their activities) is to adopt a responsible attitude by recognising eight different obligations to society in general and the Council in particular. To highlight this, two examples are quoted. Developers are advised to:

- Recognise that it may be necessary for a full geological assessment of a development site to be undertaken prior to consideration of a planning application.
- Recognise that the Council’s first priority is the conservation and interpretation of geological sites and be prepared to discuss mitigation of any impact the development may have on significant geological features.

Effectively the Council requires developers to produce full EIAs or perhaps we should say GIAs (Geological Impact Assessments).

By incorporating the geological heritage alongside the biological and archaeological and thus capturing the support of people in general, it has been possible for the forcefulness of one or two individuals at the local level, to effectively conserve a county’s Earth heritage.

These first three case studies are very different in their approach but all show how one key individual can make a difference. “Where there is a will, there is a way.” The fourth case study is different again.

4.3.4 Chester City Council

Until recently, Chester and indeed Cheshire did have an active and effective RIGS group, (established in 1992). It covered the old county of Cheshire, ie Wirral was included. The geology is relatively straightforward in that most of the county is covered by mainly three geological Periods, the Carboniferous, Triassic and Quaternary. Initially they were an active group of academics, students, wildlife officers, planners and geologists, based in the Cheshire Wildlife Trust offices in Reaseheath. A grant was obtained from Cheshire County Council to undertake RIGS notification and designation. By 1997 between 100-200 RIGS had been either researched or designated. However, after the Manchester Airport second runway Public Inquiry, job movements, illness and death of RIGS members all took their toll on the protection of local sites within Cheshire and effectively designation ceased. The setting up of a constitution also caused the group to flounder. Recently, however, a new initiative has been instigated following the national meeting in Chester of the Local Agenda 21 coordinators in summer 2001. Here the participants were introduced to geodiversity, geoconservation and an urban geology trail sponsored by the City Council. In addition, the starting of a Rockwatch group in the Grosvenor Museum has kindled public interest in geology and geomorphology.

These two events and several key individuals have set the ball rolling by setting up a four man steering group (S. Woolfall, N. Harrison, (Museum Staff) and C. Burek, D. France, (Chester College)) for restarting with earnest the RIGS group. The initial meeting was held in April 2002 to set up a formal steering group to lead to a RIGS group.

This therefore is an ideal time for them (be they the Local Authority, the RIGS group or the City Council), to consider a Geodiversity Action Plan especially as they (the County and City Councils) wrestle with community strategies. Local distinctiveness is one of the key features within the strategy and while it is public and community led, it does allow for a wider interpretation of the guidelines set. Within the Community Plan for Vale Royal (2002) for example, the section on environmental well-being has a priority for a better environment for people to live in, work in and visit. Sitting underneath that, within the action, is encouraging and enhancing existing habitats and biodiversity. By adding geodiversity, you have raised public awareness. The last action detailed is to “encourage future development, to recognise the needs and local distinctiveness of communities” which can of course be a reflection of the underlying geological and geomorphological features.

The Chester Environmental Forum and the Planners, Archaeologists, Grosvenor Museum and ecologists are keen to join with geologists to form a pilot project to produce a Local Geodiversity Action Plan within the City. This holistic approach could follow the example set by Dudley as described above. The Cheshire County Archaeologists have just received (2002) Heritage Lottery Funding for two years to set up and produce a public archaeological stratigraphy database.

4.4 Other examples of good practice

The above case studies highlight novel approaches, which already have taken place with regard to safeguarding Earth heritage. All are taking place at the local level providing you accept that local in this context means *not* national. However there are other examples, which deserve mention.

4.4.1 Oxfordshire

Oxfordshire RIGS group has produced a pilot survey which has targets embodied within it (Windle & Childs, 2000). These include:

1 Create a robust assessment and designation protocol by the end of 2000

2 Earth Science audit of all potential RIGS sites within Oxfordshire by the end of 2004. This is estimated to be in the region of 1000 sites

3 To designate and input all RIGS sites into the County Councils GIS system, majority by 2007

4 To create a permanent RIGS presence within Oxfordshire in the form of a sustainable RIGS group by 2003

5 To create a database of all RIGS sites within Oxfordshire, that is accessible to all interested parties by 2003

These are exactly the targets, which were identified at the Chester workshop as being necessary within an LGAP. At present Oxfordshire RIGS group are updating their plan and the third draft has just been published. They highlight that creating a robust assessment has been difficult to achieve but progress has been successful on the designation form. They have also revised their No 2 target to be between 500-700 sites (Windle, pers comm). By April 2002, they will have notified 43 RIGS sites, 40 within the last year. The objectives are listed in Box 11.

Box 11 Objectives for the recently revised Oxfordshire RIGS group pilot survey (Oxfordshire RIGS group, 2002).

Objective 1

To audit the geological and geomorphological heritage of the County

Objective 2

To identify and protect Earth heritage Sites (SSSIs and RIGS) with regard to English Nature's 1990 and 2001 strategies and UKRIGS 2000 Strategy

Objective 3

To achieve and maintain management agreements for sites

Objective 4

To achieve and maintain conditions for appropriate access and use at suitable sites

Objective 5 To provide information and interpretation for selected sites Objective 6 To create and maintain a database of all sites Objective 7 To follow an open, pragmatic and inclusive approach with regard to all stakeholders, especially the general public

These satisfy the stated aim of providing protection, access and use of sites of Earth heritage value and raising public awareness of the value of the sites (Oxfordshire RIGS Group, 2002). It is hoped that this draft will be formally adopted by the Oxfordshire Nature Conservation Forum by the end of February 2002 (Windle, pers comm).

4.4.2 Peterborough

In 1996, Peterborough Environment City Trust (PECT) published its unique Natural Environment Audit, which contained little if any geology within it. This was rectified in 2000 when a complete geological audit of the City was undertaken by a postgraduate student under the guidance of PECT, Peterborough City Council and Stamford & District Geological Society. Like Dudley, Peterborough City has a geological part to its coat of arms, in this case the motto "Upon this rock". The audit revealed 20 sites of importance of which seven were significant enough to be considered as RIGS to be adopted as Supplementary Planning Guidance (SPG). The response to the audit when put up for a three-month public consultation "was quite overwhelming from all sectors of the community" (Cripps, 2000). Each of the seven proposed RIGS had an action plan attached to it and six were finally notified to the local authorities. "The group is currently visiting the RIGS again to see which to tackle first. This will depend on circumstances like quarry operations and the availability of funds" (Cripps, 2000, 2000a, Larwood, 2000).

4.4.3 Western association

In the western part of Britain is a collaborative association of RIGS groups. The membership currently includes the following RIGS groups: Avon, Gloucestershire, Herefordshire & Worcestershire, Oxfordshire, Shropshire, Warwickshire and Wiltshire. The aim of the Association is to share experience and advice and where possible, resources so that stronger groups are able to directly aid weaker ones (Hereford & Worcestershire RIGS Group, 2001). This is admirable and their achievement within their first year is to be complimented. The achievements of particular interest to this report include:

- Funding for the employment of seven part-time RIGS officer posts over the Western Association area
- Joint use and testing of recording software and activities in semi dormant member groups
- Training in recording and site assessment techniques and the development of volunteer training initiatives.

The RIGS groups in the area have formed partnerships with County Record Centres, Wildlife Trusts, County Councils, Universities and the Association of UKRIGS. 550 sites have been designated to date (Oliver, 2001).

4.4.4 Devon

In Devon, the approach has been slightly different. Here the move has been away from the traditional idea of just notifying and safeguarding RIGS. These were included as part of the Local Biodiversity Action Plan (Mason, 1998). The approach has moved towards an educational emphasis. Devon RIGS, English Nature and Devon County Council have joined forces to produce an educational register of geological sites. These, like in County Durham, are called County Geological Sites. The register is both on the web and available as a CD-ROM (Chamberlain, 2000). However the CD-ROM version was only produced for key partners. This register seeks "to draw attention away from the best known and most visited sites on the coast to a plethora of inland locations" (Larwood, 2000). The exact extent of use however is impossible to gauge even though some positive feedback has been received, (Chamberlain, pers comm). However, once again the impetus has come from satisfying one of the LBAP objectives, to foster the greater use and understanding of the field sites.

5 Discussion

5.1 Consultation comments

To take the Action Plan process further forward and following extensive consultation, several other key factors have emerged. Colleagues have been eager to express their views and have been liberally quoted in italics to support the following points

- People are a key resource. Without the necessary expertise and enthusiasm, LGAPs will not be developed and maintained.

  This is shown by the case studies above.

- Funding for this must be found and widely dispersed

  "People who are paid to take the lead and to collect a group of volunteers around them"

  "Funds for a facilitator for say 3 years to cover 7 or 8 counties"

  "whoever wants a joined up national strategy (UKGAP) they need to underwrite it financially"

  "Achieved only if there is cash available"

- A national strategy must inform local strategies

  "GCR network implies a strategy which could be transcribed as a UKGAP"

- Time constraints should be set for plans and/or targets

  "Plans in each county……within a 5 year time scale"

- A holistic approach demands the spatial scale as natural features whether landscape, biological, geological or archaeological do not stop at administrative boundaries.

"…preserve type-locations of rock, soil with their indigenous flora and fauna within a region. This would allow a more complete approach to biodiversity management, eg many plant species are restricted to certain soil types, which in turn can be restricted to certain rock types. One question is how large would the region have to be?"

"Produce geodiversity maps for the local area"

Certainly, the possibility of using Natural Areas has been discussed and indeed in one meeting the planner while agreeing it would be a nightmare to administer, admitted Natural Areas made more sense from the conservation view.

- The local community must be involved and have an ownership role.

  "Encourage public education, participation, action and responsibility for the local geodiversity and distinctiveness"

  "Promote countryside character"

  "Sites that characterise the local geology"

  "Fine tuned for each county"

- Partnership is necessary

  "Involves ALL the appropriate local groups and authorities"

The preceding case studies and individual comments identify many examples of good practise but also highlight problems to be avoided.

Four further questions need to be asked.

Is there a difference between EHAPs and LGAPS?

There is little difference between them except in their framework of production.

Is the RIGS partnership sufficient to deliver LGAPs?

The answer is not everywhere. A target at the national level for English Nature must be the need to marry boundaries at the national level. There can be no gaps. Perhaps an analogy here could be the oil blocks, which are put up for auction by the national government but bid for by individuals. To develop LGAPs, groups would need to apply to English Nature or UKRIGS or some other designated national body. It is very important to have national coverage and this could prove an effective way of providing it. This would enable the system but not prescribe it by providing a framework.

It must be recognised too that if LGAPs mirror LBAPs then there will be a greater appeal for Local Authorities to provide them than some RIGS groups. There is no external driver for government and this must be recognised.

Are LGAPs worth pursuing?

Yes because they are more than UDP plans, more than BAPs and can reinforce "Public Geology". (See Figure 1) They encourage partnerships, and provide a framework of delivery but must not be regarded as a universal panacea. LBAPs have been successful but have identified major problems with delivery.

How will LGAPs be delivered successfully?

This forms the basis of the following section.

5.2 Models

Two models emerge for producing LGAPS. See discussion of recommendations (Section 6).

5.2.1 Model 1

Model 1 already being delivered by some organisations is the preferred delivery.

LGAPs are equivalent to LBAPs with a wide remit to deliver conservation action and the RIGS groups should deliver them if they widen their remit beyond just designating sites to Local Authorities. They must form partnerships either as the lead partner or as subsidiary partners in areas where the RIGS group is weak.

5.2.2 Model 2

Model 2 uses LGAPs as a generic term to describe any number of processes where geological action planning is used within existing structures and delivery. It has different meanings in different places: it may be geological conservation delivered through structure plans, BAPs or RIGS sites. This approach does not allow any sense of continuity across areas and the diversity in this case will act as a barrier to public understanding of geological conservation (see Figure 1). This is the least preferred option.

5.3 Summary discussion

The above discussion has led to several key factors emerging.

For the Geodiversity Action Plans to be successful at the local level:

- Funding must be forthcoming for monitoring and maintenance. This must be sustainable. It is straightforward to obtain money to set up a pilot project but if data bases are to be maintained and sites monitored money must be made available for a prolonged period. Therefore, the system must be embedded somewhere where it has value. Money from industry could be targeted here, eg Aggregates Levy Sustainability Fund or Landfill tax.
- Committed workers must be found to do the work. One idea piloted by both the Devon scheme and NEWRIGS is to use students who are doing the work as part of their degree programme. All geology students are normally compelled to undertake mapping. Surely assessing, monitoring and producing management plans for geological sites would be as valuable. Environmental Science students too as well as

some geography students could choose to do this. Here is an informed body of students perhaps employed either by the RIGS groups or the local authority to undertake the work for academic credit. The students might also earn a small amount of money and the local authority or the RIGS group would be able to undertake the work in the action plan. A precedent has already been set by the BGS who employ students on a part time basis in the summer for mapping projects or by Chester College who encourage students on work based learning in their second year to go into local government and undertake projects for them. This has been successful in for example the ECONET project or in the Cheshire Brown Hare BAP.

- Action Plans must be devised by partnerships of Local Authorities, RIGS groups, Museums, academics, industry, Wildlife Trusts and agencies. However, the local authorities should be charged with setting up the initial meeting if the Statutory Agency is unable to do so. Initiating the meeting does not mean taking the lead in the partnership. This can be an appointment of the best partner. Here the example of BAPs can be used.
- The authority for delivery must be the Local Authority if it can be embedded within planning guidance policies or the Statutory Agency if embedded within wider government legislation.
- Promotion, publicity and policies must be people friendly.
- As already discussed Model 1 is the preferred option.

6 Discussion of recommendations

After extensive consultation and reflection, the following recommendations of how a model LGAP could contribute to a targeted approach to geological conservation are made. Thoughts on a direction and context for RIGS conservation have also been included.

The Recommendations fall into four main areas:

- Information processing and dissemination.
- Action planning
  - Objectives
  - Targets
  - Indicators.
- Delivery models and Pilot Studies.
- Funding.

6.1 Information processing and dissemination

Three main points emerge under this heading.

- The need for a National GAP supporting a national database.
- The need for this data to be used at all levels.
- Transfer of information must be up as well as down and sideways

The importance of a national database was repeatedly stressed by both the planning authorities and the local groups. Who should have responsibility for the national database? UKRIGS and English Nature (as in the case of biodiversity is NBN and JNCC).

The existence of a national GAP with identified priorities and targets for geological conservation may have the benefit of cascading a national agenda through the LGAP system to a much wider audience of individuals and groups. This might be of significant support to an emerging LGAP system.

However, access to this could be sensitive as some material might be confidential. Further research on this aspect needs to be carried out perhaps looking at the Land Registry and the National BAP database as well as the local rECOrd discussion group in Cheshire (Local Biological Records Centre for Cheshire, 2002).

The overall purpose of LGAPs is to help geoconservation at the local level. In order to gain local support from the community, information must be available wherever possible for eg education and leisure pursuits.

It is possible that geological conservation could benefit from both the experience of the biological conservation sector and from the resources already developed within the biological conservation sector. Both biological and geological conservation are the responsibility of the JNCC and the Country Statutory Agencies. There may be potential to share infrastructure and reduce resource costs, for example, by shared websites, databases and information networks.

6.2 Action Plans

- There should be a National Geodiversity Action Plan, which both feeds and is fed by the Local Geodiversity Action Plans (LGAPs).

The Consensus of what an Ideal Local Action Plan is that:

- They should be simple and easy to implement.
- The objectives must be clear and straightforward.
- The targets should be achievable and timed.
- A local audit of resources must be the first action to establish the size of the task.
- The monitoring must be straightforward, otherwise the task will prove too time-consuming and difficult to complete.

By necessity, these are generic, as local plans must contain local priorities devised by local people.

The implementation of species action plans (SAPs) has been very successful for site-based conservation but less successful for widespread species. This implies that the action planning approach will be well suited to site-based geological conservation.

The closest possible model now for LGAPs is the BAP system so in order to keep abreast of best practise in this area and to learn by their mistakes in local areas, monitoring of LBAPs

should be undertaken. However, LGAPs must be informed by national guidelines eg objectives, targets and indicators.

6.2.1 Objectives

The Chester Workshop provided a consensus and identified the following National Geological Objectives:

- To show the best examples that represent geological history in a scientific, educational recreational and cultural setting.
- To promote sites and make geoconservation relevant to people.
- To provide a national geoconservation framework in the form of a National GAP.
- To provide a geological audit and archive all sites.
- To influence planning policy guidance

These have been discussed at length in the report. However, at a national/ country level, the aims and objectives of geological conservation should be clearly defined. The aims and objectives should be reviewed regularly in association with a process of monitoring the achievements towards the aims and objectives.

6.2.2 Targets

National/ country level priorities need to be set for targeted conservation action.
The Chester Workshop provided a consensus and identified the following National Geological Targets as:

- Identify and protect sites.
- Promote and interpret sites.
- Identify what users want.

Criteria for adopting national priorities could inform the decision-making by focusing action on geological sites that are:

- covered by legislation.
- at risk/ in decline.
- representative of the landscape character or local distinctiveness of an area.
- rare

LGAPs may not be able to deliver all national geological conservation targets.

Gaps in the knowledgebase of the status of the geological resource at the local level should be addressed by auditing or recording. This will ensure that the geological conservation targets set by LGAPs address the geological conservation needs of a local area.

There is a need to ensure that LGAPs develop realistically achievable targets and do not expend effort on conservation priorities best achieved at the national level or unattainable

given existing constraints, such as resource availability, legislation and policy. This will probably require guidance on what can be achieved by local geological conservation partnerships.

Targets for action need to be underpinned by specified mechanisms if funding costs are to be calculated.

Some important actions are never completed, for example monitoring. The achievement of action plan targets, as an indicator of success must be mindful of this, as it is a process not a product.

6.2.3 Indicators

The Chester Workshop provided a consensus and identified the following National Indicators by an increase in:

- Raised general usage especially by school groups.
- Inclusion in planning policy guidance and meetings.
- Site management plans.
- Local ownership demonstrated.
- Percentage of area reviewed within a time frame.

Indicators for LGAPs might include:

- Coverage of England by LGAPs.
- The number of organisations involved in LGAPs.
- The proportion of LGAPs making progress towards their targets
- The proportion of Action Plan targets achieved.
- The number of sites designated.
- The usage of sites.

These again are generic as local groups must take account of local conditions.

6.3 Delivery models and pilot projects

Two models have been developed.

6.3.1 Model 1

An LGAP model, based on RIGS delivery but with wider, more inclusive membership, should be able to deliver:

- The designation and notification of sites within the area covered by the action plan. Sites designated on the basis of known geological resource (ie must be an audit) and using the four categories –protected by legislation, in decline, etc, as outlined

previously. This requires specialised knowledge and ability- here RIGS is already strong but should have greater involvement with Higher Education.

- Securing the maintenance, monitoring and interpretation of all designated sites (ie membership must include landowners/ managers with sites designated; must include whoever will monitor the sites, whoever may fund the monitoring programme and importantly must include end users).
- The embedding of geological action planning within local biodiversity action plans (ie one or more RIGS member should be part of the LBAP partnership). This should lead to reduced conflict between geological and biological on-site conservation and will also further encourage the idea of geological sites as habitats eg mud flats, sand banks, bare rock etc.
- The embedding of geological action planning within local authority UDP plans (ie RIGS membership must include a member of the Planning Department for all councils within the area covered by the plan).

6.3.2 Model 2

Any existing plan for geological conservation could be considered an LGAP, for example an EHAP is considered equivalent. This cannot deliver the breadth. It is reliant on 'an individual being in the right place at the right time' rather than the RIGS group comprising the right people in the right places. It has limited scope for development but is not ideal.

6.3.3 Comparison of the two models

What are the advantages of Model 1?

- It can be funded by English Nature as a pilot scheme irrespective of the current state of the protection of the geological resource/ stage of development of the RIGS group as will set its own appropriate targets.
- More people are involved. More targets are set. More action and more varied action is encouraged.

What are the advantages of Model 2?

- Likely to be highly focused and able to deliver defined targets as long as personnel are constant.

LGAPs should support the SSSIs but at a different scale. Thus, it is envisaged that several Pilot Projects will test out the theories and practices highlighted in the report and test the feasibility and mechanisms for delivering LGAPs using the two models developed above.

LGAP partners should be drawn from, the local authorities within the area covered by the plan, representation from the statutory bodies, landowners, nature conservation organisations, land-users for example, the Ramblers Association, the education sector (both in their capacity to act as end-users but also as expertise from the Higher Education sector) and all geological groups!

The inclusion of LGAPs within the Local Authority planning structures will be enhanced if note is taken of the Planning Policy Guidance. Examples of this are highlighted above under case studies. This should be encouraged countrywide. It is also advisable to embed them in other guidance eg Local Cultural Strategies (Cheshire Cultural Strategy, 2002) where geodiversity advantages for tourism and local distinctiveness can be shown. An economic advantage to conserving geodiversity in an area will encourage Councillors to pay more attention to the resource. Therefore, Local Authority planners and others need to attend workshops to explain what and how local geodiversity can be used to their advantage, ie the local input.

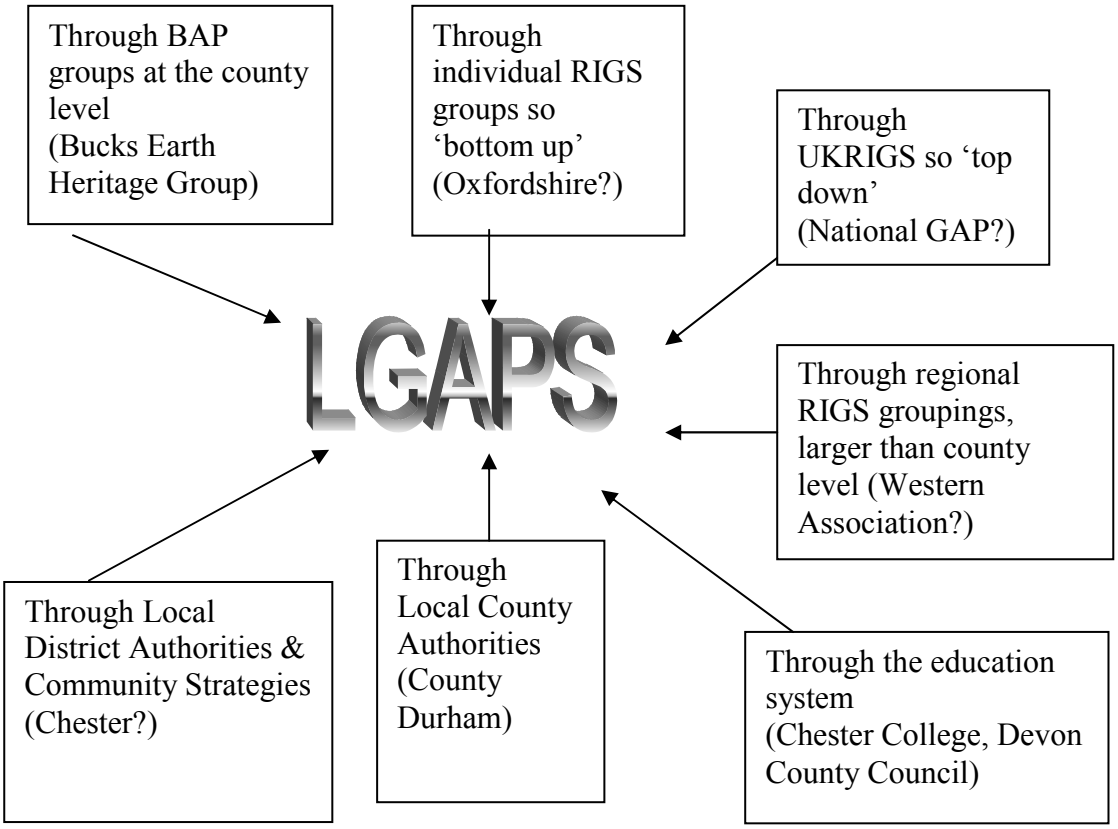


Figure 4 The different scales, which could be piloted from national through regional to local. Examples of specific areas are shown in brackets.

The place of the public is seen by many as outside the process of geoconservation with nothing to contribute to an LGAP other than 'to be educated'. Perhaps there is a need to stop thinking of the public and think of delivery to target groups such as school parties, ramblers and climbers.

As far as delivery of objectives, targets and indicators within the pilot studies, it should be recognised that indicators and objectives can be specified at this stage but targets are difficult at the local level as they will be both process targets and conservation targets. These will be determined by both the stage the group is at and the local context. As models it will be difficult to be anything but generic. Outlined below are possible objectives, targets and indicators which could be used (Table 4).

Table 4 The possible National and Local objectives, targets and indicators

National	Local
Objectives • To deliver site-based geological conservation of internationally and nationally important geological sites • To promote local site-based geological conservation of resources that are: (i) covered by legislation; (ii) that are at risk/ in decline; (iii) that represent the landscape character or local distinctiveness of an area; and (iv) rare. • To increase awareness of landscape character and distinctiveness and offer continued support for initiatives that recognise this, such as AONB and National Parks • To provide support and guidance to LGAPs • To collate and disseminate best practice among LGAP practitioners • To develop an information strategy for the storage, management and dissemination of geological conservation information	**Objectives** • To audit the local geological resource • To evaluate and prioritise actions and set targets for local geological conservation • To deliver local site-based geological conservation of resources that are: (i) covered by legislation; (ii) that are at risk/ in decline; (iii) that represent the landscape character or local distinctiveness of an area; and (iv) rare. • To embed appropriate local geological conservation targets within community strategies, UDP structure plans, LBAPs, LEAPs and any other plans that impact upon the local geological resource • To increase public awareness and appreciation of the landscape character and distinctiveness of the local area
Targets • Complete cover of England by LGAPs • No overlap in delivery of LGAPs	**Targets** • No generic targets possible • Local process and conservation targets only
Indicators • Coverage of England by LGAPs • The proportion of LGAPs making progress towards their targets • The proportion of Action Plan targets achieved • The number of sites designated • The use of geological information	**Indicators** • The number of organisations involved in LGAP partnerships • The number of organisations identified as responsible for the delivery of targets • The proportion of Action Plan targets • achieved within the timescale outlined for delivery • The number of sites designated • The use of sites identified through the LGAP process • The use of information derived from the LGAP process

6.4 Funding

LGAPs require the investment of time and effort from a range of committed individuals and groups. This investment must be supported by a clear and adequate funding mechanism to resource the development of LGAPs and the delivery of their targets.

The importance of funding cannot be underestimated. Voluntary groups need support to function efficiently and local authorities will be encouraged to participate if funding is forthcoming.

The lead partner or official of the LGAP should be funded through a national body and be able to provide adequate support to all. Money must be set-aside for this.

6.5 Imminent developments

We are dealing with a rapidly evolving system. Further developments on Local Site System developed by DEFRA needs to be taken account of. The recommendations are due to be published at the end of March 2002. This will give raised legal responsibility to Local Authorities.

Similarly, the outcome of the Aggregates Sustainability Levy Fund should be watched. This document is out for consultation and recommendations for LGAPs should be made. Both these government moves could have a significant effect on LGAPS.

Table 5 Summary of recommendations in the above discussion

Information	The need to develop and resource a clear structure to facilitate the flow of information derived from LGAPs both to other LGAPs and to a national database should be a priority.
	The storage, management and dissemination of GAP information should be carefully considered to allow the data to be used for the variety of purposes and end-users.
	The website should be retained and act as a discussion forum for further issues arising…
Action Plans	There should be a National Geodiversity Action Plan, which both feeds and is fed by the Local Geodiversity Action Plans (LGAPs)
	Identify which aspects of national strategy and action plans could be effectively achieved at the local level.
	RIGS need to work in closer partnership with end users etc. if they are to deliver LGAPs.
	Embed LGAPs in Local Structure plans of all types.
Methods of delivery	Local Authority Workshops for local geodiversity issues
Pilot projects	The Action Plans could be delivered at different scales in one of seven different ways as shown in Figure 4
Funding	The lead partner or official of the LGAP should be funded through a national body and be able to provide support to all.

7 Conclusions

At present, there appear to be two ways of implementing Local Geodiversity Action Plans. The first is by RIGS groups embedding them as Habitat Action Plans within LBAPs. This is true for Buckinghamshire and Oxfordshire RIGS. The second is to have them as supplementary planning guidance within the local authorities. This is the case for County Durham and Dudley. If we refer back to Figure 1 we can see how this fits in with the two methods of geoconservation. However, are we in danger of losing the term LGAPs if either of these two are followed? LGAPs should be delivered in their own right.

Two models emerge, one with a wider remit and one with a restricted delivery. Model 1 is preferred.

Throughout history, as mentioned in the introduction, geology and to a certain extent geomorphology are seen as destructive sciences as well as descriptive sciences. This perspective must be changed. In 1969 with the landing on the moon people saw for themselves the Earth as a single unit. This eventually led to a different environmental philosophy, Ecocentrism where man is part of the ecosystems not apart from them. This holistic approach to nature conservation issues is a recent phenomenon and only time will tell if academic research and subsequent teaching will follow this line of thought. This will then bring up a generation of people happy with the complicated issues that studying our Earth entails. Earth system science looks at this in depth and if geoconservation can also be set in this context, advancement is possible (Woodcock, 1995).

Today partnership is the key word for much research, be it excavating an archaeological site or working on the palaeoecology of a Quaternary deposit. It should not be so surprising that this is probably the key to successful local geoconservation too where there are so many interested parties. Partnership, like marriage, must involve compromise, give and take. This is as true for the planners as it is for Wildlife Trusts and RIGS groups. They all have a responsibility to the next generation to deliver *their* sustainable future. They will not forgive us if we do not try, even if we do not succeed.

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Research Information Note

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Local Geodiversity Action Plans – Setting the context for geological conservation

Report Authors: Cynthia Burek and Jacqueline Potter Date: 2006
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Introduction

Local Geodiversity Action Plans provide a new and effective route to achieving geoconservation. This research report provides the rationale for Local Geodiversity Action Plans (LGAPs). It examines previous work (up to 2002) on local geoconservation and draws comparisons with the work of Local Biodiversity Action Plans (LBAPs). The report provides case studies highlighting differing approaches to geoconservation at local levels and suggests models for the production of LGAPs.

What was done

In 2002, the authors held a workshop to bring together geological conservation practitioners to discuss the mechanism for producing and delivering an LGAP. This workshop also produced a series of objectives, targets and indicators for geoconservation at national and local levels.

The authors examined the biological conservation process of UK BAP and LBAP to establish the action planning process. In addition, in depth case studies were produced to highlight different and novel approaches to local geoconservation, which could feed into the action planning process. Four areas were examined in detail; County Durham, Buckinghamshire, Dudley and Chester and several other areas were highlighted as examples of good practice.

Results and conclusions

The proposed model for LGAP production is based on delivery by a partnership of local geology groups in conjunction with local authorities, industry, education groups and other interested parties. It is envisioned that this group would be able to audit, designate, monitor and manage local geological sites and embed geological action planning within local authority and other local plans. This model would involve a wide range of groups and would encourage a wide range of actions. A series of generic national and local objectives, targets and indicators have been produced. These are discussed further in Burek and Potter (2004) where actual LGAP aims, objectives and targets are compared from a number of case studies.

English Nature's viewpoint

English Nature supports the LGAP process and believes LGAPs provide a good mechanism for achieving geoconservation at a local / regional level. It has been widely agreed that a national overview could help emerging LGAPs share their knowledge, provide good practice guidance, establish common standards and help the process to gain wider acceptance within the conservation and planning communities. As part of English Nature's support for the LGAP process an e-mail communication network 'Mind the LGAP' has been set up and a website created to share information and promote good practice. English Nature also intends to create a framework for a national geodiversity action plan.

Further information and advice on LGAPs can be found at http://www.english-nature.org.uk/special/geological/lgap.

Selected references

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Further information

English Nature Research Reports and their *Research Information Notes* are available to download from our website: www.english-nature.org.uk

For a printed copy of the full report, or for information on other publications on this subject, please contact the Enquiry Service on 01733 455100/101/102 or e-mail enquiries@english-nature.org.uk

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Peter Wakely/English Nature 17,396
Middle left: Co_2 experiment at Roudsea Wood and Mosses NNR, Lancashire.
Peter Wakely/English Nature 21,792
Bottom left: Radio tracking a hare on Pawlett Hams, Somerset.
Paul Glendell/English Nature 23,020
Main: Identifying moths caught in a moth trap at Ham Wall NNR, Somerset.
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