

Environmental Capacity in the East Midlands: an evidence base fit for purpose

Final Report

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1 Non-Technical Summary and Recommendations

This report relates to the initial study into the measurement of Environmental Capacity within the East Midlands Region. The objectives of the study are set out in Section 2; this study is a scoping study, hopefully forming part of a larger project to consider:

- a. What indicators/measures of Environmental Capacity can be put into place in the near future within the region?
- b. What are the aspirations regarding longer term indicators / measures of Environmental Capacity in the region?

As part of the study, relevant employees from local authorities and other key agencies within the region were interviewed by telephone or by completing a questionnaire by email. The interviews covered the current data collected/used in monitoring and the possible link to the monitoring of Environmental Capacity as well as the interviewees' awareness of and attitudes towards Environmental Capacity as a monitoring tool.

This report contains:

- The context to the current study.
- An overview of Environmental Capacity and linked concepts.
- An explanation of the relevance of Environmental Capacity to spatial planning generally and the East Midlands Region in particular.
- An analysis of selected relevant studies and their implications for this work.
- The main findings of the interviews with local authorities and key agencies.
- The main finds of the workshop.
- Recommendations on the way forward.

The majority of individuals consulted in this study see the potential role of Environmental Capacity in achieving Sustainable Development in the region and the need for maintaining and improving environmental capacity because of the '*already depleted*' and current '*low starting point*' of the region. Specifically mentioned benefits include the potential power of Environmental Capacity in making local decisions on locations of development and in wider strategic policy on sustainable growth plans across the region.

The use of Environmental Capacity within spatial planning is also seen as providing a means for embedding the environment into the minds of other people engaging with the planning system (i.e. mainstreaming sustainability). Indeed, the use of Environmental Capacity at a landscape scale could potentially provide the sustainable basis for a wide range of decisions, including: inward investment, tourism, the environment, social aspects, quality of life, biodiversity, and as a mechanism for helping us adapt to the changes the region faces. Environmental Capacity links to a wide range of existing issues, including Green Infrastructure, Quality of Life, Ecosystem Services, landscape approaches etc. If developed appropriately it has the potential to act as an overarching approach linking together these issues.

There are, however, perceived problems in the application of Environmental Capacity across the East Midlands, such as negative attitudes amongst a minority of individuals, the lack of awareness of the concept and its applications, concerns regarding the implication of such an approach (i.e. will it be another monitoring burden or a positive practical tool). Many of these problems also apply to current environmental monitoring (see below). Experience from other regions shows that it is essential to get the Environmental Capacity framework, indicators and datasets in place early on.

Awareness of the current problems in Environmental Monitoring in the East Midlands Region is wide ranging and detailed. These include the lack of consistency in the collection and analysis of indicators between local authorities and gaps in coverage, with no single Environmental Capacity theme which is surveyed or monitored by all consulted Local Authorities. Monitoring Officers note that there are too many indicators required from different sources, with constant changes making trend monitoring problematical. Financial limitation, limited people hours, lack of awareness of the indicators and data availability are all key limitations in current monitoring. The resolution of available data is perceived to be a problem, with many indicators not being available at the local scale and therefore the data does not take into account variations across the region.

A logical first step in establishing indicators and targets is to explore which current indicators it would be most appropriate or useful to set targets for. To do this, we need to know which are the most important aspects of Environmental Capacity, in terms of how the public uses and values them, their level of threat and their functions/services. Broader consultation on capacity and its indicators is recommended at an early stage in the process.

If Environmental Capacity is to be applied in the region then there are issues relating to the definition of Environmental Capacity, achieving buy-in and involvement of key stakeholders and the development of mechanisms for collecting and analysing new data. In addition there will be a need for training and awareness raising. All of the above have financial implications.

Recommendations

The next stage in developing a robust Environmental Capacity monitoring approach for the East Midlands should include targeted consultation including with a wider range of key stakeholders. Securing early buy-in is essential.

Consultation and workshops are recommended to refine the approach. Key issues to reach early agreement on include:

- 1 What Environmental Capacity themes should be monitored?**
- 2 Which Environmental Capacity issue under each theme should be monitored?**
- 3 What existing indicators are available? How far do these indicators represent a direct measurement of Environmental Capacity, or how far is it a reliable proxy?**
- 4 Agreement on a framework for monitoring Environmental Capacity and the indicators to be used.**

It is recommended that an Environmental Capacity question be included within the annual monitoring process to assist in the development of indicators and definitions to be used in the EMRA CDP (Comprehensive Development Plan).

There is a need to review current regional data and identify data which can be made available at sub-regional or local scale to be able to make Environmental Capacity work.

There is a need to undertake a gap analysis to identify areas where data is unavailable, and to identify any suitable proxy measures which could be used.

There is a need to agree on a more consistent approach to coverage and use of environmental themes and indicators across the region as a starting point in developing a robust Environmental Capacity monitoring approach.

There is a need to agree on a standardised method and approach to data collection and for integration of datasets, and to agree on how local data can be made available. It is recommended that the existing Working Group be used to lead on the development of Environmental Capacity, but that **further research and consultation will need to be undertaken to develop a practical standardised working approach**

There is a need to begin to explore how to tackle topics for which there is currently a lack of data. Experience from other countries, in particular the USA and Australia could provide transferable approaches here.

There is a need for an identifiable point of data collection and interpretation. It is recommended that an **Environmental Observatory for the East Midlands be set up.** A strong evidence base is needed if Environmental Capacity is to be shown to be of practical relevance.

There is a clear need for awareness raising and training in Environmental Capacity and environmental monitoring generally. Workshops along the lines of those used in relation to Green Infrastructure are recommended. In the longer term, an appropriate support mechanism may need to be considered, an Environmental Observatory could provide this role.

Recommended key priorities for those charged with establishing the Environmental Capacity of the East Midlands will include:

- **To be clear about the criteria, indicators and targets** that should be used to measure Environmental Capacity, and to be able to support these with evidence/data;
- **To link Environmental Capacity monitoring to the information and data needed** to inform decisions relevant to Environmental Capacity (e.g. meeting the requirements for Appropriate Assessment);
- **In the medium term to develop tools/techniques that bring together different aspects of the environment** so that cumulative impacts can be understood, measured and monitored;
- **In the medium term to develop integrated techniques that capture the more subjective elements** of Environmental Capacity and take into account the views of local people;
- **To examine and promote the links between Environmental Capacity and wider socio-economic objectives**, as a major contribution to the sustainable development agenda;
- **From the start to raise awareness and increase acceptance of the use and benefit of using Environmental Capacity in the East Midland.**

2 Background to the Study

The importance of the environment of the East Midlands region to its economy and development is well recognised. It is not just the key sites such as the Peak District, Sherwood Forest, Lincolnshire Wolds and the coast which are important environmental resources for visitors and residents; the environment of the region is an asset which supports the region's agriculture, industry and the quality of life for its people. Maintenance of environmental quality is critical to the region's future development.

There are a number of major pressures acting on the region's environment; as noted in the East Midlands Regional Implementation Plan for the Rural Development Programme for England 2007-2013 (Defra 2008):

'The distinctive character of the East Midlands in general has been and remains under pressure from both modern farming and forestry practices and development and visitor pressure'

Environmental pressures include:

- there is more urban growth planned in the East Midlands than in any other English region, including 16,000 houses per year until 2021;
- key areas in the region are vulnerable to flooding and climate change;
- the character of much of the region's landscape is classified as changing or in a neglected state; and
- there is a lower than average number of environmentally protected sites (SSSIs, AONBs, National Parks) within the region.

Increasing pressure and/or development, particularly in important and sensitive areas, may have irreversible impacts on the environmental quality of the East Midlands. It has therefore been argued that there is a need to consider the capacity of the environment in strategic planning within the region. Environmental Capacity is a key consideration in ensuring sustainable development and preventing irreversible damage and depletion of resources / assets.

In a joint statement to the East Midlands Regional Spatial Strategy 8 Review by English Nature, the Countryside Agency (Landscape, Access and Recreation), the Environment Agency, English Heritage, the East Midlands Wildlife Trusts and East Midlands Environment Link (EMEL) it was noted that:

the environment of the region, across all its sub-regions and areas, has a finite capacity to accommodate increased growth before irreversible damage or depletion is incurred...

Sustainable development however, means avoiding such effects by managing resources to sustain them for future generations and that

recognition of Environmental Capacity is an essential and fundamental principle if the region is to achieve sustainable development.

East Midlands Environment Link, in its submission to the East Midlands Regional Spatial Strategy (RSS) Review (2007), noted that in several crucial natural resource areas the region has already reached or exceeded its Environmental Capacity. In the Joint Statement to EMRA, (English Nature, Countryside Agency, Environment Agency *et al* 2006) the partners wanted to see the development of a robust environmental policy framework based on the concept of Environmental Capacity **and that recognition of Environmental Capacity is an essential and fundamental principle if the region is to achieve sustainable development.** Specifically, it was recommended that between the current RSS Review and the next there should be established a robust framework of data, expressed spatially (using GIS or other appropriate tools), under a number of different trends, time periods and growth scenarios. This would provide a practical tool expressing where the environment is currently

experiencing stress, or will in the future experience stress. Environmental Capacity was considered to be a key concept in developing such a system.

Recommendations were made regarding the integration of Environmental Capacity considerations into the RSS Review, including that the concept of Environmental Capacity should have an overarching headline profile within the emerging RSS Review. There was a need for better environmental monitoring across the region; the plan should seek to build a policy based on working within, and improving the Environmental Capacity of, the East Midlands. Such an approach goes beyond a 'living within limits' approach (see Section 3) of set limits and thresholds towards seeking to increase the regional Environmental Capacity through positive management, development and planning. If a strategic Environmental Capacity based approach is to be adopted within the East Midlands then there is a need to set targets, identify appropriate indicators and identify how such capacities can be monitored. This scoping study aimed to investigate how short term and long term targets could be set and to identify the support for such measures amongst key stakeholders.

The adoption of Environmental Capacity as part of spatial planning and monitoring is currently being considered by several Regional Assemblies in England, including the East of England Regional Assembly. The use of Environmental Capacity in spatial monitoring was first considered in the 1990s but has yet to be implemented nationally or regionally. As noted by Land Use Consultants (2008) in recommending the use of Environmental Capacity in the East of England:

'Improvements to environmental monitoring data are required and (we) recommend greater coordination, management, analysis and resourcing of environmental monitoring from regional bodies and Local Planning Authorities, ... there is a need for the determination of environmental limits and appropriate indicators early on in the planning process.... with the support of key stakeholders and the public.'

This report presents results of the initial investigation into the development of an Environmental Capacity evidence base for the East Midlands, fit for purpose, i.e. for the assessment and monitoring of Environmental Capacity within the region as part of spatial planning.

The objectives of this scoping study were:

- To undertake a targeted review of current practice in the East Midlands and other UK Regions in terms of the types of Environmental Capacity which are measured and the indicators used to measure these capacities.
- To gain an understanding of the current indicators and methods of data collection used in completing the environmental sector of the RSS.
- To identify the relevant data currently held by local authorities and other organisations.
- To identify the barriers to collecting additional data identified as critical to measuring the performance of the Regional Spatial Strategy.
- To contextualise the environmental capital types and indicators in relation to relevant regional and national policy and objectives, and underlying sustainability principles.
- To undertake consultation with key stakeholders within the East Midlands Region in order to review the regional evidence base for the region in terms of:
 - What data is currently collected and how this feeds into the environmental section of the RSS and the State of the Region;
 - What the perceived issues are, which need to be addressed in tackling Environmental Capacity within the region, and how well these issues are currently addressed by environmental partners and the new policies in the revised RSS;

- Identifying the key gaps in current practice and mechanisms for overcoming these;
 - Identifying the data needed to monitor Environmental Capacity within the region, and determining the indicators and targets which can be used to measure progress on the real environmental issues in the region; and
 - Identifying how these outputs can feed into the next RSS AMR.
- To review the findings of the consultation and, in light of the reviews of current practice within the region and beyond, to produce a report with recommendations regarding future Environmental Capacity indicators and targets, and the use of these outputs in future RSS AMRs.
 - Specific recommendations regarding 3 – 4 indicators and definitions to be used in the EMRA CDP (Comprehensive Development Plan).

3 Environmental Capacity – an Overview

It has been recognised for a long time that environmental resources are finite and if over exploited this can lead to environmental damage and harm to local economy. Nearly 2000 years ago the Romans noted the impact of deforestation and resulting desertification in North Africa. In the last twenty years the idea that there are environmental limits to growth has been at the core of the concept of Sustainable Development.

For example, the UK Sustainable Development Strategy (p100) notes that:

‘While resources such as biodiversity and soils are thought of as ‘renewable’, they can be exploited to the extent that long-term irreversible damage will be caused; hence the development of the concept of ‘environmental limits’.’

External pressures such as pollution, over-exploitation of natural resources and climate change impact on the functioning of an environment, its condition and the services it provides (Defra 2007). Different environments respond to these pressures in different ways. Some may exhibit a rapid decline or even a sudden collapse – the point at which this happens may indicate an *‘environmental threshold’* or *‘tipping point’*. An environmental threshold can be defined as:

‘the point at which the functioning of an environmental asset or the services it provides, experiences a rapid decline or sudden collapse’ (Land Use Consultants 2007).

The concept of environmental/ecological thresholds has been used for many years in a variety of contexts, including conservation, rural land management, tourism and recreation etc. The associated concept of carrying capacity, i.e. the maximum level of use or development an environment can accept without undergoing significant change, has been used in a variety of studies but the idea that there are absolute environmental thresholds has been subject to debate. In many cases – particularly in the context of England’s natural environment – we are more likely to see a gradual degradation of ecosystems and a reduction of ecosystem services rather than a sudden collapse (Defra 2007). What is generally agreed, however, is that as part of sustainable development there is a need to identify the threshold, limit or capacity of an environment before degradation or collapse occurs.

Absolute environmental thresholds may be difficult to apply in practice. For many aspects of the environment the thresholds are unknown and are only identified when they are crossed and significant harm has occurred. As indicated above, the idea that there are *environmental limits* on human activities is core to sustainability thinking. Sustainable development, post- Rio and Brundtland (1992 and 1985) is predicated on current society needing to live within natural limits. Living within environmental limits is a central theme of UK Government policy for sustainable development; *environmental limits* being defined as:

‘the point or range of conditions beyond which the benefits derived from environmental resources are judged unacceptable or insufficient.’ (Defra 2007).

Similarly, the UK Sustainable Development Commission, in its report *Securing the Future*, defines environmental limits as:

‘the level at which the environment is unable to accommodate a particular activity or rate of activities without sustaining unacceptable or irreversible change.’

In the above sense environmental limits are different from environmental thresholds. An environmental threshold is an absolute scientific point beyond which irreversible harm occurs whereas an

environmental limit involves a social judgment with regards to what an acceptable limit/capacity is. Tourism professionals use an associated term i.e. limits to acceptable change (LAC).

Environmental thresholds and limits will vary by topic and over time and space. Thresholds / limits are most accurate when they refer to a specific time and place and relate to a specific issue or threat. Landscape professionals use the term capacity in relation to whether a specific threat will be above an environmental threshold or limit. The term sensitivity is used when looking at potential limits and threats in general. The phrase Environmental Capacity, however, tends to be used in a broad sense to cover both specific threats and general sensitivities.

As recognised by Entec (2007) there is no commonly accepted definition for Environmental Capacity, but it can be summarised as being:

'a reflection of the interaction between, and accumulation of, a series of thresholds (a level below which no reaction occurs) and limits (a point which cannot or should not be passed).'
(Entec UK Limited, 2007).

GESAMP (1986) more succinctly define Environmental Capacity as

'a property of the environment and its ability to accommodate a particular activity or rate of an activity...without unacceptable impact.'

Environmental Capacity is at once a straightforward and a highly complex concept. It is straightforward in the sense of expressing the idea that there are limits attached to the various environmental assets which support life, and complex in the sense of there being considerable room for interpretation over the precise character of and interactions between the components of Environmental Capacity (Entec 2007). This difficulty in defining and measuring Environmental Capacity is one of the reasons why it has not been applied practically in many areas.

The thresholds/limits which determine Environmental Capacity may (in some cases) be informed by scientific understanding of nature's properties, but they become determinants of decision making through political judgement and social choice. This judgement is about value: about what society regards as the acceptable form and rate of environmental change. (Jacobs 1997)

Although Environmental Capacity and Carrying Capacity are scientific concepts, they incorporate a strongly subjective dimension. The definition of 'acceptable change to the environment' and the determination of environmental quality standards, although informed by science, must rest on subjective judgement. Various criteria may be applied to determine what is *acceptable or unacceptable environmental change*. Some criteria can be directly and objectively measured, others are much harder to measure, such as landscape quality or ecosystem integrity (Hambray Consulting 2008).

Environmental Capacity must be determined by the democratic process, in which formally constituted bodies seek the participation and views of the people affected (Jacobs 1997). There is a clear need to agree "precautionary" limits to environmental change. This will require new decision making processes which draw on the best of scientific and economic knowledge to inform subjective but broadly agreed standards – without getting bogged down in the inevitable differences of opinion. Developing such procedures – ideally as part of Strategic Environmental Assessment - is at least as important as the science (ibid).

As indicated above, the concept of Environmental Capacity has been widely used since the 1980s, but most often as a theoretical concept or applied to specific circumstances or localities. Historically a

number of interlinked terms and concepts which relate to Environmental Capacity have been used. Key examples of linked concepts are shown in Table 1 and defined in Appendix 1.

Table 1 Some Concepts linked to Environmental Capacity

Carrying Capacity
Ecological Capacity
Ecological Footprints
Ecosystem Approach
Ecosystem Health
Ecosystem Resilience
Ecosystem Services
Environmental Capital and Assets (including critical natural capital)
Environmental Capital Approach
Environmental Infrastructure
Environmental Limits
Environmental Quality Standards
Environmental Sensitivity (and Capacity)
Green Infrastructure
Limits to acceptable change
Natural Economy
Sustainable Development
Thresholds of Irreversibility

For further details see Appendix 1.

Environmental Capacity is currently being rejuvenated as a topic of interest in the development and application of planning policy. It offers an approach which can potentially deal with the problems associated with the sustainability agenda and the challenges of translating the recommendations of Sustainability Appraisals into planning policy (Entec 2007).

As recognised by Entec (2007) in their study of the North West Region, there is room for Environmental Capacity thinking to become an important part of the pursuit of sustainable development through providing a more rigorous technical application to what is often a qualitative process. This study hopefully will form a key stepping stone to its use in the East Midlands.

4 Environmental Capacity and Sustainable Spatial Planning

At a national level the concept of Environmental Capacity has been applied to a range of issues. Environmental Capacity forms one of five guiding principles for the revised UK Sustainable Development Strategy. The 'Living within Environmental Limits' principle states the following: *'Respecting the limits of the planet's environment, resources and biodiversity - to improve our environment and ensure that the natural resources needed for life are unimpaired and remain so for future generations.'*

As part of the Revised Strategy, 68 Sustainability Indicators were developed to measure the progress towards sustainable development. For 46 of these indicators, regional versions were also published, in January 2008.

In general terms, the Sustainability Indicators used in the strategy cover four broad areas. These are:

1. Sustainable Consumption & Production. (Climate change, water resources & consumption, waste).
2. Natural Resources. (River quality, water stress, bird populations, land use, air pollution etc.)
3. Sustainable communities. (Crime, employment, poverty, education, mortality rates etc.)
4. Contextual indicators. (Economic output, productivity, demography, households and dwellings).

Environmental Capacity has the most obvious relevance to area two above, but Environmental Capacity measures may be drawn from all four areas.

The link between the UK Sustainable Development Strategy and the planning system is made in PPS1 (Planning for Sustainable Development), which sets out the overarching planning policies on the delivery of sustainable development through the planning system. PPS1 states that development plans should ensure that sustainable development is pursued in an integrated manner, in line with the principles set out in the UK Sustainable Development Strategy. Environmental Capacity could form an important element of such integration.

Under PPS1 regional planning bodies and local planning authorities are required to ensure that development plans promote outcomes in which environmental, economic and social objectives are achieved together over time. To achieve this, plan policies and planning decisions should be based on:

- Up-to-date information on the environmental characteristics of the area.
- The potential impacts of development proposals on the environment (whether direct, indirect, cumulative, long-term or short-term), positive as well as negative.
- Recognition of the limits of the environment to accept further development without irreversible damage.

The latter implies the use of Environmental Capacity in planning decisions. Its robust use, however, will be dependent on detailed up to date monitoring of environmental character/condition and impact prediction. It is clear from studies in other regions that the lack of detailed relevant environmental data is a potential barrier to the application of Environmental Capacity in planning.

There is little mention of the term Environmental Capacity in other government planning policy beyond the overall approach contained in PPS1 and detailed above.

The concept of 'living within environmental limits' is based on two key notions. First, that the environment is very important: it is irreplaceable, has intrinsic value and provides the foundations for human activity. This applies to the less quantifiable aspects of the environment, such as landscape character and the historic environment, as well as the life support systems provided by air and water. Second, that there are limits to the capacity of the environment to accommodate development, beyond which unacceptable change will result (*ibid*).

Defra (2007) propose that if we are to live within natural limits then there is a need for a more strategic approach to policy and delivery, such as that offered by the use of Environmental Capacity. They propose the following core principles which relate to Environmental Capacity:

- taking a more holistic approach to policy-making and delivery, with the focus on maintaining healthy environments and the services they provide;
- ensuring that the value of the environment and its services is fully reflected in decision-making;
- ensuring environmental limits are respected in the context of sustainable development, taking into account environmental functions and functioning;
- taking decisions at the appropriate spatial scale while recognising the cumulative impacts of decisions; and
- applying adaptive management of the environment to respond to changing pressures, including climate change.

To these should be added the need to take into account the values attributed to environmental assets and attitudes towards the environment of the local communities.

If Environmental Capacity is to be used in planning decisions then there is a need to recognise that the environment has a threshold (a level below which no changes occur) and a limit (a level above which irreversible damage occurs). These thresholds and limits need to be determined and adhered to if sustainable development is to occur. Historically, such thresholds and limits have been recognised in policy but they have proved difficult to determine and have not always been adhered to in planning decisions.

The use of Environmental Capacity as part of strategic sustainability in planning has long been recognised. In 1997, Jacobs stated that *"the principle of sustainability .. is highly relevant .. to environmental issues such as landscape, countryside and 'character'. As an objective of policy making, sustainability is concerned with the relationship between present and future generations: with 'intergenerational equity'. This is why ecological thresholds are important: they identify the point at which the present generation's use of the environment begins to deny future generations' equivalent opportunities."*

More recently, the role of Environmental Capacity in policy development, particularly at a strategic scale, was recognised in the UK Sustainable Development Strategy 2005. The document reflects the need to adopt a precautionary principle to development (based on the concept of environmental limits) and the protection of natural resources. Environmental Capacity is not only a concept and principle of sustainable development, but also the focus for examining the sustainability of development in terms of the sensitivity of environmental assets and the environmental resources required for its environmentally sustainable delivery.

Environmental Capacity has however largely been used as a guiding principle for policy creation (often at a strategic scale). It has less frequently been applied to specific local decision making regarding the location and extent of housing and other infrastructure development. As a concept Environmental Capacity can be used to underpin sustainable development. It can also ensure the protection of

natural resources by for example helping identify the areas within a region which are more able to accommodate housing developments thus assisting in the development of sustainable spatial planning policies. As indicated above national government has recognised the relevance of Environmental Capacity / limits in sustainable planning, yet at a national and regional level Environmental Capacity data is not collected, analysed or monitored. The lack of effective monitoring limits the use of Environmental Capacity beyond that of a guiding principle.

5 Conclusions from Other Environmental Capacity Studies

A number of studies within the UK have been undertaken since the 1980s looking at Environmental Capacity in relation to planning. Yet as Land Use Consultants (2008) recognise with a few notable exceptions, the application of Environmental Capacity concepts to planning has been mainly theoretical and focused on a limited range of environmental issues (e.g. heritage, agriculture etc.) or on fairly small geographical areas.

Over the last three years a series of initial studies into Environmental Capacity have been undertaken in several English regions, including the South West, North West and East of England. For example the Land Use Consultants Study for the East of England Regional Assembly (2007 and 2008) looked at the application of Environmental Capacity at a regional / sub-regional level and developed a methodology for its assessment.

Of relevance to the current study are the findings of the Environment Forum for the East of England, who concluded that:

- Environmental Capacity can provide a useful framework for development planning, but cannot be expected to supply precise numbers;
- Environmental Capital also raises the importance of the demand management side of the equation. e.g. capacity for housing is not determined solely by the amount of water available, but also by how it is used; greater efficiency may increase capacity;
- current targets can be used as a proxy for environmental limits, but that further research is needed in other cases, such as resource use, before targets or limits can be established;
- the cumulative impacts of development should be a core component of Environmental Capacity studies; and
- to embrace the concept fully and practically would require an agreed methodology, a potential rethink of the designations led approach and availability of more environmental data (ibid).

6 Environmental Capacity Indicators and Targets

6.1 Overview of Indicators and Targets

To monitor Environmental Capacity, indicators of Environmental Capacity need to be identified and targets / limits set for these indicators. Currently a wide range of Environmental Indicators and Targets are used to inform and drive policy-making and delivery on the natural environment at local, regional and national levels. These include indicators and targets in specific policy areas (e.g. for biodiversity, water, air, soil) as well as those in cross-cutting policies and strategies (e.g. sustainable food and farming, the UK Sustainable Development Strategy).

Indicators are measurable attributes chosen to evaluate the performance and effectiveness of policy for conserving and enhancing an environment. These include measures of the state of various components and processes of the natural environment. Indicators can serve a variety of purposes, including reporting (assessing progress towards stated objectives), communication (e.g. to highlight an issue of particular public interest), and management (to help managers of ecosystems understand changes and to intervene). All of these purposes are potentially relevant to this study (Entec 2007).

Targets are the objectives or standards set for delivery on the natural environment and include 'aspirational' or 'political' targets, targets relating to critical loads and thresholds in the natural environment, and those for public service delivery. They may be set on a precautionary basis, where the aim is to deliver environmental protection, or they may be more ambitious in order to achieve environmental enhancement. Targets may be attached to particular indicators or ecosystem components, or may be framed as broad over-arching objectives (ibid).

6.2 Problems with Current Indicators

Measures or indicators of capacity and change are needed to help inform what counts as acceptable or unacceptable change, in considering how environmental services can be maintained and enhanced. Yet there are two major problems at present in relation to measuring / monitoring Environmental Capacity:

- the type of data currently being collected and its specificity; and;
- the difficulty of measuring and quantifying many aspects of Environmental Capacity.

Historically, the measurement of aspects of Environmental Capacity has tended to focus on specific features (e.g. condition of Sites of Special Scientific Interest and Scheduled Buildings at Risk) rather than broader measures (e.g. biodiversity, historic sites in general) and have often made use of proxy measures (e.g. breeding birds as indicators of biodiversity). Such indicators provide an indication of the environment's capacity but ignore the broader environmental issues, which may be equally or more sensitive to change. The use of targets for such indicators can be relatively inflexible. It is often the case that what is measured is what is available and relatively easy to measure, rather than what needs to be known.

6.3 Environmental Themes and Indicators Currently Used

Despite the above difficulties of defining and measuring Environmental Capacity, it is recognised that it is an essential and fundamental principle in achieving sustainable development. Various themes and indicator types have been used at a national and regional level to assess Environmental Capacity and broader sustainable development (see Table 2).

Table 2 Environmental Capacity Themes Used in National and Regional Assessments

The key themes used in the SEA directive include the following broad headings:

- Air;
- Water;
- Soil and geology;
- Land based flora and fauna;
- Marine based flora and fauna;
- Landscape;
- Open space and historic environment.

The key themes used in Quality of Life Assessment are:

- Health and human survival;
- Biodiversity;
- Amenity;
- Sense of place;
- Historical & cultural character;
- Associations;
- Education;
- Recreation;
- Value to the economy;
- Value to society.

The themes used in the East of England Environmental Capacity Study are:

- Air Quality;
- Water Quality;
- Water Quantity;
- Soils;
- Geology;
- Biodiversity;
- Landscape;
- Tranquility;
- Open Space;
- Historic Environment.

Environmental Capacity Themes used in the NW Regional Study are:

- Climate change;
- Air quality;
- Water quality;
- Water resources;
- Flood risk;
- Waste;
- Land use, minerals and soils;
- Landscape;
- Recreation;
- Biodiversity;
- Built and historic environment;
- Marine environment.

The East Midlands Regional Environment Strategy's five key environmental components are:

- People and heritage;
- Air;
- Land and land use;
- Water;
- Natural heritage.

The above approaches look at measuring Environmental Capacity in terms of asset type. An alternative approach would be to consider Environmental Capacity in terms of services provided. The Millennium Ecosystem Assessment categorises these services (referred to as 'ecosystem functions') into four groups:

- *Supporting functions*, such as nutrient cycling, soil formation and primary production;
- *Provisioning functions*, such as the production of food and fibre;
- *Regulation functions*, covering the role that ecosystems have in controlling climate, disease, flooding and water supply; and,
- *Cultural functions*, which include spiritual, aesthetic, educational and scientific roles that ecosystems can fulfill.

The main environmental indicators used in the different English Regions are summarised in Table 3 overleaf:

Table 3 Environmental Indicators Used in Regions of England

Indicator	East of England	East Midlands	North East	North West	South East	South West	West Midlands	Yorkshire and the Humber
Designated conservation sites	Deterioration in quality of all sites	Improvement of SSSIs; changes in all designated sites	Area lost and condition of national & international sites	Condition of SSSIs	Condition of SSSIs	Land within conservation designations. Condition of SSSIs	Condition of SSSIs; change in other designated sites	
Population of birds	Decline of farmland, woodland & native species	Population of Wild Birds	Population of wild birds	Population of wild birds	Population of wild birds	Change in wild bird population		Population of wild birds
Biodiversity		Changes in priority species	Changes to priority habitats	Changes to important areas and species populations	Extent & condition of key BAP habitats	Change in priority habitats	Change in priority habitats	
Woodland		New wood creation	Area cleared; area created in specific locations		Extent of ancient woodlands		Amount of new woodland planting	Area of woodland cover; % that includes public access
Landscape	Amount of Greenfield land used for residential development	Area covered by LCAs Cases of damage to cultural/natural assets & compensatory measures		Character assessments; designations; historic characterisation; Landscape Capacity & sensitivity; changes	Land covered by management schemes; access to countryside	Habitat / landscape areas		Percentage of Plans for which up to date CCAs undertaken

Indicator	East of England	East Midlands	North East	North West	South East	South West	West Midlands	Yorkshire and the Humber
Historic Environment <i>NB all Listed Buildings-at-Risk are at grade I & II*</i>	Increase of Buildings-at-Risk register	Number of listed buildings at risk	Loss & damage to designated buildings & sites; listed buildings at risk; Damage to higher designated buildings; Numbers of listed buildings and conservation areas;	Number of nationally designated sites; % of listed buildings at risk of decay; buildings restored	Listed buildings at risk of decay	Listed buildings at risk	No. and % of listed buildings & ancient monuments at risk of neglect or decay	Listed buildings at risk
Climate Change	Per capita increase CO ₂ emissions; energy consumption; ecological footprint	CO ₂ emissions; additional CHP facilities; additional renewable energy facilities		CO ₂ emissions; renewable energy generation; carbon performance of developments	Emissions of basket of greenhouse gases; ecological footprint	CO ₂ emissions; eco-footprint		
Water Quality	Deterioration of chemical & biological quality as % of total river quality	Permissions granted contrary to EnvAg advice (also flood risk); developments with SuDS	Rivers of good quality; No. of beaches meeting guideline standard; groundwater bodies with good chemical status Permissions granted contrary to EnvAg advice on flood risk	River water quality (% in good/fair); waste water treatment; flood vulnerability Permissions granted contrary to EnvAg advice on flood risk or water quality	Rivers good/fair quality; per capita consumption Permissions granted contrary to EnvAg advice on flood risk or water quality; No. properties at risk from flood	Chemical and biological river quality; bathing waters meeting guideline standards Permissions objected to by EnvAg on flood risk or water quality;	Permissions granted contrary to EnvAg advice on flood risk or water quality	River quality; compliance with bathing water directive Permissions granted contrary to EnvAg advice on flood risk or water quality; Sea level rises
Air Quality			Days when quality above target	Population in air quality management areas	Days when air pollution moderate or high	Days per year of moderate or higher air pollution		

6.4 Environmental Indicators in the East Midlands Region

The overall key challenge regarding the environment in the region, as set out in the East Midlands Regional Environment Strategy, is:

“To integrate considerations of the environment in all decision making as part of the move towards a sustainable region.”

Under the **Regional Core Objectives** it is stated that Development Plans, Local Development Frameworks, Local Transport Plans and Economic Development Strategies will seek:

2. to protect and where possible enhance the quality of the environment in urban and rural areas so as to make them safe and attractive places to live and work;
6. to achieve effective protection of the environment by avoiding significant harm and securing adequate mitigation where appropriate, and to promote the conservation, enhancement, sensitive use and management of the region's natural and cultural assets;
7. to bring about a step change increase in the level of the region's biodiversity, by managing and developing habitats to secure gains wherever possible, and ensuring no net loss of priority habitats and species;
8. to promote the prudent use of resources, in particular through patterns of development and transport that make efficient and effective use of existing infrastructure, optimise waste minimisation, reduce overall energy use and maximise the role of renewable energy generation;
9. to take action to reduce the scale and impact of future climate change, in particular the risk of damage to life and property from flooding, especially through the location and design of new development; and
11. to promote good design in development so as to achieve high environmental standards and optimum social benefits.

Of particular relevance is **Policy 27 Protecting and Enhancing the Region's Natural and Cultural Assets**, which states:

'Sustainable development should ensure the protection, appropriate management and enhancement of the region's natural and cultural assets (and their settings). In the development and implementation of strategies and programmes in the region, local authorities and other bodies should apply the following principles:

- the promotion of the highest level of protection for the region's nationally and internationally designated natural and cultural assets;
- damage to natural or cultural assets (and their settings) should be avoided wherever and as far as possible, recognising that such assets are usually irreplaceable;
- unavoidable damage must be clearly justified by a need for development in that location which outweighs the damage that would result and should be reduced to a minimum through mitigation measures;
- unavoidable damage which cannot be mitigated should be compensated for, preferably in a relevant local context and where possible in ways which also contribute to social and economic objectives;

- overall there should be no net loss of natural and cultural assets, and opportunities should be sought to achieve a net gain across the region; and
- protection of the region's best and most versatile land.'

The East Midlands Regional Environment Strategy addresses five key environmental components:

- People and Heritage
- Air
- Land and land use
- Water
- Natural Heritage

Environmental Capacity measures need to link into these and into the broader sustainability themes and objectives for the region. The Joint Statement to EMRA (2006) also identifies the following as key environmental problems (in relation to Environmental Capacity) which need to be addressed within the region:

- Water resources (particularly East Midlands and Lincolnshire Fens WRZs).
- STW capacity (especially in Three Cities and Northern WRZ).
- Greenhouse gas emissions and air quality.
- Loss of BMV land in Eastern sub area.
- Flood risk (Southern and Three Cities sub area).
- Historic settlement capacity (particularly Nottingham and Lincoln).
- Biodiversity of the Lincolnshire Coast and Peak sub areas.

The East Midlands region's 17 Sustainable Development Objectives are set out in Table 4 below. The progress that the region is making towards meeting each objective is reported through the State of the Region report which prior to 2008 did not include an Environmental Capacity measure.

Table 4 East Midland Region Sustainable Development Objectives

Social

1. To ensure that the existing and future housing stock meets the housing needs of all communities in the region.
2. To improve health and reduce health inequalities by promoting healthy lifestyles, protecting health and providing health services.
3. To provide better opportunities for people to value and enjoy the region's heritage and participate in cultural and recreational activities.
4. To improve community safety, reduce crime and the fear of crime.
5. To promote and support the development and growth of social capital across the communities of the region.

Environmental

6. To protect, enhance and manage the rich diversity of the natural, cultural and built environmental and archaeological assets of the region.
7. To enhance and conserve the environmental quality of the region by increasing the environmental infrastructure.
8. To manage prudently the natural resources of the region including water, air quality, soil and minerals.
9. To minimise energy usage and to develop the region's renewable energy resource, reducing dependency on non-renewable resources.
10. To involve people, through changes to lifestyle and at work, in preventing and minimising adverse local, regional and global environmental impacts.

Economic

11. To create high quality employment opportunities and to develop a culture of ongoing engagement and excellence in learning and skills, giving the region a competitive edge in how we acquire and exploit knowledge.
12. To develop a strong culture of enterprise and innovation, creating a climate within which entrepreneurs and world-class business can flourish.
13. To provide the physical conditions for a modern economic structure, including infrastructure to support the use of new technologies.

Spatial

14. To ensure that the location of development makes efficient use of existing physical infrastructure and helps to reduce the need to travel.
15. To promote and ensure high standards of sustainable design and construction, optimising the use of previously developed land and buildings.
16. To minimise waste and to increase the re-use and recycling of waste materials.
17. To improve accessibility to jobs and services by increasing the use of public transport, cycling and walking, and reducing traffic growth and congestion.

7 Survey Approach and Methodology

7.1 Introduction

One of the main objectives of this study was consultation with key stakeholders within the East Midlands region to review the region's evidence base in terms of:

- the data that is currently collected and how this feeds into the environmental section of the RSS and the State of the Region report;
- what the perceived issues are which need to be addressed in tackling Environmental Capacity within the region, and how well these issues are currently addressed by environmental partners and the new policies in the revised RSS;
- identifying the key gaps in current practice and mechanisms for overcoming these;
- identifying the data needed to monitor Environmental Capacity within the region, and determining the indicators and targets which can be used to measure progress on the real environmental issues in the region; and
- identifying how these outputs can feed into the next RSS8 AMR.

Four linked surveys were undertaken to answer these questions, see Section 7.2 for details.

7.2 The Surveys

The four linked surveys consisted of:

- A desktop study of the current indicators used for monitoring in the East Midlands Region. This used data on the cdpvision website of EMRA's monitoring in the East Midlands Region.
- A questionnaire survey of local authorities to discover the extent of monitoring undertaken within certain environmental themes and to ascertain the awareness of the term Environmental Capacity and its relationship to what was currently being measured (See Appendix 2 for questionnaire format).
- A survey of key agencies within the region and nationally asking a short series of questions about understanding of Environmental Capacity, attitudes to Environmental Capacity and its use; and about data collection issues (see Appendix 2).
- A workshop for government agencies, local authorities and key stakeholders in the region.

The desk top study involved analysis of the records held by cdpvision and an analysis of key documents from individual councils. Documents and databases were analysed in relation to their coverage of the four headline indicators under the environmental heading i.e.:

- Listed buildings at risk,
- Sustainable drainage,
- Landscape character, and
- Strategic flood risk.

Relevant individuals within each of the local authorities within the East Midlands were initially contacted by e-mail to inform them of the nature of the study and ask if they were the relevant person within their authority and if they would be available to be involved in the research. The initial contacts were key monitoring officers within the authority, based on a list of names provided by Peter Williams

at EMRA. Individuals were asked to indicate an alternative person if they were unavailable or if they felt unable to answer the questions. Non-respondents were contacted by phone.

A copy of the interview schedule/questionnaire was e-mailed out prior to the interview taking place. People were given the option of being interviewed by phone or returning the completed questionnaire electronically. The questionnaire asked about the current use of environmental data, any gaps, additional data collected, and main concerns (see Appendix 2 for details). The main environmental themes covered in the interview were based on the themes used in other regions and agreed by the Steering Group (see Table 5).

Table 5 Environmental Indicator / Capacity Themes Covered in Interviews

Theme	Sub-theme
Land Management	
Landscape	
Biodiversity	
Soils, Geology and Minerals	
Water	Supply Waste water Flooding
Air	Quality
Historic environment	Built Archaeological Historic landscape
Quality of Life	Health and well being Access, amenity and recreation Education Cultural
Waste	Landfill Recycling
Energy	Use and efficiency
Climate change	

The above themes were chosen to represent key aspects or issues relating to Environmental Capacity, and because they were topics considered to be likely to be monitored by local authorities.

The overall response rate was 58% (representing 27 local authorities). The responding local authorities and respondents' positions are listed in Appendix 3. A response rate of over 50% was obtained for all types of Local Authority (Unitary, County, District etc.). See Tables 6 and 7 for details.

Table 6 Response Rates by East Midlands County

County	Response Rate
	Number of Councils (percentage)
Derbyshire	6 (60)
Leicestershire	6 (66)
Lincolnshire	4 (50)
Northamptonshire	5 (62)
Nottinghamshire	5 (55)
Rutland (UA)	0 (0)
Other	1 (100)

Table 7 Response Rate by Council Types

Type of Authority	Response Rate
	Number of Councils (percentage)
County Council	3 (60)
Unitary Authority	3 (75)
District/Borough Council	20 (55)
Other	1 (100)

The position/post of respondents varied. The majority of respondents were Planning Officers (74%) of which most were Planning Policy Officer; 19% of respondents were Research/Monitoring Officers; there was one Housing Policy Officer and one Environmental Officer (3% each); along with one joint response from Planning and Environmental Officers.

Because of the timeframe and focus of the study, consultation beyond local authorities was limited. The Steering Group was asked for organisations and contact names from key agencies both within the East Midlands and nationally. Phone interviews were held with individuals from Non-Governmental Agencies, Central Government Agencies, other Regional Authorities and Sub Regional Partnership Organisations. The interviewees are listed in Appendix 4, a sample interview schedule is shown in Appendix 2.

Following the interviews and questionnaire survey a stakeholder workshop was held on the 13th November 2008. All interviewees and individuals who had completed a questionnaire were invited to the workshop as well as representatives from Local Authorities, Government Organisations (GOs) and Non-Government Organisations (NGOs) across the region. The workshop was also promoted via existing environmental fora across the region and at relevant conferences and meetings to encourage as wide as possible attendance.

The main objectives of the workshop were:

- to verify the results of the previous analysis;
- to explore in more detail the attitudes of key stakeholders towards the relevance of Environmental Capacity to the region, the use of Environmental Capacity in Spatial Planning; and
- to obtain stakeholders views concerning priorities and potential improvements in relation to environmental monitoring.

Details of the discussion points covered in the workshop and the representatives who attended can be found in Appendix 5.

8 Results and Analysis

8.1 Current Data Collection and Use

Analysis of East Midland Local Authority coverage of the four headline environmental indicators, as reported on the cdpvision website is shown in Table 8, key shown overleaf.

Table 8 Current Indicator Coverage by East Midlands Authorities (as indicated on the cdp vision website - excluding County Councils)

Local Authority	Grade II listed buildings at risk register in place?	Sustainable drainage scheme in place?	Landscape Character Assessment produced?	Strategic Flood Risk Assessment produced?
Amber Valley	√√	X	√√	X
Ashfield	√√	√√	√√	√
Bassetlaw	√√	√√	√√	√
Blaby	√√	√√?	√	√
Bolsover	√√	√√?	√√	√
Boston	√√	√√	√√	√
Broxtowe	√√	X	X	√
Charnwood	√√	√√?	√	√
Chesterfield	√√	√√	√√	√
Corby	√√	√√	√√	√√
Daventry	X	√√?	√√	√
Derby	√√	X	√	√
Derbyshire Dales	√√	√√?	√	√
East Lindsey	√√	X	X	√√
East Northamptonshire	√√	√√?	√√	√√
Erewash	√√	√√?	√√	√
Gedling	√√	√√	√√	√√
Harborough	√√?	X	√√	√
High Peak	√√	√√?	√√	√
Hinckley and Bosworth	√	X	√√	√
Kettering	√√?	√√?	√√	√√
Leicester	√√	√√	√√	√√
Lincoln	√√	√	√	√√
Mansfield	√√	√√?	√√	√
Melton	√√	X	√√	√√
Newark and Sherwood	√√	√√	√√	√
North East Derbyshire	√√	√√	√√	√
North Kesteven	√	X	√√	√√
North West Leicestershire	√	X	√√	√
Northampton	X	X	√√	√√
Nottingham	√√	√√	√√	√√
Oadby and Wigston	√√?	√√?	√√	√
Peak District	√√	√√?	√√	X
Rushcliffe	√√	√√	√√	√√
Rutland	X	X	√√	√√
South Derbyshire	√√	√√	√√	√
South Holland	√√	√√?	√	√√
South Kesteven	√√	√√?	√√	√√
South Northamptonshire	√√	√√?	√√	√
Wellingborough	X	√√	√√	√√
West Lindsey	√√	√√?	√√	√√

Key to Table 8

- √√ Monitoring In place and being used
- √√? Uncertain from data whether this is in place but not used so far (i.e. data is 0)
- √ Monitoring in process of being implemented
- X Monitoring not in place

The findings show inconsistency in the collection and analysis of indicators between local authorities in the region. Such inconsistencies have been reported in other regions and are a potential barrier to the establishment of a robust Environmental Capacity monitoring approach.

When Local Authority officers were asked to comment on the current coverage of the identified Environmental Capacity themes (listed in Table 5), the responses were also varied (see Table 9).

Table 9 Current Coverage of Environmental Capacity Themes by Local Authority Monitoring (results expressed as percentage using indicators under each theme).

Theme	Percentage of Local authorities which collect data on or monitor the theme
Land Management	44
Landscape	37
Biodiversity	77
Soils, Geology, Minerals	30
Air	77
Water	63
Quality of Life	60
Historic Environment	89
Waste	66
Energy	70
Climate Change	37

There was no discernible difference in quality and type of response between different tiers of Local Authority, though county councils and unitary authorities indicated that they collected or used data in more of the themes. Two of the unitary authorities sent explanatory attachments about their indicators and provided comprehensive responses.

There were no major differences in quality and type of response between different officer roles but some differences in the detail provided under specific themes between respondents in an Environmental Post and in a Planning Post. It is possible that officers in different posts have different degrees of awareness of the different monitoring themes and that this may account for some of the low level of positive responses shown in Table 9. If so, it does indicate that lack of communication rather than a failure to collect data could be the problem.

Table 9 highlights a number of key problems; firstly **there is no single Environmental Capacity theme where all surveyed Local authorities either monitored or collected data**. Historic environment, biodiversity and air were the most frequently monitored (with 89%, 77% and 77% respectively). Less than half the respondents stated that their authority monitored land management, landscape, climate change, or soils/geology/minerals (with 44%, 37%, 37% and 30% respectively). Even when local authorities are monitoring or using data under a theme there was **considerable variation in the type of indicators and measures monitored** (see Appendix 4).

Secondly there appears to be some **inconsistency between what is reported** on cdpvision and what was stated by respondents, for example in terms of landscape and flooding/water.

The above results indicate that **an important starting point in developing a robust Environmental Capacity monitoring approach for the East Midlands would be developing a more consistent approach to coverage of key themes and indicators.**

In addition to the above themes, several local authorities mentioned they were collecting indicators under other categories including:

- Bi-annual Town Centre Surveys (land usage data).
- Major developments expected to reduce energy consumption.
- Environmental Partnership for strategic overview.
- Many under several headings for Core Strategy.

As expected all local authorities fed data into the RSS. However one Local Authority noted that most of the primary data the authority collects and returns to EMRA is related to Housing and Employment Returns. But reporting from other authorities is patchy and as such this doesn't provide a meaningful baseline to inform the RSS. Much of the other data used is secondary data and is probably collected or accessed through other organisations - listed buildings data from English Heritage, condition and number of SSSIs from Natural England etc.

8.2 Key Gaps in Monitoring Environmental Capacity

Consultees were asked about the current key gaps in data coverage and collection and how these may affect the development of an Environmental Capacity monitoring approach for the East Midlands.

Three underlying issues were identified. Firstly that there were too many indicators required from different sources, with constant changes making trend monitoring problematical. Secondly, that in some cases higher level data requirements are of limited benefit at local level and there is a need for core sets of nested data. Thirdly, across the region, authorities are doing different things and at different levels and lack of consistency is a major limitation.

The main gaps identified by local authorities in terms of their current environmental monitoring were:

- Reporting inconsistencies;
- The renewable indicator;
- Biodiversity - because of the huge people hours requirement;
- Air and water – because of the difficulty of assessing these; and
- Climate change – because of its generality.

In addition non-Local Authority consultees also identified the following gaps:

- Lack of biodiversity data beyond nationally designated sites (SSSIs etc.) and the need for consistent data capture;
- Lack of general environmental data, for example connectivity of habitat and capacity of wider countryside to accommodate wildlife;
- Data on what is actually affecting the environment both in terms of type and level of pressures and pressure point specific data;

- Green Infrastructure indicators; and
- Lack of detailed sub-regional and local data and hence the focus on headline indicators at regional level.

Some Local Authorities noted issues in terms of misleading data and the accuracy of the data. For example: *'the per capita carbon footprint indicator is calculated on the basis of gas/electricity consumption for both residential and commercial, divided by the number of residents. Therefore, a Local Authority that is successful in creating employment would have a higher carbon footprint than a Local Authority with a similar population but no industry or other employment opportunities. This seems misleading'*. *'There is also a question about the accuracy of the data for transport emissions'*.

Local authorities identified the following limitations affecting their current environmental monitoring, which would need to be dealt with if Environmental Capacity were to be monitored:

- Financial limitation and limited people hours;
- Reliability;
- Methodology very time consuming;
- No central co-ordination;
- Biodiversity is now countywide and [they] have lost some access to data;
- Definitions;
- Inaccurate transcription from planning applications;
- Inaccuracies transfer to GOEM;
- Data not always available;
- Problems making sense of data;
- Targets so powerful they may distort;
- Compatibility with others' datasets; and
- Generality.

It is interesting to note that some of the poorly covered themes (Table 9) were not identified by consulted authorities as important gaps in monitoring, indicating a potential lack of awareness of the importance of these topics. Some perceived gaps in data, e.g. water quality, are surprising as such data is available from government agencies, although at a cost.

A number of key gaps were identified amongst these several immediate priorities were noted, these are listed in Table 10.

Table 10 Immediate Priorities for Monitoring

Recreation and open space
Inter-authority cooperation in relation to flooding & affordable housing
An agreed set of indicators for climate change
Up-to-date population figures
Health Service data
Renewable energy
Flood risk/issues
Local Wildlife Sites data
Landscape sensitivity

Awareness of definition of Environmental Capacity
Ecological Footprint related
Climate change implications

Key actions identified were:

- the **need to standardise the method and approach to data collection, then to standardise and integrate the datasets**, and
- **the need for data at a more local scale than regional** as regional averages do not take into account the significant variations within the region.

When questioned about **longer term aspirations** in terms of data and monitoring fewer responses were received but two common themes emerged:

- The **need for an identifiable point of data collection and interpretation** such as an **Environmental Observatory**
- **Tackling the issue of longer term monitoring** of the environment and development, for example one respondent stated:

The planning system is very bad at monitoring whether planning conditions have been met; what is needed is a requirement to report results.

8.3 Relevance of Currently Collected Data to Environmental Capacity

Respondents were asked whether the data that was currently being collected would act as good indicators for Environmental Capacity or not. The responses to this question were varied and ranged from:

The positive

'Yes – the only issue is to what extent an area is reaching its capacity, which elements do you weight to determine this'.

To

'As far as I am aware we do not collect any of this information at present, not least because we are under no obligation to report on this.....'.

Most respondents recognised that there were clear gaps in the current datasets in terms of their use as monitors of Environmental Capacity. These are covered in Section 8.2 of this report. Specific issues were raised in terms of the lack of detailed local or sub-regional data and the lack of data beyond nationally designated sites. The consequences of the lack of detailed local information were explained by one respondent:

'For example NI 191 to 193 which deal with waste issues record trends towards more sustainable waste management. But in attempting to reach targets set out nationally and at the EU level are these targets based on an understanding of Environmental Capacity locally or on broad scale targets which are arbitrary and apply to all local authorities. (For example 40% of waste to be recycled or reused by 2010). Where waste facilities are located they can be very damaging and could cause significant and irreversible change to the immediate locality but when looked at strategically the data collected would

suggest that improvements are being made which may not be reflected at a more local level. As such it would appear to me that Environmental Capacity is not necessarily well related to the data we collect as blanket targets or standards cannot apply to all landscape, to the sensitivity of individual ecosystems, landscapes, etc.'

8.4 Awareness and Understanding of Environmental Capacity

When asked about understanding of the term Environmental Capacity, its relevance to spatial planning and relating current indicators to Environmental Capacity, most respondents had heard of the term and were able to provide answers. The depth of understanding of the concept and its application were however highly variable.

Three categories were used to describe the depth of respondents' understanding of the term Environmental Capacity:

- Sound Understanding
- Limited Understanding
- Uncertain/None

Answers ranged from:

Good/Sound Understanding -

'The limit of the environment to be sustained in its current state. Each component of the environment will have its own Environmental Capacity beyond which there will be danger of it being lost.'

'The ability of the environment to absorb the effects of human activities ... without significant (and possibly irreversible) damage occurring, indicated by significant reduction in quality or quantity of one or more features'

'The ability of an area to accept development without major environmental harm.'

'The ability of the environment to provide resources without unacceptable impact.'

'EC is about the value people place on their local environment, and what they regard as acceptable in terms of both the amount and location of development, and the way that it is delivered'

to:

Limited Understanding –

'How much of a hammering it can take'

and

Uncertain –

'It is a term I am not familiar with'

Only 22% of Local Authority respondents had a sound understanding of the concept, whilst just 8% had no understanding. Amongst non-Local Authority respondents there was a clear separation between environmentally related organisations who all had a sound understanding of the concept and its application and non-environmental groups (including development related). The non-environmental

groups had a limited or no understanding of the concept and expressed concerns regarding the implications of Environmental Capacity in terms of prevention of development and growth.

Concerns were raised by a few respondents regarding the potential negative implications of the use of the Environmental Capacity concept on future development in the region, for example:

'I do not like the term 'Environmental Capacity' because it implies a finite capacity. In the real world that does not happen although increasing degradation can occur. Environmental Capacity is usually only raised by those who wish to put barriers in the way of new development, and their definitions of when this capacity is reached for any location is normally very low'.

The majority of respondents had limited understanding of Environmental Capacity with key gaps in relation to the concept and its application. Over a third of local authority respondents considered capacity purely in relation to development. Only a couple referred to thresholds, limits or acceptable change and only three linked the concept to sustainability. Awareness amongst attendees at the workshop was higher, but **most respondents recognised their limited awareness and several said that advice and direction would be helpful or essential if Environmental Capacity were to be used in spatial planning.**

8.5 Relevance of Environmental Capacity to Spatial Planning

There were a range of perceptions regarding the relevance of Environmental Capacity to individual councils and organisations and to spatial planning generally. Some respondents *'recognised the relevance of Environmental Capacity to the many subjects which make up Strategic Environmental Assessment and that it had clear relevance to the development and growth agenda'* and that it is, *a fundamental principle underpinning Sustainable Development. We need to know how to adapt and Environmental Capacity will help us'.*

Most respondents saw the potential local benefit of such an approach and that *'the conclusions can help to define zones of sensitivity and clear policies for exclusion from some areas of particular activities and developments that require planning permission'*. There was consistency in opinion amongst workshop attendees who recognised the relevance of Environmental Capacity more widely across the region, because the East Midlands *'as a region is already depleted'* and *'has a low starting point'* *'and its Environmental Capacity needs to be increased'*.

Other respondents recognised the importance of Environmental Capacity as an *'attempt to measure the ability of the environment to absorb impacts or changes in a sustainable way and therefore important to local and sub-regional planning, but perceived great difficulty in being able to measure and to interpret sustainability'*.

Other key potential limitations were related to the setting of thresholds, for example *'in areas where some development can be acceptable to a certain degree, our experience has been that it is unlikely to be possible to set a threshold in advance'*.

Whilst recognising the potential worth of being able to decide the total amount of development possible in a given location and the composition and nature of development, some authorities and organisations were a little sceptical of the value of the datasets, in particular that it may be based on a *lot of pseudo-science and spurious accuracy*. Others however, recognised the positive nature of the new broader landscape approach to spatial planning and how Environmental Capacity could link into this approach, and its potential as a lever for funding.

Of those responding to a question about the relevance of Environmental Capacity to spatial planning only 32% thought it would definitely be useful, 56% had reservations, and 12% felt it would not be useful.

The main problems cited with regards to monitoring Environmental Capacity were:

- That Environmental Capacity has to be juggled with other issues.
- That Environmental Capacity is a flawed concept, development always has an environmental cost and there has to be a balance.
- The rigidity of indicators and targets.
- Expect Environmental Capacity to be applicable at regional level but difficult at the local.
- Doesn't take account of cumulative effect of different types of development.
- Can't think why we'd apply it.
- Amount of resources required; lack of in-house expertise - cost of use of consultants.
- Difficult to quantify environmental impact.
- Subjectivity.
- Problems tying into Development Plans.
- Problems getting all to agree.

The main concern for consultees at the workshop was regarding their uncertainty of the methods and mechanisms for practically applying Environmental Capacity. If Environmental Capacity is to be applied in the region then there are issues relating to the definition of Environmental Capacity, achieving buy-in and involvement of key stakeholders, development of mechanisms for collecting and analysing new data; in addition there will be a need for training and awareness raising. All of the above have financial implications.

A number of positive roles for Environmental Capacity within spatial planning were also identified:

- There is a need to plan for growth (economic and housing) while protecting and enhancing the environment. There is also a need to test delivery of higher rates of housing, and the quality of the environment, and its ability to absorb this without degradation (i.e. Environmental Capacity) is a key part of that testing;
- There is a general view that the region can't support the level of development predicted/proposed so something has to be done, and that Environmental Capacity is an appropriate approach to take;
- The power of the concept of Environmental Capacity is as a means of embedding the environment into the minds of other people engaging with the planning system (i.e. mainstreaming sustainability);
- Environmental Capacity provides a mechanism for understanding of where particular areas/sites are experiencing undue pressure and where remediation and further environmental resources are needed;
- At regional level Environmental Capacity provides the basis for everything else, inward investment, tourism, the environment, social aspects, quality of life, biodiversity etc. and
- Environmental Capacity enables aspects of the environment to be expressed in the same way as other aspects of planning policy linked to spatial expression.

All consulted groups at the workshop identified the clear link between Environmental Capacity and Sustainable Development, and the potential roles that Environmental Capacity could make in achieving Sustainable Development in the region.

9 Recommendations Regarding the Assessment of Environmental Capacity in the East Midlands

9.1 Main Problems to Overcome

Defra (2007), in relation to measuring ecosystem services, noted the following issues which equally apply to measuring Environmental Capacity:

- There remain challenges in identifying appropriate methodologies for valuing different *environmental capacities*.
- In many cases, there will be insufficient time or money available to perform a 'primary' valuation of *environmental capacities* when making decisions.
- Decisions on which *environmental capacities* services should be valued need to be made at appropriate spatial scales; *some are locally or regionally specific e.g. river catchments, some are national/global, e.g. climate change.*
- There remain some significant gaps in our understanding of ecosystem/environmental functioning and how this relates to *Environmental Capacity*, it will be necessary to understand how ecosystems respond to change and the consequent impact on the provision of ecosystem services (Haines Young *et al* 2006).

Whilst the majority of local authorities consulted recognised that Environmental Capacity was potentially useful, most had clear reservations regarding its monitoring, and several needed to be convinced of its usefulness. There is therefore **a clear need for awareness raising and training in Environmental Capacity and its application.**

Respondents reiterated several of the widely recognised problems in the measurement of Environmental Capacity which will need to be dealt with including:

- lack of clearly defined limits/thresholds;
- variation in opinions regarding acceptability leading to differences regarding what is an acceptable limit;
- need for agreed targets;
- lack of relevant data;
- difficulty in collecting relevant data;
- variation in the sensitivity and therefore limits between areas and sub-regions, for example, some areas and habitats are more sensitive to development than others. This could lead to the need for specific environmental/area limits;
- variation in sensitivity to different types of development/threats, for example some habitats may be highly tolerant of climate change, but very sensitive to development; and
- uncertainty.

There are also underlying perceptions which will need to be dealt with if Environmental Capacity monitoring is to be implemented in the East Midlands including:

- Need for clear definition and measurement.
- Has potential but difficult to implement.

- Doubtful on usefulness, especially if yes/no or a target.
- Should not be an absolute, a constraint on growth.

Such concerns and perceptions are not unique to the East Midlands. Tydesley and Associates (2007) note that a particular problem in the application of Environmental Capacity to the planning system is the measurement of capacity. Some aspects of “capacity” or “limits” are fairly easy to measure (e.g. effects of flood risk on property) and there are clear targets in place. Some indicators are scientific and objective (e.g. greenhouse gas emissions). Other indicators are subjective and qualitative (e.g. landscape quality) and yet others are not fully understood. The latter two cases present real difficulty in applying Environmental Capacity to spatial planning in the East Midlands and new approaches may be needed to overcome these.

The Entec (2007) study into Environmental Capacity in the North West of England noted that the availability and quality of data are recurrent issues in the consideration of planning policy and application. Similar concerns were noted by authorities in the East Midlands.

Entec (2007) specifically noted that in the North West in many cases, inconsistency of data across scales is a significant concern, particularly where regional policy sets a framework which it expects to be developed at the local level. Inconsistency was particularly a problem in the case of biodiversity and landscape. The importance of taking a fitness for purpose approach cannot be underestimated, tailoring indicators to their intended functions as opposed to seeking a definitive set which can be universally applied. This does not mean that data is unconnected (i.e. applicable elsewhere) or inconsistent (ibid).

Two other problems which were noted in the North West also apply to this study. Firstly, whilst the assessment of Environmental Capacity can suggest a basic threshold for development (i.e. through judging the inherent sensitivity of assets), it cannot indicate the precise amount of development which an area can accommodate (Entec 2007).

Secondly, environmental thresholds do not translate automatically into development capacity. The latter will depend on the environmental efficiency of development and the infrastructural, management and behavioural context in which it occurs. Different forms of development and environmental management will have different impacts on environmental thresholds (ibid). Absolute capacity indicators can therefore be misleading.

When the consultees were asked if the current indicators were appropriate to measure Environmental Capacity, the answers were evenly split (Section 8). Of the half who believed additional data was needed, the following were identified:

- What little we collect feeds in but we need more data in order to have impact.
- Current data not substantial enough.
- Some issues but on the whole seems robust.
- Environmental data is lacking.
- Concentrate on land use rather than what environment can cope with.
- Current data is better than nothing, but is process-based rather than appropriate and can be distorted and manipulated.

One Local Authority officer commented that **one of the main problems with environmental monitoring was the differences in resources available for environmental monitoring as opposed to social and economic monitoring. If funding were similar then more could be done.**

9.2 Experiences from other UK Regions

As indicated in Section 5, several other UK regions have investigated the application of Environmental Capacity in spatial planning within their regions. Specific points raised in previous studies which may have relevance to the East Midlands include:

- A first priority is to get the datasets right;
- There is a need as part of Environmental Capacity to both manage and enhance capacity;
- There is a need for a strong evidence base and better communication of data between local organisations and higher up the tiers;
- That Environmental Capacity may only be understandable where clear numerical standards are set (this would preclude some aspects of the environment where standards are difficult to define); therefore
- When dealing with more subjective issues, such as quality of the landscape or even views across intensive agricultural land (which will be many people's idea of capacity) definition and assessment may become impossible;
- That capacity may not be absolute and in areas where capacity has been reached it may be expanded through management, therefore absolute values may be difficult to determine;
- There is a need to link Environmental Capacity to other emerging approaches including Green Infrastructure and the Defra Ecosystems Approach.

The East of England commissioned a study by Land Use Consultants into Environmental Capacity but none of the LUC report has been implemented so far. They now think that perhaps they went too far too soon and have been somewhat dismayed by the lack of enough consistent data. With hindsight they think **the evidence based route may have been a better start point.**

One officer in another region stated that they were generally cautious about an overarching 'Environmental Capacity' approach. Their feeling is that a more useful approach in terms of policy development and implementation would be to **identify aspects of environmental quality that are clearly deteriorating or have deteriorated or are under pressure (from monitoring) and address these individually.**

9.3 Towards an Establishment of Environmental Capacity in Spatial Planning in the East Midlands

There are three underlying themes which need to be dealt with if Environmental Capacity is to be more broadly used in spatial planning in the East Midlands.

- **the issue of definition**, as recognised by Jacobs (1997), is still valid today: If Environmental Capacity is to be useful within the planning system, it must be clearly understood. Capacity does not mean that there are immutable constraints given to us by nature and determined by science. Environmental Capacity is not simply an application of ecological 'carrying capacity'. The thresholds which determine Environmental Capacity may (in some cases) be informed by scientific understanding of nature's properties, but they become determinants of decision making through political judgement and social choice. This judgement is about value: about what society regards as the acceptable form and rate of environmental change.

Environmental Capacity must therefore be determined by the democratic process, in which formally constituted bodies seek the participation and views of the people affected.

- **different components of the environment will have different capacities.** Hence it is problematic to combine them all under one term 'Environmental Capacity'.
- **much of the data collected refers to a limited range of types of environmental assets,** for example whilst there is data on the condition of designated buildings and sites there is lack of data regarding broader environmental conditions.

Key initial priorities in establishing the Environmental Capacity of the East Midlands will be to:

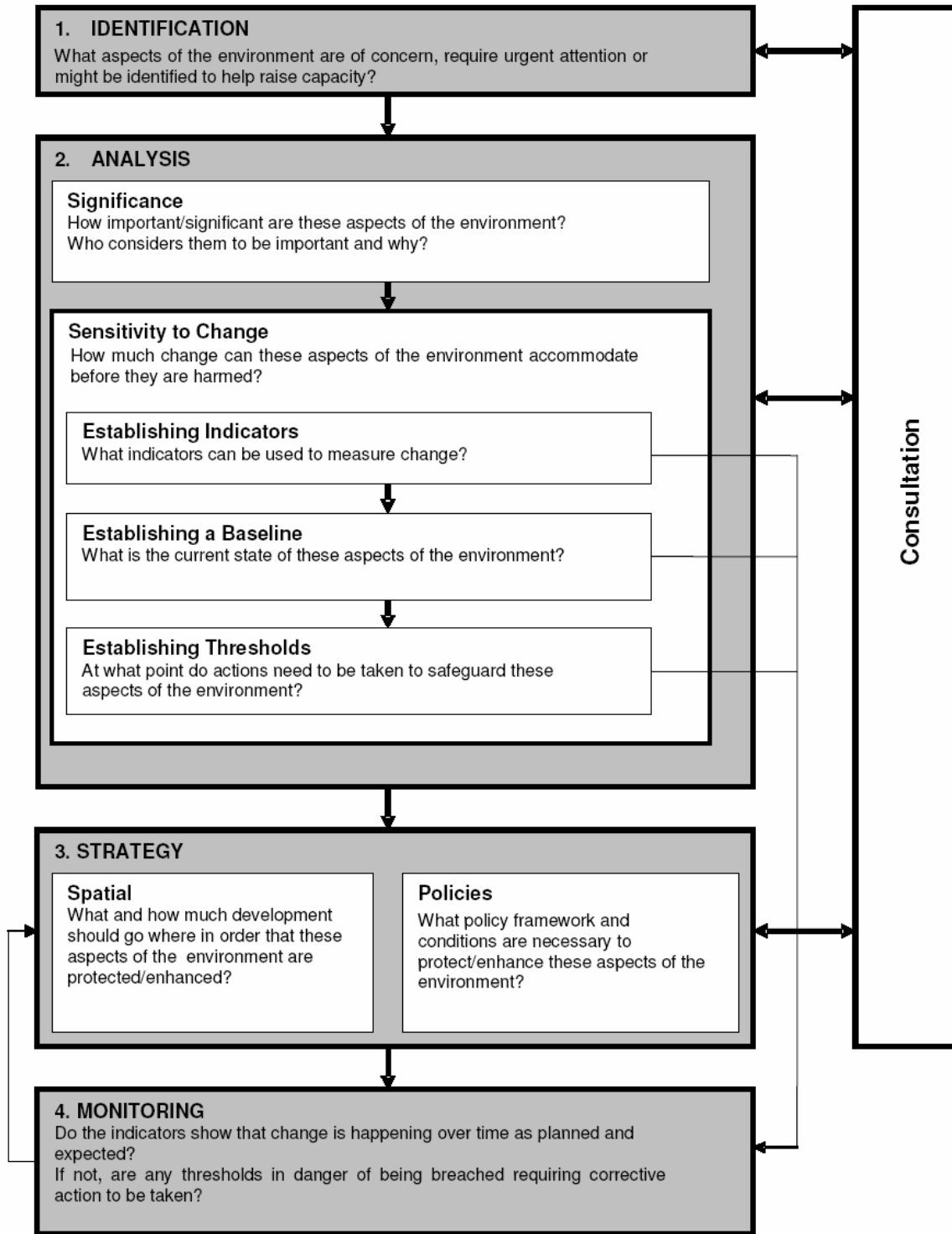
- **Be clear about the criteria, indicators and targets** that should be used to measure Environmental Capacity
- **Identify the information and data needed** to inform decisions relevant to Environmental Capacity (e.g. meeting the requirements for Appropriate Assessment)
- **Develop tools/techniques that bring together different aspects of the environment** so that cumulative impacts can be understood, measured and monitored.
- **Develop integrated techniques that capture the more subjective elements** of Environmental Capacity and take into account the views of local people.
- **Examine and promote the links between Environmental Capacity and wider socio-economic objectives,** as a major contribution to the sustainable development agenda (conclusion of the East of England Study).
- To raise **awareness and increase acceptance** of the use and benefit of using Environmental Capacity in the East Midlands.

One suggested approach to implementing Environmental Capacity in the East Midlands would be to adapt one of the four- or five- stage approaches to applying Environmental Capacity proposed for other UK Regions (LUC 2007, Entec 2007) an example is shown in Figure 1.

The LUC approach has yet to be implemented in other regions but is seen to be plausible and is supported by environmental organisations but it has not been 'sold' to the Planners yet. Planners need to see that such an Environmental Capacity approach will save them time and give answers.

Engagement with planners at an early stage is critical. Environmental Capacity is not just about using limits to prevent development, it is also about enhancement and that enhancement can take place through development.

Figure 1 Four Step Approach to Environmental Capacity (LUC, ENTEC 2007)



9.4 Monitoring Environmental Capacity in the East Midlands

Hambray Consulting (2008) found three basic requirements for the effective application of the concept of Environmental Capacity to promote sustainable development:

1. The ability to **measure** the environmental change;
2. The ability to relate this change to particular activities or sets of activities;
3. The determination of what amount of environmental change is acceptable, i.e. developing an environmental quality standard (EQS).

The results indicate that **an important starting point in developing a robust Environmental Capacity monitoring approach for the East Midlands would be developing a more consistent approach to coverage of key themes and indicators.**

In establishing indicators in the North West, Entec (2007) note the need to undertake the following in determining capacity monitoring:

- the development of clear criteria, indicators and targets to measure capacity;
- the use of appropriate types and quality of data;
- the use of a variety of tools and techniques to aid understanding of complex areas and cumulative impacts e.g. risk mapping;
- the use of tools to help inform value judgements e.g. characterisation;
- an acknowledgement of impacts at all scales, from global to local; and
- the setting of Environmental Capacity in relation to other social and economic conditions (Entec 2007).

The above list provides a useful framework for the establishment of Environmental Capacity indicators in the East Midlands. It should be noted, however, that in other regions such an approach has led to the adoption of existing measures as indicators of Environmental Capacity, rather than developing deeper interdisciplinary measures.

In considering how to measure the impacts of policies, plans, programmes and specific developments on Environmental Capacity, other regional studies have identified a series of questions to form a conclusion on the availability or lack of appropriate data and its fitness as a measure of changes in Environmental Capacity which have been adapted below to provide a suggested approach for the East Midlands.

Suggested Key Questions to be considered in Establishing Indicators of Environmental Capacity in the East Midlands

- **What Environmental Capacity themes are to be considered?**
- **What Environmental Capacity issue(s) are important in relation to the various themes?**
- Are there existing contextual indicators which show us the state of the environment in that area?
- **How far does the indicator represent a direct measurement of change in Environmental Capacity relating to the issue in question, or how far is it a reliable proxy?**

A number of key gaps were identified in Section 8 amongst these the following priorities will need to be addressed if a robust approach is to be developed:

- The need for clear guidance, training and communication;

- The need for a more consistent approach to environmental monitoring across the region, and the support mechanism to enable authorities to undertake this work;
- The need to tackle topics where there is a lack of data, including data on trends/changes (i.e. pressures on environment);
- The need to develop an inclusive approach from the start; and
- More broadly to use Environmental Capacity to raise the importance of environmental monitoring.

The following key initial priorities in establishing Environmental Capacity indicators are suggested:

- Need to look at current regional data **and identify data which can be made available at sub-regional or local scale** to be able to make Environmental Capacity work;
- Need **centralised collection and interpretation of environmental data**, quality of data and time frames, with consistency and credibility, **possibly via an Environmental Observatory**;
- Need to **put together a detailed list of what is currently collected and monitored**, to **identify gaps** and pull the data together in a consistent and comparable way across the region.
- A key gap in coverage appears to be the **data to enable pressure points to be identified** both in terms of the data on **current and likely future impacts** and the **local environmental data**.
- Select indicators have to be measurable and preferably already collected.

The **suggested criteria for identification of Environmental Capacity indicators** to include:

- **Use of a range of interdisciplinary indicators.** Ecological indicators are important but it will also be necessary to monitor the causes of change i.e. *pressures*, an interdisciplinary approach, drawing on ecological and socioeconomic data is required.
- **Relating indicators to environmental condition, function and changes.**
- **Need reference to values to be linked to societal choices;** need to consult on what the public and stakeholders seek from environments and what they value.
- **Consensus on acceptability** of change and thresholds, limits and targets.
- **Adaptability of measures to different spatial scales of assessment, and different environments.**
- **Sensitivity of indicators to change.**
- **Cost** – surveying and analysis cannot be prohibitive if the indicators are to be monitored regularly on a large scale.
- **Comprehensibility, measurability and data availability.** Indicators need to be unambiguous and easy to measure, and relevant data must be readily available (adapted from Raffaelli (2007)).

A logical first step in establishing indicators and targets is to explore which current indicators it would be most appropriate or useful to set targets for. To do this, we need to know which are the most important aspects of Environmental Capacity in terms of how the public uses and values them, their level of threat and their functions/services (Defra 2007). Broader consultation on capacity and its indicators is recommended at an early stage in the process. We suggest the use of an Environmental Capacity question within the annual monitoring process to assist in the development of indicators and definitions to be used in the EMRA CDP (Comprehensive Development Plan).

The Entec approach proposed for the North West of England decision making framework appears worthy of further investigation as a mechanism for consultation on the establishment of Environmental Capacity in the East Midlands.

The **Environmental Capacity consultation framework** to include the following procedures:

- Setting key issues/questions to be answered or explored;
- Defining key aspects of Environmental Capacity (at different scales) that are important to measure;
- Agreeing targets to assess performance against identified environmental limits; and
- Agreeing principles and procedures that will help to make informed judgements for use in planning policy; and using consultation to try and develop a degree of consensus on the foregoing steps.

Implementing Environmental Capacity monitoring across the region will involve costs for local authorities. Specific concerns from local authorities have been set out in Section 8, particularly in terms of negative perceptions amongst some planners, concern regarding the commitment, costs and difficulty in its assessment. When asked to identify what would assist local authorities most in monitoring, half of respondents made suggestions which included:

- More resources.
- Corporate collection and dissemination.
- Resources to handle requirements and amount of data.
- Same guidelines to collect the same data for all local authorities.
- Corporate monitoring officer.
- An agreed set of indicators and sources, available at all levels.

The above list applies to monitoring more generally within the region, but has specific implications for environmental monitoring. As one Local Authority officer noted, one of the main problems with environmental monitoring was the differences in resources available for environmental monitoring as opposed to social and economic monitoring. If funding were similar then more could be done. One approach which could help facilitate this process would be the **establishment of an Environmental Observatory for the East Midlands**.

Next steps: The suggested initial approach to developing an Environmental Capacity monitoring approach for the East Midlands is a more detailed analysis and consultation aimed to:

- Identify and agree themes.
- Identify current and potential indicators under each theme, assess the value of each.
- For each indicator identify and agree absolute thresholds, limits and agree targets.
- Agree method of monitoring and analysis.

It is also suggested that a broader stakeholder meeting be held as soon as possible with the objectives of reaching agreement on the relevance of the Environmental Capacity approach and agreement on the initial themes and indicators to be considered.

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Appendix 1 Definition of Some Concepts Associated with Environmental Capacity

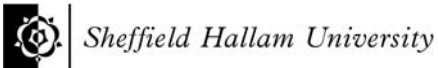
Term	Definition
Carrying Capacity	<p>In ecological terms, the carrying capacity of an ecosystem is the size of the population or community that can be supported indefinitely upon the available resources and services of that ecosystem</p> <p>In the context of sustainability, carrying capacity is the size of the population that can be supported indefinitely upon the available resources and services of supporting natural, social, human, and built capital. Variations on carrying capacity have been used, including physical carrying capacity, ecological carrying capacity, social carrying capacity, perceptual carrying capacity etc.</p>
Ecological Capacity	<p>The degree of ecological disturbance possible without undue damage to the biological/ecological resource base.</p>
Ecological Footprints	<p>The biologically productive areas of land and sea required to meet our consumption of food, energy, materials and for absorbing our wastes. The ecological footprint is a measure of human demand on the Earth's ecosystems. It compares human demand with planet Earth's ecological capacity to regenerate it.</p>
Ecosystem Approach	<p>A strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way.</p>
Ecosystem Health	<p>A systematic approach to the preventive, diagnostic, and prognostic aspects of ecosystem management, and to the understanding of relationships between ecosystem health and human health</p>
Ecosystem Resilience	<p>The magnitude of a particular type of disturbance that can be absorbed by an ecosystem without irreversible harm occurring. A resilient ecosystem has the capacity to withstand shocks and surprises and, if damaged, to rebuild itself.</p>
Ecosystem Services	<p>Products obtained from ecosystems e.g. food, fuel, materials for building. This includes direct benefits/services e.g. timber from a woodland, and indirect services e.g. the protection from wind damage that woodland provides to crops in neighbouring fields.</p>
Environmental Capital and Assets (including critical natural capital)	<p>Environmental Capital recognises that some parts of the environment are not just resources which can be used up, but are capital which is critical to the survival and functioning of that area/region and its economy. For example clean water in a river is not just a resource for a fish farm it is essential for its functioning/survival, it is therefore a capital asset. Natural England has used the concept of Critical Natural Capital to identify irreplaceable environmental assets.</p>
Environmental Infrastructure	<p>The overall framework that provides for the sustainable use of environmental resources</p>
Environmental Limits	<p>The point or range of conditions beyond which the benefits derived from a natural resource system are judged unacceptable or insufficient.</p>
Environmental Quality Standards (EQS)	<p>Environmental Quality Standards are levels set for the environment which reflect maximum acceptable levels of chemicals in air water etc.</p>
Environmental Sensitivity (and Capacity)	<p>Various definitions including the extent to which a particular environment or location is able to accommodate change without significant effect (see Section 3 for more details)</p>

Term	Definition
Green Infrastructure	Green Infrastructure is a concept originating in the United States in the mid-1990's that highlights the importance of the natural environment in decisions about land use planning, in particular the emphasis on the "life support" functions provided by the natural environment for example; clean water and healthy soils, as well as recreation and providing shade and shelter in and around towns and cities. Green infrastructure proposes a strategic approach to land and water conservation linking green spaces within and between our cities, towns and villages. Associated concepts include wildlife corridors and stepping stones
Limits to acceptable change	A system for applying adaptive management to the problem of assessing and monitoring cause and effect on ecosystems. It is a seven stage process developed by recreation researchers to determine how much human-induced change is acceptable in an area, as a concept it has clear links to the socially acceptable limits used in Environmental Capacity.
Natural Economy	The economic and other benefits derived from the natural environment. Natural economy is core to environmental economics. It is also sometimes used to denote alternative economies to the money or credit based economies.
Quality of Life and Quality of Life Assessment	Quality of life is a descriptive term that refers to people's emotional, social and physical wellbeing, and their ability to function in the ordinary tasks of living. A Quality of Life Assessment is a sustainability appraisal tool for maximising and integrating environmental, economic and social benefits as part of any land use or management decision.
Sustainable Development	Various definitions have been used, the most commonly accepted being the Bruntland definition 'development which meets the needs of the present without compromising the ability of future generations to meet their own needs' i.e. inter and trans-generational equity.
Thresholds of Irreversibility	Critical points beyond which the condition and or benefits obtained may fall below some acceptable or tolerable level, implies that once crossed the impacts can not be reversed or mitigated although this may not always be the case.

Appendix 2 Questionnaire/Interview Schedule Format for Local Authorities and Other Bodies

East Midlands Environmental Capacity Review Questionnaire

Please complete all questions listed if possible. Please return the questionnaire by email (keith@hallamec.plus.com) or post to: Hallam Environmental Consultants, Venture House, 103 Arundel Street, Sheffield, S1 2NT. The deadline for return is Thursday 24th July.



Answer boxes will expand if completing electronically, otherwise please continue on separate sheet, where necessary

Your name & position:		Contact email address
Name of your organisation or authority		

A. Current data collection & use of data in monitoring

1. Do you/ your council/ organisation currently use or monitor data on the following themes: Please describe in more detail what data is measured for each heading (if applicable):

Theme	Measured (please tick)		Data measured under theme
	Yes	No	
Land Management			
Landscape			
Biodiversity			
Soils, Geology and Minerals			
Air			
Water			
Quality of Life			
Historic Environment			
Waste			
Energy			
Climate Change			
Other <i>please specify:</i>			

2. Does the data you collect feed into the Regional Assembly's annual reports (RSS & State of the Region report)? If so how?

3. Are there any gaps or problems you face in collecting or using this data? e.g. inaccuracies, methods of data collection, applicability etc.

4. Is there any data which you feel would be useful but which is not, at present, being collected or used? Please detail

5. What would help you most in collection and use of data?

B. Environmental Capacity

1. Please describe briefly what you understand by the term Environmental Capacity:

2. Do you think Environmental Capacity is a useful concept for spatial planning or not?

3. What problems, if any, do you see in the application of the concept of Environmental Capacity in spatial planning?

4. How does the data you collect relate to National PSA28 indicators or LAA indicators?

5. Do you feel the data you are collecting act as good indicators for Environmental Capacity or not?

C. Other comments

The personal information given in this questionnaire will be held confidential.

If you are *not* willing to be involved in further consultations about this project please tick

If you would *not* like to receive the results of this initial study please tick

Sample Interview Schedule for Non-Local Authority Consultees*

The initial phase of the project involved consultation with local authorities and we are now seeking the views of people in non-council organisations. Our consultation is short but has two broad themes –

- understanding of Environmental Capacity, attitudes to Environmental Capacity and its use;
- and data collection issues

The questions we are asking are as follows:

1 What do you understand by term Environmental Capacity

2 How do you think Environmental Capacity could be used in spatial planning,
at regional level

at local level

3 What kind of data do you feel to be important to monitoring Environmental Capacity in the longer term,
What kind of indicators do you think should/could be used

4 What data that are currently being collected, or could easily be collected, could/should be used as a starting point for monitoring Environmental Capacity in the short term

5 Do you think there are any gaps or problems evident that need to be addressed,
Immediately

or in the longer term?

6 What is relevance of Environmental Capacity to your organisation

7 Has your organisation produced any reports relating to Environmental Capacity

** Note variations on the above were used with different consultees depending on the type of organisation.*

Appendix 3 List of Local Authority Respondents, including name of Council and Post of Respondent

Authority	Respondents Post
Amber Valley B C	Planning Assistant
Ashfield D C	Principal Planning Officer
Blaby D C	Planning Policy Officer
Bolsover D C	Planning Officer
Broxtowe B C	Planning Policy Officer
Charnwood B C	Principal Planning Officer
Corby B C	Housing Policy Officer
Derby City Council	Joint - Principal Planning Officer & Environment Team leader
Derbyshire Dales D C	Planning Policy Manager
East Northamptonshire Council	Research & Monitoring Officer
Gedling B C	Planning Officer (Planning Policy)
High Peak Borough Council	Environmental Planning Officer
Leicester City Council	Planner
Leicestershire County Council	Head of Environmental Management
Lincoln City Council	Planning Officer
Lincolnshire C C	Principal Planning Policy Officer Planning & Conservation
Mansfield B C	Principal Planning Policy Officer
Melton B C	Planning Policy Officer
North West Leics. D C	Monitoring Assistant
Northampton B C	Senior Planning Officer
Northamptonshire C C	Senior Research & Information Officer
Nottingham City Council	Senior Planner
Peak District National Park Authority	Research and Monitoring Manager
South Derbyshire D C	Planning Policy Officer (Sustainability)
South Holland D C	Planning Officer
South Northamptonshire Council	Planning Policy and Heritage Officer
West Lindsey D C	Development Plans Officer

Non-Local Authority Consultees included:

Organisation	Respondents Post
East Midlands Regional Assembly	Policy Adviser (Environment)
South East Regional Assembly	Regional Analyst
East of England Regional Assembly	Senior Policy Officer
Intelligence East Midlands (Regional Observatory)	Coordinator
Natural England	East Midlands Regional Officer
Wildlife Trusts	Regional Policy Officer
Government Office East Midlands	Rural Affairs Team
Council for the Protection of Rural England	Regional Policy Officer
National Forest / Community Forests	Chief Officer Land Use
Alliance SSP	Chief Executive

Appendix 4 Analysis of Questionnaire and Interview Responses – Data used under Environmental Themes

1. Do you use data on the themes listed?

Theme	Yes	No	Data measured
Land Management	11	8	Housing & Employment land Council's own land management plans Land usage monitoring (res, ind, comm land take, space, empty land) Greenfield land lost Green Flag scheme data Completed devpts outside urban Greenfield/brownfield devpt Transport
Landscape	6	13	Landscape Character Assessment review due Open space surveys Landscape & Forestry Strategy includes 'landscape areas' Monitoring local wildlife sites Landscape Character Assessment review under way Buy in data from NE, WT & Records Centre LCAreas; hedgerow consent notices; open space in towns
Biodiversity	16	3	Data from Notts Biological & Geological Records centre Area of/Surveys of SINCS Change in Priority Habitats & Species Contribute to new countywide BAP City Core Strategy Indicators Numbers of/Change in designated areas Buy in data from/SLA with NE, WT & Records Centre RSS and LDF Core Output Indicators 2008 SSSIs Monitoring local wildlife sites
Soils, Geology, Minerals	5	14	Contaminated land survey Minerals production RSS and LDF Core Output Indicators 2008 % land Grade 1 or 2 agric
Air	15	4	NO2, O3, PM10 particles, SO2 Air Quality Management Areas/Updates EHO licences processes NO2, SO2, PM10, Benzene City Core Strategy Indicators CO2 emission estimates, NO, NO2, PM10, RSS and LDF Core Output Indicators 2008

Water	11	8	Private water supplies per 1991 Regs only Planning permissions contrary to EA advice City Core Strategy Indicators Domestic consumption Biological & chemical quality of rivers Nitrates, phosphate EA usually provide Area at risk of flood
Quality of Life	11	8	Frequent (usually annual) Survey of all residents Citizens Panel asked for views City Core Strategy Indicators Rely on Indices of Deprivation PLACE survey Community partnerships survey
Historic Environment	16	3	No. Listed Buildings Buildings at Risk Register Conservation Area/review programme City Core Strategy Indicators
Waste	13	6	Amount of household waste City Core Strategy Indicators Municipal waste, arisings, recycling Amount, recycling, compost New facility capacity; waste arising RSS and LDF Core Output Indicators 2008
Energy	14	5	Renewable capacity installed (by type) On/off site renewables for new devpt may come in soon City Core Strategy Indicators Internal only but going out soon Own consumption In Carbon Trust prog RSS and LDF Core Output Indicators 2008 No sites providing onsite renewables
Climate Change	6	13	NI 186/7 City Core Strategy Indicators Measuring emissions Use of public transport; cycling; travel plans New devpt over 100dh to have bus access within 205m Council Carbon footprint assessment
Other	4		Bi-annual Town Centre Surveys (land usage data) Major developments expected to reduce energy consumption Environmental Partnership for strategic overview Many under several headings for Core Strategy

Appendix 5 EMRA Environmental Capacity – Summary of the Stakeholder Workshop

Introduction

As part of the scoping study into 'Environmental Capacity in the East Midlands: An evidence base fit for purpose', a stakeholder workshop was held on the 13th November 2008. Representatives from Local Authorities, Government Organisations (GOs) and Non-Government Organisations (NGOs) across the region were invited. Invitations were sent to all organisations and individuals who had previously been interviewed, to all local authorities across the region, as well as key GOs and NGOs, details of the workshop were circulated via sub-regional and regional environmental fora to encourage as wide as possible attendance, particularly from the voluntary sector.

The workshop was one element in the triangulation of methods used in the study along with the interview/questionnaire survey of representatives from local authorities and a desktop study of the current indicators used for monitoring in the East Midlands Region.

The workshop was used to verify the results of the previous analysis and explore in more detail the attitudes of key stakeholders towards the relevance of Environmental Capacity to the region, the use of Environmental Capacity in Spatial Planning, and views concerning priorities and potential improvements in relation to environmental monitoring, in order to address the above questions. The workshop was attended by representatives from the following authorities and organisations:

Delegates

Delegates from the following organisations attended the workshop:

Organisation	Job Title
Blaby District Council	Planning Policy Officer
Bolsover District Council	Planning Officer
Campaign to Protect Rural England	Regional Policy Officer
Derbyshire County Council	Environment Team Leader
Directorate of Public Health - East Midlands	Assistant Regional Director of Public Health and Head of Regional Partnerships
East Midlands Regional Assembly	Head of Planning Policy
East Midlands Regional Assembly	Policy Advisor, Environment
East Midlands Rural Affairs Forum (EMRAF)	Rural Affairs Co-ordinator
English Heritage	Regional Planner
Environmental Services	Environmental Policy and Projects Officer
Forestry Commission	Development and Delivery Officer
Government Office for East Midlands	Rural Affairs Team
Hinckley & Bosworth Borough Council	Planning Policy Monitoring Officer
Leicester City Council	Planning Policy and Design
Leicestershire County Council	Team Leader Environmental Action
Mansfield District Council	Senior Planning Policy Officer
Mansfield District Council	Planning Policy Manager
Melton Borough Council	Planning Policy Manager
Natural England	East Midlands Regional Officer
Newark & Sherwood District Council	Principal Landscape Architect
North Kesteven District Council	Policy Planning Officer
North Northants Joint Planning Unit	Planning Policy Officer
North West Leicestershire District Council	Monitoring Assistant
Nottinghamshire County Council	Environment and Regeneration
Nottinghamshire County Council	Acting Head of Service

Organisation	Job Title
Oadby and Wigston Borough Council	Planning Officer (Forward Plans)
Peak District National Park Authority	Not indicated
Peak District National Park Authority	Landscape Architect
Rutland County Council	Senior Planning Officer
South Northamptonshire Council	Heritage Officer / Policy Monitoring Officer
The Sherwood Forest Trust	Chief Executive Officer
The Wildlife Trust for Bedfordshire, Cambridgeshire, Northamptonshire and Peterborough	Conservation Officer
The Wildlife Trusts	Head of Regional Conservation Policy
West Lindsey District Council	Development Policy Officer
Woodland Trust	Project Manager

Methodology

The workshop involved short presentations on the context and initial findings of the study interspersed with two focus group discussion sessions facilitated by members of the Steering Group. There were six discussion groups of between five and eight delegates. The workshop was structured around the key questions agreed by the Steering Group and developed from:

- Initial objectives of the study;
- outputs of individual consultations; and
- emerging issues / themes.

The themes of the questions were divided into two sessions; one following each of the presentations which introduced the key themes in relation to these questions. During sessions, individuals were provided with response sheets clearly set out to invite responses to the following key questions:

Session One ‘the concept of Environmental Capacity’

Questions for discussion:

- Do you believe Environmental Capacity is relevant to the East Midlands?
- How should Environmental Capacity be used in Spatial Planning in the East Midlands?

Session Two ‘monitoring Environmental Capacity’

Questions for discussion:

- What are the key **short-term** priorities in environmental monitoring in the region?
- What are the key **longer-term** priorities / aspirations for environmental monitoring?
- How might improvement in the mechanism for delivering better environmental monitoring be achieved? (i.e. What would assist you most in environmental monitoring?)

Further to initial, individual responses being considered, groups were encouraged to share their opinions and ideas in order to provide a collaborative feedback sheet providing group answers to the key questions, which could then be shared and compared with the other group responses. The key issues identified by each group were summarised and presented to the whole audience as part of a plenary session.

Key Findings

Groups were fairly consistent in their responses to the exercise and consistent also with the results obtained from the interview / questionnaire survey. Responses indicated a growing awareness of the relevance of Environmental Capacity to the East Midlands and to Spatial Planning. All groups demonstrated through their responses an understanding of Environmental Capacity and all groups propounded its relevance in the East Midlands.

There was consistency in opinion that Environmental Capacity is relevant to the region, on the basis that the East Midlands ‘as a region is already depleted’ and ‘has a low starting point’ and its Environmental Capacity needs to be increased.

Groups’ responses were also consistent in the themes they flagged up as being of concern. The most commonly raised issues were concerns regarding the practical application of environmental capacity and uncertainty regarding the clarity of the concept of Environmental Capacity. These highlighted both limitations in the current practice and mechanisms of monitoring Environmental Capacity, as indicated from the results of the interview stage, and limitations in the capability of stakeholders to implement improved mechanisms.

Session One

Issue 1 Do you believe Environmental Capacity is relevant to the East Midlands?

This question intended to assess the understanding of the invitees of Environmental Capacity and to judge the level of importance that Environmental Capacity monitoring may be given by key stakeholders in the region. The results indicated that Environmental Capacity is considered to be relevant to the region in terms both of the region’s need to increase its environmental capacity and in more general environmental terms. Some concerns however were raised regarding the approach and application of Environmental Capacity in practice.

Levels of understanding of the meaning of Environmental Capacity appeared to be good, but with some reservations regarding practical application and scope (i.e. what should or should not be considered in relation to Environmental Capacity). The main positive responses and concerns are summarised in the tables below:

Positive View of the Relevance of Environmental Capacity

Theme	Response
Relevance	All groups acknowledged relevance of Environmental Capacity in general. Three groups made specific reference to the ‘low level’ or ‘depleted’ Environmental Capacity in the East Midlands, making Environmental Capacity particularly relevant to the region.
Approach	Two groups made reference to the positive nature of the new / different / broader landscape approach to spatial planning.
Monitoring and Application	Three groups made specific reference to the physical need to increase Environmental Capacity in the East Midlands. All groups mentioned the relevance to the region in terms of monitoring.
Funding	One group highlighted that consideration of Environmental Capacity as a potential lever for funding.

Concerns Regarding the Relevance of Environmental Capacity

Theme	Response
Application / Process	Four groups showed explicit concern over uncertainty of methods and mechanisms of application. All groups identified the need for clear and well defined processes of application.

Scope of the Relevance of Environmental Capacity

Theme	Response
Cultural Assets	Two groups made reference to the need to protect valued cultural assets.
Green Infrastructure	Flagged up as difficult to consider but this is needed.

There was general agreement across the delegates that despite the above concerns, Environmental Capacity was potentially a relevant concept to the East Midlands.

Issue 2 How should Environmental Capacity be used in Spatial Planning in the East Midlands?

This question intended to address the issue of practical application of Environmental Capacity to Spatial Planning in the region. Key stakeholders attending the workshop included representatives from local authorities and other bodies involved in Spatial Planning and so directly involved in the potential application of Environmental Capacity in future policy and decision making. Most stakeholders were already involved in environmental monitoring, therefore being best placed to identify key gaps in current practice and mechanisms for overcoming these.

All groups identified the link between Environmental Capacity and sustainable development, and agreed that awareness of Environmental Capacity in relation to Spatial Planning is necessary. Key themes were drawn out in relation to direct application of Environmental Capacity concerns and monitoring and additional requirements needed to aid application in Spatial Planning. The main points raised in relation to the practical application of Environmental Capacity and the main issues which would have to be dealt with are summarised below:

Practical Applications of Environmental Capacity in the East Midlands

Theme	Response
Management	Five groups made reference to how Environmental Capacity could / should be managed with specific reference being made to the role of Environmental Capacity in relation to Strategic Environmental Assessment, Planning Policy Statement 1: Delivering Sustainable Development (PPS1) and practical links to Green Infrastructure
Measurement of Environmental Capacity	Five groups stated the need for clarity of measurement of Environmental Capacity (clearly defined indicators and scales of measuring)
Locality	Two groups identified the need to categorise areas depending on their landscape type / particular issues and the need for area-specific analysis rather than a standard off the shelf approach.

Additional Requirements and Concerns Regarding the Practical Application of Environmental Capacity in the East Midlands

Theme	Response
Definitions	Two groups highlighted a need for clearer definitions – in terms of the nature of Environmental Capacity generally and its urban and rural definitions.
Participation	Five groups indicated a need for involvement of other groups / organisations and community involvement.
Data	Two groups identified the issue of collecting ‘new’ data and the current lack of capacity to deal with additional data and monitoring
Training	Three groups identified the need for acquiring further knowledge or training
Resources	One group showed concern at the ‘resource hungry’ nature of environmental monitoring.
Funding	One group showed concern regarding separating funding from development.

The key gaps in relation to the concept and application of Environmental Capacity that were uncovered in the interview stage of this study were reiterated in the consultees’ responses to the question of application of Environmental Capacity to the arena of spatial planning. Although respondents were more confident with the concept of Environmental Capacity, when asked to provide direction on the question of application, responses circled around issues of preparatory work, clarifying and further defining the role of Environmental Capacity and the structure of policy and practices surrounding its application.

Session Two – Monitoring Environmental Capacity

In order to build on the review of current environmental monitoring in the region and assess the relative priorities for future monitoring, discussion points were divided into stakeholders’ perceptions of short term and longer term priorities with a further question addressing the mechanisms used in monitoring and how these can be improved.

Issue 1 What are the key short-term priorities in environmental monitoring in the region?

Workshop attendees were encouraged to think practically about the current gaps and weaknesses in current environmental monitoring and the initial actions to be taken in terms of improving environmental monitoring generally and specifically in relation to monitoring Environmental Capacity.

Delegates were asked to consider priorities generally and in terms of particular aspects of the environment. In most groups the responses mainly related to priorities in terms of general methods / structures to be used, with some reference to particular immediate monitoring priorities. Key findings in terms of methods and scope / focus are summarized below:

Short-term Priorities in terms of Methods of Environmental Monitoring

Theme	Response
Guidance	All groups made reference to the need for some guidance or central governance, specifically in terms of standardisation and centralisation of data
Consistency	The need for a consistent / iterative approach specified as essential by five groups
Communication	All groups focussed on the need for improved information flow / linkages between sectors, interest groups and on a local/regional/national scale.

Standardisation of methodology	All groups indicated a need to develop an agreed method for assessing aspects of Environmental Capacity (including sensitivity and capacity) – to standardise and combine different aspects (e.g. LCA etc.)
Participation	Three groups identified need for integrative approach – including Regional Development Agency, Government, political advocates, statisticians etc.
Monitoring	Four groups made some reference to the need to raise awareness of environmental monitoring and establish the necessary resources / increase funding in this area.

Short-term Priorities in terms of the Scope / Focus of Environmental Monitoring

Theme	Response
Studies	Two groups specified a short term need to carry out sensitivity studies or phase one habitat / LCA / HLC studies.
Climate Change	Climate change was flagged up as a short term priority for one group, but identified as needing to be recognised as just an aspect of Environmental Capacity by another group.
Specific concerns	Only one group put most of their short term focus on climate change, water resource and quality, biodiversity and renewable energy.
Data	Three groups suggested need to identify and interpret existing data / indicators and to use them to better effect.

Key actions identified at the interview stage of consultation were reconfirmed by consultees at the workshop as of immediate importance. Namely:

- the **need to standardise the method and approach to data collection, then to standardise and integrate the datasets**, and
- the **need for data at a more local scale than regional** as regional averages do not take into account the significant variations within the region.

Other key short-term actions iterated at the workshop were:

- the **need for central governance and an integrative / communicative approach** between sectors
- the **need to raise awareness and increase funding** / resources to this area.

Issue 2 What are the key longer-term priorities / aspirations for environmental monitoring?

All responses to the question of longer term priorities were centred on issues pertaining to Environmental Capacity methodology and application rather than specific monitoring priorities. This may indicate a lack of awareness of environmental issues or resistance to identifying key issues among key stakeholders involved in the region's spatial development. It should be noted that one group expressed the concern that 'only short term priorities happen' and therefore this group only made all their priorities short-term priorities. The findings here cross over with the issues raised under improved mechanisms for monitoring on the following page. The longer term priorities are summarized overleaf:

Longer-term Priorities in terms of Methods and Application of Environmental Capacity

Theme	Response
Leadership	One group stated a need for an identified responsible body to lead the way with regards to Environmental Capacity
Accessibility of data	Two groups expressed the wish for a regional data portal or equivalent. Most groups indicated a need to identify gaps in existing data. The need to break down barriers between potential sources of data was expressed.
Regulation	Three groups indicated a need for standards and systems to regulate Environmental Capacity monitoring and for standards within spatial planning in response to the monitoring
Cross-sectoral working	Two groups stipulated a need to work with and learn from sectors other than the environmental sector
Awareness-raising	Three groups indicated that a longer term priority should be in raising understanding of environmental concerns.

Again, results obtained at the interview stage of consultation were reinforced at the workshop stage. The two common themes drawn out at interview stage were:

- the **need for an identifiable point of data collection and interpretation** such as an **Environmental Observatory**
- **Tackling the issue of longer term monitoring** of the environment and development.

These themes were expanded during workshop discussion to address issues such as

- the **need for co-operation** between sectors and data holders
- the need for **raising awareness** of environmental concerns

Issue 3 How might improvement in the mechanism for delivering better environmental monitoring be achieved?

The presentation on environmental monitoring highlighted the current gaps and limitations in monitoring which were identified at the interview stage of consultation. Stakeholder responses reflected and built on these concerns but seemed to focus primarily on questions of clarity, organisation and understanding around the area of Environmental Capacity monitoring and are summarised below:

Theme	Response
Resources	Two groups highlighted the need for increased resources / funding to support action
Consistency	Again all groups identified the need for clarity and consistency in data collection / themes / presentation methods
Spatial Interpretation	One group saw a need for spatial interpretation of Environmental Capacity data (such as those done for RNRP). LCA analysis and spatial awareness was a common theme.
Awareness-raising	Three groups placed emphasis on raising understanding of environmental monitoring and concerns.
Action!	Two groups expressed the point that further to monitoring etc. something needs to be done with the information – the need to follow up. One group went as far as to mention translocation further to implementation.
Targets	Two groups at least identified the need to set baselines and identify targets for the future.

The results of the workshop discussions indicate an awareness of the problems cited at the interview stage with regards to monitoring Environmental Capacity and a general willingness to tackle these problems, with some suggestion of how to do so. The main themes highlighted for improving the monitoring of Environmental Capacity were:

- the **need for clarity and consistency** in data collection, application and presentation
- the **need to raise awareness and understanding** of the need for environmental monitoring
- the **need to follow up** monitoring with **action**



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an evidence base fit for purpose

Final Report
December 2008

